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Anatomy of an Iron Age Roundhouse

The Cnip Wheelhouse Excavations, Lewis

Ian Armit

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IAN ARMIT

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Summary

The Cnip wheelhouse complex is a spectacularly well-preserved Iron Age settlement on the west coast of Lewis, in the Western Isles of Scotland. The site was revealed by coastal erosion on a small machair beach during 1988 and was subject to two short seasons of rescue excavation. Cnip forms part of the rich archaeological landscape of the Bhaltos peninsula, along with a range of other Iron Age monuments. The importance of the site lies in its exceptional degree of preservation, both structural and stratigraphic, which permitted the dissection and interpretation of the drystone buildings themselves and of the Iron Age occupation deposits within them.

The settlement when first built (Phase 1) comprised two wheelhouses of which one (Wheelhouse 2) was left incomplete with unused masonry stacked in parts of its entrance passage and interior. The other wheelhouse, Wheelhouse 1, survived with elements of its peripheral stone roofing intact. The partial dismantling of the unfinished wheelhouse and the recording of the standing sections of Wheelhouse 1 enabled a detailed reconstruction of the process of construction from the digging of foundations to the emplacement of the roof. This has shown that the quality of drystone construction demanded skill levels analogous to those required in the tallest broch towers. Although monumental in internal construction, the resultant structures were sunk into a sand dune, and all but hidden from the outside. During Phase 2, Wheelhouse 1 began to become structurally unstable and the settlement was progressively modified to create a cellular layout. Occupation continued inside the wheelhouse, although some of the bays were blocked and parts of the roofing propped up, altering the spatial arrangements. A second building, Structure 4, was built off the wheelhouse entrance passage, forming a separate focus for the settlement. In Phase 3 the cellular layout was replaced by a single, rectilinear domestic building, Structure 8, presently unique in Atlantic Scotland. Following the abandonment of this structure and subsequent small-scale re-use, the site was abandoned and engulfed by sand. There is no indication of any break in this sequence of occupation.

A series of radiocarbon dates, taken almost exclusively from mammal bone stratified within the house floors, provides reasonably secure dating for Phase 2 (*c* AD 1–100) and Phase 3 (*c* AD 100–250) but leaves problems of interpretation for Phase 1. It seems likely that the dates obtained from Phase 1 comprise a mixture of bone discarded during occupation and curated bone deriving from foundation deposits. Although it is impossible to date the construction of the wheelhouse with any confidence, there was clearly occupation during the first century BC and construction may have been a century or more earlier.

The excavations produced a rich artefactual assemblage including some 6,000 sherds of pottery, much of it highly decorated, forming a tightly stratified sequence. This material provides new insights into the chronology of Iron Age pottery in the region, and highlights the steady reduction in the quality and variety of ceramic production in the early centuries AD. Other artefactual material includes a wide range of bone and antler objects, mostly indicating the working of materials such as hides and textiles, but including more unusual and evocative objects such as a lyre tuning peg, a model sword and a gaming piece. There is also a small assemblage of rotary querns, all found in secondary contexts, and an absence of saddle querns. Copper alloy objects were very rare and could not have been common on the site, although there was some evidence for iron tools, including a remarkable iron spade shoe used for hand cultivation of the light machair soils. The distribution of finds gave some evidence for the zoning of activities, including the apparent segregation of metal-working and (more surprisingly) mammal-bone-working, from the houses themselves.

The faunal evidence is equally striking, indicating an economy with a significant reliance on red deer, which probably involved the active management of these 'wild' animals. There is also a considerable reliance on the raising of cattle which can be interpreted in two ways. It is possible that the kill-patterns in the cattle assemblage indicate a marginal economy where calves were slaughtered young to provide meat and avoid the need to maintain

them through the winter. An alternative is that the same patterns may indicate a dairying economy, where calves are killed to free up milk for human consumption. The arguments are detailed in the main text. There was a lesser reliance on sheep and a few pigs were kept on the site. As elsewhere during this period, there was little dependence on fishing although marine mammals were exploited on an opportunistic basis.

Throughout the deposits there is evidence for ritual activity including the deposition of human and animal body parts, as at other wheelhouse sites where they have been used to argue for a well-developed Iron Age cosmology. These deposits can be associated with key moments in the lives of the inhabitants and in the 'birth, life and death' of individual buildings on the site. There is a particularly marked incidence of human skull fragments suggesting a special interest in the curation and display of the human head, which finds echoes elsewhere in the British and European Iron Age.

The final part of the report deals with some of the wider issues relating to Cnip and its place in the Atlantic Scottish Iron Age. The lives of the community at Cnip were closely inter-twined with those of their neighbours both in terms of their economic lives, especially transhumant pastoralism, and their social lives. The adoption of wheelhouse architecture in a region previously dominated by the more outwardly monumental Atlantic roundhouses clearly indicates major shifts in social relations. These are discussed in relation to shifting patterns of land-holding and the emergence of social inequalities at the end of the first millennium BC.

Résumé

(translated by Kirsten Leask)

Le complexe de 'wheelhouse' de Cnip est un habitat spectaculairement bien préservé de l'âge du fer sur la côte occidentale de Lewis, dans les Iles Hebrides, en Ecosse. L'habitat a été découvert suite à l'érosion côtière d'une petite plage de *machair* en 1988 et a été le sujet de deux saisons courtes de fouilles de sauvetage. Cnip fait partie du riche paysage archéologique de la péninsule de Bhaltos, avec beaucoup d'autres monuments de l'âge de fer. L'importance de l'habitat se situe en son degré exceptionnel de conservation, structurale et stratigraphique, qui a permis la dissection et l'interprétation des bâtiments en mur de pierres sèches et des niveaux d'occupation de l'âge de fer associés.

L'habitat initialement construit (phase 1) a comporté deux *wheelhouses* dont une (Wheelhouse 2) a été laissée inachevée, la maçonnerie inutilisée empilée dans une partie de son passage d'entrée et de son intérieur. L'autre *wheelhouse* (Wheelhouse 1) a survécu avec des éléments de sa toiture périphérique en pierre intacts. Le démantèlement partiel de Wheelhouse 2, non finie, et l'étude des sections preservées de Wheelhouse 1 ont permis une reconstruction détaillée du processus de construction, du creusement des fondations à la mise en place du toit. Ceci a prouvé que la qualité de la construction des murs en pierres sèches a demandé des niveaux de compétence analogues à ceux exigés dans les tours des plus grands *brochs*. Bien que monumentales dans la construction interne, les structures résultantes ont été inserées dans une dune de sable, presque cachées de l'extérieur. Pendant la Phase 2, Wheelhouse 1 a commencé à devenir structurellement instable et l'habitat a été progressivement modifié pour créer un plan cellulaire. L'occupation a continué à l'intérieur de la *wheelhouse*, bien que certains des compartiments aient été bloqués et que certaines parties de la toiture aient été étayées vers le haut, changeant les arrangements spatiaux. Un deuxième bâtiment (Structure 4) a été construit en dehors du passage d'entrée de Wheelhouse 1, formant un different point focal pour l'habitat. Dans la Phase 3, la disposition cellulaire a été remplacée par un bâtiment domestique simple et rectiligne (Structure 8), actuellement unique en Ecosse Atlantique. Après l'abandon de cette structure et quelques réutilisations temporaires suivantes, l'habitat entier a été abandonné et englouti par le sable. Il n'y a aucune indication d'une quelconque coupure dans cette occupation.

Une série de dates radiocarbone, prise presque exclusivement sur des os mammifères stratifiés dans les sols de la maison, a permit de dater raisonnablement la Phase 2 (1–100 ap. J.-C.) et la Phase 3 (100–250 ap. J.-C.) mais il est difficile de dater la Phase 1. Il semble probable que les dates obtenues pour la Phase 1 comprennent un mélange d'os rejetés pendant l'occupation et d'os curés dérivant des dépôts de base. Bien qu'il soit jusqu'à maintenant impossible de dater la construction de la *wheelhouse* avec confiance, il y avait clairement une periode d'occupation pendant le 1er siècle av. J.-C. et la construction elle-même a pu avoir été debutée un siècle ou plus auparavant.

Les fouilles ont produit une grande collection de mobilier, comprenant environ 6,000 tessons de céramique, en grande partie décorés, formant une étroite séquence stratigrahique. Ce matériel fournit de nouvelles informations sur la chronologie des céramiques de l'âge du fer dans la région, et met l'accent sur la régulière réduction de la qualité et de la variété de la production céramique dans les premièrs siècles ap. J.-C. L'autre matériel mobilier inclut un éventail d'objets en os et en bois de cerfs, la plupart du temps témoignant du travail de matériaux comme peaux et textiles, mais aussi incluant des objets moins communs et plus évocateurs tels qu'une cheville d'accord de lyre, une épée modèle et une pièce de jeu. Il y a également un petit assemblage de meules rotatoires, toutes trouveés en contextes secondaires, et une absence de meules 'en selle'. Les objets en alliage de cuivre étaient très rares et ne pouvaient pas avoir été communs à Cnip. En revanche, il y avait quelques outils en fer, y compris un remarquable fer de bêche utilisé pour la culture manuelle des sols légers de *machair.* La distribution du mobilier a démontré un zonage des activités, y compris la ségrégation apparente de la métallurgie et (plus étonnant) du travail des os mammifères, des maisons elles-mêmes.

Les données sur la faune sont également importantes, indiquant une économie dépendante fortement des

cerfs et impliquant probablement la gestion active de ces animaux 'sauvages'. Il y a également une dépendance considérable sur le bétail, ce qui peut être interprété de deux manières. Il est possible que les modes d'abattage indiqués dans l'assemblage du bétail indiquent une économie marginale où les veaux étaient abattus jeunes pour fournir de la viande et pour éviter la nécessité de les maintenir à travers l'hiver. Une alternative serait que les mêmes modes d'abattage indiquent une économie d'industrie laitière, où les veaux sont tués pour libérer le lait pour la consommation humaine. Les arguments sont détaillés dans le texte principal. Il y avait une moindre dépendance sur les moutons et quelques porcs ont été gardés sur l'habitat. Comme ailleurs à cette période, il y avait peu de dépendance à l'égard de la pêche bien que des mammifères marins aient été exploités opportunément.

Dans tous les dépôts, il y a des preuves d'activité rituelle comprenant la déposition de parties de corps humains et animaux, comme à d'autres *wheelhouses*, ce qui a provoqué la citation de ces monuments comme plaidoyer d'une cosmologie bien développée dans l'âge du fer. Ces dépôts peuvent être associés aux principaux moments dans les vies des habitants et dans la naissance, vie et mort des différents bâtiments. Il y a une importance particulièrement marquée des fragments de crânes humains, suggérant un intérêt spécial pour la curation et l'affichage de têtes humaines, ce qui se retrouve ailleurs dans l'âge de fer Britannique et Européen.

La dernière partie du rapport traite des questions plus larges concernant Cnip et de sa place dans l'âge de fer Ecossais Atlantique. Les vies au sein de la communauté à Cnip étaient étroitement entrelacées avec ceux de leurs voisins en ce qui concerne leurs économies, en particuliers le pastoralisme transhumant, et leurs vies sociales. L'adoption de l'architecture *wheelhouse* dans une région précédemment dominée par les 'Atlantic roundhouses', beaucoup plus monumentales, indique clairement de profonds changements dans les relations sociales. Ces dernières sont discutées par rapport aux modèles changeants de propriété à la terre et de l'apparition des inégalités sociales à la fin du 1er millénium av. J.-C.

Zusammenfasung

(translated by Ulrike Wenzel)

Der Cnip 'Wheelhouse'-Komplex ist eine beeindruckend gut erhaltene Siedlung aus der Eisenzeit, an der Westküste von Lewis, äussere Hebriden, Schottland. Die Stätte wurde 1988 durch Küstenerosion auf einem kleinen 'Machair'-Strand freigelegt und wurde in zwei kurzen Ausgrabungsprojekten geborgen. Cnip, ebenso wie eine Anzahl weiterer Eisenzeit-Monumente, ist Bestandteil der reichen archaeologischen Landschaft der Bhaltos Halbinsel. Die Bedeutung dieser Stätte liegt in ihrem aussergewöhnlichen Erhaltungsgrad, sowohl strukturell als auch stratigraphisch, welcher eine Analyse und Interpretation der Trockensteingebäude an sich und der darin enthaltenen Eisenzeitgegenstände erlaubte.

Die Siedlung, zum Zeitpunkt der ersten Bauphase (Phase 1), bestand aus zwei 'Wheelhouses'. Eines der beiden Häuser wurde nicht fertiggestellt und enthielt Stapel ungenutzten Mauerwerks im Eingangs- und Innenbereich. Das andere 'Wheelhouse', Wheelhouse 1, blieb mit Elementen des periphären Steindaches erhalten. Ein partieller Abbau des unfertigen 'Wheelhouse' und die Aufzeichnung der stehenden Bereiche von Wheelhouse 1 ermöglichten eine detaillierte Rekonstruktion des Bauprozesses, vom Aushub des Fundaments bis zum Einbau des Daches. Dieses zeigte, dass die Qualität der Konstruktionen aus Trockenstein eine Fertigkeit erforderte, die analog zu der ist, die beim Bau der höchsten Broch-Türme benötigt wurde. Obwohl imposant in der Innenkonstruktion, versanken die fertigen Bauwerke in einer Sanddüne und wurden somit vor der Aussenwelt verborgen. Im Laufe der Phase 2 begann das Wheelhouse 1 strukturell instabil zu werden und wurde schrittweise zu einem zellartigen Layout umgewandelt. Die Bewohnung des Hauses bestand fortlaufend, obwohl manche der Erker gesperrt und Teile des Daches abgestützt wurden und somit die räumliche Einteilung geändert wurde. Ein zweites Gebäude, Bauwerk 4, wurde neben der 'Wheelhouse'-Eingangspassage errichtet und formte einen gesonderten Fokuspunkt in der Siedlung. In Phase 3 wurde der zellenförmige Grundriss durch ein einzelnes, geradliniges Wohngebäude, Bauwerk 8, ersetzt, welches zum heutigen Zeitpunkt einzigartig im atlantischen Schottland ist. Im Anschluss an die Aufgabe dieses Bauwerks und die anschliessende Wiederverwendung in kleinerem Masstab wurde diese Stätte verlassen und von Sand eingehüllt. Es gibt keine Anzeichen auf jegliche Unterbrechung in dieser Abfolge der Besiedlung.

Eine Serie von Radiokarbon-Daten, ermittelt fast ausschliesslich aus in den Hausboden eingelagerten Säugetierknochen, gewährt eine relativ sichere Datierung von Phase 2 (zirka 1–100 n.Chr.) und Phase 3 (zirka 100–250 n.Chr.), birgt jedoch Probleme für die Auswertung von Phase 1. Es scheint wahrscheinlich, dass die von Phase 1 ermittelten Daten aus einer Mischung von Knochen aus Essensabfällen zu Zeiten der Bewohnung, sowie von aus den Fundamentablagerungen stammenden älteren Knochen bestehen. Obwohl es unmöglich ist den Bau des 'Wheelhouse' mit Sicherheit zu datieren, gab es eine nachweisbare Bewohnung des Gebäudes im 1. Jahrhundert v. Chr. Der Bau könnte möglicherweise im Jahrhundert zuvor oder noch eher erfolgt sein.

Die Ausgrabungen produzierten eine reiche Sammlung an Artefakten, einschliesslich 6,000 Tonscherben, welche zum grössten Teil stark dekoriert sind und eine dicht geschichtete Sequenz formten. Dieses Material bietet neue Einsichten in die Chronologie der Töpferwaren der Eisenzeit dieser Region und hebt die beständige Reduzierung in Qualität und Vielfalt in der Tonwarenproduktion in den ersten Jahrhunderten nach Christus hervor. Andere artefaktische Materialen beinhalten eine weite Reihe von Knochen- und Geweih-Objekten, welche zumeist zum Bearbeiten von Häuten oder Textilien benutzt wurden. Zudem gab es weitere ungewöhnliche und sinnträchtige Gegenstände, wie einen Stimmwirbel für eine Leier, ein Modellschwert und ein Spielstein. Des Weiteren gab es eine kleine Sammlung an Drehmühlen aus Stein, alle in sekundärem Zusammenhang, es fehlten die dazugehörigen Sattel-Steinmühlen. Kupferlegierte Objekte waren sehr selten und konnten nicht sehr gebräuchlich an dieser Stätte gewesen sein, obwohl einige Belege für Eisenwerkzeuge vorhanden waren, einschliesslich eines aussergewöhnlichen eisernen Spatenblatts, genutzt für die Handbestellung der leichten

'Machair'-Böden. Die Verteilung der Funde brachte einige Beweise für die Zonierung der Aktivitäten, einschliesslich der offensichtlichen Ausgliederung der Metallbearbeitung und (überraschenderweise) Säugetierknochen-Bearbeitung aus den Häusern an sich.

Die faunistischen Belege sind gleichermassen eindrucksvoll und weisen auf eine Wirtschaft mit einer signifikanten Abhängigkeit auf Rotwild hin, welche wahrscheinlich das aktive Management dieser Wildart beinhaltete. Weiterhin gab es einen beachtlichen Verlass auf die Rinderzucht, welches in zweierlei Hinsicht interpretiert werden kann. Es ist möglich, dass das Schlachtmuster der Rinderherde auf eine marginale Wirtschaft hinweist, in der die Kälber jung getötet wurden, um Fleisch zu liefern und zudem nicht mehr durch den Winter gebracht werden mussten. Eine Alternative ist, dass der gleiche Ablauf auf eine Milchwirtschaft hinweist, in der die Kälber geschlachtet wurden, um die Milch für den menschlichen Gebrauch freizugeben. Diese Thesen sind im Haupttext näher beschrieben. Es gab eine geringere Abhängigkeit von Schafen, dazu wurden in der Siedlung ein paar Schweine gehalten. Wie anderswo zu dieser Zeit verliess man sich weniger auf die Fischerei, obwohl Meeressäuger auf opportunistischer Basis genutzt wurden.

In durchweg allen Schichten gibt es Belege für rituelle Aktivitäten, einschliesslich der Ablagerungen von menschlichen und tierischen Körperteilen, welche, genau wie in anderen 'Wheelhouse'-Siedlungen, zur Unterstützung der Argumentation zugunsten einer gut entwickelten Eisenzeit-Kosmologie verwendet wurden. Diese Ablagerungen können mit Schlüsselmomenten im Leben der Bewohner assoziiert werden, ebenso wie mit 'Geburt, Leben und Sterben' der einzelnen Gebäude der Stätte. Ein besonders hervortretendes Vorkommnis von Fragmenten menschlicher Schädel deutet auf ein spezielles Interesse an der Heilung und Darstellung des menschliches Kopfes hin, welches sich ebenso in anderen Teilen Britischer und Europäischer Eisenzeit wiederfindet.

Der abschliessende Teil dieses Berichtes behandelt einige weitere Themen bezüglich der Stätte Cnip und deren Stellung in der atlantisch-schottischen Eisenzeit. Das Leben in der Gemeinde von Cnip war eng mit dem der Nachbarn verflochten, im wirtschaftlichen Aspekt, insbesondere in Bezug auf die transhumane Weidewirtschaft, sowie im sozialen Aspekt. Die Aufnahme der 'Wheelhouse'-Architektur in eine Region bislang beherrscht von den mehr äusserlich imposanten Atlantischen Rundhäusern, ist ein klarer Indikator für eine starke Veränderung sozialer Beziehungen. Diese werden in Bezug zu den sich wandelnden Modellen des Landbesitzes und den hervortretenden sozialen Ungleichheiten am Ende des 1. Jahrhunderts vor Christus diskutiert.

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Notes

The excavated site lies at NB 0978 3659 and is recorded in the National Monuments Record for Scotland as NB 03 NE 17. The site archive has been deposited with the National Monuments Record of Scotland. Throughout this report, the Gaelic spellings of Bhaltos, Cnip, Calanais, Chàrlabhaigh, Bostadh and Clibhe are used to accord with current road signs and forthcoming map editions. Older maps and previous archaeological publications often refer to these places by their anglicized spellings, Valtos, Kneep, Callanish, Carloway, Bosta and Cliff.

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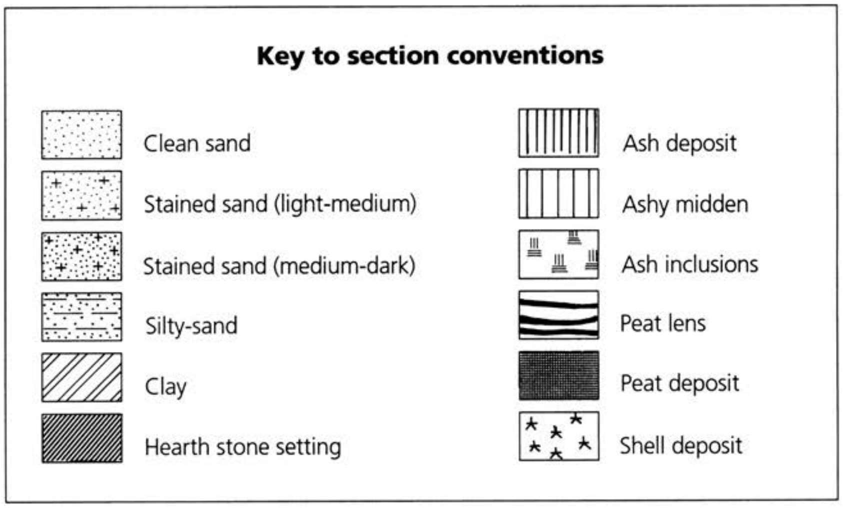
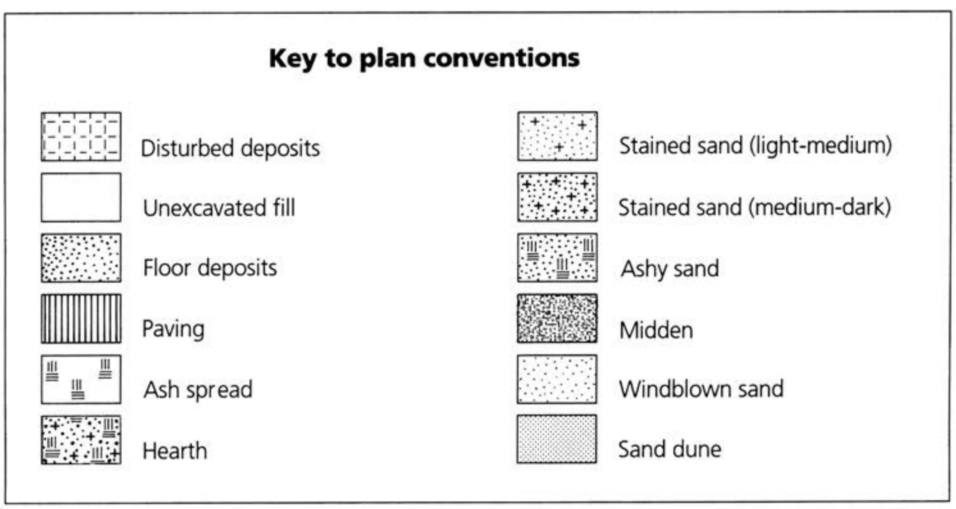
Key to section and plan conventions





Chapter 1

Introduction

It is rare for an archaeological excavation, at least in northern Europe, to discover a previously unknown prehistoric building with elements of its roof still intact. Yet that is what happened at Cnip, on the west side of Lewis over Easter 1988 (Ill 1.1). Six weeks of increasingly frenetic digging gradually revealed the remains of a small Iron Age settlement from its construction in the final centuries BC, through its modification, decline and eventual abandonment around the third century AD. This report tells the story of that excavation and explores the ways in which the results help us to understand the nature of Iron Age life in the Western Isles and beyond.

1.1 BACKGROUND TO THE EXCAVATION

The excavations at Cnip formed part of a wider programme of survey and excavation carried out in Lewis by Edinburgh University's Calanais Archaeological Research Project (cf Harding & Topping 1986; Harding & Armit 1990; Harding & Gilmour 2000; Harding & Dixon 2000). Unlike other elements of the project, however, the work at Cnip was organized in response to a sudden and direct threat to the survival of the site, and was largely funded by Historic Scotland and its predecessor organizations as part of their Rescue Archaeology programme.

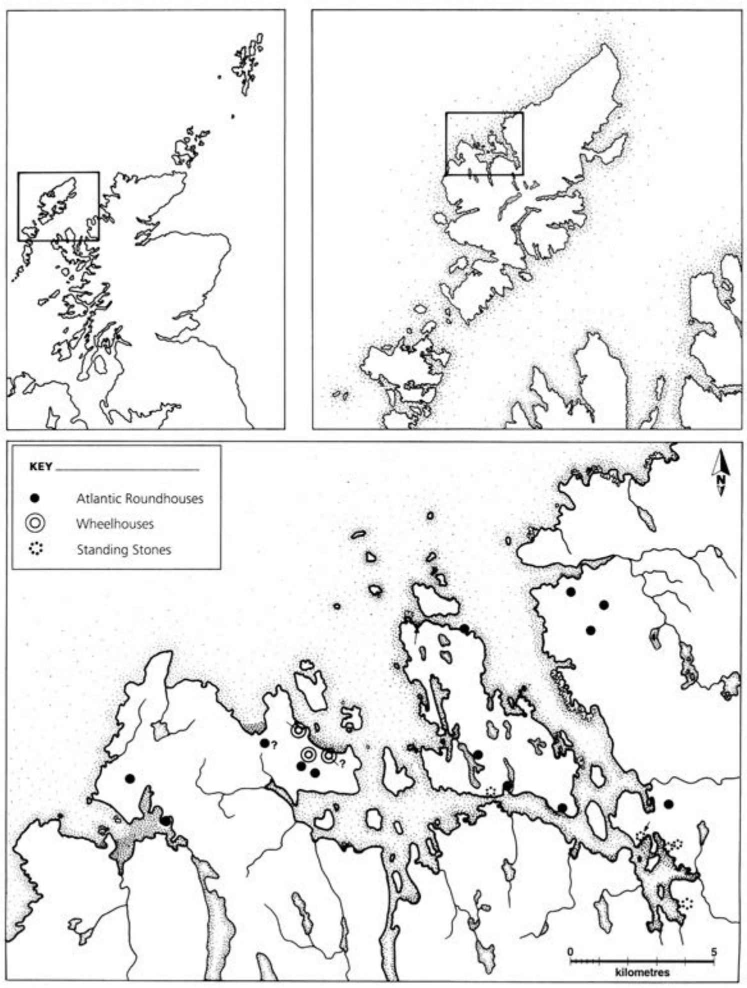


ILLUSTRATION 1.1
Location map.

ILLUSTRATION 1.2
The beach section, seen from the east during initial recording, Easter 1986.

The site first came to archaeological attention during Easter 1986. During the holiday period a steady stream of visitors passed through the excavations at the Loch na Beirgh broch tower on the Bhaltos peninsula, then being conducted by the Calanais Archaeological Research Project (CARP). Among the visitors were Mr and Mrs Leviseur from the neighbouring township of Cnip, who happened to mention that the severe winter gales had caused substantial erosion of the sand dunes fringing the beach in front of their house. This erosion had apparently revealed a mass of collapsed masonry and dark sand. As the site in question lay just 1.5km north of the Loch na Beirgh site, and well within the CARP study area, a site visit was clearly in order.

An inspection quickly confirmed the initial suspicion, that the stonework and dark soil represented a potential prehistoric structure and accompanying midden, eroding onto the beach. A small collection of largely unstratified material, including characteristic Middle Iron Age pottery, gave a broad indication as to the likely date of the structure. At the end of the season's work at Loch na Beirgh, therefore, it was decided to clean, straighten and record the section in order to assess the nature of this new and intriguing site.

A couple of days spent recording the section revealed an apparent concentration of activity within a band at least 26m long and 1m deep (Ill 1.2). The south-eastern part of the section seemed to represent the collapsed dry-stone wall of a building, while the north-western part was largely free of stones and seemed more likely to represent former midden and cultivated soil (Armit 1986). The initial hypothesis, that this section represented the wall of a wheelhouse which had only just begun to be exposed, was to prove more or less accurate, and subsequent work on the site was carried out in the light of this interpretation.

From its initial discovery it was clear that this was a site under severe threat. Reliable local reports suggested that at least 2.5m of the sand dunes along this part of the beach-front had been lost to tidal erosion in the previous two years. There was considerable worry locally about the effects that this movement of the coastal dunes would have on the houses closest to the sea, one of them less than 15m from the exposed erosion face. Initially, however, it appeared that there was no way in which this site could be manageably excavated, as the overburden of sterile windblown sand would have been hugely cumbersome to excavate, while its removal would potentially have de-stabilized the area still further.

Matters were brought to a head during 1987, when Comhairle nan Eilean announced plans to address the precarious situation on the Cnip beach-front by building a protective sea-wall along the worst affected area, at the south-east end of the beach. While this was clearly the best answer for the preservation of the modern houses, however, the cutting-back required to build the sea-wall would involve the loss of a large part of the archaeological site. Worse still, from the archaeological point of view, the plan also involved the emplacement of a sewerage trench behind the sea-wall, adding further to the loss of archaeological deposits.

In order to assess the likely impact of these works a trial excavation was arranged in September 1987 to examine an area behind the dune-front (Ill 1.3). Examination of a single trench, some 10m by 6m, established that the area due for destruction did indeed contain archaeological deposits. This exercise not only appeared to confirm the earlier interpretation of the site as a wheelhouse but also produced evidence of a later, linear structure provisionally interpreted as a souterrain (Harding & Armit 1987). Further finds reinforced the earlier view that the structures were of Iron Age date.

These results clearly indicated that this was a site of some complexity and importance, particularly in view of its potential relationship with the nearby excavated sites of Loch na Beirgh and Dun Bharabhat (Harding & Gilmour 2000; Harding & Dixon 2000). The scale of work required, as well as the timescale of the proposed construction operations, meant that the excavation, if it was to happen at all, could not be accommodated within the normal workings of the CARP. An application for funds was therefore made to the Historic Buildings and Monuments Division of the Scottish Development Department (henceforth referred to by the name of its successor body, Historic Scotland).

Once funding had been secured, an initial season of excavations, with a team of 11 excavators, was arranged from 21 March to 14 April 1988. The extraordinary quality of preservation of the dry-stone structures on the site was such that a follow-up excavation season was required. Consequently a new team of 11 was despatched for a further three weeks, from 3 to 21 May 1988.

Excavations in 1988 were concentrated on the area behind the proposed sea-wall and in the path of the proposed sewerage trench (Ill 1.3). The nature of the threat, together with the limited time and resources available, dictated the excavation strategy. A single trench, approximately 16m by 15m in its final form, was opened over the threatened area, with the initial aim of complete excavation. The deep overburden of sterile sand was removed by a Hymac supplied by the site contractor, with the blessing of Comhairle nan Eilean, and the debris was dumped forward onto the beach (Ill 1.4). The exposed archaeological layers were then excavated entirely by hand.

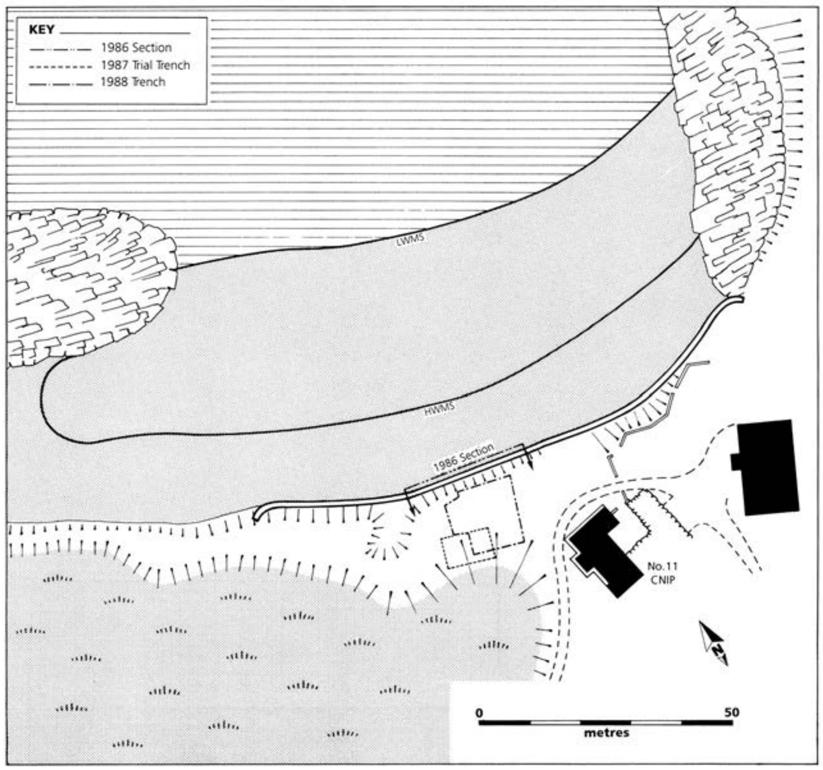


ILLUSTRATION 1.3
Location of the excavations (showing 1986, 1987 and 1988 work).

ILLUSTRATION 1.4
Traigh Bhaltos, during the excavation: the site lies behind the mounds of dumped sand which project onto the beach.

There was little scope for active decision-making in the placing of the trench. Its south-eastern extent was restricted by a sharp rise in ground level, approaching the drive-way of No 11 Cnip, a croft-house situated worryingly close to the area of excavation (Ill 1.5). Further buried structures may well lie under this and other modern houses to the east and south-east of the excavated areas, but they are entirely inaccessible.

The north-east edge was limited by the coastal erosion face and a baulk had to be left, around 2m wide, to prevent the dumped sand overburden from being blown or washed back into the trench. This had the unfortunate effect of dissociating the observations made in the 1986 section from the main excavated sequence (the 1986 section has been deposited in the site archive, but is not discussed further in this report). Local reports of 'black soils' on the beach-front hint that much had been lost to the north-east over previous decades, but whether this included buildings as well as midden material is unclear.

The north-western and south-western edges were the areas where further extensions could have been made had resources permitted. However, the trench as opened scored a more or less direct hit on a coherent and richly preserved group of structures, while evidence of structures and deposits seemed to fade away both to the north-west and south-west (as indeed the 1986 section recording had suggested: Armit 1986). Although we could not discount the possibility of further remains in these directions, the excavation had quickly found its focus and further extension would have been unmanageable in the time available. A further concentration of structures of probable prehistoric date certainly does lie a short distance along the beach to the north-west (Armit & Dunwell 1992), but there does not appear to be any surviving physical link between the two sites. Furthermore, any structures and deposits which do exist to the immediate north-west and south-west of the excavated area will probably have survived the subsequent construction operations on the site and will be available for future work.

Within the single excavated trench we had more than enough to keep us busy (Ill 1.5). The site eventually produced two wheelhouses, one with parts of its roof intact (first identified in the 1987 trench), the other apparently unfinished (first identified in the 1986 section). It also produced a secondary settlement of cellular plan, and a final occupation represented by a rectilinear structure (the 'souterrain' of the 1987 excavations). At any one time all of the buildings on the site were accessible from each other and appear to have formed a single settlement unit.

During the course of the excavations, as the exceptional condition of the site became apparent, consideration was given by Comhairle nan Eilean and others to its consolidation and preservation. The excavations generated considerable local and national publicity and a continuous stream of visitors meant that, for the second season at least, at least one team member had to be on duty at all times to give site tours and to stop over-curious visitors from disappearing into gaping voids in the Iron Age masonry. In the end, however, the impracticality of preserving unstable dry-stone masonry backed into dry, unconsolidated sand meant that the original plans were followed through to completion. Following excavation, therefore, the site duly received its sewerage pipe and the northern part of the trench was quarried away to hold the new sea-wall. Nothing is visible of the site today and the masonry buildings have been largely destroyed. An important exception is the section of preserved wheelhouse roof, comprising two corbelled bays, which has hopefully been preserved by a slight diversion of the sewerage pipe. It is also possible that the lowest levels of the principal wheelhouse remain substantially intact, together with their unexcavated primary floor deposits.

1.2 AIMS AND LIMITATIONS

The aims of the excavations at Cnip were largely dictated by circumstances. This was a rescue excavation in the truest sense, with anxious contractors peering over the excavators' shoulders throughout. Despite the preliminary works in 1986 and 1987, the organization of the main excavations had to be carried out at short notice and before we had real any idea of the quality of structural preservation likely to be encountered.

The initial intention was simply to unravel what was already recognized as a potentially complex stratigraphic sequence, and to characterize the various buildings present, as from the 1987 work it had been apparent that more than one structural type was represented. The dating of the various structures, both relative and absolute, was a priority from the beginning, not least because of my then ongoing research into the later prehistoric structures of the islands (subsequently published as Armit 1992). The recording and analysis of constructional techniques was another primary objective which assumed even greater significance

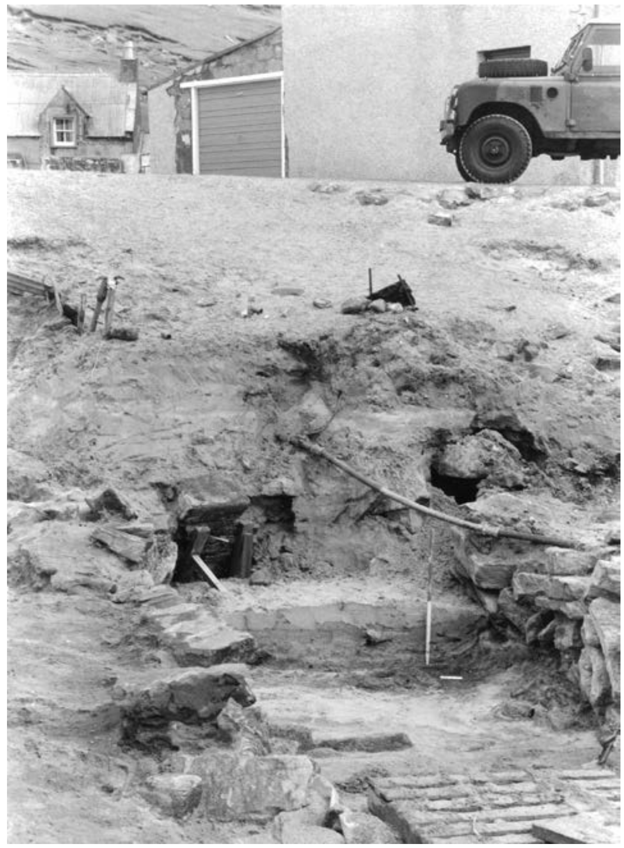


ILLUSTRATION 1.5
The initial discovery of the corbelled cells after the machine removal of the upper blown sands. The voids of the empty cells can be seen towards the centre of the photograph, and the upper front of one bay is propped up with wooden stobs. Compare this photograph with Ill 6.5 which shows the upper parts of the bays partially excavated. Note also the proximity of the house and drive-way. The water-pipe which spans the cleared area had clipped the tops of the bay roofs.

once the extent of the preservation of the buildings was realized. The priority given to this element of the work lay in the intention, at that time, to embark on a programme of experimental building reconstruction as part of the CARP.

Other primary aims included the recovery of artefactual and ecofactual material which might expand our understanding not only of the Cnip wheelhouse site, but also of the wider cultural, social and economic changes which occurred within the Bhaltos peninsula during the Iron Age, complementing the accumulating evidence from Loch an Beirgh and Dun Bharabhat.

In these aims the project has been largely successful, particularly in terms of the evidence recovered for construction methods (especially for the wheelhouses) and for the detail in which it became possible to trace the development of the settlement. The dating evidence for all but the primary phases has proved immensely useful and has enabled the characterization of an artefactual assemblage which can be unusually closely dated. Evidence for the economic basis of the site has been both profuse and surprising (particularly with regard to the importance of red deer) and is especially informative when combined with the results from other sites in the Bhaltos peninsula. There are, however, limitations in the range of data resulting from two inter-related factors: firstly, and rather ironically, the high degree of structural preservation; and secondly, the pressure on time and resources during fieldwork.

It became apparent after only a few days excavation that the survival of the buildings at Cnip was far greater than could reasonably have been expected.

ILLUSTRATION 1.6
This photograph shows the cramped and rather precarious working conditions inside Wheelhouse 1 and gives some idea of the scale of the surviving stone elements.

ILLUSTRATION 1.7
This photograph, taken shortly after the machine clearance of the sand overburden, shows the process of cleaning back to reveal the tops of the stone structures.

The site boasted not one but two wheelhouses, one of which had parts of its roof intact. Furthermore, the 1987 'souterrain' was found to be a presently unique rectilinear structure intact to its wall-head. Various elements of the cellular complex also had intact roofs, and the preservation of masonry was complemented by deep and clearly stratified accumulations of sediment, rich in both bone and pottery. A total excavation period of around six weeks with a maximum of 11 people was by no means enough to do full justice to a site preserved on this scale, and prioritization was inevitable.

The time of year was a further hindrance, although the weather was, sometimes, kinder than we had any right to expect. At other times the excavation team was sand-blasted and soaked, either sequentially or simultaneously, and walls and sections periodically abandoned themselves to gravity before they could be fully recorded. Such losses of information were not devastatingly serious, but they did occur, and will be mentioned as appropriate throughout the report.

It was realized early on that the total excavation of the principal wheelhouse (Wheelhouse 1) was an impossibility given safety problems associated with the towering pillars of unstable masonry, aside from any question of the resources required (Ill 1.6). For example, deposits within the two wheelhouse bays which retained their original corbelled roofs could not be excavated for obvious safety reasons. Excavation concentrated, therefore, on those elements due for complete destruction, essentially the upper masonry and upper floor levels. The earliest deposits were sampled in specific parts of the main wheelhouse, but much of this material remained out of reach. As a result, the project does not present any significant new evidence for the primary spatial organization of the main wheelhouse, beyond a few superficial observations (although there is important evidence for the differential use of space across the settlement in Phase 2). While this is undoubtedly a weakness the quality of the evidence for other aspects of the site's development, notably the construction methods and the development of the settlement from its primary form through several phases of use, perhaps makes up for this inevitable omission.

The survival of upstanding masonry imposed significant restrictions on working space, and caused innumerable safety problems. In many cases structural elements had to be dismantled to prevent catastrophic collapse, occasionally before full recording by plan and section was possible. Aside from one or two of the principal site sections, which were maintained throughout, sections had generally to be established to address specific questions at specific points during the excavation. In several cases it did not prove possible to extend existing sections downwards because of the appearance of unexpected masonry, or the need to reduce working areas for safety reasons. This has resulted in several cases where composite sections have had to be constructed, with non-contiguous elements 'projected' on (see especially Ill 2.20). This is noted wherever it occurs and should generally present no problems of interpretation.

A further potential limitation has been alluded to earlier, that is, the restricted nature of the excavated area. The area of the excavation was almost wholly filled by domestic buildings, leaving little or no room for the exploration of outbuildings, activity areas and midden deposits (Ill 1.7). This restriction must be borne in mind when considering the evidence from the excavations, and in particular the taphonomy of the finds. The degree to which this limits interpretation will be discussed in the appropriate sections later in the report. Probably, however, little would have been gained from the extension of the excavation in those areas (the north-west and south-west) where extension was a possibility. As we will see, the excavated area at Cnip represents a part, and possibly the major part, of an Iron Age settlement which can best be regarded as either a single developing settlement unit, or, less likely, as a distinct and discrete element within a larger settlement. At each phase of occupation the buildings seem to have formed a self-contained unit. Neither the 1986 section, nor superficial examination of modern drains and other disturbed areas in the vicinity of the excavations, suggest that much survives in the areas immediately beyond the main trench.

1.3 THE HEBRIDEAN WHEELHOUSE

Wheelhouses are Iron Age dry-stone roundhouses, commonly dug into sand-hills or the ruins of former buildings, but occasionally free-standing. What makes them distinctive is their characteristic spatial organization: a series of internal stone piers radiate from a central area containing the hearth (Ill 5.1b). In plan this arrangement resembles a spoked wheel, hence the early adoption of the term 'wheelhouse'. In some cases the stone piers were bonded into the outer walls while at others there was an intervening gap or 'aisle', leading to the occasional use of the term 'aisled roundhouse'. The similarities between these two sub-groups far outweigh this single constructional difference and the term wheelhouse has usually been preferred.

The term wheelhouse has seldom been closely defined. At its loosest it has been used to refer to a highly disparate collection of more or less radially partitioned buildings from across Atlantic Scotland (Crawford 2002). The more conventional usage is restricted to those buildings where a regular arrangement of radial dry-stone piers both divides the floor into a series of regularly sized, peripheral rooms or bays, while at the same time forming the principal roof supports of the building. It is this intermarriage of architecture and spatial patterning which distinguishes wheelhouses, in the sense used here, from other groups of cellular buildings in Atlantic Scotland.

Although wheelhouses can be identified as a coherent architectural phenomenon, they also lie within much longer-lived traditions of vernacular architecture in Atlantic Scotland. From the Neolithic to the end of the Pictish period, domestic buildings in this region were essentially cellular in layout. Separate cells, bays or rooms were demarcated using dry-stone walling or upright slabs to create a fragmented living space. Buildings were characteristically thick-walled and low to the ground, thus conserving heat and offering the roof a limited measure of protection from the wind. The cellular layout minimized the spans of timber required for the roofing of any one section (especially important given the likely reliance on driftwood in parts of the region), while the smaller cells could in some cases be roofed entirely by corbelling. Overall the buildings were well-insulated, wind-resistant and made minimal demands on scarce supplies of timber. All of these tendencies are present to some extent in the wheelhouse tradition.

Wheelhouses are apparently confined to two island groups: the Western Isles, where numerous examples have been excavated, and Shetland, where the sequence at Jarlshof provided the original 'type-site' (Hamilton 1956). Their absence from Orkney is all the more striking considering the substantial amount of work carried out in those islands and must, presumably, reflect a real divergence of settlement development between neighbouring parts of Atlantic Scotland in the last centuries BC. Indeed the appearance of wheelhouses in the Western Isles was more or less contemporary with the emergence of the major Orcadian broch villages, such as Gurness and Midhowe (Armit 2003), which themselves have no counterparts in the west.

In both Shetland and the Western Isles wheelhouses are broadly successive to the patterns of Early and Middle Iron Age settlement dominated by broch towers and other Atlantic roundhouses (Armit 2005). However, there is strong emerging evidence from the current excavations at Old Scatness to suggest that wheelhouses in Shetland may extend much later in date than those of the Hebrides (Dockrill pers comm), perhaps into the second half of the first millennium AD. This is clearly not the case for the Hebridean wheelhouses which, as we shall see, are essentially a Middle Iron Age phenomenon with a floruit around the last centuries BC and first centuries AD. For present purposes, therefore, discussion will be confined to the Western Isles.

Antiquarian investigation of wheelhouses had apparently begun by the middle of the nineteenth century, with the first recorded intervention being the 'opening' of a probable example on South Uist by the local landowner's son in 1855 (Dryden 1857). More significant was the work of the naval officer and pioneering antiquarian, Captain FWL Thomas (Thomas 1870), whose survey of the well-preserved upland site at Usinish, also in South Uist, provided the first detailed record of a Hebridean wheelhouse. Things began to move more rapidly in the early twentieth century with the arrival in North Uist of Erskine Beveridge, a wealthy incomer who built his home on

TABLE 1.1
Hebridean wheelhouses: principal excavated sites (in chronological order of excavation).

Name	**NGR**	**Location**	**Island**	**Excavator**	**Date of Excavation**	**Reference**
Eilean Maleit	NF 7748 7388	Machair	North Uist	Beveridge	1900s	Beveridge 1911
Cnoc A Comhdhalach	NF 7708 7413	Machair	North Uist	Beveridge	1905–07	Beveridge 1911
Sollas (Machair Leathann)	NF 8035 7577	Machair	North Uist	Beveridge	1906	Beveridge 1911
Foshigarry	NF 7430 7636	Machair	North Uist	Beveridge	1911–14	Beveridge 1930
Garry Iochdrach	NF 7724 7427	Machair	North Uist	Beveridge	1912–13	Beveridge 1931
Bac Mhic Connain	NF 7695 7620	Machair	North Uist	Beveridge	1919	Beveridge and Callander 1932
Clettraval	NF 7489 7136	Moorland	North Uist	Scott	1946–8	Scott 1948
Calum MacLeod's wheelouse	NB 1021 3564	Machair	Lewis	MacLeod	1950s	Armit 1991, Ref W.2
A Cheardach Ruadh	NF 7763 6157	Machair	North Uist	Scott	1950s	Scott 1956
Tigh Talamhanta Allasdale	NF 6768 0220	Moorland	Barra	Young	1950–3	Young 1952
Kilpheder	NF 7327 2026	Machair	South Uist	Lethbridge	1952	Lethbridge 1952
A Cheardach Bheag	NF 7577 4037	Machair	South Uist	Fairhurst	1956	Fairhurst 1971
A Cheardach Mhor	NF 7571 4128	Machair	South Uist	Young and Richardson	1956	Young and Richardson 1959
Bruach Ban	NF 7870 5661	Machair	Benbecula	Scott	1956	Armit 1991 Ref W.12
Bruthach A Tuath	NF 7870 5661	Machair	Benbecula	Wallace	1956	Armit 1991 Ref W.13
The Udal	NF 8242 7843	Machair	North Uist	Crawford	1963–90s	Crawford 1967/78, 1975, 1985
Hornish Point	NF 758 470	Machair	South Uist	Barber	1981	Barber 2003
Balelone	NF 719 741	Machair	North Uist	Barber	1983	Barber 2003
Cnip	NB 0980 3665	Machair	Lewis	Armit	1986–8	Armit 1988, this volume
Kildonan	NF 728 285	Machair	South Uist	Zvelebil	1989–91	Zvelebil 1991
Bagh nam Feadag	NF 8666 5735	Moorland	Grimsay	Ashworth	1993–7	McKenzie 2005
Allt Chrisal	NL 6418 9776	Machair	Barra	Foster	1996–8	Foster 1998

the tidal islet of Vallay. By the time of his death in 1917 Beveridge had excavated numerous archaeological sites in and around the Vallay Strand, including several wheelhouses (Table 1.1). In fact it is due almost entirely to Beveridge's activities that this part of North Uist remains the densest area of the Hebridean wheelhouse distribution. Beveridge's legacy, however, was one of quantity rather than quality: following the antiquarian tradition of the preceding century his excavations were carried out largely by unsupervised estate staff, and recording was rudimentary at best.

From the 1930s a new wave of wheelhouse excavations began, and for the first time these structures began to be recognized as a distinct monument class in their own right. Sir Lindsay Scott, with his excavations at Clettraval (Scott 1948), was the first to place the Hebridean wheelhouses at the centre of the diffusionist debates of the time. Scott's successor, Alison Young, carried on his work, completing and publishing his excavations at Allasdale (1952), while T C Lethbridge excavated the well-preserved site of Kilpheder in South Uist (Lethbridge 1952). During the mid-1950s a proposal by the Ministry of Defence to establish a Rocket Range at the northern end of South Uist resulted in the excavation of numerous archaeological sites, including several wheelhouses (eg Young & Richardson 1960; Fairhurst 1971). These produced a wealth of new information although they did not fundamentally alter earlier interpretations, at least at the time. The most influential of the numerous 1950s wheelhouse excavations, however, was J R C Hamilton's work at Jarlshof in Shetland, where a sequence of wheelhouses was revealed, built over the ruins of a former Atlantic roundhouse (Hamilton 1956). The results from Jarlshof established the idea that wheelhouses generally post-dated Atlantic roundhouses; a view strengthened by subsequent work including the use of radiocarbon dating from the 1960s onwards (Chapter 5).

During the 1960s and 1970s there was a decline in the numbers of wheelhouses being excavated in the islands, although notable campaigns of excavation were pursued, for example by the Central Excavation Unit in the Uists (Barber 2003). Excavations of a multi-period site with a phase of wheelhouse construction at the Udal, in North Uist, have also continued over an extended period from the early 1960s (Crawford nd). It is probably fair to say, however, that both in terms of their academic study and popular recognition, wheelhouses were very much in the shadow of the more spectacular broch towers throughout this period (Armit 2003).

Despite this long tradition of excavation and study, the excavations at Cnip in 1988 represented the first archaeological excavation of a wheelhouse in Lewis. Since then there have been other excavations throughout the islands (Table 1.1), but more striking has been the discussion of wheelhouses on a more theoretical level, particularly focusing on non-utilitarian aspects of their use. Recent discussions, for example, have shown how wheelhouses represent the adoption of a form of 'inward-looking' monumentality quite distinct from the 'outward-looking' monumentality of the Atlantic roundhouses that precede them (eg Armit 1997). The apparent transfer of architectural impact from outside to inside seems to reflect wider changes in Hebridean society, possibly relating to shifting power relations and patterns of land tenure (ibid), or to a reduction in the perceived risk of violence.

There has also been considerable debate on the nature of the ritual activities conducted within wheelhouses, many of which involved the careful placing of animal and human remains in pits or wall cores (eg Campbell 1991; Armit 1996). The debate was spurred by Ewan Campbell's publication of R J C Atkinson's mid-1950s excavations at Sollas in North Uist, which had uncovered a large array of plainly non-utilitarian pit deposits within the floor levels of the wheelhouse (Campbell 1991). The cosmological principles which might have structured such activities have also been discussed (eg Parker Pearson & Sharples 1999), often within the context of wider debates on the nature of ritual and cosmology within the British Iron Age (eg Fitzpatrick 1997; Oswald 1997; Parker Pearson 1996b). It has been increasingly recognized that modern perceptions of geographical marginality should not be allowed to obscure the potential contribution of this region to wider understandings of Iron Age Britain and Europe. The work at Cnip contributes to each of these debates and interim publication of the results has already fed into several of them. It is in this wider context that the results of the excavations will be discussed in Chapter 7.

1.4 THE ARCHAEOLOGY AND ENVIRONMENTAL HISTORY OF BHALTOS

1.4.1 LANDSCAPE, LOCATION AND TOPOGRAPHY

The excavated site of Cnip lies on the Bhaltos peninsula which juts into West Loch Roag, in Uig Parish on the west coast of Lewis (Ill 1.8). The area has long been known as one of the most important archaeological

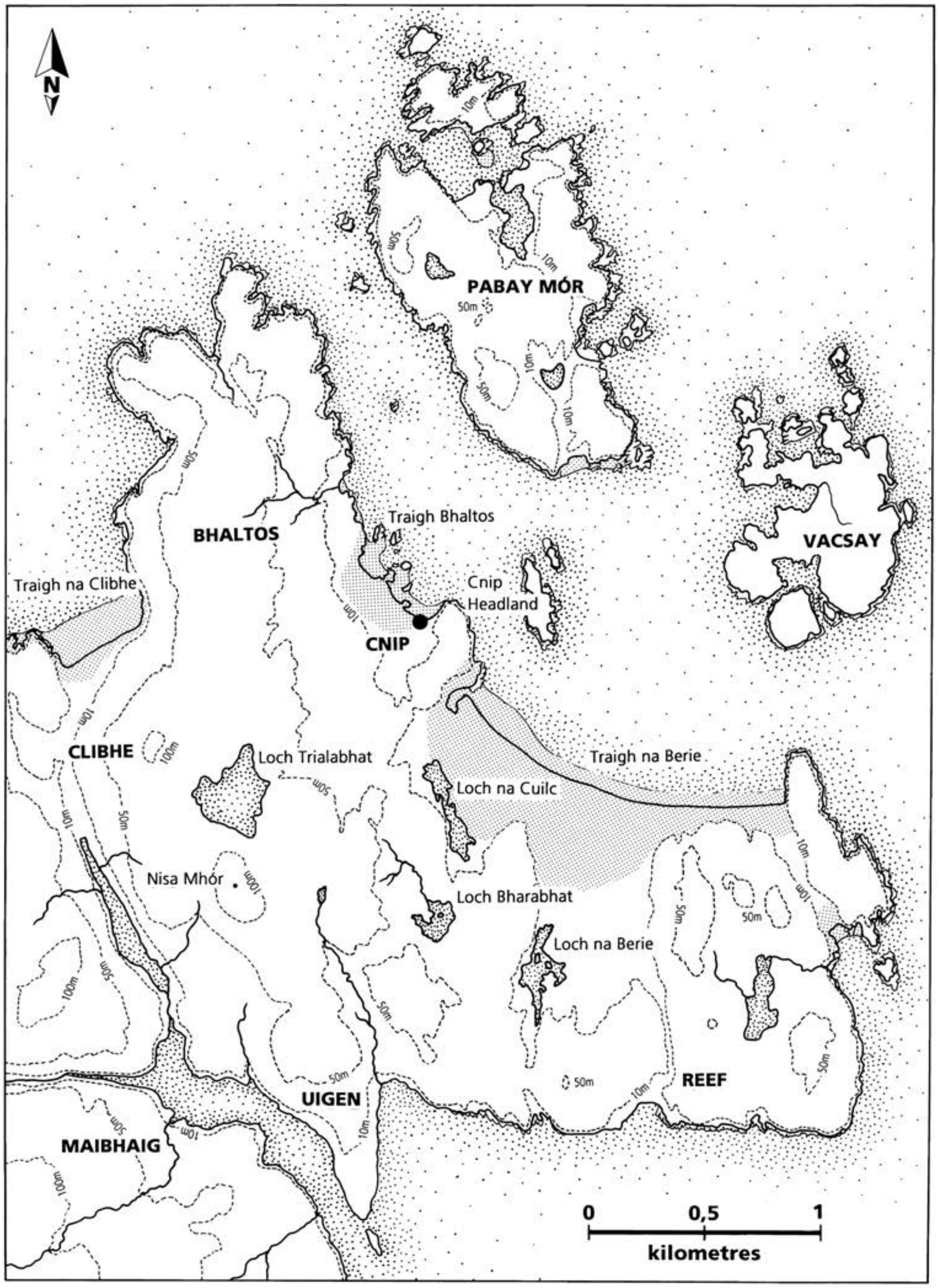


ILLUSTRATION 1.8
Bhaltos, showing places mentioned in the report.

areas in Lewis, and has a lengthy, if sporadic, history of archaeological investigation. Despite its small size, some 4km by 3.5km, Bhaltos is divided into a series of sharply delineated zones bounded by natural features. The core of the peninsula is formed by a series of low, rugged hills, rising to 136m at Nisa Mhor. The interior is generally ill-drained and unwelcoming peatland, with numerous outcrops of Lewisian gneiss and many small lochans, although signs of post-medieval activity, including occasional cultivation remains, can be seen in all but the most extreme areas. The excavated complex Atlantic roundhouse of Dun

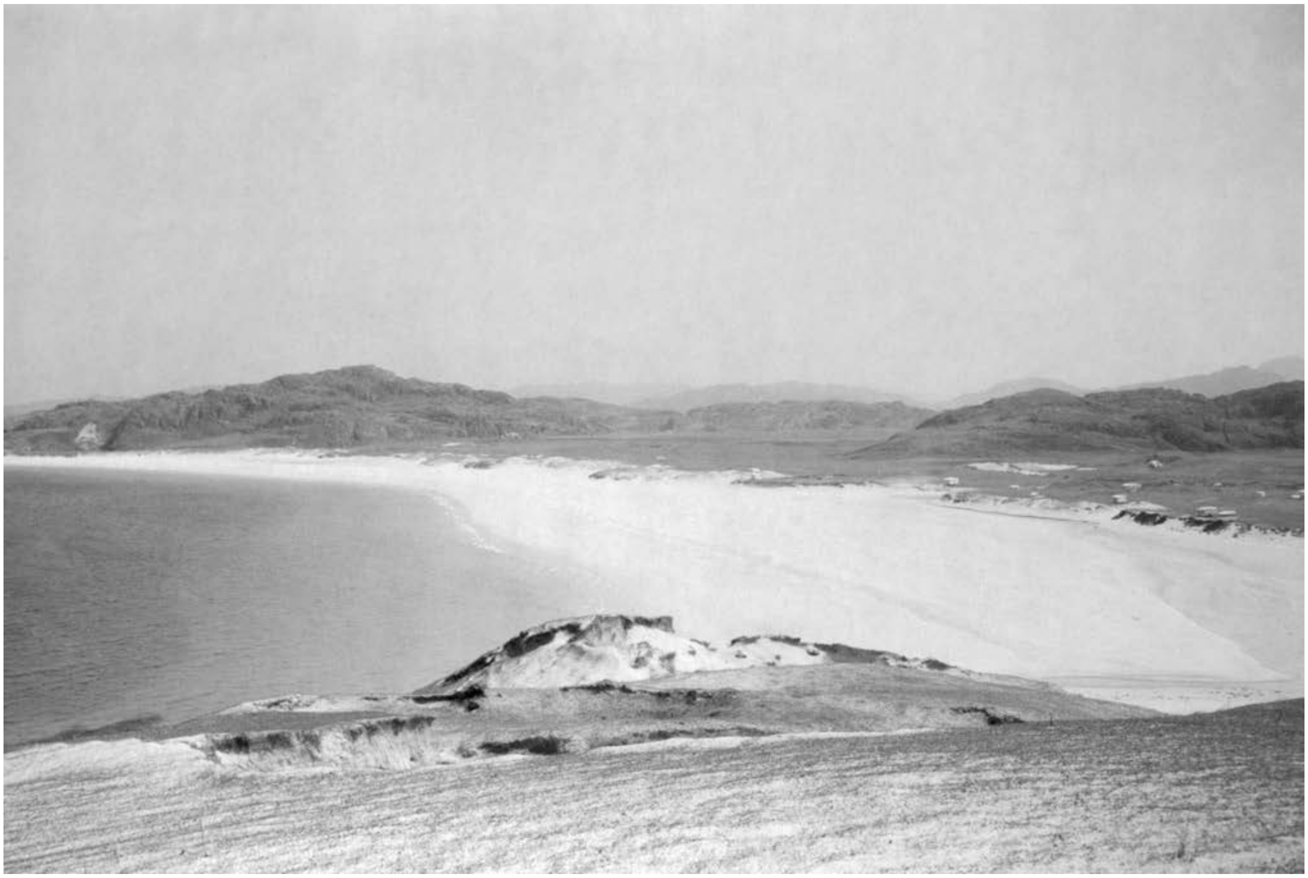


ILLUSTRATION 1.9
Traigh na Beirgh.

Bharabhat occupies one of these interior hill-circled lochans (Harding & Dixon 2000).

Most important from the archaeological perspective are the three main machair systems which back onto the hills. The largest, Traigh na Beirgh, is reminiscent of the more extensive machair plains which form the western fringes of Harris and the Uists (Ill 1.8–1.9). This broad, sheltered and exceptionally scenic beach fronts a strip of formerly cultivated machair plain, at the rear of which lies a series of clogged-up, marshy lagoons trapped against the foot of the hills. Traigh na Beirgh has produced considerable evidence for prehistoric settlement, including the long-lived and apparently high-status site of Loch na Beirgh (Harding & Gilmour 2000).

By contrast, the north-facing Traigh na Clibhe (Ill 1.8) is much smaller and more exposed. The hills behind the beach rise far more sharply than at Traigh na Beirgh, and leave considerably less land available for settlement. Traigh Bhaltos, on which the Cnip wheelhouse lies, is small like Traigh na Clibhe, but sheltered like Traigh na Beirgh. It fronts a moderately productive, though rather confined area of machair, now occupied by the adjoining crofting townships of Cnip and Bhaltos. It will be described in rather more detail below.

Despite its position on the exposed west coast of Lewis, only the north-western part of the Bhaltos peninsula has to face to the full unadulterated blast of the Atlantic gales and tides. The north-eastern part, including Traigh Bhaltos, is afforded some shelter by the small islands of Pabay Mor and Vacsay, while the south-facing part overlooks a sheltered inlet of Loch Roag (Ill 1.1).

Although the circuitous land route might suggest otherwise, Bhaltos is rather less than 10km from such major Hebridean monuments as Dun Carloway and the Calanais stones, as well as being within a few kilometres of the find-spot of the Lewis Chessmen. The purpose of such chronologically diffuse associations is simply to reinforce the point that, among communities who routinely travelled by sea, Bhaltos was not necessarily the backwater it can seem to the modern overland traveller. Indeed its location on a major sea route, down the west coast of the Hebrides, and its scattered but significant pockets of fertile land, made Bhaltos well-placed to support communities with a stable economic base and widespread sea-borne contacts.

1.4.2 RESEARCH PRIOR TO THE 1980s

There is no record of any extensive antiquarian work in the Bhaltos peninsula, and indeed it was not until the RCAHMS survey visit in 1914 that serious archaeological attention was devoted to the area (RCAHMS 1928). The Royal Commission's work in Bhaltos seems to have been rather more intensive than elsewhere in Lewis, as a number of significant though often ephemeral sites were identified in addition to the more obvious dry-stone monuments. The series of prehistoric middens eroding along the dune-face of the Traigh na Beirgh form one notable example (ibid, nos 84 and 9).

The next archaeological episode concerned the work of Lacaille who identified what he considered to be examples of primitive stone industries from a number of locations in Bhaltos (Lacaille 1937, 1954, 299–304), including the south-east side of Cnip Headland. Lacaille's initial surveys were not, however, followed-up with more extensive excavation. Subsequent excavations have tended to be opportunistic and largely independent of wider research frameworks. A wheelhouse on the slopes behind the Traigh na Beirgh was partially excavated by Mr Calum MacLeod of Reef in the 1950s, while on Cnip Headland, a rich Viking grave (Welander et al 1987) and a multi-phase Bronze Age cairn (Close-Brooks 1995) were both excavated during the 1970s.

The latter two sites were exposed as a result of erosion episodes on the hillside overlooking the Traigh na Beirgh. Many similar exposures have been recorded more superficially, and innumerable entries in the National Monuments Record for Scotland testify to the observation and recovery of midden material, bone and artefacts of various periods from each of the machair areas.

1.4.3 RECENT WORK

The first major programme of archaeological research in Bhaltos began in 1985, with the establishment of the CARP (Harding & Armit 1990). The work of the project has included two major excavations, at the Loch na Beirgh broch tower and later structures, and at the complex roundhouse of Dun Bharabhat (ibid). The Cnip excavations grew out of this wider project, as has been discussed, although their organization and structure have since followed a rather different path.

During the 1990s wider-ranging survey and targeted excavation expanded the fieldwork interests of the CARP beyond the immediate environs of the Bhaltos peninsula. Most importantly, perhaps, for present purposes, have been excavations by Simon Gilmour and Mike Church at the site of Guinnerso (Burgess et al 1997) which appear to have identified a later prehistoric transhumance site potentially associated with core settlement in either Bhaltos or, more likely, around Uig Sands. Work associated with the CARP has also included a survey of the Bhaltos peninsula (Armit 1994), and a small excavation on Cnip beach-front (Armit & Dunwell 1992). Further work, sponsored by Historic Scotland and conducted by the Centre for Field Archaeology, has further explored the Viking and Bronze Age cemeteries on Cnip Headland (Dunwell et al 1995a, 1995b), first identified in the 1970s (Welander et al 1987; Close-Brooks 1995). Only 5km across the water, on the northern tip of Great Bernera, a further excavation by the Centre for Field Archaeology has uncovered an important Late Iron Age site at Bostadh (Neighbour & Burgess 1996). In addition, research has been carried out on the palaeo-environmental history of the area, co-ordinated by Professor Kevin Edwards of the University of Sheffield (cf Edwards & Whittington 1994).

In sum, then, research since the mid-1980s has brought about a significant increase in our understanding of the archaeology and environmental history of this part of Lewis focusing primarily on the later prehistoric period, defined broadly from 1000 BC–AD 1000.

1.4.4 ENVIRONMENTAL HISTORY AND SITE VISIBILITY

The history of sea level change, soils and vegetation in Lewis, as elsewhere in the Western Isles, are subjects of controversy and the arguments have recently been summarized elsewhere (eg Armit 1996; Lomax 1997). Nonetheless, there is little doubt over the main trends of environmental change: sea levels have risen, possibly drastically, over the period of human occupation, while woodland cover has been lost to be replaced by blanket peat and heathland (cf Bennett et al 1990; Lomax 1997). The local climate during the Iron Age seems likely to have been much as it is now, wet and windy, but not unduly cold. The evidence of excavation shows that peat was the principal fuel source even before the Iron Age, and the blanket peats that characterize the interior of the island today would have been well-established by the Iron Age.

Studies of cores from Loch Bharabhat, in the Bhaltos peninsula (Lomax 1997, 242), have shown that a major episode of clearance, probably a 'relatively short-lived event', led to the virtual elimination of trees (an open birch-hazel woodland with some oak, elm and pine) from the catchment around 3700 BP (the Middle Bronze Age in archaeological terms). This clearance event was apparently paralleled at Calanais and can be tentatively linked to the expansion of human activity in west Lewis at that time (ibid). This event followed relatively soon after the first definite appearance of cereal cultivation in the catchment at around 4000 BP, and corresponded with an expansion of blanket peat and heathland. Lomax has linked this period of woodland decline with the suggestion that environmental problems may have contributed to a shift in settlement focus onto the coastal belt, and the machair in particular, from the Neolithic onwards (Lomax 1997, 264; Armit 1992).

A further change occurred in the Late Bronze Age or Early Iron Age, around 2500 BP, when peat erosion within the catchment increased dramatically (Lomax 1997). This episode of instability continued to around 1920 BP (ibid), and closely resembles the dating of the life-span of the Atlantic roundhouse at Dun Bharabhat (Harding & Armit 1990), which seems to have been abandoned in the last centuries BC. The end-date for the erosion episode, which signals a return to a lower level of human activity in the Loch Bharabhat catchment, falls within the radiocarbon dated life-span of Phase 2 at Cnip (Chapters 2 and 6).

Cores from Loch na Beirgh, on the machair but only some 500m from the 'upland' catchment of Loch Bharabhat, remain to be adequately dated, but show strong evidence for the cultivation of cereals on the machair during the Iron Age (Lomax 1997, 256).

The general rise in sea levels, the growth and spread of blanket peat, and the processes of machair formation and movement, have all conspired both to destroy and obscure archaeological sites throughout the Western Isles. Indeed, the known archaeological sites in the Bhaltos peninsula, around 50 in number, excluding settlements and field systems marked as occupied on nineteenth-century maps, must represent only a fraction of those originally present. The Bhaltos sites have recently been catalogued and discussed in some detail, and the processes affecting their survival and discovery have similarly been explored (Armit 1994), so only the briefest of summaries will be required here.

The Bhaltos peninsula highlights some of the ways in which the processes involved in machair development can distort the perceived prehistoric settlement pattern, adding to the usual range of hazards for archaeological survival. Coastal erosion, as at Cnip itself, is the most visible threat. The scale of past destruction is exemplified by the disappearance of sites located by the Royal Commission in the early part of this century, particularly along the beach-front on the Traigh na Beirgh (RCAHMS 1928, nos 84 and 98). Equally destructive is the deflation and re-deposition of the machair through wind erosion. This is most spectacularly demonstrated on the south-east-facing slopes of Cnip Headland, where a large part of the hillside is undergoing sand movement, periodically uncovering burials of both Viking and Bronze Age date (Dunwell et al 1995a, 1995b). The problem is further exacerbated by rabbit infestation on many of the known sites.

Elsewhere, the sand re-deposited from these erosion sites has been laid down as a thick blanket obscuring sites further inland. This seems to be particularly so behind the Traigh na Beirgh, where former lochs, including Loch na Beirgh, have been choked with windblown sand. These combined processes of wholesale destruction through wind and tidal action of sites along the retreating coasts, and burial under sand of sites further inland, make field survey in the machair more than usually problematic. The massive stone structures at Cnip itself were entirely invisible from the surface, and the machair topography gave not the slightest hint of the underlying structural forms.

Nonetheless, despite these obvious restrictions, a wide range of sites is known from Bhaltos, and these provide a necessary background for any attempt to understand the nature and development of the Iron Age settlement at Cnip.

1.4.5 MODERN AND EARLY MODERN SETTLEMENT

The three machair beaches have formed focal areas for settlement in Bhaltos since prehistory, and it is in these areas that most of the evidence for prehistoric settlement is concentrated. During the early eighteenth century the peninsula was divided between three tacksmen (major tenants), at Bhaltos, Cnip and Reef, and presumably further sub-divided between an unknown number of sub-tenants (Moisley 1962, 8). Subsequently the townships of Clibhe and Uigen emerged as independent holdings, only to be re-absorbed with the lotting of crofts in the early nineteenth century (Ill 1.8).

The earliest documented pattern of land-holding, then, suggests a broadly tripartite division of the peninsula, although any attempt to see this as a natural, topographically determined situation, relating

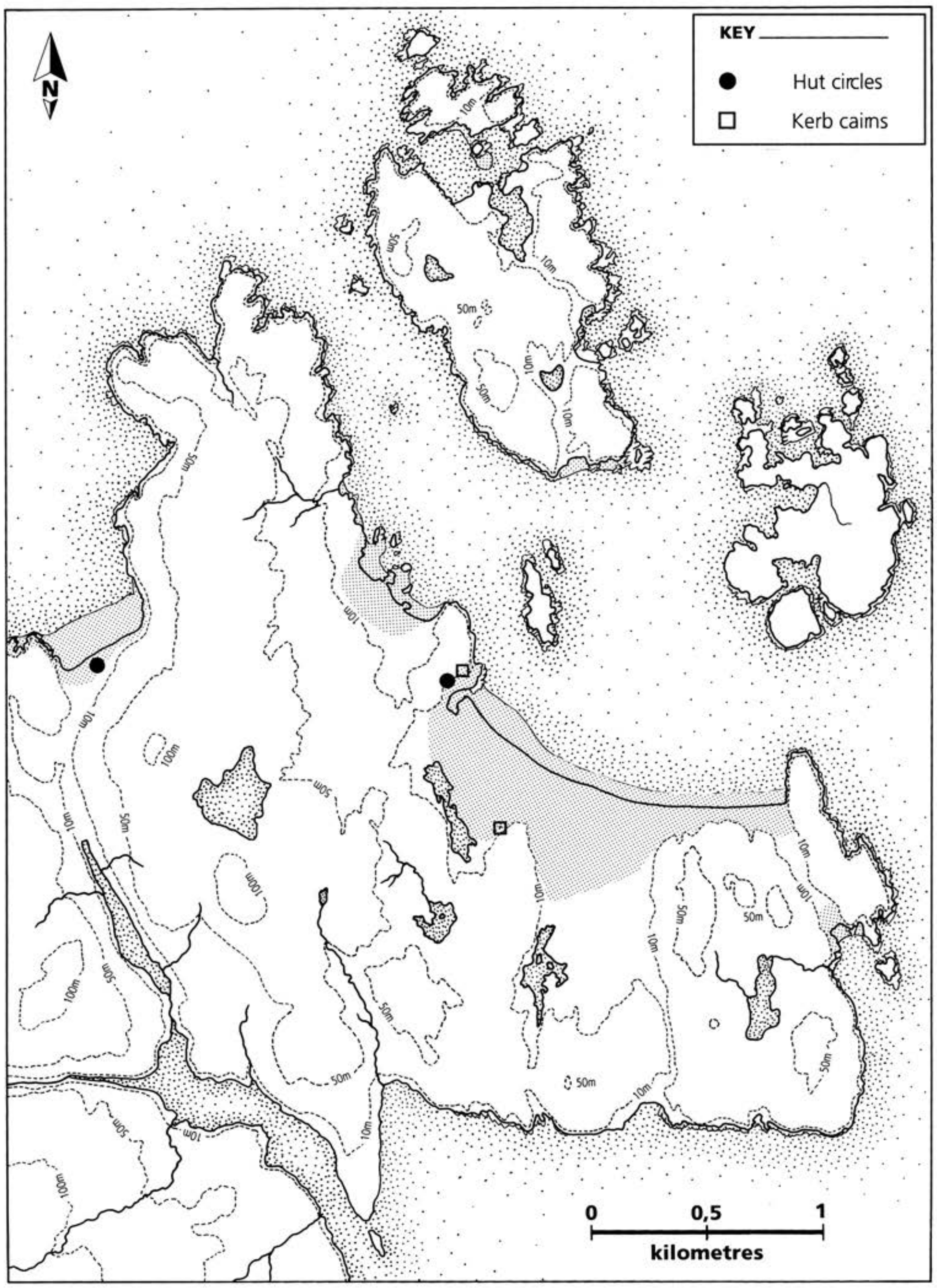


ILLUSTRATION 1.10
Bronze Age sites in Bhaltos.

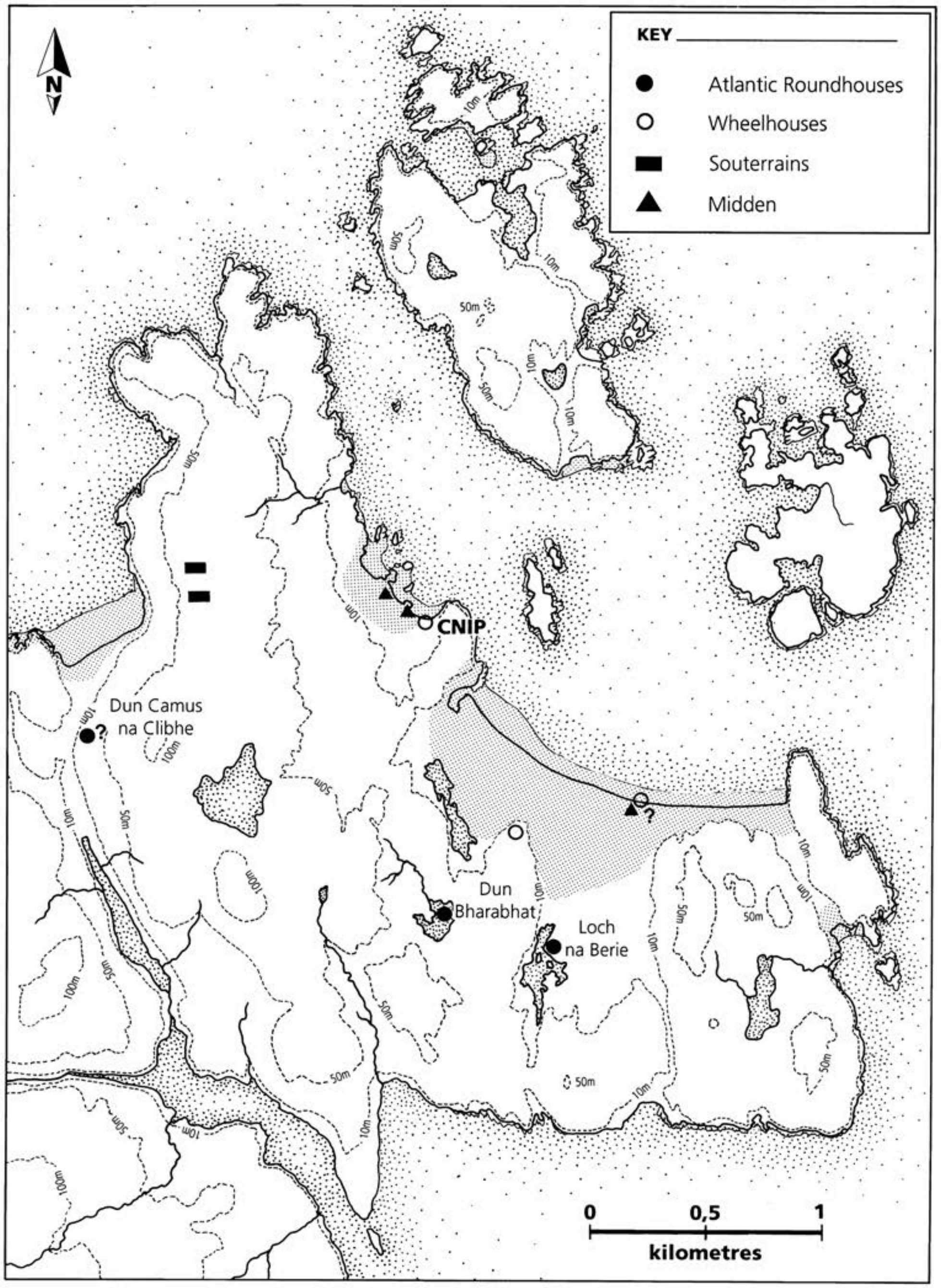


ILLUSTRATION 1.11
Iron Age sites in Bhaltos.

to the three machair foci, is hampered by the refusal of the townships to correlate with these landscape elements. Instead, the settlement cores of Cnip and Bhaltos crowd together in the small pocket of machair behind Traigh Bhaltos, while the croft-houses of Reef straggle around the southern fringe of the peninsula. Traigh na Beirgh, an important settlement centre in prehistory, is now virtually unoccupied, its lands divided between the townships of Cnip and Reef. Centuries of environmental change, social manoeuvring and wholesale clearance (see Moisley 1962 for the latter two), have clearly distorted any original topographically determined system that might have existed.

Indeed, it seems most probable that similarly complex and irrecoverable social factors will have determined the division of land within the peninsula from the earliest times and there seems little point in looking to the patterns of historic land division for anything more than indication of possibilities. The survey of archaeological sites on Bhaltos suggests at least three periods of major settlement dislocation prior to the post-medieval period (Armit 1994, 90–1), which again argues against the assumption of any environmentally determined pattern of settlement or land organization in the peninsula.

1.4.6 PREHISTORIC SETTLEMENT

Despite Lacaille's identification of archaic traits in lithic assemblages from the Traigh na Beirgh, there is no definite evidence of a human presence in the archaeological (as opposed to palaeo-environmental) record in the Mesolithic or Neolithic periods. This absence is rather puzzling, given the relatively high potential of the area for early agriculturalists, but not especially relevant to this report: it is discussed further elsewhere (Armit 1994).

The Bronze Age is represented in Bhaltos by the multi-phase burial cairn and smaller satellite cairn on Cnip Headland (Close-Brooks 1995; Dunwell et al 1995a) and one or two less certain examples (Ill 1.10). Settlement broadly contemporary with these burials is difficult to identify; the most likely contenders being a series of circular stone-footed structures on Cnip Headland.

Evidence for Iron Age settlement is more extensive (Ill 1.11) and, as it will be discussed in some detail in subsequent sections of this report, it is mentioned here only in outline. Atlantic roundhouses are known at Dun Bharabhat (a complex roundhouse) and Loch na Beirgh (a broch tower with later occupation). A third probable site in this category is Dun Camus na Clibhe, an Atlantic roundhouse re-located during field survey in the 1980s (Armit 1994, site 8). Also of Iron Age date are two wheelhouse settlements, one on the rising ground at the rear of Traigh na Beirgh, and the other being Cnip itself. A third wheelhouse settlement is hinted at by reference to an apparently stone corbelled structure found within a string of now-vanished middens along the Traigh na Beirgh (RCAHMS 1928, no 98). These middens also produced two sherds of Samian Ware (which represents an appreciable percentage of the total Roman pottery assemblage known from the Western Isles!). A recent find of Samian Ware from the secondary cellular structures in the Loch na Beirgh broch tower further emphasizes the unusual concentration of Roman material in this locality (Harding pers comm), although the absolute number of sherds remains pitifully small. Two poorly recorded souterrains may also be of broadly Iron Age date (Armit 1994, sites 10 and 11), while the cellular structures at Loch na Beirgh carry known occupation in Bhaltos into the immediately pre-Norse period, as, potentially, do the structures identified at Cnip sites 2/3 (Armit & Dunwell 1992).

Ill 1.12 shows the scatter of Norse period sites, all burials, in Bhaltos, together with a series of undated 'settlement mounds'. The latter have tentatively been suggested as possible Norse or later prehistoric settlements (Armit 1994), although they remain untested by excavation. The issues relating to the Norse and later settlement of Lewis are beyond the scope of this report, but it is worth noting the complete absence of Norse material from all of the excavated later prehistoric settlements in Bhaltos. The evidence could be read as suggesting a major settlement dislocation during the ninth century AD, terminating the traditional patterns of land holding and settlement location built up during the later prehistoric period (ibid, 90–1).

1.5 THE EXCAVATED SITE AND ITS SETTING

The excavated site at Cnip is located on the beach-front below and behind the modern sea-wall (built after the excavation, in 1988) at the south-east end of the beach known as the Traigh Bhaltos (Ill 1.3–1.4). From earlier map sources, it appears that this name originally referred only to the northern half of the beach, while the southern part was known as Traigh Cnip. The two were divided by a rocky promontory and more or less equated to the land belonging to each of the two townships of Bhaltos and Cnip which share the area behind the beach. However, the modern Ordnance Survey map represents the whole beach as Traigh Bhaltos and that is the name used in the most detailed description available (Ritchie & Mathers 1970). The name Traigh Bhaltos will, therefore, be used here to denote the whole beach.

Traigh Bhaltos is a far smaller machair system than its neighbour, Traigh na Beirgh, being only some 400m long and containing a fairly small area of machair trapped between the beach itself and the surrounding

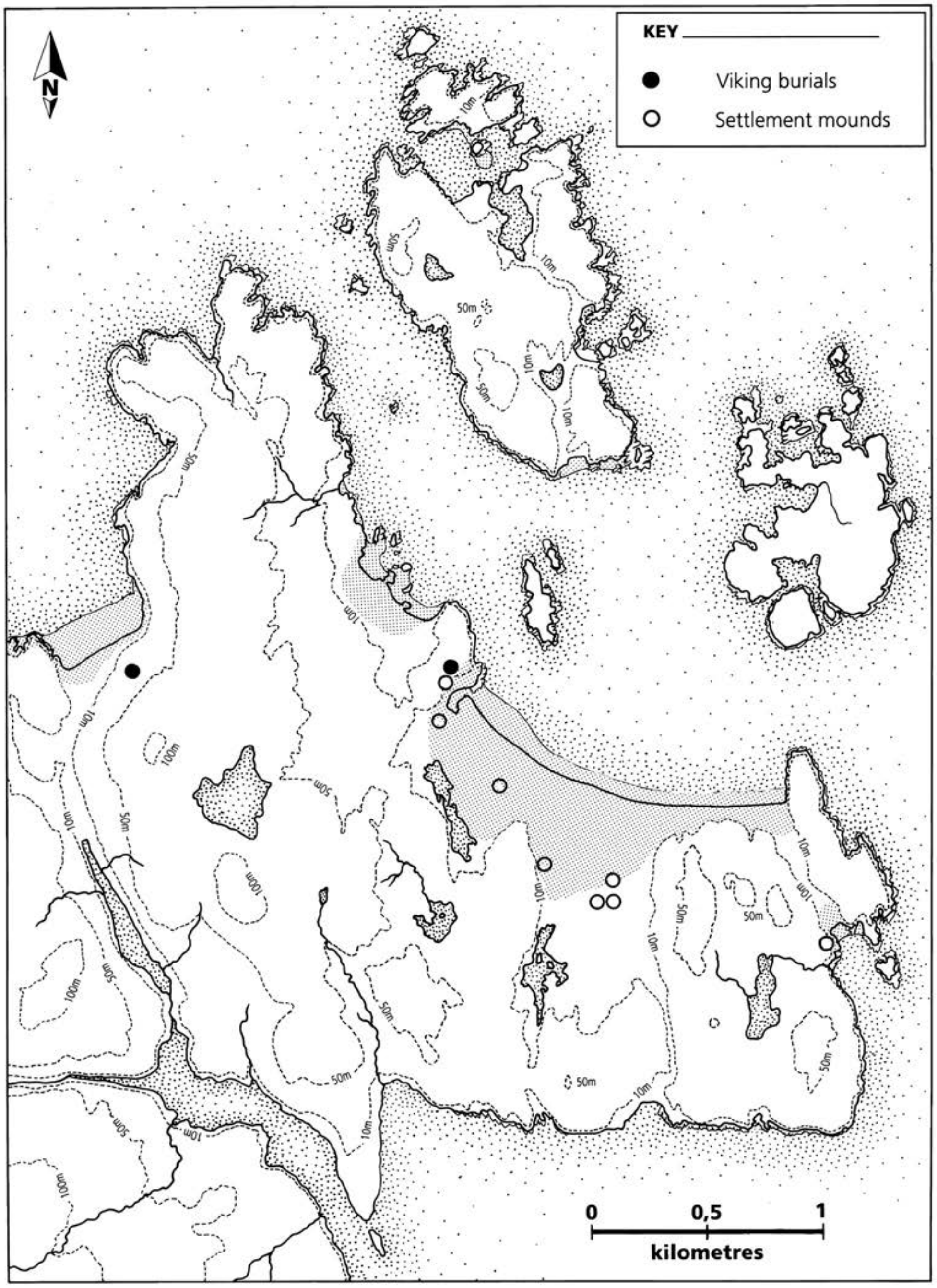


ILLUSTRATION 1.12
Viking burials and settlement mounds in Bhaltos.

hills. The beach, of fine white shell-sand, formed into low dunes, is sheltered by a group of skerries just off shore, and further out by the larger islands of Pabay Mor and Vacsay (Ill 1.8). These protect it to some extent from the tidal battering experienced at more exposed beaches, such as Traigh Clibhe.

The solid geology of the area is the ubiquitous Lewisian gneiss, capped in places by deposits of glacial till, as on Cnip Headland which forms the south-eastern boundary of the beach. Between the beach and the hill-slopes is a small pocket of machair, now scattered with modern croft-houses and the ruins of former blackhouses, interspersed with small plots of improved land. The sandy soils here have been intensively worked through cultivation over many centuries, although much of the area has now reverted to a condition of weedy neglect. The mixture of the underlying peaty soils with windblown sand, and an unknown degree of deliberate admixture of manure and domestic midden, has created soils which were formerly considered relatively productive. Virtually all of the available land seems to have been cultivated and there are signs of former deflation episodes which have served to level out the machair, one of which seems to have previously affected the excavated site itself (Chapter 2).

Traigh Bhaltos has been eroding for many years. Ritchie and Mathers describe, in 1970, how the south-east end of the beach was under active erosion, while the north-west end was accreting, as the beach gradually seemed to be adopting 'a more northerly orientation' (ibid 63). The shore at the south-east end appeared to have lost at least 15m between 1971, when the latest visit by the Ordnance Survey was made, and 1988, with some 2.5m seemingly having been lost between 1986 and 1988 (see Section 1.1). Examination of the Ordnance Survey first edition map for the area suggests that little more than 10m had been lost between 1850 and 1971, apparently confirming the strongly held local view that erosion had accelerated significantly in the 1970s and 1980s. It is at this eroding south-east end of the beach that the excavated site lies.

The site itself nestles at the foot of the gentle slope up towards Cnip Headland at almost the extreme southern point of the beach (Ill 1.4). The main wheelhouse, once exposed, turned out to lie within 10m of the modern house known as No 11 Cnip, virtually under part of its driveway. The nature of local topography gave the site a natural north to north-westerly aspect, and indeed all of the principal domestic buildings on the site had entrances facing onto the relatively level ground to the west.

It seems highly probable from the analysis of the old maps of the area that the Cnip wheelhouse was not constructed immediately adjacent to the sea, but it was nonetheless founded on clean windblown sand, and could not, therefore, have been far from the coast. The site was clearly occupied in an active machair environment as the occasional depositions of windblown sand show. While it is impossible to reconstruct the Iron Age coast-line with any certainty, it seems most likely that the site was built on the former machair plain, behind the then active dunes, with the beach some distance further out than it is now; at least 25–30m distant, and probably not more than 150m, close to the point of Cnip Headland.

Some aspects of the Iron Age environment around the site would have been familiar. Although the sea was slightly further out, the hills would have been rocky and treeless as now, creating a small, sheltered bowl within the southern part of which the wheelhouse settlement was established. As we shall see, we can be fairly sure that the available machair was farmed, as it was until recent years, adding to a picture of a landscape not too sharply dissimilar to its appearance in recent centuries. Whether this discrete and self-contained patch of land was shared or not is unknown. Contemporary settlements may lie under the modern township, or may have been lost to the sea.

While the modern eye looks inland, seeing a patch of farmable machair and a rim of hills for upland pasture, the opposite view was probably at least as significant in prehistory. A few steps away, the sea gave access to fishing grounds and to neighbouring communities around the coasts of Lewis and beyond.

1.6 REPORT STRUCTURE

This report supersedes all previous statements concerning the excavations at Cnip, primarily the interim report (Armit 1988), and the relevant part of an earlier summary of the CARP more generally (Harding & Armit 1990). However, the phasing and basic interpretation of the site sequence are unchanged from these reports and there is divergence only on occasional points of detail. There is of course, an enormous quantity of new information present in this volume, primarily from the specialist work and the more detailed analysis of the site stratigraphy and comparanda, which enables us to expand on previous statements.

Chapter 2 details the results of the excavation using the framework of phases which is unchanged from the interim report:

> Phase 1: the construction and primary occupation of the main wheelhouse and a second unfinished wheelhouse.
>
> Phase 2: the continuing occupation of the now-modified wheelhouse and accompanying cellular structures.
>
> Phase 3: the construction and occupation of a rectilinear structure incorporating earlier structural elements.

As we shall see in Chapter 6, Phase 2 appears to be confined principally to the first century AD, with

Phase 3 extending occupation perhaps into the third century AD. The dating of Phase 1 is less secure, as will become apparent, but it probably began in the last two centuries BC.

The excavations have produced a wealth of artefactual remains, which are of more than usual importance in that they can be tied closely to the well-established stratigraphy of the site. The assemblages from Phases 2 and 3 are particularly closely dated in absolute terms and provide an important typological benchmark for the development of various artefacts, particularly the problematic Hebridean pottery sequence. The artefactual analyses form Chapter 3, below. No less important is the evidence for the environment and economic basis of the site, discussed in Chapter 4. Again the well-contexted nature of the material adds to its value, as does its potential for incorporation within the wider picture emerging for the Bhaltos peninsula. Of particular importance is the evidence for the economic importance of red deer.

In Chapter 5 the structural evidence from the two excavated wheelhouses is assembled and synthesized to discuss the processes by which wheelhouses were constructed. The mechanical processes underlying the construction of the Cnip wheelhouses seem fairly clear, but certain issues are raised concerning the social organization of the construction process which are more difficult to address.

Chapter 6 deals with the issue of absolute dating, using in particular the evidence of the radiocarbon dates. The dating evidence is strong for Phases 2 and 3, but numerous factors conspire to complicate the dating of Phase 1, not least the apparent re-use of curated midden and artefactual material apparently much older than the settlement itself. The implications of this phenomenon are discussed, as well as the interpretation of the absolute dating of the structural sequence. This discussion inevitably leads on to the question of site formation processes, and more particularly the role of human agency in the creation of the archaeological deposits. This issue has long been recognized in relation to certain obvious ritual deposits in wheelhouses, but is clearly also of importance in understanding the wider processes of site formation. This aspect of the site is discussed in Chapter 7.

Also in Chapter 7 the evidence from Cnip is used as the basis for a reassessment of wheelhouses more generally in the Western Isles and beyond, and an attempt is made to understand how the settlement was inhabited as part of a living community. This last section attempts to integrate the diffuse interpretations generated by the studies of the artefacts, ecofacts and architecture, looking particularly at issues such as resource exploitation, the nature of the household, the economic basis of society, the ritualization of daily life, contacts both within and beyond the peninsula, and patterns of movement through the landscape. This section will also examine the site's place in the longer-term social and settlement picture of the Iron Age in Lewis.

I hope that this last section can begin to give some impression of what might it have been like to inhabit a wheelhouse and to live and work in the Iron Age land and seascapes of west Lewis.

Chapter 2

Excavation results

2.1 INTRODUCTION

The full stratigraphic report on the site is contained in the site archive. In that report, every stratigraphic context encountered during the excavations is listed and its place within the overall site stratigraphy detailed. What follows here is a summary report organized according to the three main chronological phases of occupation.

Each phase is introduced with a summary site plan, following which the stratigraphy is discussed by structure or group of deposits. Although sufficient information has been recorded to relate these summary discussions to the primary site archive, contexts are individually discussed only where they contribute to an understanding of the overall sequence, or where they contain significant artefacts or ecofacts mentioned in Chapters 3 and 4.

The inclusion of significant context numbers in the text and on the illustrations should allow the published descriptions to be related seamlessly to the more detailed context-by-context descriptions, in the site archive.

It should be stressed from the outset that the occupation of the site was apparently continuous. Even short periods of abandonment, or buildings left unroofed, would have resulted in incursions of windblown sand. The final abandonment of Structure 8 shows exactly this phenomenon, as does the build-up of sand over abandoned buildings during Phase 3 (see Sections 2.5.1.4 and 2.6.1). That this does not occur elsewhere is testimony to the unbroken nature of the occupation.

Given this manifest continuity, the phasing should be seen as a tool for analysis, rather than as having any implications for major cultural changes or breaks in occupation. Phases 1 and 2 in particular show clear continuity. Although the 'core' of the settlement changed from a monumental wheelhouse (Phase 1) to an increasingly unstable and non-monumental element within a larger cellular settlement (Phase 2), there was probably no single point in time at which the change could ever be said definitively to have occurred.

Phase 3 is rather more distinct, as it involved the abandonment of all earlier structures and the construction of a wholly new structural form, yet again it seems to have followed Phase 2 with no break in occupation.

The phasing of the site, therefore, although important in understanding the development and eventual decline of the settlement, should not over-ride the basic impression of continuity and stability, over several centuries.

2.2 NOTES ON THE RECORDING SYSTEM

2.2.1 CONTEXTS AND BLOCKS

Each identifiable entity encountered during the excavation, whether a sediment, cut, or element of masonry etc, was allocated its own context number. As the excavation progressed, the individual contexts were grouped into related batches which have been termed 'blocks'. For example, the masonry elements which together formed Wheelhouse 1 are grouped together as Block 6.

These blocks form, in effect, detachable elements from the overall site stratigraphy. They were defined initially in the field and their numbers are entirely arbitrary. The original numbering system has been retained in order to enable this report to be used in conjunction with the site archive.

The Site Matrix (Ill 2.1) indicates the stratigraphic relationships between the various blocks and the relationships of the blocks to interpretative phases (Table 2.1). It is thus the starting point for an understanding of the stratigraphy of the site. Matrices for individual blocks have not been included, for reasons of space, but these can be consulted in the site archive.

In general, each individual context within a given block will have an identical stratigraphic relationship to any context within any other block. Thus all contexts within Block 5 (the deposits within Wheelhouse 1) are earlier than all contexts within Block 1 (the deposits within the later Structure 8).

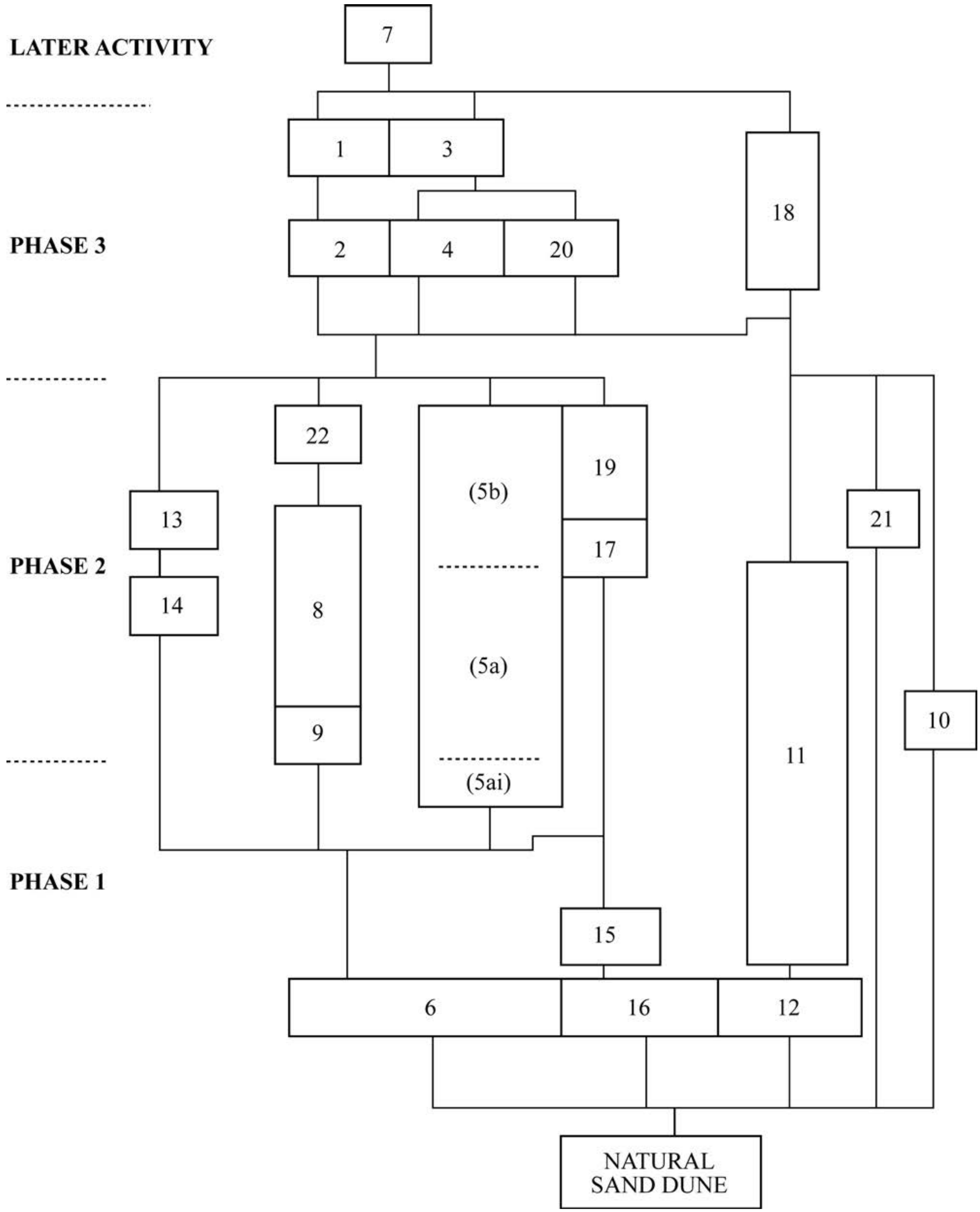


ILLUSTRATION 2.1
Site Matrix, showing the relationship of stratigraphic blocks to interpretative phases (see Table 2.1 for key to blocks).

2.2.2 PHASING

The system of phasing is not a primary part of the site record (Ill 2.1). It is probably best thought of as an interpretative overlay. In most cases, any given block will fall entirely within a single phase, but there are some important exceptions. For example Block 5, the fill of Wheelhouse 1, formed as a discrete and sealed sequence of contexts during both Phases 1 and 2. The precise boundary between the two cannot be determined stratigraphically, although it can be demonstrated, to a reasonable level of confidence, by other means (see Section 2.3.1).

Some elements of the phasing are better-defined than others. Looking at the Site Matrix (Ill 2.1) it is clear that certain blocks, for example Block 21, could 'slide' up and down the vertical axis to lie in either Phase 1 or Phase 2. This indicates that there is no strict stratigraphic evidence to prove that Block 21 lies in Phase 2 (there is in fact evidence of a different kind, but this will be discussed below, see Section 2.4.6). Note, however, that the stratigraphic 'bottleneck' which separates Phases 2 and 3 prevents any such re-arrangement of the blocks on either side, thus confirming the stratigraphic integrity of Phase 3.

A fuller assessment of the stratigraphic issues relating to individual phases is given in the relevant sections below.

TABLE 2.1

Stratigraphic blocks: phasing and summary description.

Block	Phase	Summary description
1	3	Structure 8, internal deposits
2	3	Structure 8, masonry and construction
3	3	Structure 8, entrance passage deposits
4	3	Structure 8, entrance passage, masonry and construction
5	1/2	Wheelhouse 1, internal deposits
6	1	Wheelhouse 1, construction and masonry
7	N/A	Post-abandonment activity
8	2	Structure 4, internal deposits and Structure 9
9	2	Structure 4, masonry and construction
10	2?	Pits
11	1/2	Wheelhouse 2, entrance passage deposits
12	1	Wheelhouse 2, entrance passage, masonry and construction
13	2	Structure 5, internal deposits
14	2	Structure 5, masonry and construction
15	1	Wheelhouse 2, internal deposits
16	1	Wheelhouse 2, masonry and construction
17	2	Structure 3, masonry and construction
18	3	External midden deposits and Structure 10
19	2	Structure 3, internal deposits
20	3	Structure 8, sump
21	2?	Structure 6
22	2	Structure 7

2.2.3 OTHER INFORMATION

The following sections also incorporate, where relevant, the results of physical, chemical and magnetic analysis carried out on individual soil samples by Dr Mike Church, Department of Archaeology, University of Durham. The full report on this work is lodged in the site archive.

Where it is material to the discussion, reference is also made to artefacts and ecofacts. This information is by no means exhaustive, however, and fuller accounts of these aspects are available in the following chapters. Radiocarbon dates have been appended wherever they occur, although these again are discussed more fully in Chapter 6. Unless otherwise noted, these are quoted calibrated, at 1 sigma. Some of the dates have been statistically adjusted using the methodologies described by Magnar Dalland in Chapter 6 (and shown in Table 6.4): adjusted dates are indicated as such wherever they are used.

Data are also presented relating to the quantities, characteristics and size ranges of pottery sherds within various blocks and context. This information was assembled during the preliminary sorting of material following excavation, and there are inevitable discrepancies between the crude data recovered by this method and the more precise counting and analysis carried out by Dr Ann MacSween for the formal pottery report. Nonetheless, it was felt that the crude results of the pottery quantification exercise were sufficient for the purpose of examining broad scale variation of pottery deposition and sediment taphonomy between the various blocks and contexts. It was also felt that any minor increase in precision to be gained by repeating the initial quantification exercise would not justify the time and resource implications of carrying out the work.

Tabulated data on pottery quantification for all blocks and contexts on the site are included in the site archive. It is only for Block 5 and its various sub-divisions (the fill of Wheelhouse 1), where internal pottery variability is a major issue, that the full tabulated data are presented in this report. Elsewhere, occasional reference is made to particular aspects of the assemblage as appropriate but the site archive should be consulted for further detail. Where reference is made to the percentage of 'large sherds' within a block or context, it refers to the proportion of sherds with at least one dimension greater than 50mm.

2.3 PHASE 1: THE WHEELHOUSE SETTLEMENT

The Phase 1 deposits appear to have been founded on an unoccupied site with no evidence for earlier human activity, at least within the excavated area. This phase comprises the construction and occupation of Wheelhouses 1 and 2, of which the latter appears to have been unfinished (Ill 2.2).

Blocks 6, 12 and 16 comprise the construction of, respectively, Wheelhouse 1, Wheelhouse 2 and the expanded entrance passage of the latter (Ill 2.1). The degree to which the fabric of the walls is interconnected suggests contemporaneity, although it is possible to detect parts of the sequence of construction. The attribution of each of these blocks to Phase 1 is secure.

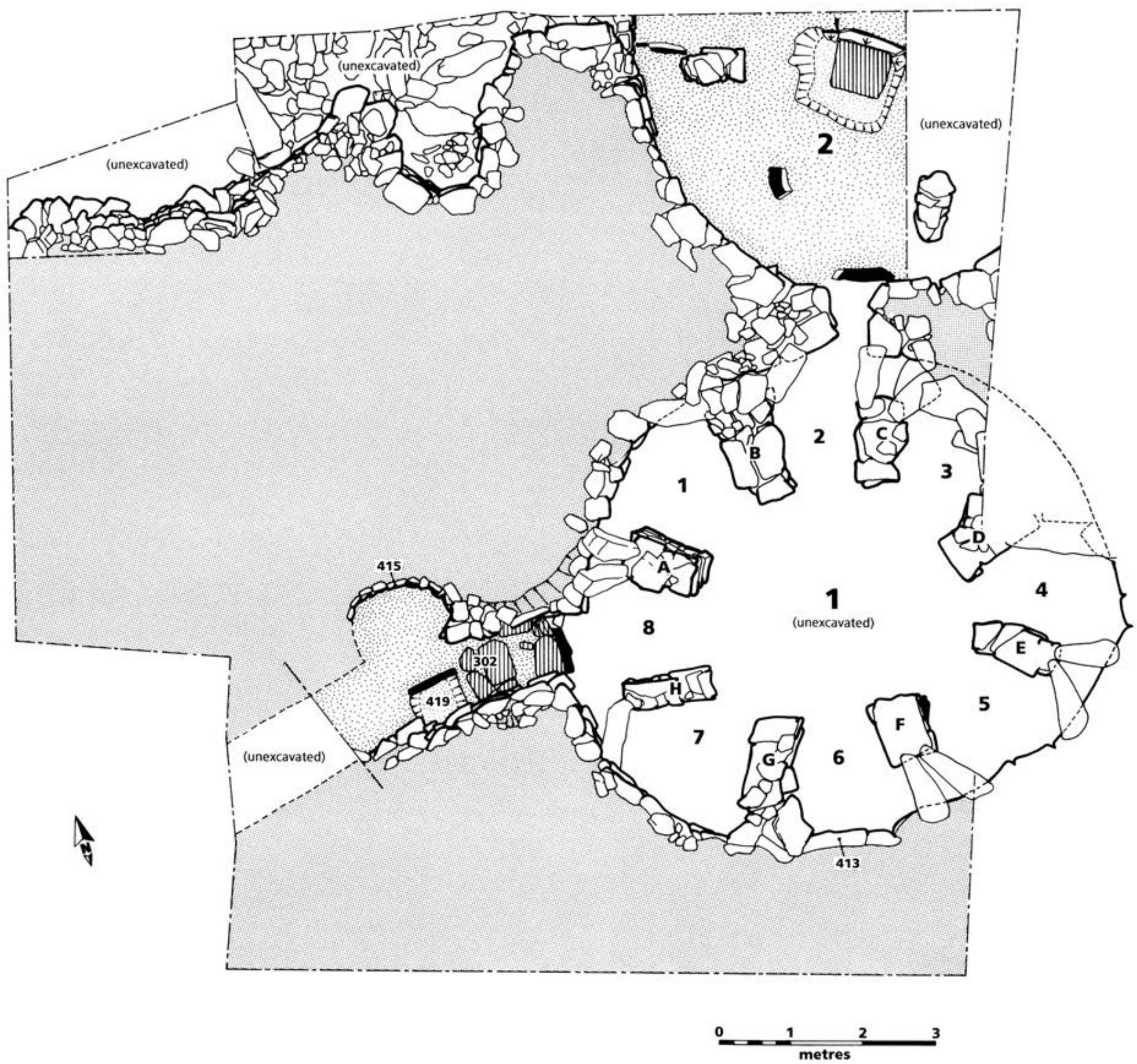


ILLUSTRATION 2.2
Phase 1 summary plan, showing numbering of bays and piers in Wheelhouse 1. This drawing also shows the context numbers of the Wheelhouse 1 entrance passage features; note that elements of paving (C302) have been removed over the pit (C419).

More difficult is the phasing of the deposits within these structures. Blocks 11 and 15 relate to the deposits within Wheelhouse 2 and its entrance passage. As the construction of a later building (Structure 3) over the infilled Wheelhouse 2 is one of the prime determinants of the Phase 2, these deposits (Block 15), by definition, belong to Phase 1. It is probable, however, that later material found its way into Block 11 (the fill of the Wheelhouse 2 entrance passage) as this area was not subsequently built over and the upper masonry was still visible as late as Phase 3. It can be seen from the Site Matrix (Ill 2.1) that Block 11 could slide up and down the matrix between Phases 1 and 2 without prejudicing the stratigraphic relationships between the blocks. Although described here entirely under the heading of Phase 1, it should be remembered that part at least of the upper fill of the Wheelhouse 2 entrance passage almost certainly belongs to Phase 2.

Within Wheelhouse 1, the picture is less clear. It is not possible definitively to relate particular contexts within Wheelhouse 1 to the re-ordering of the settlement which comes in Phase 2. It appears, however, that apart from a restricted series of deposits in two of the wheelhouse bays (sub-block 5ai) all of the excavated deposits within Wheelhouse 1 relate to Phase 2. Earlier deposits were clearly present but were not fully excavated. The justification for the division between Phases 1 and 2 is discussed below in the section dealing with Wheelhouse 1.

As can be gauged from this discussion the separation between Phases 1 and 2 cannot be determined with absolute precision on all parts of the site. Therefore, only those blocks which belong definitively to one or the other have been used in comparisons of artefactual and other material between blocks. The phasing of the structures themselves is clear.

2.3.1 WHEELHOUSE 1: BLOCKS 5AI AND 6

Wheelhouse 1 was of a type which has been described as an 'aisled roundhouse' (Scott 1948) because of the presence of the gap, or 'aisle', between the enclosing wall and the outer ends of the radial stone piers, which would have allowed the possibility of access between the bays. It was approximately circular, although markedly asymmetrical. It was divided internally by eight radial piers which defined seven bays in addition to the main entrance bay. A second entrance gave access into Wheelhouse 2 (and later into Structure 3). The bays and piers are labelled on Ill 2.2, and these numbers will be used to structure the following discussion.

The internal diameter of Wheelhouse 1 varied between 7.9m from the entrance to the back of Bay 4, to 6.9m between the backs of Bays 2 and 6 (the smaller dimension is estimated since Bay 6 was not excavated to its foundation course, but the figure is not likely to be more than 0.1m out). The central area was similarly slightly oval with dimensions of 3.9m by 3.2m. The open sides of the bays were mostly close to 1m wide at ground level. The only bays to depart noticeably from this pattern were Bay 7 (*c* 0.75m) and Bay 4. However, Bay 4 was not excavated to anywhere near its base so its unusually narrow open side of *c* 0.6m would undoubtedly have widened as it descended, although probably not to as much as 1m.

Time and safety considerations prevented the excavation of the primary deposits of Wheelhouse 1. Two major episodes of floor reorganization were excavated, both of which appear to relate to periods when the wheelhouse was already beginning to show signs of structural instability. The deposits pre-dating the second reorganization form the sub-block 5a, and those post-dating it, 5b.

It was originally thought that sub-block 5a might relate to Phase 1 occupation, and 5b to Phase 2. This seems, in retrospect, to have been rather simplistic. Instead, the presence of unexcavated deposits below the first recognized floor, the radiocarbon dates and detailed morphological comparisons with features in Structure 4 (see Section 2.4.3), all combine to suggest that both of these episodes relate to Phase 2 in the overall site sequence. The only excavated deposits which seem likely to relate to the primary use of Wheelhouse 1 are thus those pre-dating the first recognized floor reorganization (although even these *might* belong to Phase 2), and these have been grouped under the rather clumsy heading of sub-block 5ai. It is those deposits alone which will be discussed in this section, with the remainder being discussed under Phase 2.

2.3.1.1 Construction: Block 6

The processes of wheelhouse construction are discussed in considerably more detail in Chapter 5 of this report. This section, therefore, provides only a limited description of the structural remains of Wheelhouse 1.

The first stage in the construction process was the excavation of a large circular pit (C414) into the natural sand dune, with a linear extension forming an entrance passage (although see Chapter 5 for a more detailed discussion of the various alternative modes of construction). The sides of this pit were then lined with a stone wall (C413) of blocky, angular stones and occasional better quality building slabs. The lower courses of this wall seemed to have been built directly against the cut in the sand dune, but a series of deposits had been placed as packing material between the sides of the pit and the upper courses, from around 1.5m above the sand floor.

This packing material was extremely heterogeneous, ranging from compact inorganic sand (C107, C119) to bright orange-red peat ash (within C032, C106) to organic-rich midden debris (C129) and stained sand (C095, C123). This material may derive from a number of sources and certainly implies the use of occupation debris brought from off-site. A sample from C032 produced plant macrofossil evidence for the burning of part of a cleaned barley crop, represented by cereal caryopses. This was an unusual piece of evidence for a single-episode of discard on the site, and may represent either material derived from another settlement, or else from a cooking episode during construction. The same context contained several large angular stones (see Section D in Ill 2.39). Part of the packing material behind the wall in Bay 1 (C123) had slumped forward to cover part of the collapsed rubble in the upper part of the bay when the wall gave way at the end of Phase 2. This material had been revetted by the wall backing of Structure 8 (Ill 2.39).

Little of this packing material could be excavated, as the wall of Wheelhouse 1 was not taken down. The excavated deposits, therefore, come from the tops of the walls and were only partially excavated. Despite the low volume of material excavated, these deposits contained 140 sherds of pottery.

More notable was the range of metal-working debris (see Section 3.11) as well as a perforated iron sheet (SF54) and a fine bronze fitting (SF31) for an organic object of some kind. This material was overwhelmingly concentrated in one deposit (C108), a grey-brown sand some 50mm thick which appeared to constitute a single-episode dump in the wall-packing behind Bay 5 of the wheelhouse. Also present within the packing material were an unfinished spindle whorl (SF256), worked antler (SF37, SF290), a bone and antler handle (SF250, SF60), a bone point (SF53), and a bone modelling tool (SF91) (see Chapter 3).

A warning note is sounded by the radiocarbon date obtained from a sample of bone found in C129. This yielded an uncalibrated date of 1570 ± 140 BP which is the latest on the site by far and clearly long-post-dates the construction of the wheelhouse (see Section 6.1.2). As this group of wall-packing deposits lay close to the modern, pre-excavation, ground surface, they were exposed by the initial machine removal of sand from the site. It seems highly probable that machining has obscured some later, probably post-abandonment disturbance of the upper layers, from which the dated sample was obtained. This group of contexts as a whole, however, does not pose a problem in stratigraphic terms, as their relationship to the Wheelhouse 1 wall was unambiguous during excavation. We must, nonetheless, be wary of possible contamination in the finds assemblage as well as that indicated by the radiocarbon date for the bone assemblage, since material from the initial cleaning of the deposit may be contaminated. C108, however, which contained the bulk of the metal-working debris, was securely stratified.

It was possible to observe in section that a mixed and heterogeneous deposit of midden and sand lenses (C502) rose over the tops of the corbelled bays (Bays 4 and 5), and filled the gaps between the upper parts of the Wheelhouse 1 and 2 walls (Ill 2.20). The banding of the lenses within this material was highly irregular, suggesting that they had been put in place by human action, rather than forming naturally over the roof. They were presumably the remains of material used to seal the tops of the stone corbelled roofs. These deposits had been horizontally truncated, presumably by wind erosion (Ill 2.20). Interestingly it appears that there have been multiple episodes of horizontal truncation within this deposit, as the section shows that the uppermost band of sediment in the northern part of the combined C502 seals a series of truncated deposits, but is itself sealed by similarly truncated deposits over the southern part of the wheelhouse. It seems most likely that these layers together represent the remains of numerous re-roofing episodes of Bays 4 and 5, possibly extending as late as Phase 3 (when these bays formed part of Structure 8, see Section 2.5.1). This complex deposit could only be recorded in section (Ill 2.20) where its upper parts appear to overlie part of the Phase 3 midden (C012) which itself overlies Wheelhouse 2. This context appears, therefore, potentially to span all three phases of the site, and has accordingly been kept out of Block 6, and not formally allocated to any block. No artefactual material was recovered from it.

The wheelhouse wall was continuous in construction with an entrance passage which led westwards from a doorway some 0.8m wide, for a distance of at least 3m where it ran into the limit of the excavated area. This passage had been heavily disturbed by subsequent structural modifications, particularly on its north side which had been substantially removed. Three to four courses survived of the southern passage wall in places. The passage measured some 0.8m wide at its inner end, perhaps widening to 1m at the furthest point traced.

A small cell (C415) was constructed on the north side of the entrance passage. It was C-shaped, opening onto the passage, and measured approximately 1.2m east to west by 0.9m. It had been heavily truncated by later constructions and its west side had lost all of its stonework, being identified only by a cut into the sand. It survived to no more than two courses in height. The north side of the passage had also been removed beyond this point during the construction of Structure 4 in Phase 2.

The interior of the wheelhouse was divided by eight radial stone piers, each around 1.3m to 1.5m long at their bases, which seem, from the limited excavation of the earliest deposits, to have been bedded directly onto the sand floor. The piers rose from a narrow base, only one stone wide, to between 0.5m and 1.5m, at which points they were joined to the enclosing wall by paired lintels. The piers, lintels and wall around each bay then formed the base for the individual corbelling of each cell, as could be seen from the preserved corbelling over Bays 4 and 5 (Ill 2.3).

Pier A (C069), which survived to only approximately 1.3m high (it had to be progressively dismantled during excavation so some of the later photographs show it substantially reduced in height) and had slumped dangerously to the south where it had been incorporated in the wall of the later Structure 8, was fully excavated to its base. This revealed that the front of the pier at its base was formed by a vertical slab bedded into the sand floor. Above this rose five surviving courses, each formed at the front of the pier by a single stone, each slightly wider than the one below, thus widening from around 0.3m at the base to 0.55m at a height of around 1.3m. The paired lintels which joined the pier to the enclosing wall were set at a height of only some 0.5m above the sand floor.

Pier B (C078) survived to around 1.6m, its upper portion being joined to the enclosing wall by a pair of lintels above an aisle some 1.3m high (Ill 2.4). Preserved on the lintels was a deposit of rubble which seemed to form the base of the infill of the corbelled roof of the adjoining bays. Pier B was also excavated almost to its base, which narrowed to 0.2m in width.

ILLUSTRATION 2.3
Wheelhouse 1, general view from north-west during the excavation. Bays 3–6 can be seen at the limits of excavation.

Pier C (C077) survived to approximately 1.6m in height, by 1.4m long. It too was connected by paired lintels to the enclosing wall. Unlike the other piers, however, the northern of the two lintels, adjacent to the entrance to Wheelhouse 2 (C163), ran straight back to join the enclosing wall, rather than running at an angle to the pier (Ill 2.2). This seems unambiguously to suggest that Pier C was deliberately designed so as not to block the connecting entrance to Wheelhouse 2, thus confirming that the two wheelhouses were built as elements of one overall design.

ILLUSTRATION 2.4
Wheelhouse 1, Pier B.

Piers D and E (C023, C035) survived intact to their corbelled roofs (Ill 2.5), but the unstable masonry prevented excavation within the bays around them (Bays 3–5). Their precise dimensions, and the form of their lower coursing, are thus unknown. This part of the wheelhouse, nonetheless, was of crucial significance for the understanding of the roofing of the structure, and will be discussed in more detail in Section 5.3.3. These bays extended under the main south-east section of the excavation trench, hence the projection of the Wheelhouse 1 floor-plan outside the limits of the main excavation trench. The ground above rose sharply at this point to the drive-way of the adjacent house, and no extension of the excavated area was possible.

Piers F and G (C128, C098) could also not be excavated for safety reasons, and indeed were so badly collapsed that their dimensions could not be accurately gauged. The ends of these piers had been incorporated into the wall of the later Structure 8, and this walling was so precarious that it could not be safely dismantled. It could be seen from limited excavation on plan that both piers were bonded to the enclosing wall by paired lintels as elsewhere.

Pier H (C070) formed the southern entrance pier. It was the worst-preserved of all, standing only some 0.6m in maximum height, and 1.3m long, but it had been joined by a lintel to the enclosing wall at a much lower level than the other observed piers (*c* 0.5m) with the exception of Pier 1 which also flanked the entrance.

2.3.1.2 Occupation deposits: Phase 1: Block 5ai

As has been discussed, the only deposits which can be associated with the primary use of Wheelhouse 1 are those which form the limited sub-block 5ai. This sub-block is defined as those contexts which underlie an extensive laid sand floor deposit (C274, C288, C286) which covered much of the central area and extended into the bays. It should be borne in mind that even earlier deposits may have underlain the recognized elements of sub-block 5ai, which need not be absolutely primary to the use of the structure.

Deposits relating to sub-block 5ai were excavated only in Bays 2 and 7. In Bay 2 the sand floor deposit (C274) was underlain by a distinct layer of orange peat ash and midden debris (C275). Adjacent to this was a similar deposit (C290), also restricted to Bay 2, which contained a higher density of organic material. The latter contained 47 sherds of pottery including 17 per cent large sherds.

Within Bay 7, the equivalent sand floor (C286) overlay an organic-rich ashy deposit (C293) which extended into the central area, and which in turn overlay a similar but lighter coloured ashy material (C297). Below this was an area of more compressed and trampled peat ash (C298). Only the northern half of Bay 7 was excavated, yet these limited deposits still produced 51 sherds of pottery. The deposits within Bay 7 had a distinct bowl-like surface.

2.3.1.3 The entrance passage deposits

The entrance passage deposits associated with Wheelhouse 1 were extremely disturbed, much of this material having been removed in the construction of Structures 4 and 7, and subsequently by the excavations for the linear sump of Structure 8 in Phase 3 (see Section 2.5.1.3). They were also excavated in conditions of near total panic on the final evening before the excavation ended. This meant that they could not be properly planned at a primary level, and relevant sections of the plan presented in Ill 2.2 have been based partly on photographs.

The earliest feature identified was a small pit (C419) cut directly into the clean dune sand in the passage outside the entrance passage cell. This was approximately 0.8m in diameter and some 0.5m deep and partly sealed by the entrance paving above (C302). It was lined on its south and west sides by single slabs, and had irregular sloping sides on its north and east. Its fill comprised mixed stained sand (C418), small stones in moderate density and no cultural material.

A single layer of primary paving slabs (C302) lay along the passage to a distance of 3.2m from the wheelhouse entrance. They lay directly on the natural dune sand, partly sealing the pit (C419), and had been reached in places by the later trench cut for the linear sump in the passage to Structure 8 (see Section 2.5.1.3.). A narrow stone-sided gully (C312) some 0.1m wide, ran for a short distance along the north side of the passage (not shown on plan). Its relationship with the paving could not be resolved. A series of discontinuous ashy sand deposits (C294, C295, C277, C260, C211), all extremely compacted, lay above these assorted primary features and below the reach of the later sump. They appear to relate to activity within the wheelhouse but cannot be assigned to any particular period.

2.3.1.4 Interpretation

Wheelhouse 1, although small in diameter by the standards of Hebridean wheelhouses, was a monumental construction built to a high standard despite unpromising building materials. The survival of the corbelled roofs over Bays 4 and 5, which were empty to a depth in excess of 1m when discovered during excavation, is testimony to the strength and stability of at least some elements of the structure. The graceful shape of the piers, best demonstrated in excavation by Pier B, soaring upwards from a single stones width, and gradually widening to form a corbelled arch with the adjacent piers (Ill 2.4), would have been a remarkable sight. The process of construction will be discussed in more detail in Chapter 5.

There is little doubt that Wheelhouse 1 was intended as a domestic building, even though the earliest deposits could not be excavated. What was seen of the presumed primary floor debris suggested peat ash and midden material similar to that from the secondary reorganization, which was unambiguously domestic (see Section 2.4.1.2). Wheelhouses elsewhere, as will be discussed later, have also produced a great deal of evidence to support their interpretation as a monumental but essentially domestic structural form.

The architecture of the building created a series of well-defined zones which would have structured daily life inside. The central area would presumably have had a hearth, as it did during Phase 2, and seems to have been the domestic as well as architectural focal point of the building. As well as the entrance passage, this area gave access to seven bays which, from the limited evidence available, were neither kerbed nor otherwise sealed off from the interior. The bays were accessible one from another through the low but easily passable gaps or 'aisle' which ran behind them, around the enclosing wall. Only the piers on either side of the main entrance were linked to the wall at a level too low for an adult to pass comfortably through. This suggests that access was perhaps not intended to be allowed from the entrance passage directly into the bays. Everyone thus had to pass through the central area.

Bay 2 contained the entrance to Wheelhouse 2, which, as we shall see below (see Section 2.3.3.3), was never completed. It is not clear to what extent Bay 2 was used in the primary occupation as a passage, and to what extent it was simply another bay of the wheelhouse. This entrance was walled-up during the early part of Phase 2, and this walling may well have been put in place as early as Phase 1. It was dismantled later in Phase 2 to give access to the newly constructed Structure 3.

As we have seen, there are very few excavated deposits that can be attributed to the primary use of the wheelhouse, and these are restricted to Bay 2 and the excavated half of Bay 7. These 'primary' deposits are sufficient to indicate that there was some build-up of occupation debris within the structure, principally peat ash and organic material, prior to the deliberate deposition of a clean sand layer across the wheelhouse interior at the start of Phase 2 (see Section 2.4.1.1). They are insufficient, however, to enable any assessment of the nature or spatial distribution of the activities involved, or to enable any estimate of its duration. It may well be, for example, that the wheelhouse interior was kept scrupulously clean for many years while it retained its original monumental appearance, and was only allowed to build up substantial floor deposits once structural failure had begun to rob it of its original grandeur.

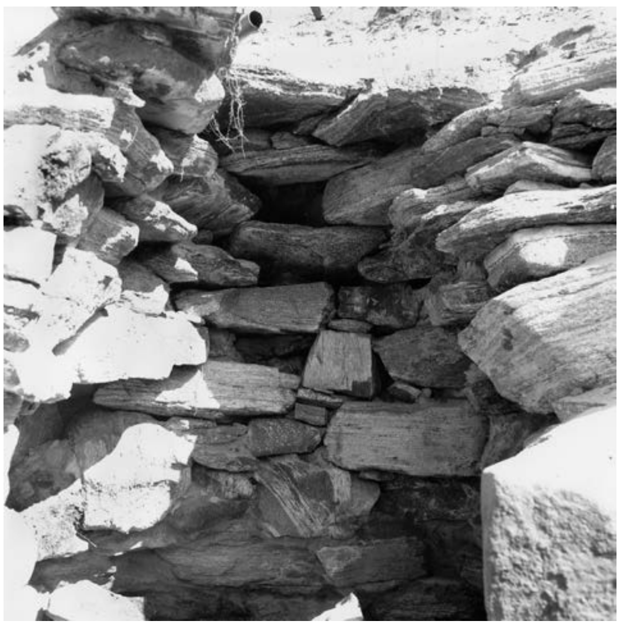


ILLUSTRATION 2.5
Detail of upper corbelling of Bay 4, looking up from the front of the bay.

2.3.2 WHEELHOUSE 2: BLOCKS 11, 12, 15 AND 16

Wheelhouse 2 lay immediately to the north of Wheelhouse 1 to which it was connected via the lintelled door-way from Bay 2. Only around half of Wheelhouse 2 was preserved, the remainder having been lost to coastal erosion, and only around two thirds of what survived could be safely excavated. Enough was preserved to indicate that it was of similar size and shape to Wheelhouse 1 (Ill 2.6).

The long and complex, independent entrance passage to Wheelhouse 2 was similarly bisected by erosion. Indeed it was highly fortuitous that a small part of the main entrance to Wheelhouse 2 was detected, running into the edge of the excavation trench on the north of the site. Without this, it would have been far from obvious that these complex masonry remains did actually represent the remains of an entrance passage associated with Wheelhouse 2, rather than, say, part of a later figure-of-eight building.

It was clear early on that Wheelhouse 2 had undergone a completely different structural and depositional history to that of its neighbour. Indeed it appears that Wheelhouse 2 was never completed, at least to its original design, and never formed more than an out-building to Wheelhouse 1. It was deliberately infilled during Phase 1 and replaced by a smaller cell, Structure 3, during Phase 2.

2.3.2.1 Construction: Blocks 12 and 16

As with Wheelhouse 1, the construction process for Wheelhouse 2 is discussed in detail in Chapter 5. This section, therefore, describes the physical evidence from the buildings without addressing detailed questions of constructional technique.

Estimating from the surviving portion, the pit dug to accommodate the wheelhouse appears to have been around 7m in diameter, and adjoined the linear trench (C403) cut for the accompanying entrance passage (this section). The cut for Wheelhouse 2 sliced through packing material for Wheelhouse 1, demonstrating that the latter was already in existence prior to the construction of Wheelhouse 2, although the design of the piers of Wheelhouse 1 clearly demonstrated that the two structures had been planned as one overall design (see Section 2.3.1.1). Indeed, Wheelhouse 1 need not necessarily have been completed by the time work on Wheelhouse 2 began.

A stone-lining, one stone in thickness (C116), was constructed against the sides of the pit, forming the wall of Wheelhouse 2. The stones were graded with the smallest towards the base (Ill 5.2). No packing was used up to the surviving height of the wall, at around 1.7m. Indeed, all of the structural features, walling and piers, rested directly on the natural sand floor with no indications of any packing or foundation material.

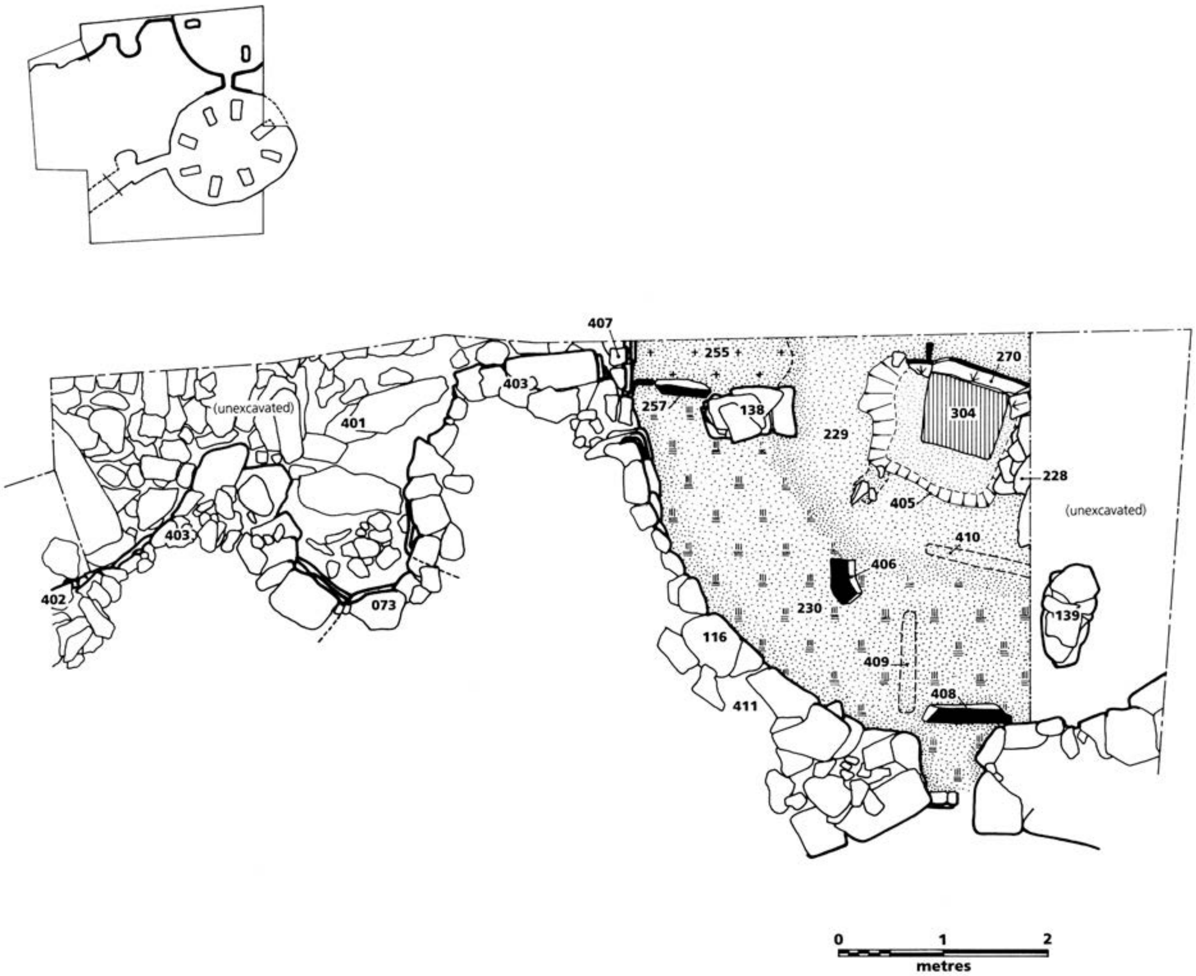


ILLUSTRATION 2.6
Wheelhouse 2, plan of internal features and entrance passage.

An entrance (C163), built into the south-west arc of Wheelhouse 2 connected the structure to Wheelhouse 1. This was capped by a substantial stone lintel at a height of approximately 1.5m and was 0.8m wide at the base, narrowing to 0.4m below the lintel. The entrance, and indeed the lintel, had been re-used for the later Structure 3, but there were no signs of secondary modification to the surviving features. An edge-set slab (C408) was set into the natural sand transversely across the connecting entrance between Wheelhouses 1 and 2, to form a threshold on the Wheelhouse 2 side of the entrance. This slab was set in such a way as to form a prominent inverted V (Ill 2.17) and formed rather an irregular obstacle to passage between the two structures.

The other access into Wheelhouse 2 was the main, north-west facing entrance, leading into the entrance passage. This was bisected by the edge of the excavation trench and its width cannot be judged. Its lintel did not survive. This entrance had been blocked by coursed walling (C407) surviving to five courses (approximately 0.45m) in height (Ill 2.7). This blocking walling, too, was set directly upon the natural sand floor, and seems to have been put in place soon after the construction of the main wall (C116).

The excavated portion of Wheelhouse 2 also contained two radial piers (C138, C139) and part of (or a marker for) another (C406). The pier to the south-west of the main (blocked) entrance (C138) was one stone in width, and measured approximately 0.7m high by 0.9m long (Ill 2.7). It ran approximately south-east to north-west and was founded directly onto the natural sand floor of the construction trench. It had been built

ILLUSTRATION 2.7
Wheelhouse 2, view of blocked entrance from interior.

of moderately flat slabs. There were no indications of collapsed masonry deriving from this pier.

In the southern part of the excavated area were the remains of second pier (C139) running approximately north-east to south-west. This again was only one stone wide and around 1m long, and founded on natural sand. Although not excavated for safety reasons, it was recorded in section, and survived to 1.2m in height (Ill 2.8; note that the section was deliberately cut back somewhat from the area excavated on plan to allow for recording of the pier). The base of the front (interior) end of the pier was formed by a large orthostat with five courses of surviving masonry above it.

Between these two piers was a single orthostat (C406), 0.35m high, set into natural sand in exactly the position where an intermediate pier would have been expected. Assuming a regular spacing of piers as found in other wheelhouses, no further piers would have been expected to be found within the confines of the excavation trench.

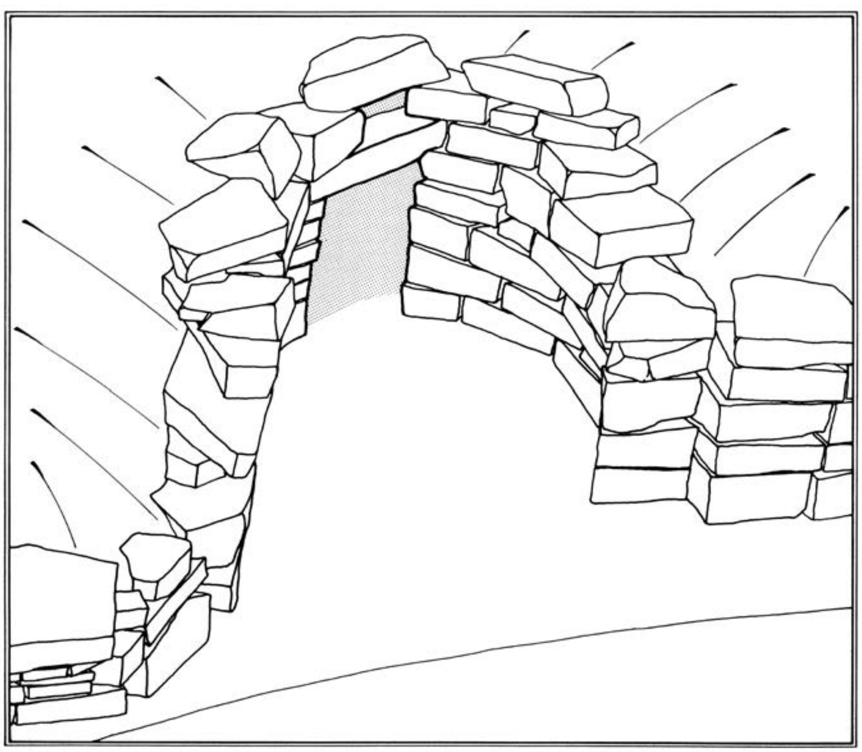
Despite the lack of packing material behind the Wheelhouse 2 wall, several items were found between the stones and their sand-backing, and can only have been placed there deliberately during construction. Cattle vertebrae (see Section 4.2), the head of a great auk (see Section 4.3), two potsherds (V2531, Ill 3.4e, see Section 3.2.6), and a complete decorated pot (V1366, Ill 3.5a, see Section 3.2.6), were all recovered from around waist height in the small section of walling taken down (a length of only 1.5m extending southwards from the main entrance). These presumably ritual deposits are discussed in more detail later in this report. The cattle vertebrae (C116) yielded a radiocarbon date of 615–255 BC, at one sigma (GU-2754). The reliability and significance of this rather early date is discussed in Section 6.3.2.

The construction of the entrance passage to Wheelhouse 2 (Block 12) appears to have been undertaken as a single event, possibly contemporary with the construction of the wheelhouse itself. The walling of the entrance passage was bonded into the main wall of Wheelhouse 2 (Block 16) and formed a stone-lined approach, at least 9m long. It was set into a trench (C403) cut into the natural sand dune, the sides of which had been sheared to receive the stone lining. A small amount of stained sand, presumably derived from construction activity, had become incorporated behind the passage walls (C124/111).

A short passage, some 1.8m long, led north-westwards from the door-way to Wheelhouse 2. This gave access to a small cell (C073) which opened out to the south-east and survived as an irregular oval. The walls of this cell were formed of angular boulders, a single stone thick, and stood to around 1.4m high. The walling contained the broken upper stone of a rotary quern (SF133, Ill 3.25a, see Section 3.6).

ILLUSTRATION 2.8
Wheelhouse 2, unexcavated pier in section.

ILLUSTRATION 2.9
Wheelhouse 2, 'false entrance' leading off entrance passage cell. The accompanying drawing highlights the structural features, including the small, square, weight-relieving void above the entrance.



The cell measured little more than 1m wide internally, by at least 3m transversely, across the entrance passage. Built into the south-east wall of the cell was a peculiar feature which appeared as a low, lintelled entrance. This feature was around 0.6m high by 0.4m across and had a distinct 'void' above its lintel some 0.2m by 0.2m, seemingly intended to relieve weight stresses above the lintel. This 'false' entrance did not lead to any further cell or passage, but simply backed into the clean, unmodified natural sand dune (Ill 2.9).

Westwards from this cell, the passage opened out somewhat to a width of not less than 2m. This outer entrance passage was at least 5m long and survived to a height of around 1.2m. It reduced in height somewhat towards its western end. While the inner entrance passage may well have been lintelled, and the cell (C073) seems to have been intended for corbelling, this outer passage (C402) was of a rough coursed construction, incorporating many rather unstable water-worn stones, and may never have been intended for roofing. Indeed, if its northern side bowed out as much as the surviving southern side, it may well be better interpreted as some form of open, sand-revetted yard, fronting the entrance passage proper. Its rough construction would probably have suggested a separate and later addition to the entrance had not the evidence for abandonment during construction been so strong (see Section 2.3.3.3).

The upper parts of the dune sand revetted behind this westward extension of the Wheelhouse 2 entrance passage contained a small scatter of small stones, perhaps indicating some dumping of excavated material as wall-packing, although the boundary between the natural and potentially modified levels could not be established with any certainty.

A small assemblage of pottery (22 sherds) derived from material incorporated behind the entrance passage walling. While none of this material in itself suggested deliberate deposition, the possibility should not be ignored, particularly in view of the deposits behind the wall of Wheelhouse 2. The high proportion (32 per cent) of decorated sherds may suggest some deliberate selection of material.

2.3.2.2 Internal deposits: Blocks 11 and 15

As mentioned above, the entrance to Wheelhouse 2 was deliberately blocked, by the construction of a coursed blocking wall (C407, above, Section 2.3.2.1), before any deposits had formed in the entrance passage (Ill 2.7). It appears most likely that this was done as soon as the plan to complete the wheelhouse had been abandoned.

The other primary deposits and features within the abortive wheelhouse are amongst the most problematic on the site. They comprise a pit (C405), an overlying stone stack (C228) and a series of residual internal divisions and deposits (Ill 2.6).

The pit (C405) was dug into clean sand in the centre of Wheelhouse 2 prior to the formation of any deposits within the structure. It measured approximately 1.2m wide by 1m long at its base as excavated, although it would presumably have been rather longer originally as it disappeared into the edge of the excavated area. It was around 0.65m deep.

The base of the pit was formed by a large flat slab (C304) which extended just short of the drawn section (Ill 2.10). A series of at least three vertically set slabs (C270) formed the north-east edge of the pit. These had been inserted after the basal slab, but at least one had been rammed down into the sand (C229) below the original base of the pit. The largest of these slabs was some 0.75m long and had traces of a boulder-clay capping (C276). C276 yielded two radiocarbon dates with ranges of 40 BC–AD 85 and 925–600 BC respectively, at one sigma (GU-2755 and GU-2756). The significance of these widely divergent dates is discussed in Section 6.3.2. It seems probable that the sample yielding the earlier date contained bone which was old at the time of deposition.

The pit gave no immediate clues as to function. It was not water-tight, as its sand sides were unlined for much of their length, and it had no evidence of in situ burning. Filling the lower portion of the pit was a series of ashy dumps (C285, C296) comprising a loose, crumbly, orange-red peat ash. Analysis of a sample from C296 concluded that the deposit was of the common, mixed type found throughout the site sequence and deriving from a range of domestic debris.

Above this level the pit was almost wholly filled with a carefully constructed stack of building stone (C228) quite distinct from the disorganized rubble contained in the deposits which sealed it (this section). The stone deposit filled and overlapped the pit, standing directly on clean sand (C229). Overall the deposit comprised up to nine courses of stacked stone, rising some 0.5m above the sand floor (visible in Ill 2.10 and 2.20). The lowest courses (C271) appeared to be arranged in such a way as to corbel over the base of the pit, leaving a void which had largely filled with the loose ash deposits mentioned above (C285, C296).

ILLUSTRATION 2.10
Wheelhouse 2, view of central pit, excavated.

Two shallow linear cuts were also identified in the clean sand floor (C229) of Wheelhouse 2. The first (C409) ran approximately north-east to south-west from the west side of the door-way connecting Wheelhouses 1 and 2. It was approximately 0.05m deep by 1m long by 0.15m wide, and appears to have been the setting for a former slab partition. A second cut (C410) ran approximately south-east to north-east, parallel to the southern edge of the central pit (C405) but set around 0.4m back from it. This cut was again around 0.05m deep by 1m long by 0.15m wide, and was probably the setting for another slab partition.

There were other concentrations of activity within Wheelhouse 2, mainly around the southern and western periphery of the structure. The southern periphery contained a series of thin, ashy-clay deposits (C230), deepest close to the entrance to Wheelhouse 1, although discontinuous and not visible in the drawn section (Ill 2.20). These deposits stopped short of the central stone stack and were badly disturbed by rubble in the deposits above them. They appear to represent trampled occupation deposits, presumably derived from Wheelhouse 1. A particular concentration (C216, C213) was identified immediately south of the pier at the main entrance to Wheelhouse 2 (Ill 2.6). No sign of any hearth was traceable in Wheelhouse 2 nor indeed was there any direct sign of burning in situ.

A further group of deposits formed close to the blocked entrance to Wheelhouse 2. Over the clean sand floor (C229) was a thin layer of stained sand (C255) into which were set two small orthostats (C257). These closed the gap between the northernmost pier of Wheelhouse 2 (C138) and the blocked entrance. A thin lens of sterile windblown sand (C254) subsequently accumulated, followed by a series of stained sands with some evidence of organic material (C252, C246). This area, on the whole, seems to have witnessed less human activity than the area close to the connecting entrance with Wheelhouse 1.

All of the contexts so far described can be related to the primary use of Wheelhouse 2, whatever that use may have been. All could conceivably have formed within a few days or weeks, although they may occupy a rather longer period of deposition. All were to be sealed by a major deposit of voided rubble and mixed sand (C130, C131) which appears to represent the deliberate throwing down of the walls into the interior. The deposit was deepest against the walls (Ill 2.11), but covered virtually the whole of the interior, including the stone stack (C228). C131 yielded two radiocarbon dates, with ranges of 56 BC–AD 130 and

480–165 BC respectively, at one sigma (GU-2757 and GU-2758). These divergent dates repeat the pattern seen in the dates from the earlier C276 in the same block. It seems likely that the earlier date has been contaminated by the presence of bone which was old at the time of deposition, most probably derived from the wall-packing which was cast down into the structure along with the upper masonry.

The quantity of voided rubble in this collapse horizon (C131/130) suggests a single-episode of destruction. The fact that this material was not restricted to any single part of the structure seems to imply deliberate human action, in other words a concerted attempt to level the structure. It may have been intended as a preparation for the construction of Structure 3 (see Section 2.4.2), although the formation of a series of subsequent deposits seems to suggest that the area lay vacant for a considerable period.

ILLUSTRATION 2.11
Wheelhouse 2, view of collapsed stone in western part of interior.

The latest series of deposits which accumulated in Wheelhouse 2 during Phase 1, comprised a thick series of mixed stained sands (C031) with ashy inclusions, and episodes of windblown sand (C036, C049). They probably represent an essentially natural accumulation which incorporated a certain amount of domestic debris as a result of their proximity to the occupied building. It is impossible to judge over what period these deposits formed, but it may have been decades or even centuries rather than years (contra the interpretation given in the interim report: Armit 1988, 17, which mistakenly referred to an absence of naturally accumulated windblown sand in these deposits). It is particularly interesting that numerous episodes of windblown sand are identifiable in these deposits. This appears to confirm that there was some wind erosion of the machair close to the settlement even during Phase 1, and further highlights the absence of any windblown sand deposits within the fills of the main structures, which might otherwise denote temporary or seasonal abandonment of the roofed structures.

One find of particular importance was made in the upper part of the infill of Wheelhouse 2 (C031). This was the upper part of an adult human skull (HB01, see Section 3.4) and two sherds of pottery (V2513 and V2454, Ill 3.3 d and e, see Section 3.2.6), one with a zigzag cordon, placed together in a hollow scooped out of the surface of the sand and rubble. It lay directly below the later Structure 3, the construction of which had removed the upper sands from this area of the interior. Despite being set into the destruction deposit of Wheelhouse 2, therefore, it is probably best seen as associated with the construction of Structure 3, placed in position after the trench for this later structure had been excavated, removing the upper sands.

The deposits within the entrance passage to Wheelhouse 2 could not be fully excavated because of the density of stacked building stone combined with the limited working area between the passage wall and the edge of the excavation trench. These deposits were not subsequently sealed by further structures and, after the initial deposition of slabs (this section), cannot be definitively assigned to Phase 1 or 2.

The earliest deposits identified comprised a stack of slabs (C401) which occupied almost the whole of the passage, and were particularly densely packed towards the east (wheelhouse) end (Ill 2.12). These were recorded on plan and by photograph, but could

ILLUSTRATION 2.12
Wheelhouse 2, view of stacked stone in entrance passage. The recessed butt-joint of the Wheelhouse 2 wall and its entrance passage can clearly be seen.

not be removed. They were contained, at their eastern extent, by the wall blocking the Wheelhouse 2 entrance (C407). They are interpreted as deposits of building stone stacked ready for use, but abandoned when construction of the wheelhouse was aborted (see Section 5.3.2).

This stone deposit was sealed by a series of thin layers of ashy domestic refuse (C089, C090, C110, C072, C122). Analysis of a sample of one of these (C090), from the westernmost extension of the entrance passage, suggested that this deposit was essentially a single-episode discard of hearth waste, with a high charcoal content, and with some admixture of other domestic refuse. This group of deposits may thus be interpreted as deriving from floor clearance within Wheelhouse 1 or, less likely, Wheelhouse 2. The same context also contained the greater part of the hind limb and all of the fore limb of a sheep of around six months old which appears to have been deliberately deposited (see Section 4.2.3.2). The initial deposition of this material must have followed rapidly on the abandonment of construction of Wheelhouse 2, as no sand deposits seem to have accumulated around and between the stacked stones.

Finally, a dark, organic, stained sand (C086/218) accumulated within the entrance passage up to a depth of at least 0.6m. This homogenous deposit contained relatively little pottery (74 sherds) for its volume, and is interpreted as a slowly accreting mixture of windblown sand with limited inputs of domestic waste from Wheelhouse 1 and other structures. The much smaller volume of sediment from the ashy dumps below contained far higher concentrations of pottery.

The depression and upper walling of the entrance passage were partly visible during Phase 3, at which point they were filled and covered over by the midden deposits of Block 18 (see Section 2.5.3). It is possible that the passage had simply not filled in completely by Phase 3. It is also possible, however, that it had entirely filled during Phase 2, but had been re-exposed by soil movement during Phase 2 (see Section 2.4.7). The absence of clean windblown sand lenses within this deposit is intriguing, particularly given the evidence of such deposits in Wheelhouse 2. It appears to suggest that multiple episodes of deposition and erosion may have removed traces of Phase 1 natural deposition from this area.

One particular find from this group of deposits should be highlighted. This was an iron spade-shoe (SF23), retaining part of its wooden haft, found in context 072; a mixed deposit of stained sands formed over the stacked stone in the inner entrance passage between the small cell (C073) and the Wheelhouse 2 entrance. While this may represent the casual discard of a broken tool, its position, just outside the blocked entrance to Wheelhouse 2, is suggestive of a formal closure deposit. A date obtained from the wooden haft provides a range of AD 25–130 at one sigma (AA–29767). The context probably formed during Phase 2 but an earlier formation, during Phase 1, is not excluded as a possibility by either the stratigraphy or radiocarbon dating.

2.3.3.3 Interpretation

Wheelhouse 2 appears never to have been used as a domestic building. It contained no hearth, at least within the excavated area, and no build-up of domestic debris such as has been identified in Wheelhouse 1 and all of the other inhabited structures on the site. The size and shape of the structure, however, and the presence of at least two radial piers and a 'marker' for another, all suggest that the structure was designed and laid out as a wheelhouse on a similar plan to the adjoining Wheelhouse 1. Indeed, if one super-imposes the plan of Wheelhouse 2 onto that of Wheelhouse 1, aligning the entrances of the two, they are an almost exact fit: the two piers of Wheelhouse 2 line up exactly over the equivalent piers in Wheelhouse 1, and the 'marker' stone stands exactly on the line of the intervening pier.

Yet there are several strands of evidence to suggest that the construction of Wheelhouse 2 was abandoned well before completion:

1. Had the wheelhouse been completed it would have required a further radial pier between the two which were identified (C138, C139) in order to support its superstructure. This pier would have stood on the west side of the entrance which connected Wheelhouses 1 and 2. Any pier which had stood here must have been removed before any of the thin ashy deposits (C216, C213, C230) which covered the sand floor in this area had formed. It seems highly improbable that the removal of a pier, and thus of the stone corbelled roof of the bay, could have been effected without leaving any trace of rubble, trampling or other disturbance in the smooth sand floor. Either the pier was never built, or else it was removed prior to the completion of its upper corbelling. In either case, the structure could never have been roofed as, or have functioned as a wheelhouse. The 'marker' stone (C406), standing in the position where a pier would have been expected, may have formed part of the laying out of the structure, or all that remains of a dismantled pier.
2. The careful walling-up of the main entrance to Wheelhouse 2, before any deposits had formed in the interior or the passage, suggests that the structure was reduced to a cell, accessible only from Wheelhouse 1, at an early stage in its structural history. As this walling seals off deposits of stacked building stone in the passage, it would appear that it was built immediately on abandonment of construction, and that the passage of Wheelhouse 2 was never again used for access.
3. The deposits of large stones, both in the passage (C401) and in the stack (C228) above the central pit (C405), are difficult to interpret other than as material deposited ready for construction, but never apparently used.
4. The 'false entrance' leading southwards from the Wheelhouse 2 entrance passage cell (C073) seems to have been intended to lead into a cell or passage which was never built. A trench cut into the sand behind this cell found that the area comprised nothing but undisturbed dune sand.

It would appear, therefore, that the construction of Wheelhouse 2 was abandoned at a stage where the wall had been constructed to rather more than 1.7m (the amount of rubble in C130 and C131 might suggest that some 2m of walling was originally present although this is no more than a scale order estimate), but before all of the piers had been built.

Quite why the project should have been abandoned is unknown, but a wide range of reasons are possible, ranging from death or injury to the builders or intended occupants, structural failure of the walls or piers (though there is no sign of such problems in the excavated masonry), to a lack of resources for completion. We will obviously never know. The original intention, to construct two adjoining wheelhouses, was an extremely unusual one, and the implications of this will be explored in later sections of this report.

The complexity of the entrance passage to Wheelhouse 2 is worth noting. This is particularly important as it has sometimes been thought that such entrances were cumulative constructions, extended to prevent sand build-up around the door-way (eg at Sollas, Campbell 1991), or to add to the monumentality of the wheelhouse. In the case of Wheelhouse 2, however, it appears that the entrance passage was laid out, in all its complexity, at a relatively early stage in the construction of the wheelhouse.

Assuming then that Wheelhouse 2 was never completed and never occupied as a domestic building, it remains to account for the deposits which were found within it. Our understanding of these is of course greatly hampered by the limited area available for excavation. The features seem unusual and inexplicable, but this may be at least in part a result of the incomplete plan which is available.

It seems unlikely that Wheelhouse 2 was ever roofed. Roofing could presumably only have been achieved by resting the rafters of a conical roof behind the wall-head. Such a roofing mechanism would have required timbers of much greater length than those required for Wheelhouse 1. Although not impossible, therefore, it seems intuitively highly unlikely that such scarce and valuable resources would have been directed to what seems to have been effectively an out-building.

It is possible that partial roofing might have been achieved using the partly built radial piers as supports. This might explain the retention of at least two piers which were otherwise structurally redundant. It is at least equally possible that no part of Wheelhouse 2 was ever roofed, and that the structure was simply left open for a short time as a yard accessible from Wheelhouse 1 (during which the small quantity of deposits formed within its interior), with the intention that it might at some stage be completed. It was presumably infilled when that idea was finally abandoned.

How long Wheelhouse 2 stood open, and what, if anything, it was used for over this period is unclear, but from the lack of sand accumulation in what was effectively a deep pit in an active machair system, it seems improbable that it was open for more than a few years. The few deposits relating to this period are uninformative and seem most likely to derive from Wheelhouse 1 floor clearance. Aside from the ceramic assemblage the few other finds are restricted to fragments of cetacean and antler-working debris, a bone pin (SF73), a hammerstone (SF206) and a rotary quern stone (SF133) (Table 2.2).

TABLE 2.2
Finds (excluding pottery) from Wheelhouse 2 (Phase 1).

Internal deposits	**Entrance area**
Whalebone (SF128)	Iron spade (SF23)
Worked antler (SF71a)	Whalebone (SF301)
Antler roughout (SF71b)	Rotary quern stone (SF133)
Bone pin (SF73)	
Hammerstone (SF206)	
Human skull fragment (HB01)	

The stack of stones within the interior filled and sealed the partly slab-lined central pit (C405), which had presumably, therefore, been dug during the initial period of construction. The pit was positioned more or less where one would normally expect the central hearth of a wheelhouse to be located, and its function is entirely unknown (given that few, if any, primary central hearths have been removed from wheelhouses, it is entirely possible that similar pits have gone undetected elsewhere). The stones around its sides were unburnt so it was apparently not a disturbed kiln or cooking pit, although there were small fragments of charcoal of indeterminate species within its fill (C296). The sides of the pit, although partly lined, were not clay-luted, so it is not comparable with the water-tight tanks found on some Atlantic roundhouse sites. No unusual finds came from the fills, which appear to have percolated through the voids in the stone stack above. During the period when Wheelhouse 2 lay open, the pit would have been buried below a stack of building stone which stood at least 0.5m above the sand floor surface.

The closest parallels for the pit are probably the primary pits below the floor of the Sollas wheelhouse in North Uist (Campbell 1991), although no overtly ritual deposits survived within the Wheelhouse 2 example. It may well be that the pit would have been back-filled and covered over with a central hearth had the construction of Wheelhouse 2 been completed.

The closure of Wheelhouse 2 seems to have been a pre-meditated act involving the toppling in of the upper walls of the structure. The interior was by no means filled and the substantial hollow left in the sand was subsequently filled by a series of predominantly natural deposits of sand, the varying organic components of which seem to reflect the varying conditions and speed of deposition.

2.4 PHASE 2: THE CELLULAR STRUCTURES

Phase 2 represents the period in the life of the settlement during which Wheelhouse 1 ceased to be occupied in its original monumental form and the settlement was progressively modified to create a cellular layout. Occupation continued inside the wheelhouse, although some of the bays were blocked and parts of the roofing propped up, altering the spatial arrangements of the settlement. At broadly the same time a second domestic building, Structure 4, was built adjacent to, and accessed from, the wheelhouse entrance passage. Later in Phase 2, a small cell, Structure 3, was built over the remains of Wheelhouse 2, accessed directly from the surviving Wheelhouse 1. A series of smaller structures and features are also associated with this phase.

This phase has been divided for descriptive convenience into sub-phases 2a and 2b (Ills 2.13–2.14) which relate to two successive re-orderings of the interiors of the two main structures; Wheelhouse 1 and Structure 4. This division should not be allowed to obscure the continuous nature of the development of the settlement during Phase 2.

Also of interest is the apparent evidence for soil erosion during Phase 2. This appears to have resulted in the removal of any midden or other material which

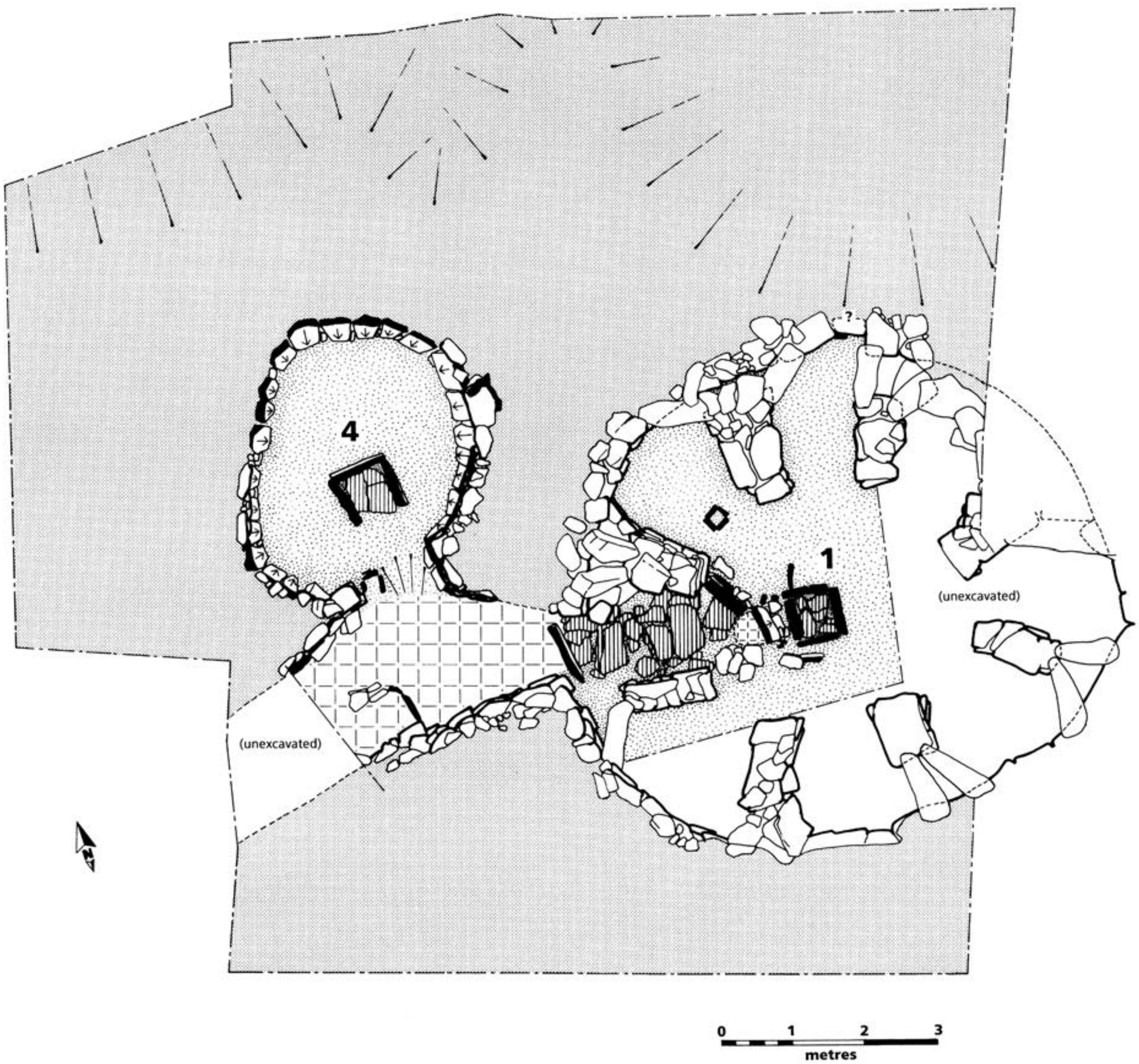


ILLUSTRATION 2.13
Phase 2 summary plan No 1.

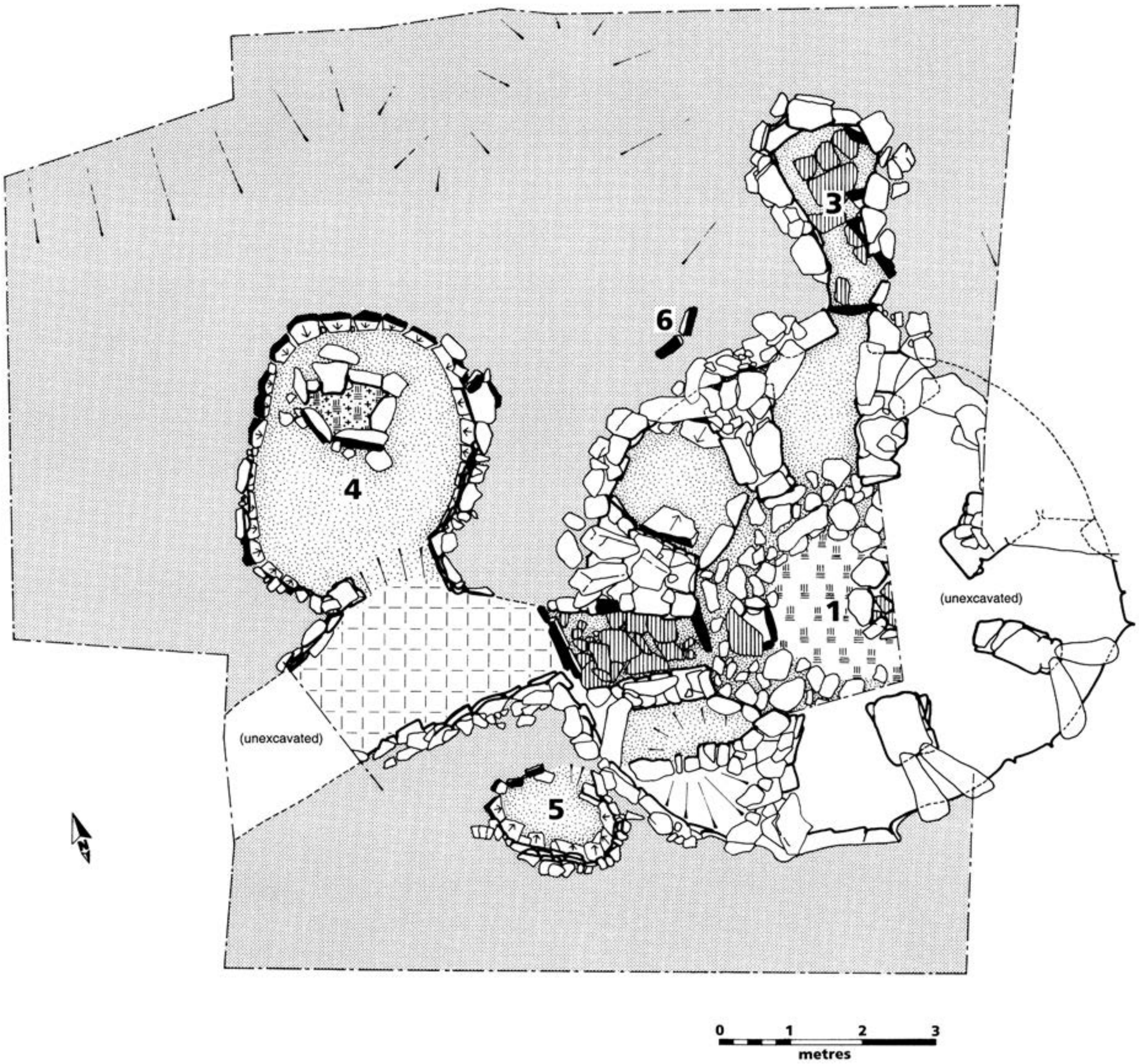


ILLUSTRATION 2.14
Phase 2 summary plan No 2.

may have been deposited around the Phase 1 and 2 buildings, as well as the partial destruction of certain Phase 2 structures.

The main changes can be summarized as follows:

1. The settlement no longer had a 'monumental' character, and the wheelhouse was now an increasingly unstable and progressively modified structure.
2. Activity was spread around a greater number of smaller structural foci, giving the settlement a cellular character.
3. Slab-revetting was adopted as the predominant structural technique.
4. There were, for the first time, definite signs of soil erosion around the structures.

Block 5, the internal deposits within Wheelhouse 1 (Blocks 5a and 5b), continued to form during Phase 2 (Ill 2.1). Blocks 8 and 9, representing the construction and occupation of Structure 4, also relate entirely to Phase 2. These blocks were sealed by deposits of Phase 3, and clearly post-date deposits of Phase 1. Block 22 represents Structure

7, a secondary cell built over Structure 4 after its abandonment, but still within Phase 2. Blocks 17 and 19 represent the construction and use of Structure 3 which is also sealed by Phase 3 deposits and which itself seals deposits of Phase 1.

The remaining blocks (Blocks 10, 13, 14 and 21) relate to two stone-lined pits, Structures 5 and 6, and two further pits. All are sealed by Phase 3 deposits, but only Block 14 has a direct stratigraphic link with deposits of Phase 1 (it is clearly later than the construction of Wheelhouse 1). Structures 5 and 6 are assumed to belong to Phase 2 because of their similarities in construction with Structures 3 and 4, and because the original roofing of Wheelhouse 1 appears incompatible with the presence of Structure 5.

2.4.1 CONTINUING OCCUPATION OF WHEELHOUSE 1

There was no apparent break in occupation between the Phase 1 activity in Wheelhouse 1 and that of Phase 2. Phase 2 deposits comprise the overwhelming majority of the material excavated from within the wheelhouse and lay to a depth of around 0.6m in the central area, with even deeper accumulations in some of the bays.

2.4.1.1 The first reorganization and subsequent occupation – Phase 2a: Block 5a

Following the Phase 1 occupation of the wheelhouse interior, the entire central area and parts (if not all) of the bays were covered with a deposit of clean white sand (C274, C286). The deposit was devoid of cultural material and seems to have been intended simply to create a new floor (similar to the natural sand floor originally present when the wheelhouse was first constructed). This deposit was not fully excavated.

It was on this floor surface that a substantial rectangular hearth (C235) was constructed (Ill 2.15). Overall, the hearth measured some 1.1m north-north-west to south-south-east by 0.8m. The larger, south-south-eastern sector was well-paved with flat slabs and carefully kerbed, with external dimensions of around 0.8m north-north-west to south-south-east by 0.8m. The north-north-western sector was smaller, comprising an area of rougher paving only some 0.2m by 0.6m, enclosed between the kerbing of the south-south-east sector and by a small upright slab.

The hearth was set close to the centre of the wheelhouse and was aligned on the entrance bay. Its fill comprised numerous lenses of heavily burnt and friable peat ash (C236), and a spread of similar peat-ash-rich material (C237) lay around it. This material produced an assemblage of some 65 sherds of pottery. Two slabs (C503), one edge-set, to the south of the primary hearth seem to have related to some form of structure, perhaps a seat or bench adjacent to the hearth.

A floor division some 1m long, formed of two principal edge set slabs, and further smaller stones (C504), was also set into the laid floor (C274). This seems to have been the base for a slab or more likely a timber partition which would have blocked entry to the northern half of the wheelhouse from the entrance. This would have forced anyone entering the building to turn to their right and enter anti-clockwise.

The first hearth was replaced by a second (C222) in the same location but with a rather different design (Ill 2.15 inset and 2.16). The new hearth was again rectangular, slightly larger, and with a base formed by a new layer of heat-cracked slabs. It retained the former bipartite division. The larger sector was re-kerbed with a mixture of edge-set slabs and small, water-worn beach pebbles, and widened to 0.85m. The upright slab between the hearth and the entrance was retained, and further smaller slabs were added to fully enclose this part of the hearth. Further somewhat rounded stones were used to re-pave this smaller sector.

This second hearth seems to have been the source for a major and extremely compact deposit of trampled ash and sandy occupation debris (C204) which formed over the whole of the interior. This deposit was up to 0.15m in maximum depth but more commonly 0.05m deep. It lapped up markedly against the inner edges of the piers and mounded towards the centre of the building. It formed only a thin covering of a few centimetres over the second hearth (C222), which it also filled. The central area deposits of Block 5a produced a total of some 295 sherds of pottery.

C204 yielded two radiocarbon dates, with ranges of AD 70–135 and AD 30–105 respectively at one sigma (adjusted) (GU-2751 and GU-2752).

The superimposition of the two hearths, and the formation of deposits associated with them, created a distinct mounding in the centre of the wheelhouse interior which accentuated a slighter mounding present in the laid floor deposit (C274). The latter is perhaps most likely the result of an underlying hearth below the excavated area.

During the period of activity associated with these hearths, a rather more complex series of deposits formed within Bay 1. The interpretation of these deposits was hampered by mixing and distortion in the western part of the bay, seemingly caused by the outward slumping of Pier A in towards the entrance bay. The lowest level reached in Bay 1 was formed by two flat paving slabs (C510), set within the centre of the bay (their positions are dotted on Ill 2.15). Above these lay a dark stained sand (C292) which had formed across the whole of the bay, with a central 'bowl'. The gap or aisle between Bay 1 and the entrance bay had been roughly walled-up (C509) during or before the formation of this

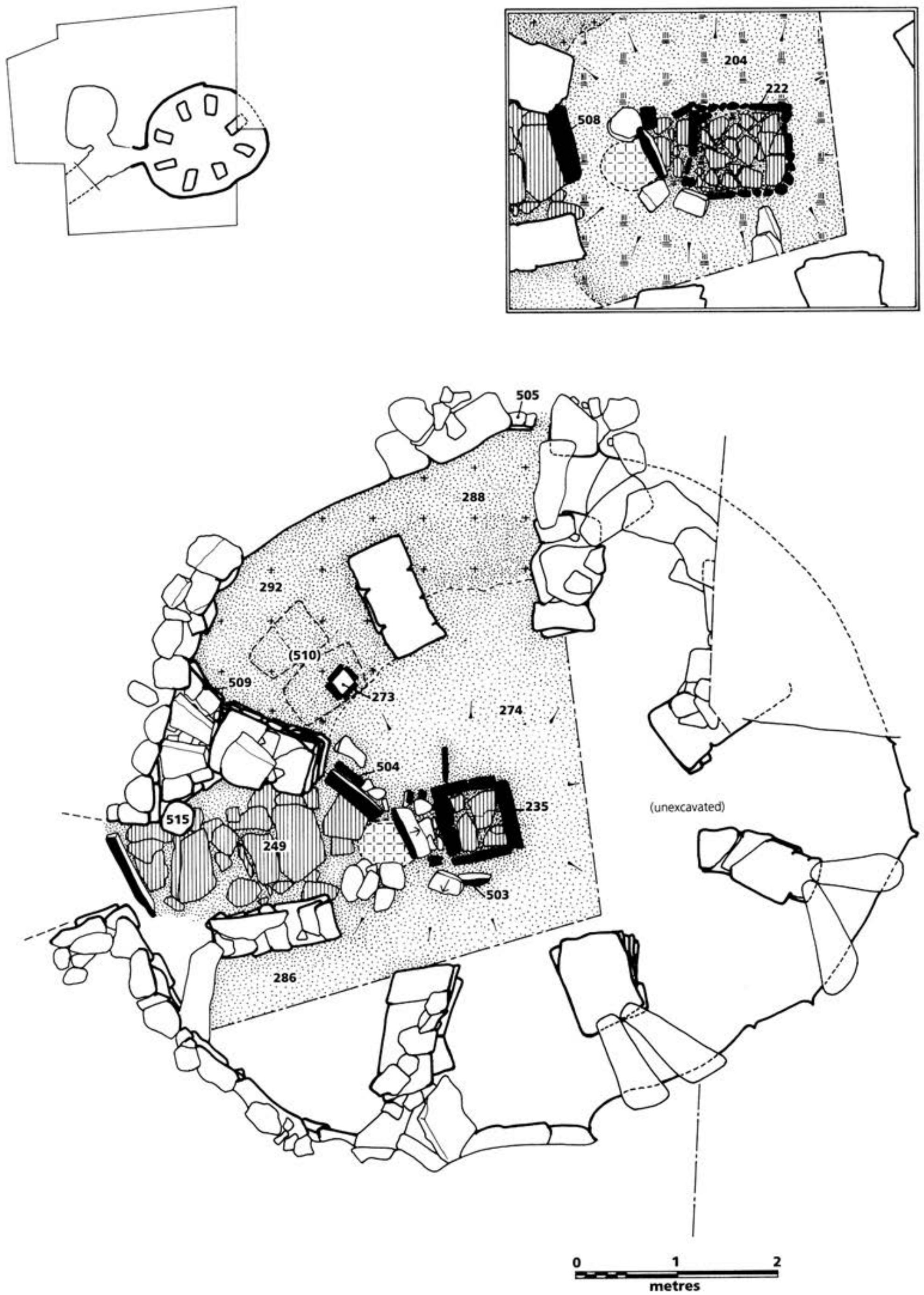


ILLUSTRATION 2.15
Wheelhouse 1, Phase 2a floor. The inset shows the second Phase 2a hearth and part of the secondary paving.

ILLUSTRATION 2.16
Wheelhouse 1, the second Phase 2a hearth from the east. Not all of the elements in this photograph are stratigraphically in phase. The Phase 2b stone features in Bay 1 have been only partly removed, as have those around the periphery of the central area, while the entrance buttress and Bay 7 kerb stones also belong to Phase 2b. The hearth shown here is thus rather earlier than most of the other visible features.

The final deposit in Bay 1 prior to the next reorganization was a layer of vivid orange peat ash, which extended into the central area where it was sealed by the extensive floor deposits (C204). The total amount of pottery within these Bay 1 deposits was relatively small (88 sherds).

The deposits of Bay 2 in this first period of Phase 2 activity were similar to those in Bay 1. All formed against a wall of small to medium coursed stones (C505) which blocked the lower portion of the entrance between the two wheelhouses (Ill 2.17). This wall seems to have been dismantled to the level of the top of these deposits (assuming that it originally extended higher) during the next phase of reorganization (see Section 2.4.1.2). It was presumably inserted when the building of Wheelhouse 2 was abandoned, and removed when access was required to the later Structure 3 (see Section 2.4.2).

The laid sand floor (C274) extended slightly from the central area into Bay 2, where it rapidly thinned

ILLUSTRATION 2.17
View through connecting entrance from Wheelhouse 1 towards Wheelhouse 2, showing three courses of residual blocking wall. Note also the triangular threshold stone on the far side of the entrance.

material. The bowl within the bay deposits seems to have been deliberately filled by the deposition of a lens of clean sand (C503) to level the surface of the cell, before sinking again to allow the formation within the bowl of a further layer of occupation debris (C291). This was sealed by a compact stained sand, perhaps another laid floor (C272).

Seemingly at this point a post-setting (C273) was inserted at the front of the bay. This was nearly square, some 0.3m by 0.35m in size internally, although the slabs had been slightly displaced, perhaps by removal of the post, or by downwards pressure. Its position suggests that it was intended to hold a post some 0.3m in diameter propping up the front of the corbelling over the bay. This may be supported by the shallowness of the post-setting (0.2m) which implies that the post must have been held in place by pressure from above.

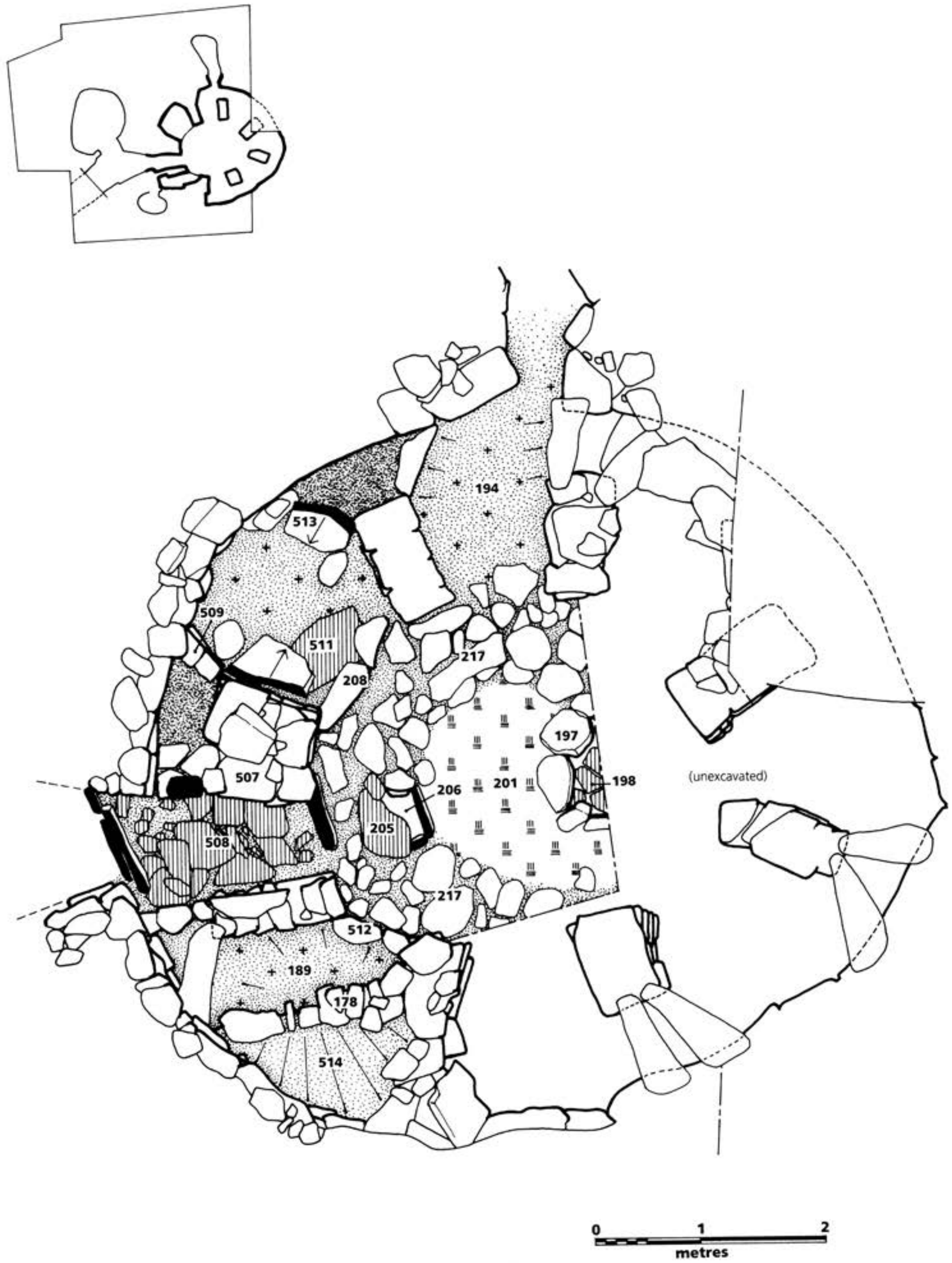


ILLUSTRATION 2.18
Wheelhouse 1, second Phase 2 floor.

and fragmented. The remainder of the bay was filled with a discontinuous, burnt, reddish peat ash layer (C288), which also extended in places into the central area. The relationship between C288 and C274 could not be established with any degree of confidence. Above these layers was a deposit of orange-brown peat-ash and organic-rich material (C265) which was continuous with the similar deposit across the central area (C237), and which seemed to derive from the primary hearth (C235). An upper deposit of peat-ash-rich material (C261) subsequently formed with a distinct bowl at its centre. This was then levelled with a greenish, clean sand deposit (C256), before the laying of a fine, white shell sand (C242) across the whole of the bay, banking up into the aisles behind the piers. This layer was then sealed by the ubiquitous floor deposits (C204) which extended over much of the interior.

Bay 2 contained almost five times as much pottery as Bay 1 despite its comparable volume of sediment, and the density of ceramics seems to have been relatively constant throughout the build-up of deposits. C265 yielded two radiocarbon dates; one spanned 40 BC–AD 55 at one sigma (adjusted) (GU-2749), while another at 6800±80 BP (GU-2750) was clearly a rogue date.

The deposits within Bay 7 seem to have been broadly continuous with those of the central area. After the deposition of the white, laid sand floor (C274, C286) a layer of orange peat ash deposits (C287) formed, continuous with those in the interior (C237), which seemingly derived from the primary Phase 2 hearth (C235) This was overlain by a further deposit of peat ash (C289) which underlay the extensive floor deposits (C204), mentioned above, in each of the other bays and the central area. Like the other two excavated bays, the deposits of Bay 7 formed in a distinct bowl-like formation. The assemblage of pottery from Bay 7 (167 sherds) is comparable with the large assemblage from Bay 2, as only half of Bay 7 was excavated.

2.4.1.2 The second reorganization and subsequent occupation – Phase 2b: Block 5b

The second reorganization was marked by the construction of an entirely new hearth (C197) directly onto the underlying trampled ashy floor (C204). This hearth was only half excavated, the other half extending under the section which had to be left in place to avoid destabilizing the corbelled Bays 3, 4 and 5 (Ill 2.18).

This new hearth was set off-centre within the wheelhouse interior, with its western edge adjacent to the east end of the earlier hearth. Its position suggests that it would have made access to Bay 4 rather constricted.

The hearth was formed by laying an irregular oval of water-worn boulders some 1.3m in approximate diameter. Unlike the earlier hearths there was no formal kerbing and no paved base. The construction and dimensions of this hearth, as well as its position away from the entrance, are strikingly similar to the secondary hearth in Structure 4 (see Section 2.4.3.2). It was filled with a greasy, orange-black peat-ash (C198) deposit up to 0.3m deep, which spilled over the earlier floor deposits.

ILLUSTRATION 2.19
Wheelhouse 1, Phase 2b, the covered pit and entrance pier buttress from the east.

There was no trace of a laid sand floor as had been deposited at the beginning of Phase 2. Indeed, a stained sand deposit (C217) containing numerous angular stones was found over the earlier, ashy floor deposits (C204), around the periphery of the central area (Ills 2.18–2.19). This layer also contained numerous stones which defy detailed interpretation but which were clearly deliberately laid rather than a random accumulation of rubble. There was more than one layer of laid stones present in places, and large stones were set at the front of Bays 1 (C208) and 7 (C512), acting as raised kerbs. This deposit appears to have been deliberately set in place at the time of the construction of the new hearth.

These stones may have formed components of some form of internal furniture, such as timber benching around the hearth, or perhaps formed a discontinuous and irregular paving or cobbling. The quantity of stones within the floor deposits of this phase of activity contrasts sharply with the lack of stones in the preceding period, as is clear from the drawn section (Ill 2.20). They also made it extremely difficult to link the sequence of deposits within each of the bays with those of the central area.

Above these deposits, the central part of the central area, west of the hearth, was covered by a layer of compact trampled material (C201), which analysis suggests is derived predominantly from organic debris, with a high ecofactual content, and with only a limited input of ash. This rather contradicted the field interpretation of the deposit as a predominantly ash-derived sediment. A sub-sample from the same context was identified as an inorganic sand lens, containing no ecofacts, presumably dumped as flooring during the period of occupation. This overall deposit then would appear to derive from a range of domestic activities.

The only other feature identified within the central area at this time was a small stone-lined pit (C206), set into the sand and stone layer (C217) between the hearth and the entrance (Ill 2.19). The east side of the pit was formed by the upright hearth slab from the primary hearths which had been left in place. The interior of the pit measured some 0.3m by 0.2m and had been capped using a small, slightly displaced slab (C205). One of the wall slabs was formed of a quarter fragment of a rotary quern (SF171, Ill 3.25b, see Section 3.6.2). The floor of the pit was unlined and cut through the earlier ashy deposits (C237). Although a certain amount of ashy material (C210) had percolated into the interior, the pit was largely empty when discovered. Similar pits in similar positions have been discovered on other wheelhouse sites, for example Sollas (Campbell 1991) and A' Cheardach Bheag (Fairhurst 1971).

A further extensive layer of peat ash and mixed occupation debris (C177) covered these internal features and was sealed directly by construction deposits associated with Structure 8 (see Section 2.5.1.1).

Despite a broadly equivalent volume of material, the second period of Phase 2 use in the central area produced only 75 sherds of pottery, as opposed to 295 in the earlier period. This included 25 per cent large sherds as opposed to 20 per cent previously, perhaps because of the relatively sheltered environment between the laid stones from which many sherds were recovered.

Within Bay 1, the earlier post setting (C273) had been covered over by a large flat slab (C511) set at the front of the bay. It is possible that this slab acted as a post-pad and thus superseded the former post. Set over the front of this slab was a kerb formed by two edge-set slabs (C208). This seems to represent the first time at which the interior of the bay was formally separated from the interior, although part of the reason for the insertion of this kerb may have been to protect a post, if the flat slab was indeed in use as a post-pad. The setting of the kerb made the relationship between deposits inside and outside the bay extremely difficult to assess. The deposits which formed behind the kerb were a series of variously stained sands, incorporating varying quantities of peat ash (C196, C195, C188) and quantities of blocky rubble built up in the gaps connecting Bay 1 with Bay 2 and the entrance bay (C509, C513).

Above these was a thick dump of orange peat ash (C187), which had been piled up to completely block the aisle to Bay 2. The deposit did not extend into Bay 2, being separated from it by a void under the lintels which connected the intervening pier to the enclosing wall. Analysis of a sample of this material confirmed that it derived from the repeated dumping and compacting of peat ash. This in turn was sealed by a complex series of striated bands of level sandy deposits (C172), up to 0.5m deep, seemingly reflecting multiple successive laid bay floors.

This whole group of deposits contained some 386 sherds, significantly more than accumulated in the earlier period (88 sherds) and five times the quantity recovered from the central area. The high proportion of large sherds (34 per cent) seems to indicate only limited trampling and activity in this bay.

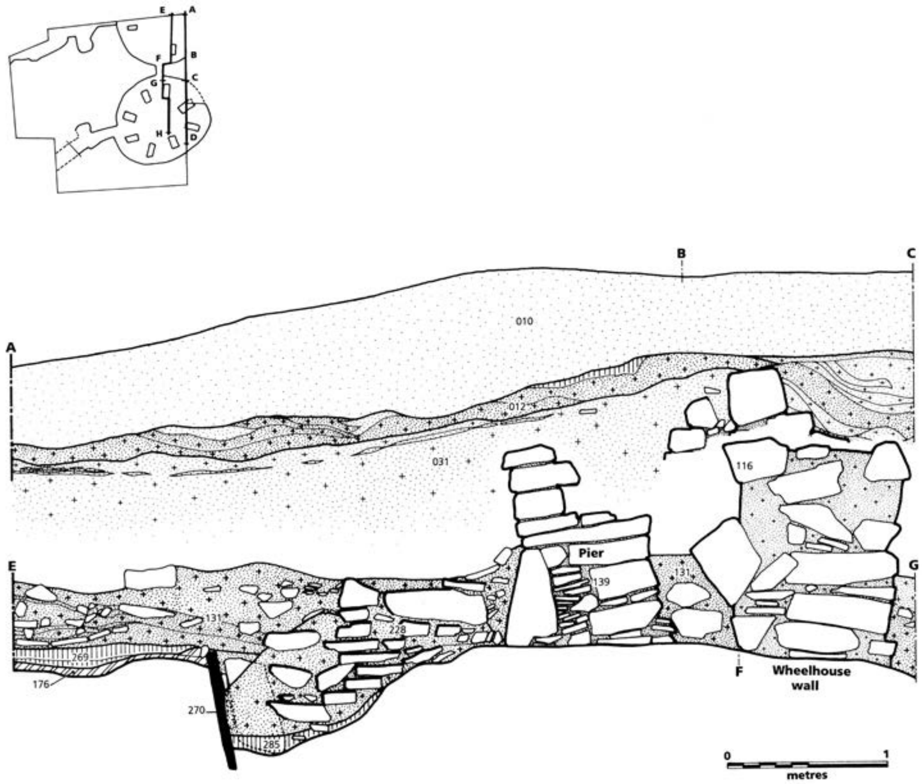


ILLUSTRATION 2.20 (a)

Section through Wheelhouses 1 and 2. *Note 1*: the upper part of the section is drawn along a line set back from the lower part. This was due to the impracticality, for safety reasons, of extending the initial site section downwards. The 'join' between the lower and upper parts is shown on the attached sections. The split does not prejudice any of the stratigraphic relationships shown. *Note 2*: the northern part of the section extends slightly north of the area excavated on plan, as time was available to quickly extend this part of the excavation before the section was drawn. *Note 3*: the section through Wheelhouse 2 clipped the edge of the pit in the centre of the structure. The fill has been projected on, and the slab which lines the side of the pit has been dotted. *Note 4*: the lower part of the section through Wheelhouse 1 shows all layers excavated after the removal of Structure 8. The cut for Structure 8 is reflected in the profile of the uppermost layer shown in this part of the section (C177).

Finally the bay was sealed by a thick and unconsolidated deposit of loose sand and rubble (C120, C145) which appears to derive from the collapse of the building at the beginning of Phase 3 (see Section 2.4.1.4). This material contained no pottery.

Bay 2 contained a series of variously stained sand layers (C194, C173, C168), each backing up against the aisles to either side and containing a relatively small amount of pottery (124 sherds), less than a third of the amount from Bay 1. They appear to represent a series of trampled sand floors. Analysis of a sub-sample from C173 identified it as boulder clay, with a pH value (7.05) outside the range of almost all of the other samples from the site. These deposits were above the level of the earlier blocking wall (C505, see Section 2.4.1.1) and abutted the threshold to Structure 3 (see Section 2.4.2.1) which appears to have been in use at this time. The final deposit in Bay 2 was a deep mix of sand and rubble (C146) similar to that in Bay 1 (C120, C145).

A series of predominantly sandy deposits also formed within Bay 7. The first two of these (C232, C234) were extremely rich in decayed shell and may represent a single-episode of discard. Also of note was a small deposit of boulder clay (C238) adjacent to Pier 8. An accumulation of densely stratified sands and peat ash deposits then formed (C231, C226, C225, C224, C219, C189), together up to 0.25m deep, and compressed into a bowl in the centre of the bay, before a rough boulder wall

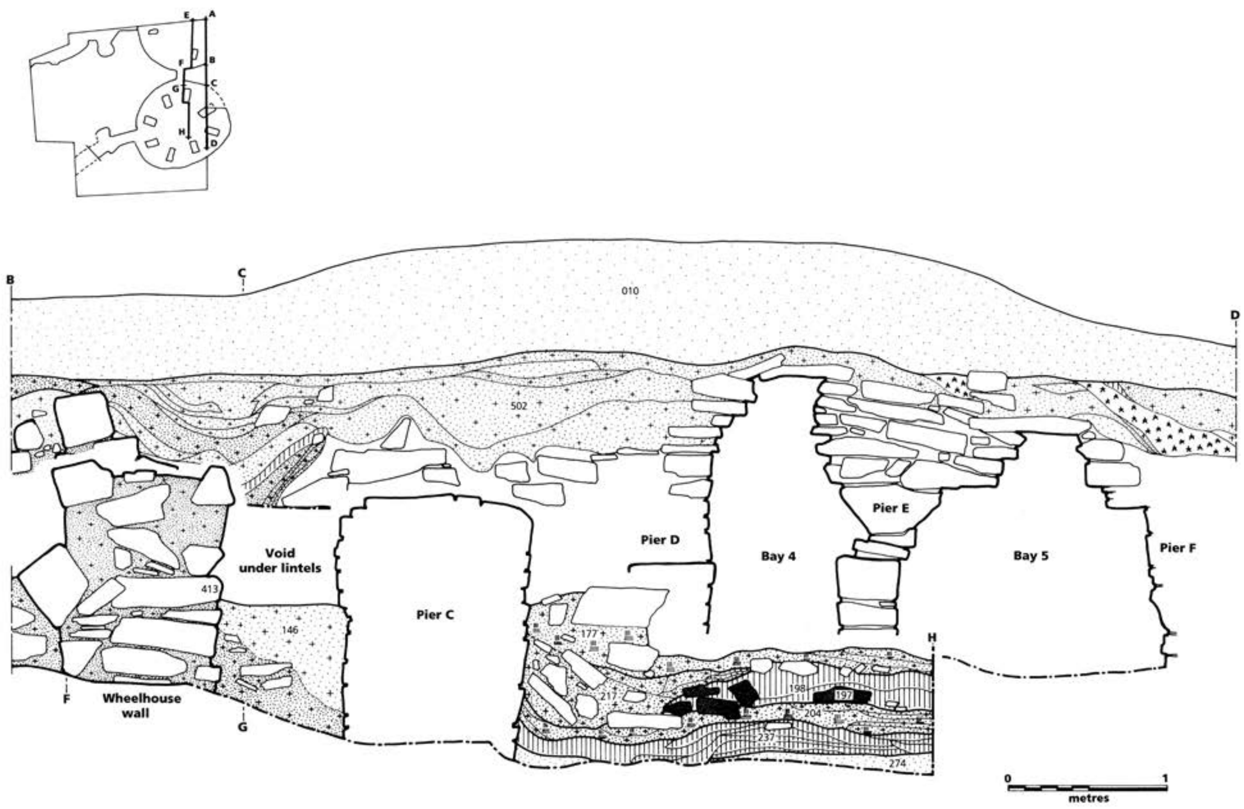


ILLUSTRATION 2.20(b)
Section through Wheelhouses 1 and 2.

(C178), up to three courses high and one stone thick, was constructed diagonally across the bay. This wall revetted a mixture of sand and rubble (C514) which presumably represents some form of structural collapse from the enclosing wall or Pier 7. This short length of walling was subsequently robbed and partly re-used in the construction of Structure 8. A dump of loose rubble in front of the wall (C180) may represent further collapse. It was sealed by a lens of peat ash (C179) before the collapse of sand and masonry (C096, C137) associated with the commencement of Phase 3.

Given that only half of the bay was excavated, the amount of pottery (357 sherds) from Bay 7 is extremely high, almost equalling that from Bay 1, and almost three times as much as was recovered from Bay 2.

2.4.1.3 The entrance bay deposits

Deposits within the entrance bay cannot be easily related to those within the interior, largely because of the density of stone paving and the homogeneity of the sediments presumably caused by trampling.

The earliest deposit encountered was a deposit of paving slabs (C249). This extended from a threshold stone, some 1m long, set across the entrance itself, to almost abut the hearth (C235) and partition (C504) in the central interior, turning south (right) as it passed through the entrance bay into the interior. On the left, just inside past the threshold stone, was a rounded, flat-topped block some 0.2m across its surface (C515), set at a slightly higher level than the remainder of the paving. This appears to have been deliberately placed. The threshold stone itself rose approximately 0.2m above the paving. The paving was not removed in its entirety, although it appeared from visual inspection to relate to the laid floor (C274) which marked the beginning of Phase 2 within the wheelhouse. This paving was overlain by a series of compact trampled ash and sand deposits (C248, C245, C247, C192).

A second layer of paving (C191) was subsequently put in place, including the lower stone of a rotary quern and a faceted hammerstone (see Section 3.6.2 and 3.6.3), and seems to have been added to with further slabs (C508) as occupation continued. This retained the outer threshold stone, but also added a new threshold slab across the inner end of the bay, between the two piers. These together defined an area of paving slabs some 1.6m in length. The new, inner threshold stone abutted Pier 1 to the north side of the entrance, but stopped slightly short of Pier 2 on the south side. It seems most probable that this re-paving equates broadly to the second Phase 2 reorganization of the interior, although it may have been emplaced while the second Phase 2a hearth remained in use (Ill 2.15 inset). A faceted hammerstone (SF188, Ill 3.25f, see Section 3.6) was incorporated into this paving.

Resting directly on this paving, and climbing over the inner threshold stone at its inner end, was a substantial stone buttress (C507) which abutted Pier 1 (Ills 2.16–2.19). As we have seen, Pier 1 had slumped dangerously towards the entrance passage, and it appears that the construction of this buttress was a response to that problem. It was similar in construction to the piers themselves, being some 1.6m long and 0.4m wide. It stood to a height of approximately 0.5m (some three to four courses of angular masonry) but it may have been partially dismantled during the construction of Structure 8. Its upper surface remained visible in Structure 8, projecting as a slight 'bench' from the north wall.

A final layer of paving slabs (C506) was subsequently laid in the entrance bay, abutting the buttress and covering over both the inner and outer threshold stones. This paving remained in use until the end of Phase 2b (Ill 2.19).

A total of 94 sherds of pottery were recovered from the entrance bay of which only 13 per cent were large sherds, again reflecting the degree of disturbance to deposits in this area.

2.4.1.4 The decay of the wheelhouse during Phase 2

Throughout Phase 2 there were signs of instability within the wheelhouse. By the beginning of Phase 2, if not earlier, the aisle between Bay 1 and the entrance passage had already been walled up (C509), presumably to stabilize the pier. The post-setting (C273) at the front of Bay 1 was inserted slightly later, suggesting a need to provide increased support for the roof of the bay (Ill 2.13). Later still, a stone buttress (C507) was added along the side of the pier in the entrance bay, presumably again in an effort to halt the southwards slumping of the pier (Ill 2.21). Each of these chronologically sequential acts seems to indicate a continuing concern with the structural stability of Bay 1, a concern which originated no later than the start of Phase 2. The pronounced slumping of Pier A, which was so visible during excavation, is presumably a result of this early instability. The aisle between Bays 1 and 2 was also deliberately blocked with masonry and midden material, perhaps as a preventative measure, although the walling did not form a solid block underneath the lintels, suggesting that it did not serve any great structural purpose. It is possible that the midden material packed under the lintels has simply reduced in volume as it decayed, and that originally the gap was completely blocked, albeit with material which would have done little to strengthen the superstructure of the pier.

ILLUSTRATION 2.21
Wheelhouse 1, Pier A, showing the pronounced slumping of this pier. Note also the rounded, flat-topped stone to the right at the rear of the entrance, which forms part of the primary entrance paving.

Bay 7 seems to have suffered even worse structural problems during Phase 2 although these are not so obviously presaged. Instead, the first sign of problems was the construction of a retaining wall (C178) to revet masonry and mixed sand which had seemingly collapsed into the bay, rendering it effectively uninhabitable (Ill 2.18). This rubble must presumably have derived from the corbelled roof or the back wall of the cell.

There is thus plentiful evidence, allowing for the relatively small number of bays excavated, of structural weakness leading up to the final catastrophic collapse, or deliberate dismantling, of the upper walls and cell roofs, which marks the end of Phase 2, and which is represented by a series of rubble and sand deposits in each of the excavated bays (eg C120, C145, C146). It may be surmised that Wheelhouse 1 during Phase 2, while still perhaps impressive as a structure, did not have quite the monumental interior of Phase 1.

2.4.1.5 Spatial patterning within the wheelhouse

Despite the inaccessibility of certain areas for excavation, there is a reasonable amount of evidence for differentiation of functions between distinct zones of the interior. There seems little question that throughout Phase 2 the wheelhouse was in use as a domestic building, and the cultural material from its floor deposits suggests that a wide range of domestic activities were carried out, including cooking and eating.

In the first period of Phase 2 the wheelhouse was dominated by a small, well-built central hearth, shielded from the entrance by an upright slab at its west end (Ill 2.13). A slab partition (C504) linked the north corner of the hearth to the inner end of Pier A. This is important as it meant that anyone entering the building was not presented with a choice of moving left or right around the hearth, but was compelled to pass to the right, anti-clockwise. It also had the effect of distorting the symmetry and circularity of the interior, although this need not have had great visual significance if the partition was relatively low. The remarkable similarity between this spatial arrangement and that in the earliest occupation of Structure 4, as well as the similarity in the size, shape and design of the hearths (see Section 2.4.3.2), suggest that these two episodes of occupation may have been contemporary.

No other primary Phase 2 structural features could be recognized in the interior, although at some point the post-setting (C273) was inserted; the first clear sign of structural instability within the wheelhouse. Subsequently the hearth was replaced by a slightly larger version incorporating unusual pebble-kerbing, and Bay 1 was separated from the interior by a kerb.

The frequently noted bowl-like formation of deposits within the centre of the bays suggests that they were subject to some form of compression, perhaps through use for working or sleeping. In Phase 2a this applies to all three excavated bays, 1, 2 and 7. The much better preservation of the laid floor deposit (C274) in the central area as opposed to the bays, further suggests that the latter were subject to more compression and mixing.

The distribution of pottery within the wheelhouse in Phase 2a adds to the impression of spatial differentiation (Ill 2.22a). Broadly equivalent amounts of pottery were recovered from the central area (31 per cent of the total) and from Bay 2 (38 per cent). The smaller amount from Bay 7 (12 per cent) can be effectively doubled since only half of the bay was excavated, giving a density not dissimilar to Bay 2 and central area. A much smaller amount (10 per cent) was recovered from the entrance bay, as would be expected from the use of this area primarily as a thoroughfare which did not accumulate much depth of deposits.

What is more interesting is the extremely low amount of material in Bay 1 (9 per cent of the total), which does not relate to any lesser volume of deposits but seems rather to represent a genuine difference in deposition. Bay 1 was also the bay least accessible from the entrance (given the constraints on movement around the interior) and thus, on a purely functionalist level, perhaps the least likely bay to be cleared out regularly. Whatever the function of Bay 1 it appears that substantially less broken pottery found its way into the deposits here than elsewhere in the excavated parts of the interior.

Analysis of the size ranges of the pottery assemblages from the different parts of the interior provides further information on the different spatial zones. The percentage of large sherds from each zone is given on Ill 2.22b. Again there is little difference between the central area (14 per cent) and Bay 2 (17 per cent), both close to the average for the site as a whole (15 per cent). Perhaps surprisingly the entrance bay assemblage is similar (13 per cent), despite the presumed effects of trampling. It seems probable that the large sherds here survived by virtue of being deposited to the sides of the entrance bay and within the 'aisles'.

Again, however, Bay 1 has a notably high large sherd percentage of 23 per cent. This would appear

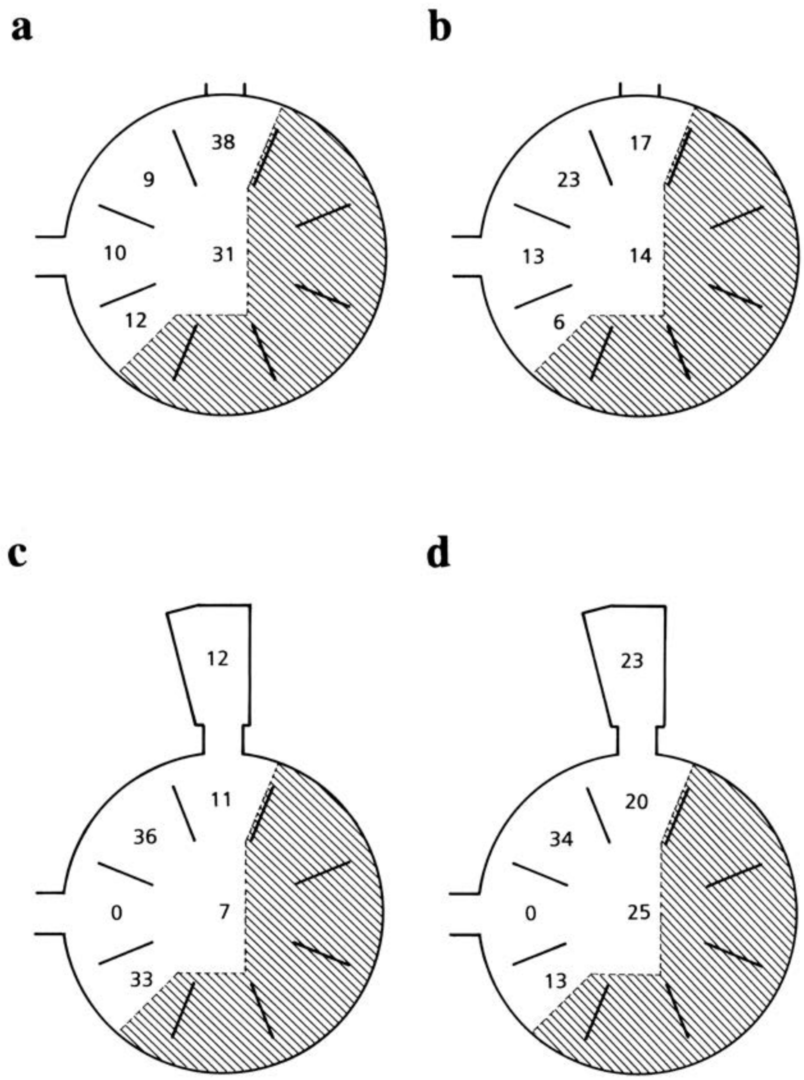


ILLUSTRATION 2.22
Wheelhouse 1 and Structure 3, distribution of pottery: (a) and (c) show the percentage of pottery in each zone during Phases 2a and 2b respectively; (b) and (d) indicate the percentage of large sherds in each zone during these two sub-phases.

to suggest that the pottery sherds which did reach Bay 1 were subject to less subsequent trampling and disturbance than in Bay 2 or the central area. Together with the low absolute level of pottery deposition here, it seems probable that this bay was used differently from the other areas discussed, and was perhaps not a focus for day-to-day activity. The most obvious function would seem to be storage, although there may of course be other possibilities.

The reverse would seem to apply to Bay 7 which has a large sherd percentage of only 6 per cent, suggesting even more trampling and disturbance than in the central area. While this may relate to more intense activity in this bay it is worth bearing in mind that later collapse of masonry, which affected this bay more than any other, may conceivably have caused the compression and breakage of pottery in these lower deposits. The distribution of other finds is fairly even throughout the excavated area (Table 2.3).

The Phase 2b reorganization of the interior seems to have altered the division of space within the wheelhouse significantly (Ill 2.18). Most obviously the hearth was set back from the entrance. This shows a remarkable similarity with the secondary hearth in Structure 4 (see Section 2.4.3.2) which was of the same boulder construction and was again set back from the entrance. This might be taken to suggest that Wheelhouse 1 and Structure 4 were reorganized as part of a general re-design of the settlement during Phase 2b. A further, rather obvious, change was the opening up of the entrance which had formerly led to Wheelhouse 2 and which now gave access to the newly constructed Structure 3 (discussed in its own right below, see Section 2.4.2).

The forced anti-clockwise path around the interior seems to have been abandoned, and the paving in the entrance bay now terminated abruptly at a newly inserted inner threshold slab. Rough paving or cobbling seems to have circled the periphery of the central area around the hearth, leaving a small central zone clear and apparently featureless. A small slab-capped pit was the only other recognizable internal feature. This may have acted as some form of sump to drain wastewater from the central area, or it may have had some more symbolic purpose, as appears to be the case at other wheelhouses in the Western Isles (Chapter 7).

The clean sand floor (C242) laid across Bay 2 during the primary period of Phase 2b seems to signal a change in use from bay to passage-way, presumably associated with the construction of Structure 3 (see Section 2.4.2). Structure 3 has been added to the

TABLE 2.3
The distribution of Phase 2 finds (excluding pottery) from areas within Wheelhouse 1.

Block	Bay 1	Bay 2	Bay 7	Central area
5a	Bone pin (SF207) Pick (SF299) Peg/punch (SF302) Peg/point (SF303)	Spindle whorl (SF281) Bone comb (SF204) Worked antler (SF221) Whale bone vessel (SF218)	Bone pin (SF251) Worked antler (SF292) ?Moulds (SF272-SF277)	Polisher (SF124) Worked antler (SF219) Gaming piece (SF145)
5b	Spindle whorl (SF280) Worked antler (SF143, SF111) Whale bone (SF162) Antler pick (SF101) Copper pin (SF193) Mould (SF270)	Spindle whorl (SF98) Whale bone (SF110) Forked tool (SF100) Bone pin (SF96) Mould (SF273) Worked antler (SF293)	Antler tool (SF181) Mould (SF271, SF272) Whale bone (SF304)	Worked antler (SF286, SF132, SF202, SF289, SF114) Whale bone (SF118, SF163, SF169, SF156, SF192, SF296) Chopping board (SF170) Bone pin (SF115) Rotary quern (in pit) (SF171)

Entrance bay: hammerstone (SF188) and rotary quern fragment (SF189) in paving
Structure 3: worked antler (SF138)

diagram showing the pottery densities within the structure (Ill 2.22c and d).

There are some significant broad-scale differences in the nature of the finds assemblages from this and the earlier period. Although the pottery assemblage sizes are remarkably similar (942 sherds for the later period as against 858), the later assemblage had a higher percentage of large sherds (23 per cent as against 15 per cent) suggesting that the deposits may have formed rather more quickly and been less exposed to trampling. Despite the broadly equivalent amounts of pottery in the two sub-phases, Phase 2b incorporated a very much larger assemblage of bone debris, eg 215 cattle bone fragments as against only 70 in Block 5a, and 128 red deer fragments as against 34 in Block 5a. This again might suggest that the deposits formed rather more quickly with less attention being paid to cleaning of the floor surfaces. It should be remembered, however, that, had the structure been occupied a little longer, these Phase 2b deposits might themselves have been thoroughly cleaned out, and the apparently greater deposition in this period may be illusory.

The greater percentage of large sherds in Phase 2b may in part account for the much higher percentages of decorated sherds (6 per cent compared to 3 per cent), rim sherds (10 per cent compared to 3 per cent), and bases (2 per cent compared to 1 per cent), since the larger the sherd the more likely it is to include parts of the rim, base or decorated section of the vessel. In other respects the assemblages are extremely similar (see Section 3.2) and it appears that the statistical differences quoted are largely a factor of the relative size ranges.

More significant than these broad-scale differences is the entirely different spatial distribution of pottery within Phase 2b. Only 7 per cent of this pottery comes from the central area as opposed to 31 per cent in the earlier period, and the amount in Bay 2 dropped from 38 per cent to only 11 per cent. Structure 3, accumulated some 12 per cent of the pottery while the entrance bay was entirely free from sherds. There appears, therefore, to be a broadly even density of pottery from the central area, Bay 2 and Structure 3 (Ill 2.22c).

By contrast, Bay 1 contains 36 per cent as opposed to 9 per cent before, and the excavated half of Bay 7 contains 33 per cent, as opposed to 12 per cent before. The implication would appear to be that Bays 1 and 7 were now being used to dump debris, including pottery, perhaps cleared from the central area. This hypothesis is supported by the large sherd percentage of 34 per cent from Bay 1 (Ill 2.22d) which is significantly higher than for the central area, Bay 2 and Structure 3 (25 per cent, 20 per cent and 23 per cent) and more than twice that of the site assemblage overall (15 per cent). The implication would appear to be that the material dumped in Bay

1 was again subject to little trampling. Bay 1 would appear still, therefore, to be little used for human activity, although now it was apparently used as a repository for cleared debris, incorporating large amounts of pottery.

Bay 2 was apparently rather similar in this respect. Its low percentage of large sherds (13 per cent) may relate simply to the disturbance to the underlying deposits caused by falling masonry during this period of occupation.

In contrast to the pattern of pottery distribution, antler- and whale bone-working debris concentrated firmly in the central area (Table 2.3). This would appear to suggest that different patterns of deposition affected the movement of pottery sherds and other artefacts around the structure. It seems most likely that pot sherds were generally cleared and moved, perhaps with hearth debris, while the debris of bone- and antler-working may have become incorporated into floor deposits closer to the areas where these activities were carried out. Whatever the precise processes, there does seem to be some suggestion that antler-working and whale bone-working were practised in the central area of the wheelhouse, and minimal evidence that this activity extended into the bays.

There may be significance in the fact that all three spindle whorls from the wheelhouse were found in the bays (two in Bay 2 and one in Bay 1), with a complete absence in the central area (Table 2.3). This could conceivably indicate that spinning was primarily restricted to the bays, or simply that the distribution of these finds reflected the same depositional processes as that of the overall ceramic assemblage. In general, however, the non-ceramic artefacts are too few in number to present any more than hints of the likely significant patterning within the structure.

In conclusion, it appears from the nature of the deposits and from the pottery data, that during this second period of Phase 2 occupation, Bays 1 and 7 had become little used, structurally unstable, peripheral areas which were not subject to the same degree of cleaning and maintenance as the central area, Bay 2 and Structure 3. The more formal pattern of spatial differentiation seen in the earlier occupation, where the bays accumulated rather less pottery than the central area, thus seems to have broken down as the structure itself began to crumble. This picture of decline may also be reflected in the greatly increased incidence of bone debris which was left to become incorporated in the floor deposits (see Section 4.2).

2.4.2 STRUCTURE 3: BLOCKS 17 AND 19

Structure 3 was a small corbelled cell entered from Wheelhouse 1 (Ill 2.14). It was built within the abandoned and infilled Wheelhouse 2 and used the entrance which had formerly connected the two wheelhouses. When discovered, the structure was intact with its roof in place and a substantial void between its uppermost deposits and the underside of the roof. Its entrance had been sealed off by the accumulation of rubble in Bay 2, prior to the construction of Structure 8 in Phase 3. The structure was also sealed from above by the deposition of a layer of midden material (C012, Block 18, see Section 2.5.3).

The stratigraphic position of Structure 3 is thus unambiguous. It succeeded Wheelhouse 2 and thus clearly post-dated Phase 1. It was in turn sealed by Structure 8 and thus pre-dated Phase 3. As it was still accessible and open prior to the construction of Structure 8, it is clear that Structure 3 was accessible until the end of Phase 2.

2.4.2.1 Construction: Block 17

The walls of Structure 3 were formed of vertical slabs revetted into the fill of Wheelhouse 2, supported in places by an informal foundation course of rougher boulders, and surmounted by coursing of small angular blocks (C162). The area enclosed was approximately 2.5m along its main axis, by 1.4m at its widest point, with a south-west facing entrance into Wheelhouse 1. The southern part of the cell was narrow and constricted, while the inner, northern end, opened out somewhat giving a pear-shaped plan overall. A threshold of three upright slabs (C221) was also emplaced at the inner end of the short entrance passage at this time, although only the westernmost of the three actually crossed the passage (the other two being incorporated within the wall fabric, Ill 2.23a). A further single slab formed a threshold at the outer (wheelhouse) end of the passage.

Between these two thresholds, within a layer of dark stained sand (C220) were buried the skulls of two sheep and the post-cranial remains of one adult sheep (see Section 4.2.3.2). Many of the long bones had been deliberately broken for the removal of marrow and one distal humerus displayed knife marks. None of the bones, however, had been gnawed, and all of the toe bones were missing. The unusual nature of this deposit relative to the remainder of the animal bone assemblage, together with its position within the entrance, suggests that it represented a ritual deposit associated with the

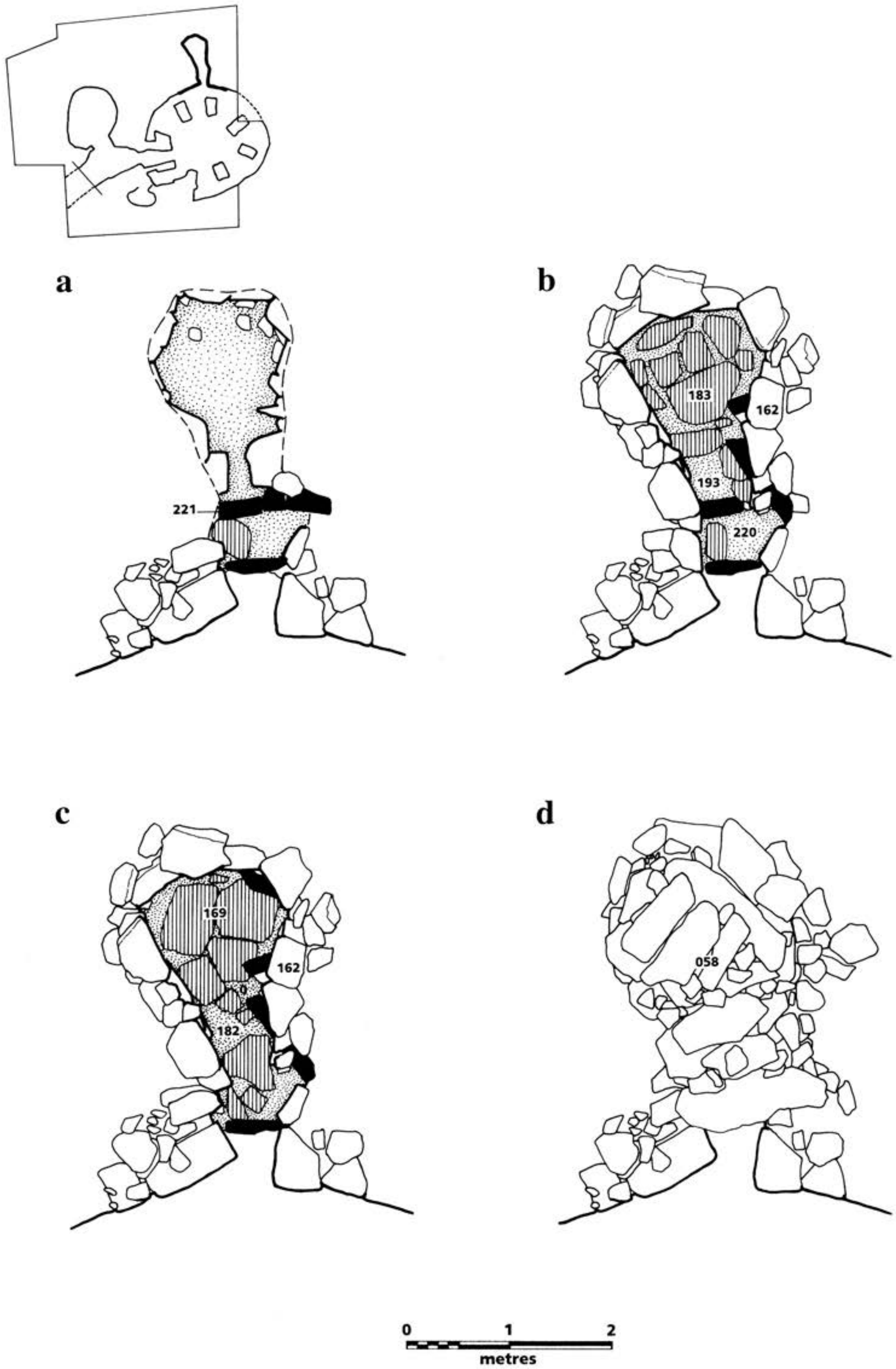


ILLUSTRATION 2.23
Structure 3 plans.

ILLUSTRATION 2.24
Structure 3 roof.

foundation of Structure 3. Also within this deposit was a beater tip (SF172) associated with weaving.

The low walls were corbelled over using a line of five long thin slabs (C058) to completely cover the interior (Ill 2.23d and 2.24). The large upper slabs rested on somewhat smaller angular slabs, and one extremely long slab, over the slab-revetted walling. Above the roof were traces of a dark peaty deposit (C047) which may represent the remain of a former turf or peat covering over the stone roof. Without such a covering the roof would not have shed water effectively. The roof would have been no more than 1m above the floor in the primary period of use and still less after re-paving (see Section 2.4.2.3).

A section was drawn running approximately south-east to north-west across the intact roof of Structure 3 (Ill 2.25). This shows the relationship between the walls and roof of Structure 3, the upper Phase 3 midden (C012, Block 18) and the infill of Structure 2 (C031, C049). The section suggests that the walls of Structure 3 were set into a pit dug within C031 and C049 (Block 15) which themselves overlie the primary deposits of Wheelhouse 2.

The same section shows the remains of the apparent capping of the cell (C047) which is preserved in this section only over the eastern part of the roof. This and other deposits are sealed by a stained sand deposit (C012) which is broadly contiguous with the other sandy midden deposits which formed during Phase 3 (see Section 2.5.3, Block 18). It would appear that the roof capping (C047), assuming that this interpretation is correct, was subject to substantial erosion or deliberate removal prior to the formation of the sandy deposit above (C012). As we will see below, in the discussion of the Phase 3 middens (see Section 2.5.3), this seems to correlate to other

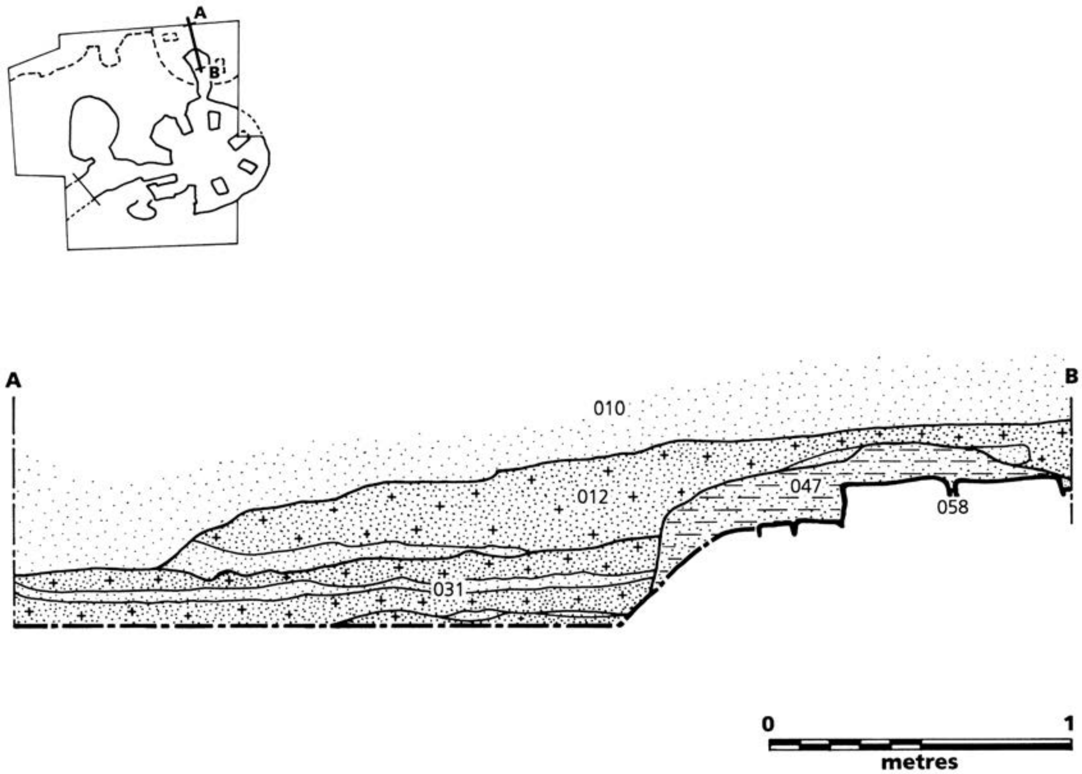


ILLUSTRATION 2.25
Section, showing relationship of Structure 3 roof and walls to deposits within Wheelhouse 2.

areas of apparent soil erosion which occurred during Phase 2.

The base of the pit constructed to receive the walls of Structure 3 was dug into the surface of the underlying rubble and sand destruction deposit of Wheelhouse 2 (130, 131, see Section 2.3.2.2). Within a hollow scooped into this material was laid a fragment of human skull (HB01, see Section 3.4 and Ill 2.26) and a sherd of cordoned pottery retrieved from the digging of the pit (another sherd was probably similarly retrieved (V2513 and V2454, Ill 3.3c and d, see Section 3.2.6)). As has been discussed above (this section), this presumably ritual deposit is best interpreted as associated with the construction of Structure 3.

2.4.2.2 Internal deposits: Block 19

Once the walls of Structure 3 had been constructed, a mixed deposit of sand, ash and a distinct yellow-green boulder clay (C193) was deposited within the interior of the structure. This deposit appears to represent a deliberate setting mixture for a series of substantial slabs (C183) which formed the primary paving of the structure (Ill 2.23b and 2.27).

Above this primary paving was a relatively thin layer (*c* 0.15m maximum) of mixed sand, ash and organic refuse, again with some inclusions of boulder clay (C182). This may represent an in situ accumulation of material, or alternatively a deliberate bedding deposit for the secondary paving (C169). This latter paving was rather less well-constructed than before, comprising a series of level slabs within the centre of the main cell with somewhat blockier stones around the sides and in the passage (Ill 2.23c).

Finally a further mixed sandy deposit, containing some mixed midden material (C164), had formed over these secondary paving stones. The cell had by no means been allowed to fill up, however, before it was sealed off by the collapse of Bay 2. All of the internal deposits must have formed while Structure 3 was accessible from Wheelhouse 1, with the possible exception of some sand percolation through the roof post-abandonment (although such material seems to have formed only a superficial scatter on the surface of the final internal deposits) (C164). When abandoned, approximately 0.6m separated the surface of the floor

ILLUSTRATION 2.26
Deposit of human skull and pottery below Structure 3.

deposits from the under-side of the slab roof in the centre of the cell.

2.4.2.3 Interpretation

The function of this building is far from clear. While it appears at first glance to be a subsidiary storage cell, there are several features which complicate its interpretation. Firstly, Structure 3 was the only part of the entire settlement, other than the entrance to Wheelhouse 1, to be deliberately paved. The purpose of the paving could have not been to avoid damage from the passage of feet, as Structure 3 at no time had sufficient height to allow an adult to stand or even crouch. Yet it is hard to imagine what form of storage would necessitate the emplacement of such massive paving stones.

The structure contained no sign of burning, whether in the form of sooting, damage to the friable gneiss wall and roof stones, or quantities of ash or other waste. An industrial or cooking function thus seems unlikely. Strangely, perhaps, both 'setting' deposits for the successive pavings of the cell (C093, C182) contained the only evidence for the burning of seaweed (in the form of burnt marine mollusc shells of species parasitic to seaweed) pre-dating Phase 3 (see Section 2.5.1.2). Either or both of these deposits may well have been brought into the cell for a specific purpose and it seems improbable that seaweed was burnt in situ.

Not only was Structure 3 paved, it was re-paved. If it is difficult to interpret the function of the primary paving it is even more difficult to explain the secondary version. The primary slabs were unbroken and apparently quite sound. They were certainly not inaccessible, being sealed under only a few centimetres of deposits (indeed, they may have been entirely visible, as the deposit which seals them seems quite likely to have been a deliberate setting for the secondary slabs). It is possible, however, that the re-paving could be related to the deposition of the sheep burial in the threshold area.

The re-paving further reduced the available head-room to a maximum of 0.8m. It would have been a considerable operation manoeuvring the paving slabs within this constricted space, but it would nonetheless have been possible if one person squeezed inside the cell while another passed in the slabs. The other possibility is that the re-paving involved breaking through the roof; a far more laborious operation.

ILLUSTRATION 2.27
Structure 3 excavated.

The slabs used in both the walling and paving of Structure 3 represent some of the best-quality building stones on the site. It seems probable that most derived from the abandoned Wheelhouse 2, where they may have formed parts of piers and lintels. In this case the impressive masonry may relate less to the perceived importance of Structure 3, and more to the availability of good building stone. The rather lower quality of the secondary paving stones may simply relate to the lack of availability of similarly high-quality material at this later stage in the settlement's development.

The pottery assemblage from Structure 3 was generally undistinguished, although the density of sherds was reasonably high, at 133, given the restricted volume of sediment within the structure. The greatest concentration derived from C193 which is interpreted as representing a setting material for the primary paving, and thus strictly pre-dates the use of the structure. A further concentration occurred in the passage between Structure 3 and Wheelhouse 2, and this is where a high proportion of larger sherds were located. Their presence would seem to suggest that movement along

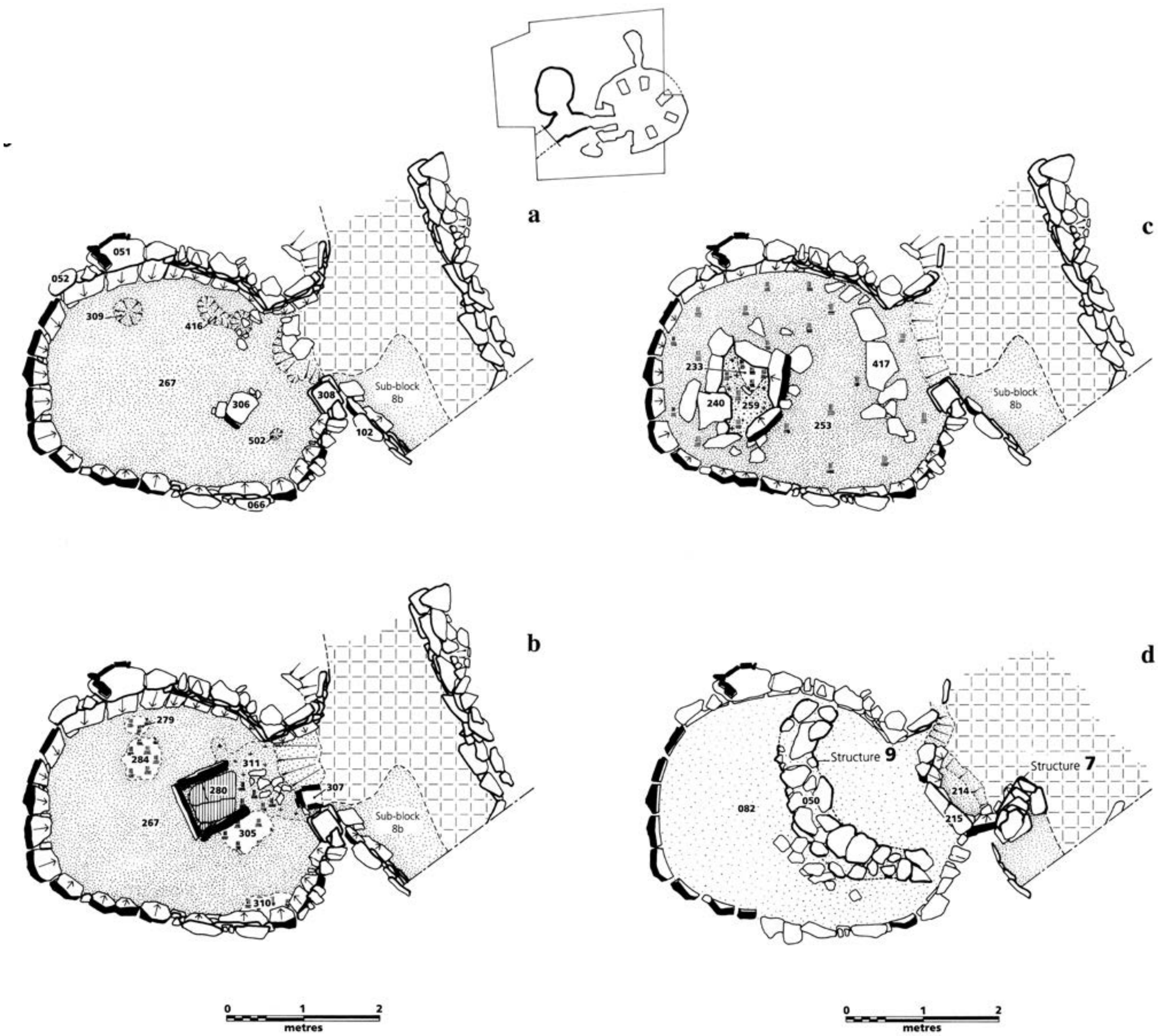


ILLUSTRATION 2.28

Structures 4, 7 and 9: (a) shows residual features below first coherent primary floor plan in Structure 4; (b) first coherent primary floor plan in Structure 4; (c) secondary reorganization in Structure 4; (d) Structures 7 and 9.

this passage was far from constant. The remainder of the pottery was found under and above the secondary paving. Relatively few large sherds were identified in these contexts and the evidence does not suggest that these necessarily represent storage vessels broken in situ. The ceramic evidence does not, therefore, greatly help in the attribution of function to this cell.

The largely negative evidence for the function of Structure 3 raises the inevitable spectre of primarily ritual or symbolic purpose. There were, however, no recognizably 'special' deposits within the cell suggestive of an overtly ritual function. Nonetheless, the foundation deposit of a human skull (see discussion under Wheelhouse 2, above, see Section 2.3.2.2) set below Structure 3, and the sheep burial within the entrance passage do suggest a special function for this cell, although such deposits are clearly not restricted to buildings with a specifically ritual purpose in the Hebridean Iron Age.

Whatever its function, it would appear that Structure 3 was kept relatively free from the build-up of deposits, a process made easier by the presence of the paving. Storage seems the least problematic solution, although, as discussed, the evidence suggests that more care and effort was lavished on this structure than was probably necessary for a simple storage function.

2.4.3 STRUCTURE (4) BLOCKS 8 AND 9

Structure 4 was a small, slab-walled building leading off the entrance passage to Wheelhouse 1 (Ill 2.13). It had internal dimensions of approximately 3m north–south by 2.6m, and was an irregular oval in shape, being markedly flattened on plan on its north-west side. Structure 4 appears to have formed a second

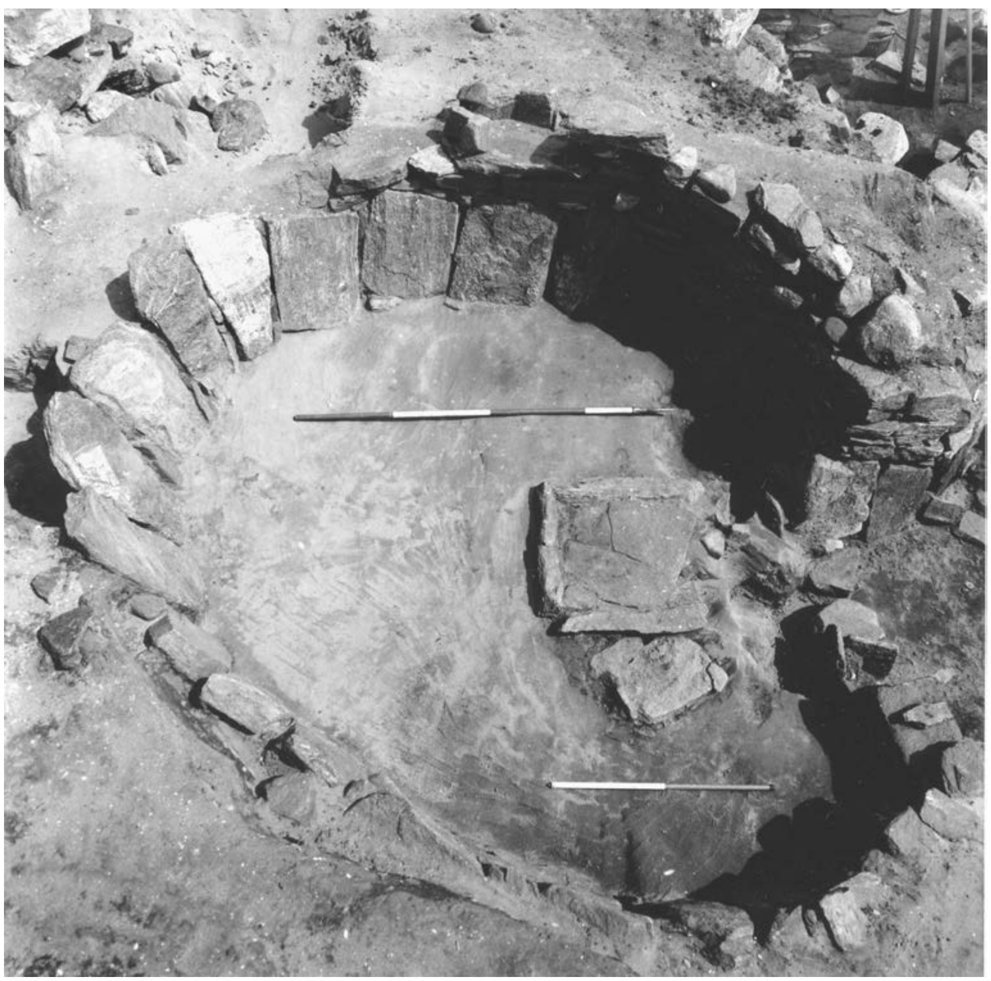


ILLUSTRATION 2.29
Structure 4: first coherent floor.

ILLUSTRATION 2.30
Structure 4: north wall slabs seen from entrance.

domestic focus for the settlement. Like the subsidiary buildings of Phase 2, Structures 3 and 5, the walls of Structure 4 were formed of a foundation course of edge-set slabs, capped by coursing.

The walling of Structure 4 sealed the original entrance passage cell of Wheelhouse 1 and was clearly, therefore, not a primary feature of the settlement. Indeed, the entire north wall of the original wheelhouse entrance passage appears to have been dismantled and re-built to create a rather wider passage, which may in fact have been an area of occupation in its own right, rather than simply a thoroughfare. Structure 4 was later sealed by the construction of the much smaller Structure 7, still within Phase 2, and indeed had been out of use for some time prior to the construction of Structure 7.

2.4.3.1 Construction: Block 9

The first stage in the construction of Structure 4 was the dismantling and widening of the north side of the original entrance passage to Wheelhouse 1, and the excavation of a large oval pit, at least 1.1m deep, into the natural sand accumulations to the north of the former passage. Before they had any opportunity to weather, the sides of this pit were lined with substantial flat slabs (C052, C066) set on end (Ill 2.28a). The largest slabs measured up to 1.1m in length.

The foundation course of edge-set slabs was capped with at least six courses of smaller, angular stones, packed behind with a reddish, ashy, midden-derived material (C071). There is no indication of what had happened to the large volume of sand which must have been removed to accommodate the structure, or of the deposits presumably cleared from the wheelhouse entrance passage. The latter may well have formed part of the wall-backing material (C071).

The north wall of the wheelhouse entrance passage was re-built in a similar style to the main cell of Structure 4, although the foundation slabs were rather less substantial (C102) and the walling survived to a maximum height of only 0.8m. The packing material (C101) used behind the new passage wall was similar to that used in the main cell.

The walls of the main cell of Structure 4 were continuous with those which opened out into the entrance passage. The gap in this walling at the entrance to Structure 4 measured 1.6m, but this was narrowed to 1.1m by the insertion of a non-revetted block of coursed masonry (C308) which adjoined the main revetted wall at the west side of the entrance. The door-way was further narrowed by the insertion of a post-setting (Block 8, see Section 2.4.3.2) which was probably intended to support a timber door. This implies a door-width of 0.6m.

One of the most curious structural features within Structure 4 was a 'shelf' (C051) set into the east wall, just above the slab foundation course (Ill 2.28a and 2.29). This was formed using a single flat slab (0.7m by 0.4m in size) lined on at least two sides by small kerb-stones (the south side of the kerb did not survive long enough to be recorded, having been disturbed by machining in this area). While the plan indicates that this would have been open to the west (ie facing inwards), a displaced stone recorded before the feature had been properly identified suggests that the kerb may have entirely surrounded the slab, creating a feature not dissimilar to a stone bowl set in the wall. This would have had internal dimensions of approximately 0.4m by 0.15m, by around 0.15m in depth.

It is possible that similar features may have been present elsewhere around the wall, but have simply not survived. Any such feature in the wall opposite, for example would have lain above the level to which the wall there was preserved.

A further striking architectural feature of Structure 4 was the careful arrangement of the foundation slabs. These were graded in height, with the largest being set directly opposite the entrance on the north of the wall circuit (Ill 2.30). This seems to have served to focus attention on this part of the wall. The gaps between the bases of the largest slabs were filled using elongated chocking stones set on end. The upper coursed walling had been used to level up this graded foundation course, although it is not clear how high it originally stood. The regularity of the wall-head on the best-preserved, south-east arc, suggests that it may never have been much higher than around 1.1m.

The pottery assemblage associated with these construction deposits was confined to the wall-packing material (C071, C101) and the disturbed sand surface behind the Structure 4 wall (C099). The 4 per cent component of large sherds supports the hypothesis that the material derives from discarded and disturbed domestic refuse, most probably from the wheelhouse entrance passage. Interestingly, this wall-packing material contained a much greater density of artefactual material than the occupation deposits and included metalworking debris (see Section 3.11) and an antler point (SF035, see Section 3.5). This reflects the pattern of artefact-rich wall-packing material seen in Wheelhouse 1 (above), even to the extent of incorporating otherwise rare evidence for metal-working.

2.4.3.2 Occupation deposits: Block 8

The deposits which formed within Structure 4 can be divided into three main groups: a primary occupation (itself showing signs of time-depth), a secondary re-modelling and later re-use. A fourth group of deposits (Block 8b) was separated from the main block by an area of disturbance caused by the later insertion of Structure 7 (see Section 2.4.4).

Ill 2.28 shows four successive plans of Structure 4. The first two plans (a and b) illustrate the primary occupation, which represents a palimpsest of features deriving from multiple episodes of occupation and clearance. The first plan illustrates a series of fragmentary features and deposits preserved beneath the lowest coherent floor plan. All had been horizontally truncated and survived only in dips and hollows in the natural sand floor. The main detectable features here comprised a primary hearth (C306) lying partially under its successor (C280, this section) and represented by two flat paving slabs and a displaced kerb stone on its north side. Two smaller stones represent displaced kerbing on the south side of the hearth. The hearth was set into the natural sand dune floor (C267) and contained residues of orange peat ash (C305) which extended under the paving of the adjacent, later hearth (C280).

Other features at the base of the primary occupation comprised a series of hollows (C309, C416) none more than a few centimetres deep. They may indicate the position of items of stone or timber furniture set around the periphery of the building.

Later, but still within the period of primary occupation, during which the floor was repeatedly scoured to re-expose clean sand, a second hearth (C280) was constructed (Ill 2.28b and 2.29). This was a carefully paved and kerbed, near-square structure, with an open end facing towards the entrance (the south-south-west). It was set close to the door-way, and indeed its position could be taken to imply that the door to Structure 4 opened outwards into the entrance passage rather than inwards (but see below, this section). Three flat slabs, set close together, formed the base of the hearth, while each side of the kerb was formed of a single long angular slab set on edge. The overall dimensions of the hearth were approximately 0.85m east to west by 0.85m. Where not overlying ash from the earlier hearth, this second hearth was set into natural dune sand (C267) demonstrating again how the floor had been scoured down to the clean sand base after a period of occupation.

A small amount of bright orange peat ash (C281) survived within the hearth, in the interstices of the stones, and several other patches from around the structure also seemed to survive from this period of primary occupation. These included ashy patches against the west wall (C310), the east wall (C279), and close to the north-west of the hearth (C284), and a more extensive area of ash deposits (C311) concentrated between the hearth (C280) and the entrance to Structure 4. In this latter area it appears that increased exposure to trampling has led to the compression of successive ash tips into the sand floor, and thus to their preferential survival. C311 extended to a depth of up to 0.05m, which was significantly deeper than any of these other primary deposits (it is distorted at its southernmost extent in the drawn section through having been cut through in the construction of Structure 7, resulting in a block of material being re-deposited in a vertical spread behind the later wall). Only two sherds of pottery were recovered from the whole of this primary occupation, although it should be stressed that the overall volume of deposits recovered was extremely small.

The other important feature of this primary occupation was a small post-setting (C307) built against the west side of the entrance. This was formed of three small edge-set slabs (a fourth, nearest the entrance passage, has probably been removed during the construction of Structure 7) which defined a square area with inner dimensions of 0.2m. A series of smaller exterior packing stones held the slabs in position, but there were no internal packing stones. From its position it is presumed that this post-setting related to a timber door some 0.6m wide which gave access into Structure 4.

Any other door support structures which may originally have been present are unlikely to have survived the later construction of Structure 7. However, it seems improbable that a second post-setting of similar dimensions would have been

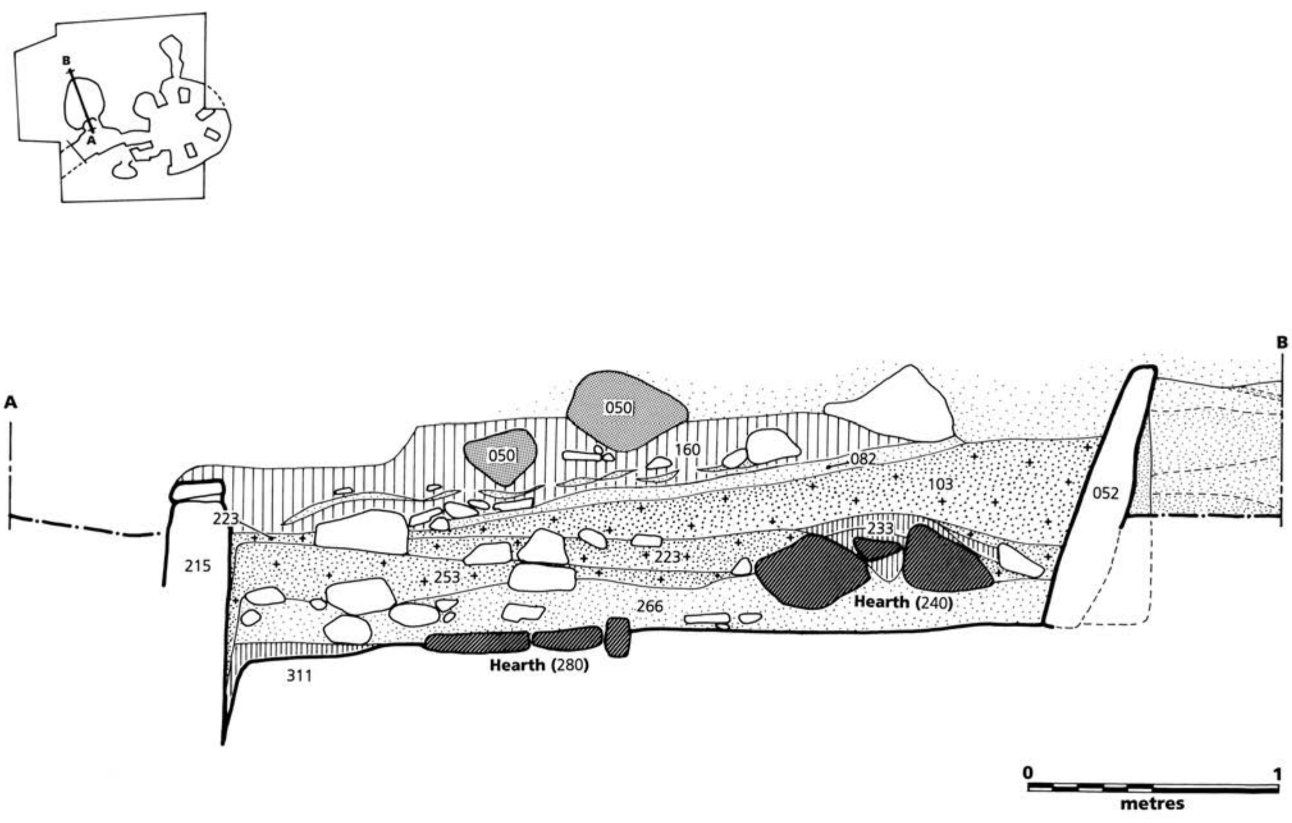


ILLUSTRATION 2.31
Section through Structure 4. The ash deposit (C311) which represents the primary occupation of Structure 4 appears to have been disturbed by the cut for Structure 7 (C215) resulting in a block of this material falling vertically into the cut for the later wall.

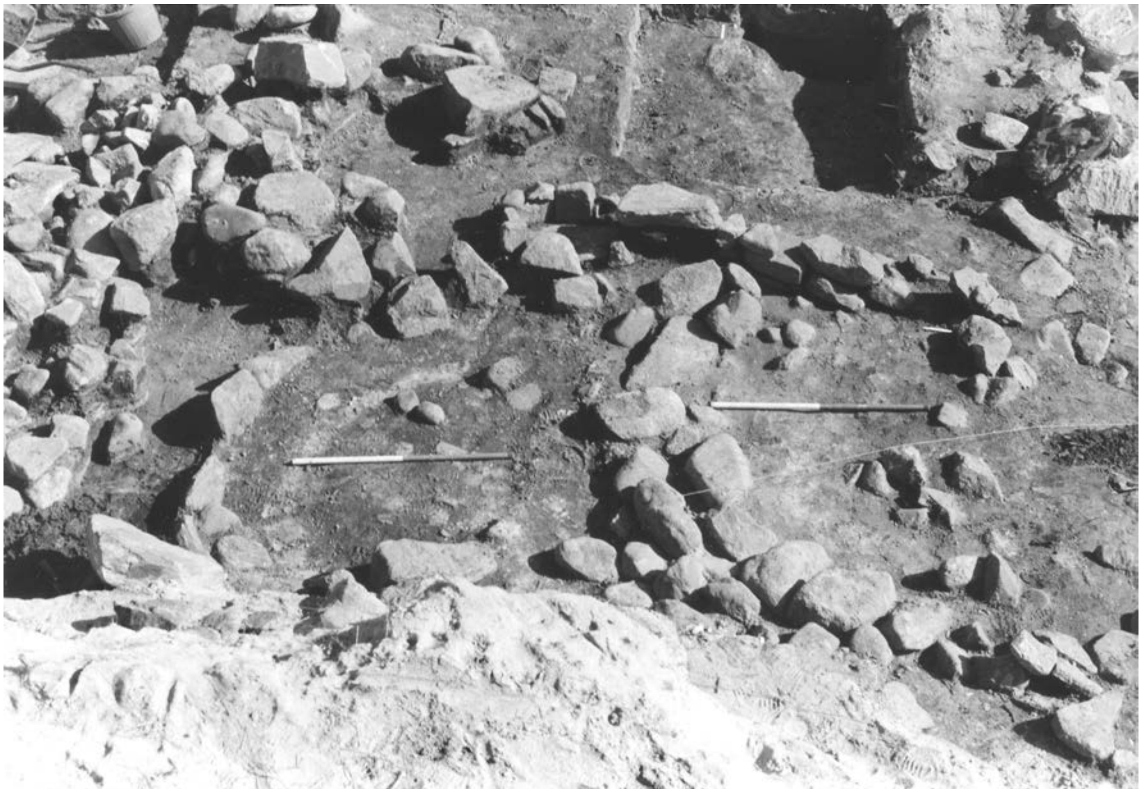


ILLUSTRATION 2.32
Structure 9, from the north-west.

squeezed into the narrow gap available. The surviving setting most likely held a pivot-post. The floor plan in Ill 2.28b indicates the area of later truncation of the sand floor towards the entrance to Structure 4.

At the end of the period of primary occupation an extensive dump of stained sand material (C266, C253) seems to have been spread across the interior of Structure 4 to a combined depth of up to 0.4m. Analysis of samples from C266 appears to confirm the field interpretation that it derived from a deliberately deposited inorganic sand floor deposit, subsequently admixed with organic domestic debris, presumably from occupation on its surface. This material included seven of the 11 great auk bones recovered from the site. The upper portion of the deposit (C253) was markedly more organic in composition than the lower, suggesting greater exposure to mixing and disturbance. This upper portion (C253) was deeper in relation to the lower (C266) in the southern half of the building, suggesting, perhaps unsurprisingly, that the entrance area had been subject to more intense mixing and trampling. A substantial assemblage of pottery had been incorporated within these deposits, presumably by trampling.

Alternatively, it is possible that these secondary floor deposits may have built up gradually, with periodic sand deposits becoming incorporated into an accumulating deposit of domestic debris. In this case, the change from the primary to secondary occupation would be marked simply by the cessation of regular cleaning of the building, with clean sand simply being spread across the surface whenever required.

C266 yielded two radiocarbon dates with ranges of 85 BC–AD 50 and AD 15–100 respectively, at one sigma (adjusted) (GU-2746 and GU-2748).

This secondary occupation marks a significant break in the use of Structure 4, reflected in the reorganization of features within the interior (Ill 2.28c). Set into the top of the laid floor was a new hearth (C240). This was a far less well-built structure than the primary hearths, and had no trace of any formal paving. It comprised seven large, elongated slabs set in an approximately rectangular arrangement towards the rear (north) wall of Structure 4, and measuring approximately 1.2m north-west to south-east by 1.1m. Most of the hearth-stones were distinctly more rounded than those of the earlier hearths. The hearth-stones seem to have been displaced slightly outwards, perhaps by the weight of deposits above.

This hearth retained in situ ash deposits, comprising a basal layer of grey-white compact ash (C259) and an upper deposit of bright red-orange peat ash (C233), the latter containing fragments of unburnt peat. Around and partially over it formed the final occupation surface within Structure 4 (C223); an ashy deposit rich in organic material up to 0.15m thick. This context yielded a radiocarbon date with a range of AD 75–125, at one sigma (adjusted) (GU-2747).

The entrance deposits at this secondary level had been even more disturbed by subsequent construction than those lower down, and it is impossible to tell whether the door-post setting remained in use, or whether some other entrance arrangement had been devised. Interestingly, the secondary hearth was set well back from the entrance, presumably indicating some re-ordering of space within the structure.

The only other recognizable feature in this secondary occupation was a rough alignment (C417) running across entrance to Structure 4, approximately east–west for a distance of around 2.4m. It consisted of flattish stone slabs, and stood to no more than a single course. Its function is entirely uncertain, but its form is reminiscent of the laid stone features in the Phase 2b floor of Wheelhouse 1 (Ill 2.18).

Following this secondary occupation the structure seems to have suffered some structural failure, with rubble, ash and midden debris (C103) being dumped or falling onto the floor deposits (C223), forming up to 0.45m thick against the north wall, though fading out to the southern part of the interior. This midden debris contained exceptionally high concentrations of fish remains (see Section 4.4). The subsequent accumulations of midden over the abandoned structure (C085, C067, C160) were interrupted by an apparent episode of windblown sand deposition (C082), up to 80mm thick, over which was constructed an irregular alignment of rounded boulders (C050, Structure 9) of uncertain function, *c* 3m long by 0.6m wide (Ill 2.28d and 2.32). It is possible that this apparently short-lived structure (sealed by midden deposits C067 and C160 which were themselves truncated by Structure 7) may have extended beyond the confines of Structure 4 but was preferentially preserved within the ruined building. It does at least serve to demonstrate that Structure 4 was largely infilled and certainly out of use as a domestic building before the construction of Structure 7.

2.4.3.3 Entrance area deposits: Block 8b

The deposits which formed outside Structure 4, in its entrance area, have been grouped together as sub-block 8b (Ill 2.28a). The external stratigraphic relationships of this sub-block are the same as those of the rest of Block 8, but the precise linkages between contexts within 8 and 8b have been obscured by the later insertion of Structure 7 (see Section 2.4.4). It would appear that the lowest deposits in this sub-block (C283, C282) relate to the primary occupation, while the later deposits (C251, C250, C244, C171) must represent material accumulated during the later periods of occupation, as they combine to all but obscure the entrance passage walling. The deposits are predominantly stained and organic-rich sands, with lower concentrations of domestic debris than were visible in deposits inside Structure 4. A sample from C283 produced rachis internodes and possible straw plant macrofossils, suggestive of the burning of crop processing debris as fuel.

2.4.3.4 Interpretation

Structure 4 seems to have been a domestic cell forming a second focus for occupation within the settlement during Phase 2. Despite the remarkable complexity and apparent time-depth present in the structure, its occupation seems to have been short-lived, for even by the end of Phase 2 it had been abandoned and infilled for long enough to be sealed by two successive structures (Structures 9 and 7). It may be best interpreted as fulfilling a need for additional domestic space during a relatively brief period within which the household had expanded beyond the capacity of the primary structure, Wheelhouse 1, whether this was defined on the basis of numbers or by the composition of the household.

The dismantling of earlier masonry within the Wheelhouse 1 entrance passage shows that the original entrance arrangements had been substantially modified. The re-modelled entrance was too wide to be roofed with slabs, and was presumably roofed in timber (Ill 2.13). Later disturbance prevents any detailed understanding of the nature of the use of this passage during Phase 2, although the deposits of Block 8b suggest that occupation was not as intense as within Structure 4 or Wheelhouse 1. The width of the re-modelled passage suggests that it may have had a more varied use, perhaps for storage or as an ante-room, than the original, narrow wheelhouse passage which seems to have represented a more formal and

TABLE 2.4
Finds (excluding pottery) from Structure 4 (Block 8, Phase 2).

Floor deposit	**Entrance area (Block B)**	**Dumped midden**
Spindle whorl (SF283)	Human skull fragment (HB03)	Spindle whorl (SF278, SF285)
Bone pin (SF187)		Chopping board (SF149)
Pumice		Pumice
		Bone model sword (SF20)
		Bronze ring (SF142)
		Human tibia fragment (HB04)
		Antler roughout (SF294)

less flexible space. Within one of the upper fills of this entrance area (C171) was found a fragment of human skull (HB03) into which someone had attempted to drill a hole (see Section 3.4). It is not clear whether this was a deliberate or fortuitous deposit.

It is clear from the deposits which accumulated inside it that Structure 4 was a roofed building. Given the absence of internal roof supports, it is presumed that a conical timber-framed roof would have been used (although stone corbelling cannot be entirely ruled out), resting on rafters set into the tops of the walls (or perhaps set into a timber wall plate), at a height of at least 1.1m above the primary floor. This would have given a height from the floor to the apex of the roof of at least 3m. The building was thus reasonably substantial, but far from monumental in scale, although the grading of the wall slabs, the slope of the floor and the construction of at least one wall shelf, hint at a formalized approach to design and construction.

ILLUSTRATION 2.33
Structure 7.

The evidence for differential levels of trampling in specific parts of the building, represented by the survival of compressed ash layers and by disturbance in the underlying sand floor during the primary occupation, may reflect aspects of the way in which the interior space was used. The evidence for intensive trampling of deposits at the entrance is no great surprise, but there does seem to be a clear trend for this trampling to carry around the east side of the hearth (Ill 2.28a). This implies that people entering the building would have moved to their right around the hearth, following a anti-clockwise (the opposite of 'sun-wise') path. The off-centre position of the earliest hearth may even have been intended to facilitate movement around this side of the floor. This is remarkably similar to the pattern in Wheelhouse 1 in the early part of Phase 2, when the slab partition between the entrance piers and the hearth also forces anyone entering the building to move around the hearth in an anti-clockwise direction.

A notable area of compression also occurs directly below the wall-shelf in the east wall, suggesting some focus of activity there. It is unfortunate that the lack of artefactual material from these thin primary deposits does not allow us to build on these intriguing patterns.

The secondary occupation was marked by a reorganization of space within which no obvious patterns of spatial division can be observed, other than an apparently greater intensity of trampling in the southern half of the building. The movement of the secondary hearth to the rear of the building implies some change in the mode of use. An almost identical movement of the secondary hearth, accompanied by a similar change from slab to boulder construction, is seen within Wheelhouse 1 in Phase 2b, and it is tempting to equate the two events. The relatively poor construction of the hearth, together with the failure to maintain the cleanliness of the floor, and thus the height of the walls, and the partial blocking of the tallest wall slabs by the re-positioning of the secondary hearth, all hint at a decreasing interest in the formal architectural aspects of the building during this secondary use. It should be borne in mind, however, that had the building been inhabited for a further few years, this whole mass of secondary deposits might have been removed once again down to clean sand, and previous cycles of occupation may have been equally productive of occupation debris which periodic cleaning has simply removed.

One potentially significant difference emerges from the comparison of finds from Structure 4 and the Phase 2 deposits in Wheelhouse 1. Although containing only around 25 per cent less pottery (1,448 sherds, as against 2,027 sherds) Structure 4 was almost entirely lacking in all other types of finds. There was a complete absence of worked antler and whale bone, and only one bone object (a pin tip, SF187). Aside from the pin, the sole objects represented within Structure 4 floor deposits were a spindle whorl (SF283, not illustrated, see Section 3.3) and a piece of pumice (see Section 3.8 and Table 2.4). This discrepancy might suggest that the range of activities carried out within Structure 4 was rather more restricted than within Wheelhouse 1.

Once abandoned, the structure seems quickly to have been allowed to infill with midden deposits and stained sands. This process had apparently begun before the first deposit of windblown sand formed within the shell of the building. It is tempting to suggest that these deposits represent abandonment and de-roofing during the spring or summer, with subsequent deposition of domestic waste, followed by sand deposition over the first winter when the structure lay open. Whatever the timescale, these deposits were soon sealed below a stone wall, Structure 9. This may originally have formed part of a more extensive structure, but it survives only within Structure 4, where compression of the underlying deposits seems to have reduced its absolute level, protecting the lower courses from later stone-robbing. Its function is unclear, but, whatever its intended purpose, it was itself out of use and largely robbed before the end of Phase 2, as it came to be sealed by the construction of Structure 7, below.

2.4.4 STRUCTURE 7: BLOCK 22

After Structure 4 had been abandoned and had largely infilled with debris, a new cell, Structure 7, was constructed on the north side of the Wheelhouse 1 entrance passage (Ill 2.28d and 2.33). A hollow was dug out from the infilled entrance area of Structure 4, and lined with vertical slabs with upper coursing to form a C-shaped cell (C215), the open side of which faced south. The walling contained the broken upper stone of a rotary quern. There was no obvious use of packing material behind the walls. It is possible that midden deposits (C160, C067, Block 8, see Section 2.3.1.1) which overlay the former wall, Structure 9, behind Structure 7, were thrown up as wall-packing for Structure 7, rather than formed in situ. However, these deposits seem too extensive to derive from this construction activity and seem more likely to have been simply cut through in the construction of Structure 7. Indeed, there are indications in section (Ill 2.31) of a cut through these deposits set slightly back from the Structure 7 wall-head which may have been part of the cut made to accommodate Structure 7.

The group of deposits which form this structure (Block 22) clearly sealed Block 8 and were themselves truncated by Block 20. They can be firmly assigned to the latter part of Phase 2.

The structure measured approximately 1m across its open side, by 0.8m deep, and had a maximum surviving height of 1.1m. It is not clear to what extent the surviving plan was representative of the original structure, as Structure 7 had itself subsequently been truncated in the construction of the sump along the Structure 8 entrance passage in Phase 3 (see Section 2.5.1.3).

The only detectable primary fill within Structure 7 was a deposit rich in peat ash (C214) and again truncated on its south side. This deposit contained a relatively high density of pottery sherds (C60) and included a high percentage (32 per cent) of large sherds, suggesting that the deposits may have formed in situ, with limited exposure to trampling.

Structure 7 occupied almost the same position as the much earlier wheelhouse entrance cell (C415, Ill 2.2) which had preceded Structure 4 in Phase 1. Its purpose is unknown and it is not clear if it was

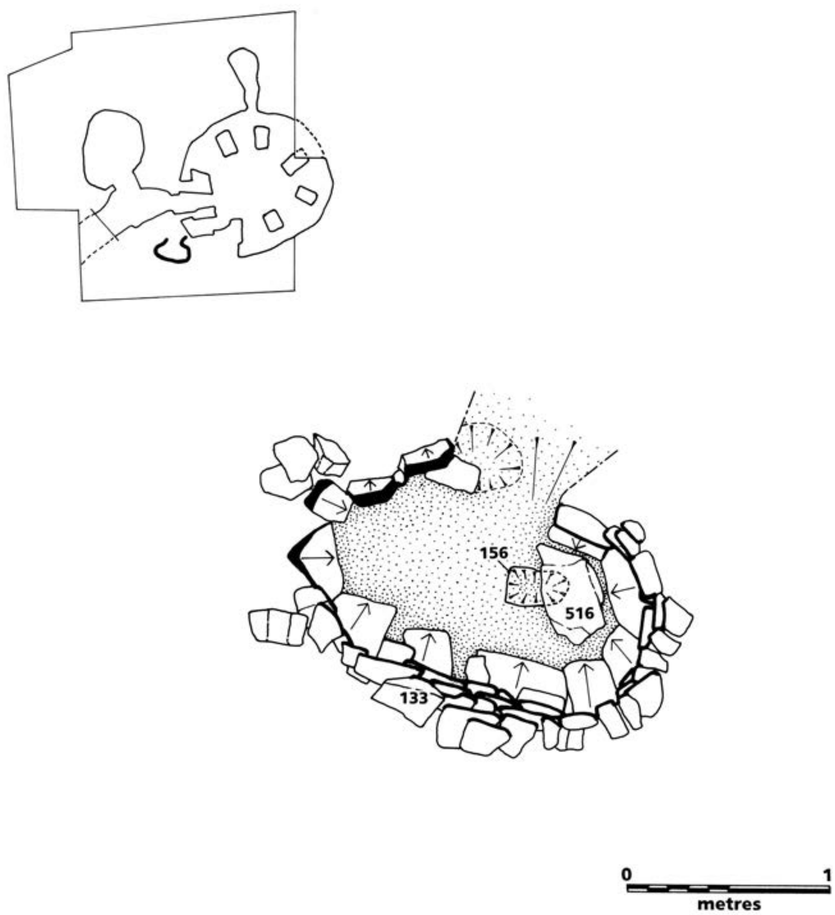


ILLUSTRATION 2.34
Structure 5 plan.

a roofed structure. It may have been encompassed by the overall roof of the entrance passage. It was clearly not a domestic structure and thus did not presumably replace the function of Structure 4. It is perhaps significant that Structure 4 seems to have gone out of use some time before the construction of Structure 7, suggesting that the two may be unrelated in function.

2.4.5 STRUCTURE 5: BLOCKS 13 AND 14

Structure 5 was a small stone-lined pit located close to the south of the Wheelhouse 1 entrance and adjacent to the Wheelhouse 1 wall (Ill 2.34). Indeed, the cut for the pit (C155) clipped the edge of the Structure 1 construction trench, demonstrating that Structure 5 was later in construction than Wheelhouse 1. This does not in itself mean that Structure 5 necessarily belonged to Phase 2, as its construction could have followed shortly on that of Wheelhouse 1. It is believed to belong to Phase 2, rather than Phase 1, largely because of its constructional similarities with Structures 3 and 4, and because its position would seem incompatible with the roofing of Wheelhouse 1, as the lining of the pit virtually touches the wheelhouse wall and would thus presumably have interfered with any form of roofing over the wheelhouse bays.

2.4.5.1 Construction features: Block 14

Structure 5 was dug into clean, natural sand, its sides being formed by a foundation course of vertically set slabs surmounted by two or three courses of small angular stones (C133). The wall was nowhere more than one stone thick. Some packing of stained, mixed sand seems to have found its way behind the wall (C159), but this does not appear to represent a formal constructional feature. Similarly the foundation stones were found to be set in pronounced depressions within the natural sand, but these appear to result from the weight of the wall rather than representing a deliberate preparation for the wall construction.

The wall formed an apparently unbroken circuit with dimensions of approximately 1.6m by 1.8m. Although initially thought to be a small cell, when first exposed, Structure 5 seems to have had no entrance. Where undisturbed, the level and uniform nature of the upper course suggests that it represents the original unmodified top of the pit. This would give an original depth of around 0.7m.

2.4.5.2 Deposition summary: Block 13

The earliest feature within Structure 5 was a shallow cut or depression some 0.2m by 0.3m by some 0.1m deep (C156). This was filled by a stained sand deposit (C157) and partially sealed by a flat slab (C516) similar to those used to form the foundation course of the wall (Ill 2.35). This stone appears to derive from the adjacent north-eastern circuit of the wall, where a slab of similar dimensions was missing. This would seem to imply that the wall of the structure had collapsed or been partly dismantled prior to the accumulation of any substantial deposits on its floor. Indeed only a thin deposit of stained sand and ash (C153) seems to have been in place before this partial collapse occurred.

ILLUSTRATION 2.35
Structure 5 from south (fully excavated).

Analysis of this thin deposit suggests that it derived from a mix of sand, ashy hearth waste and other domestic refuse, of a type common throughout the site. There was nothing in the results of the analyses to suggest that the material derived from any special function particular to Structure 5. Analysis of the fill of the primary depression (C157) suggested a much less organic composition, seemingly indicating a different source for this material. This would appear to support the suggestion that this depression was filled quickly, and perhaps deliberately, before any debris had time to accumulate.

The fallen part of the Structure 5 wall lies immediately adjacent to the wall of Structure 8 which was constructed in Phase 3 (see Section 2.5.1.1). It seems highly likely that it was during the disturbance associated with the construction of Structure 8 that this damage was caused, and thus that the Structure 5 was still largely empty at the end of its life, at the end of Phase 2.

Above the primary deposit, the upper fills of Structure 5 were formed of a series of mixed and stained sands which rose to the level of the wall-head. These deposits, and the wall-head itself were then sealed by the cobbled path associated with Structure 8 (see Section 2.5.1.3). Within this sandy infill, and confined to the western part of the floor, resting against the wall, was a deposit of stones comprising, small angular slabs (C152) supporting a small 'bank' of cobbles (C149) and small flat stones (C143) of a type commonly used as 'wedges' in the various dry-stone walls on the site.

The pit contained a fairly large assemblage of pottery totalling around 197 sherds. While this might seem surprisingly high for such a restricted volume of deposits it is not in fact any greater in terms of concentration than other Phase 2 deposits, notably Block 8. The very small percentage of large sherds (4 per cent) reflects the likely derivation of this material from re-deposited domestic debris.

2.4.5.3 Interpretation

There is little evidence as to the primary function of Structure 5. Storage of some form is most likely, although there is nothing in the sediments retrieved that hints at what the stored products might have been. The only primary deposits (C153), other than the fill of the primary depression, appear to be trampled admixtures of the general sandy, ashy domestic debris which formed much of the site stratigraphy. The primary depression (C156) with its distinct, though inorganic and unspectacular fill (C157) may hint at some form of special deposit, emplaced prior to or during the use of the structure, but the evidence is equivocal.

The structure was presumably roofed, since no windblown sand or other such material seems to have accumulated. A slab roof is possible, as was the case for Structure 3, but since the roof formed the only access, we might perhaps envisage a more easily removable timber-built covering.

The majority of the internal deposits seem to relate to a short-lived phase of activity which followed directly on the abandonment of Structure 5. The wall on the north-east side seems to have been pushed inwards and the largely empty interior filled with a heterogeneous dump of domestic debris and loose stained sand derived from Phase 2 deposits in the vicinity. The discrete stone dump, deposited against the west wall, after the partial collapse of the pit appears to represent a small stack of either construction material which was never required, or waste material from the construction of Structure 8. The orderly deposition of these stones suggests a single event, with the rapid accumulation of the stained sandy deposits above.

Rather bizarrely, the finds from Structure 5 contained two of only three pieces of bone-working debris (other than whale bone) present on the entire site. The two pieces (SF83 and SF84, see Section 3.5) derive from dumped fills (C134, C140) and may

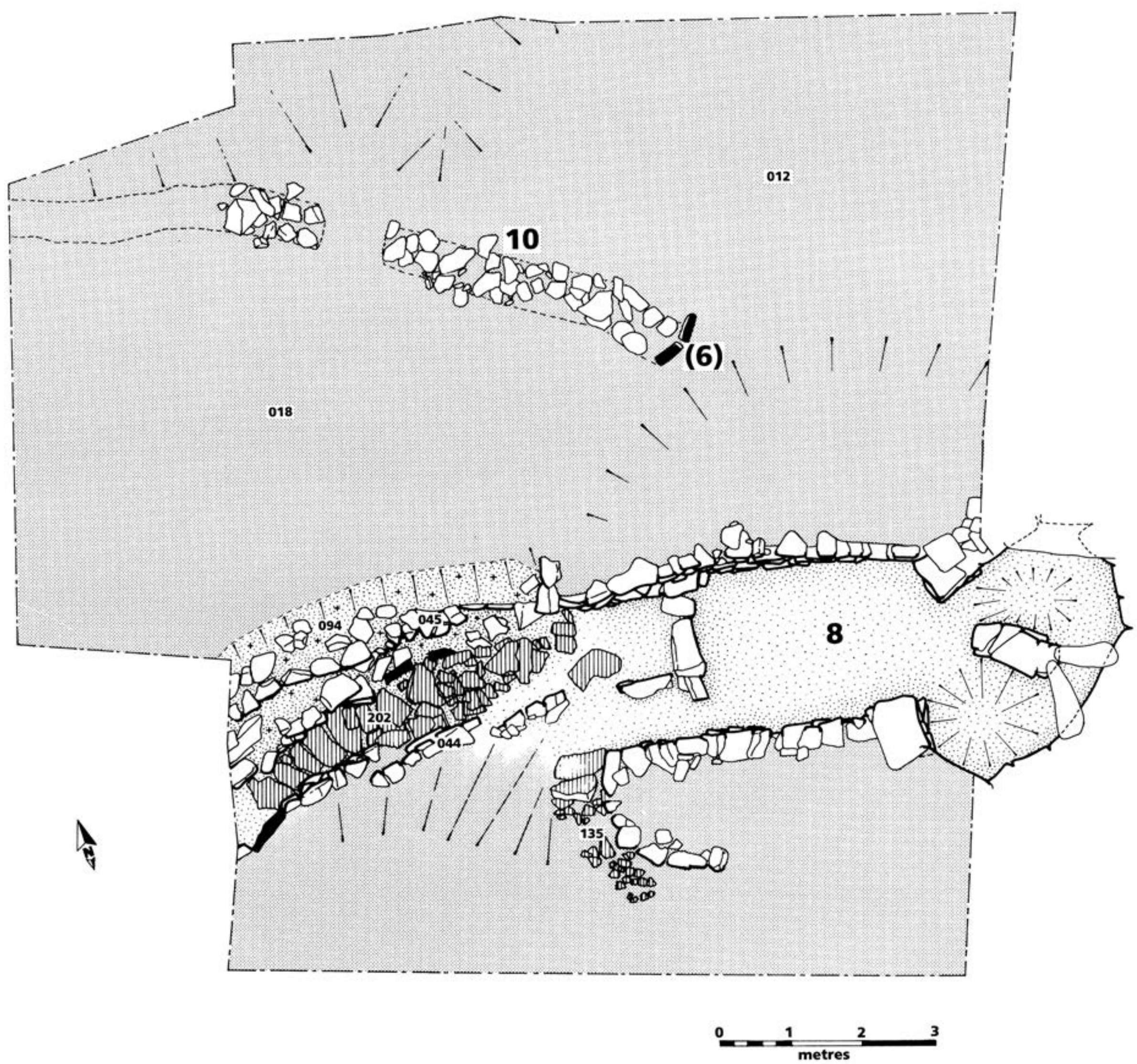


ILLUSTRATION 2.36
Phase 3 summary plan.

suggest that part at least of the fill does not derive from the other excavated structures. If this material did derive from, say, Wheelhouse 1, it seems odd that virtually no bone-working debris was identified in that structure. Even more surprisingly, this material contained no mammal bone refuse other than the worked fragments. This would appear to confirm that the dumped material did not derive from the excavated buildings, which were generally relatively rich in bone debris.

2.4.6 STRUCTURE 6: BLOCK 21

Structure 6 is interpreted as representing the remains of a stone-lined pit similar to Structure 5. Its sole surviving components were two orthostats, dug into the natural dune sand (Ill 2.14) which, if the interpretation is correct, would have formed the southern arc of the original pit. No coursing was present and no other slabs were identified. The only detectable fill was a slightly stained sand deposit containing some peat ash flecks (C186). No finds were associated with this structure.

Whatever the precise form of the original feature, it was apparently dismantled prior to the construction of a wall (Structure 10) during Phase 3. The remains of Structure 6 formed the south-east terminal of this later wall (Ill 2.36).

The apparent disappearance of much of this structure suggests that some alteration of ground levels must have occurred between the construction of Structure 6 (which was sand-revetted) and the construction of Structure 10 (which was free-standing). The ground appears to have sloped downwards gently to the north away from the surviving elements of Structure 6. It is possible, therefore, either that the missing elements of the structure may have been free-standing, or that some degree of soil loss, presumably through deflation of the surrounding sands by wind, may have caused the structure to lose its sand support.

2.4.7 PHASE 2 SOIL EROSION

At various points in this discussion the issue of soil erosion has arisen and it is perhaps worth drawing some of these threads together. The erosion of the surrounding sand into which the structure was revetted has been cited as a likely reason for the poor condition of Structure 6. Similarly, the section in Ill 2.25 shows that the roof capping of Structure 3 had apparently been substantially lost prior to the formation of the Phase 3 midden (C012) above it. The underlying deposits in the fill of Wheelhouse 2 (C031, C049) also appear to have been truncated horizontally in the same section.

Indeed, there are no surface deposits anywhere on the site which can be dated earlier than Phase 3, and earlier midden material can be identified only in sediment traps formed by abandoned buildings, eg Structure 4.

It would appear, therefore, that there may have been a significant loss of soil from around the various structures during Phase 2, and perhaps earlier, prior to the deposition of substantial midden material during Phase 3, often onto re-exposed natural sand (see Section 2.5.3). Excluding deliberate human action, which seems unlikely, the only reasonable explanation for this soil loss is wind erosion, such as can observed widely in the modern machair environment. This in turn implies the presence of broken ground around the buildings, perhaps caused by the processes of construction and building maintenance, or by the over-grazing of animals (perhaps especially pigs) around the wall-heads and roofs of the settlement.

2.4.8 UNASSOCIATED DEPOSITS OF PHASES 1 OR 2

Two small features could be shown to pre-date Phase 3 (as they underlie the midden deposits of Block 18), but cannot be definitively related to deposits of either Phase 1 or 2. They may belong to either of these phases or, conceivably, to even earlier activity (not on plan).

2.4.8.1 Negative features: Block 10

A small, charcoal-rich pit (C200), some 0.1m deep by 0.25m diameter, was identified between the entrance to Wheelhouse 2 and the north wall of Structure 4. It was cut into natural sand. It appears to represent the base of a stake or post-hole. A similar pit (C300), 0.15m deep by 0.15m diameter, with a V-shaped base, was identified close behind the west wall of Wheelhouse 2.

2.4.8.2 Interpretation

It seems most likely that these features relate to ephemeral structures emplaced during Phases 1 or 2. Seven sherds of pottery were recovered from the fill of feature C300 but the assemblage is uninformative, except insofar as it supports the association between the feature and the main period of settlement on the site.

ILLUSTRATION 2.37
Structure 8, from north-west, showing primary floors and re-use of corbelled cells.

2.5 PHASE 3: THE RECTILINEAR STRUCTURE

During Phase 3 the cellular layout of Phase 2 was replaced by a single, rectilinear domestic building, Structure 8 (Ill 2.36). A wall, Structure 10, was also constructed, possibly as part of an enclosure around the settlement.

The main changes can be summarized as follows:

1. The network of small cells was replaced by a single dominant structure.
2. The building form changed from circular to rectilinear, with concomitant implications for roofing.
3. The slab-revetting building technique was abandoned.
4. The settlement was apparently at least partially enclosed.

Deposits belonging to this phase comprise Blocks 1–4, 18 and 20. The Site Matrix (Ill 2.1) shows clearly the stratigraphic 'bottleneck' which separates these blocks from all earlier deposits on the site.

Blocks 2 and 4 represent the construction of, respectively, the main walls and entrance passage of Structure 8. They are in turn sealed by Blocks 1 and 3, the fills of Structure 8 and its entrance passage. Block 20 comprises the structure and fill of a drain or sump which lay below entrance passage of the building.

Block 18 comprises the only group of Phase 3 deposits not directly related to Structure 8. It contains a series of midden deposits and the wall, Structure 10, which sealed all structures and deposits of Phases 1 and 2. It appears to have formed in parallel with the occupation of Structure 8 (the midden deposits did not extend into or over Structure 8, suggesting that they formed while it was still roofed and in use). The nature and condition of the artefactual material supports the hypothesis that this block formed during the main occupation of the settlement and did not incorporate significantly later material.

2.5.1 STRUCTURE 8: BLOCKS 1–4 AND 20

Phase 3 saw a major reorientation of the settlement with the dismantling or final collapse of much of the unstable Wheelhouse 1, and the construction in its place of Structure 8 (Ill 2.36, 2.37, 2.38). The new building was the first and only rectilinear building on the site, and its form is presently unique in the Iron Age of the Western Isles. It was partially revetted into earlier deposits and wheelhouse masonry, re-using the line of the original wheelhouse entrance passage. Throughout the occupation of Structure 8 the two corbelled south-eastern cells of the wheelhouse remained in use, substantially unmodified.

Structure 8 was built wholly within the interior of the former Wheelhouse 1 and its construction therefore necessitated the partial demolition of the latter. Alternatively, it may have been the accidental collapse of much of Wheelhouse 1, pre-figured by the signs of structural weakness apparent during Phase 2, which led to the re-configuration of the settlement in Phase 3.

There is no indication that any significant period of abandonment separated the occupation of the two structures. For example, there is no evidence for the accumulation of wind-blown sand within the abandoned wheelhouse, and indeed, as we shall see below (Section 2.5.1.1), there is some positive

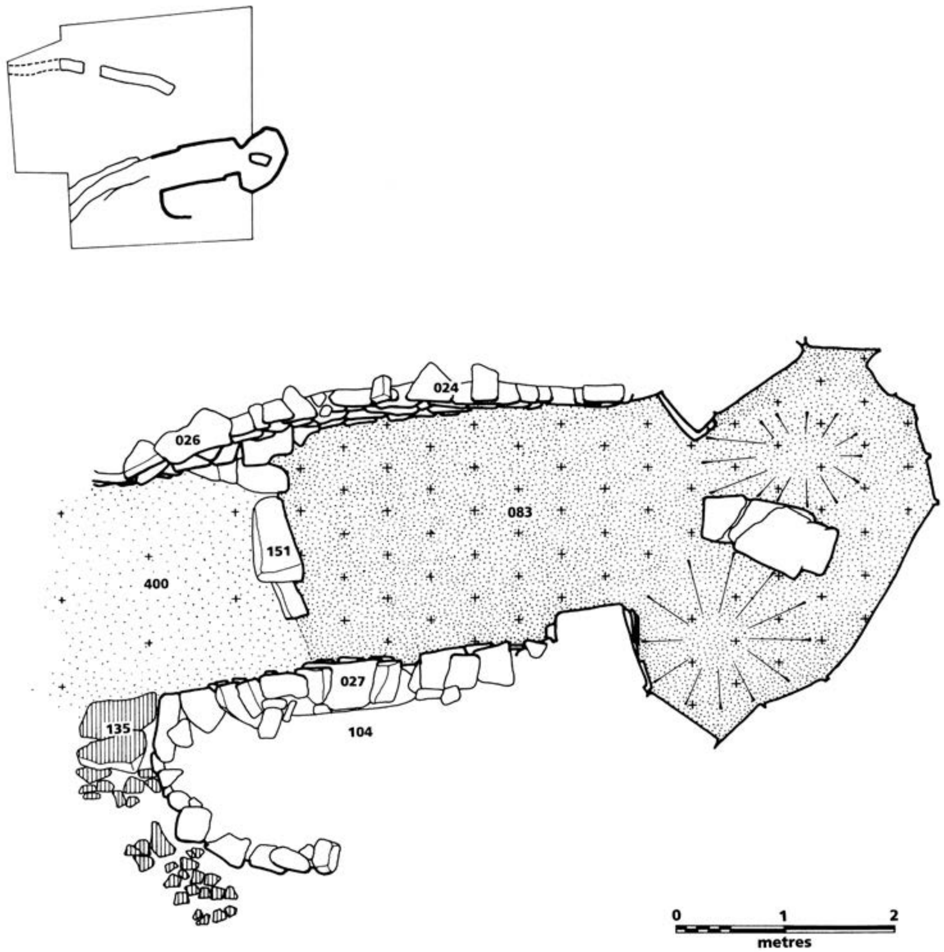


ILLUSTRATION 2.38
Structure 8, plan of primary floor. Note that the sub-division (C151) would, in reality, have been covered over by C132 by the time C400 and C083 formed.

evidence that the deep hole formed by the derelict wheelhouse had not filled with any appreciable quantities of material prior to the construction of Structure 8.

Regardless of whether the reorganization of the settlement resulted from choice or necessity, Structure 8 was clearly a radical break from the circular and curvilinear structures which had gone before. The structure was rectilinear on plan, aligned north-west to south-east, with a north-west entrance. It measured some 7.5m in length and had a maximum width of 2.2m, with its south-east end formed by the two surviving corbelled cells of Wheelhouse 1. The walls survived to a height of 1.5m along most of the north side, with a level wall-head which appears to have been substantially intact.

2.5.1.1 Construction: Block 2

The condition of Wheelhouse 1, immediately prior to the construction of Structure 8, can be reconstructed to some extent. The walls around the circuit seem to have been reduced to around head height everywhere except for the two surviving corbelled cells on the south-east. The other bays were clogged with unconsolidated sand, rubble and midden (the latter presumably fallen roof packing or sealing material). The interior, however, does not seem to have been deeply buried, and we must assume that the central timber roof had been removed. The floor of Structure 8 was dug into the uppermost occupation deposits of Wheelhouse 1, over which only a thin coating of sand and rubble had accumulated (no more than around 0.4m at the centre, Ill 2.39).

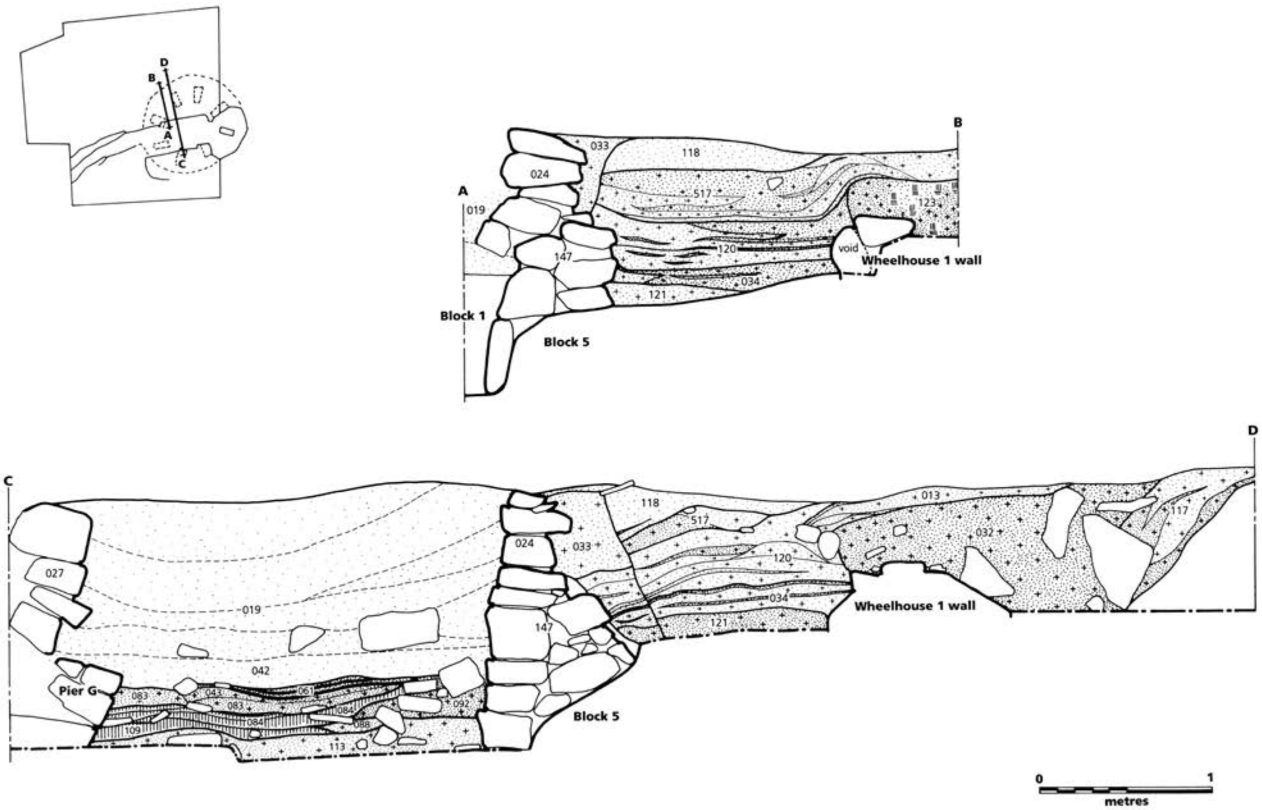


ILLUSTRATION 2.39
Structure 8, sections through the interior, north wall and upper fill of Wheelhouse 1.

The north wall of Structure 8 (C024, C147) was the better-preserved of the two long walls, and had clearly been constructed in two phases. It incorporated numerous substantial flat slabs of reasonable quality, presumably removed from Wheelhouse 1. Although the pier immediately adjacent to the north side of the Wheelhouse 1 entrance, and its buttress, survived to form part of the backing for the Structure 8 wall, the remainder of the north wall stood well forward of the remaining wheelhouse piers.

The primary part of the north wall (C147) had a foundation course formed by slabs and boulders revetted directly against earlier deposits within the interior of Wheelhouse 1. It included the upper stone of a small rotary quern (SF086, see Section 3.6.2). A maximum of around 0.3m of Wheelhouse 1 occupation deposits appears to have been removed, although in places it was probably considerably less. Above this basal course the north wall of Structure 8 had a distinct outer as well as inner face and appeared in section as a free-standing structure (Ills 2.39–2.40).

In the space between the outer face and the wall of the ruined wheelhouse, a number of deposits subsequently formed. These were an extremely complicated series of striated sandy layers and tips with varying admixtures of ash and midden material. These deposits were simplified for recording purposes into four main groups (from the top downwards: C118, C074, C517, C120, C034, C121) but this should not be allowed to mask the complexity of the formation. One of these deposits (C034) contained lenses of uniform yellow/white sand, although the presence of pottery showed that it was not a simple windblown accumulation.

A fragment of worked human skull (HB02, see Section 3.4) was found within one of these wall-backing deposits (C074). It is unclear whether this was deliberately or fortuitously deposited.

The formation of these deposits raises significant questions. During excavation it was assumed that the primary north wall of Structure 8 had been free-standing and that these deposits had formed some

ILLUSTRATION 2.40
Photograph showing the section through the wall of Structure 8 and the upper fills of Wheelhouse 1. The upper part of Pier B can be seen in the foreground. The emergence of this pier made it impossible to maintain this section line at a lower level.

time after its construction. However, it is debatable whether a free-standing dry-stone wall only some 0.6m wide would have been able to support the thrust of the timber roof which presumably spanned Structure 8. It is perhaps more likely that the deposits behind the wall were deliberately emplaced after the wall had been constructed to provide the additional support required for the roof. It is probable, therefore, that the double-faced construction of the north wall was simply a device to ensure that the wall would stand until supporting material could be dumped behind it. The thin dry-stone wall was thus perhaps only intended to be self-supporting for a matter of hours or days, and was never intended to support the weight of a roof.

The deposits themselves give some support to this hypothesis. Several lapped up against the primary wall of Structure 8, showing that the wall was in place before they formed (Ill 2.39, especially A). The same deposits also lapped over the earlier deposits within the ruined Wheelhouse 1, and in one case at least (C120) rose at such a sharp angle that it seems improbable that they represent a natural formation (Ill 2.39, A). Indeed, in part B of the section, the underlying Wheelhouse 1 deposits (C032) also maintain an unnatural, near-vertical profile against which these later deposits had formed.

It would appear, therefore, that these deposits must have formed rapidly, and were indeed most probably deliberately deposited over an extremely short time-period, before the cut through the Wheelhouse 1 deposits had had time to weather and reach a more natural angle of rest (if indeed the near-vertical angle of rest does represent a cut; if the wheelhouse had been demolished immediately before work began on Structure 8, it is possible that this simply reflects the accumulation of material deliberately toppled into the wheelhouse which was not given time to weather into a more ‘natural’ formation. The presence of numerous voids in the deposits around the Wheelhouse 1 wall (Ill 2.39) lends weight to this interpretation).

At some later stage, the upper part of these deposits was cut through and a new, single-faced wall (C024) was inserted, with a packing of mixed ashy, sandy material (C033, C076) filling the spaces behind it. A maximum of five courses of this new single-faced revetted wall seem to have been built. The later walling was constructed of angular blocks of various sizes and was generally of less accomplished construction than the earlier elements. Towards the west of the structure, close to the entrance, an area of stone patching (C026) hints at a further episode of minor structural repair.

The construction of the new upper walling seems to have had a peculiar effect on the deposits behind the primary wall. The main section through this material (Ill 2.39, B and especially 2.40) shows a sharp disjunction in the otherwise coherent layers behind the primary wall. This disjunction seems to extend downwards from the point at which the upper part of this material was cut through. It would appear, therefore, that a substantial part of this block of material slipped by a few centimetres during this construction work, but not sufficiently to bring down the lower part of the Structure 8 wall, or indeed to show in the adjacent section (Ill 2.39, A). It may be surmised that this manifest instability may have been responsible for the initial collapse which had necessitated the re-building of this wall in the first place.

The re-building of the north wall cannot be accurately equated with the sequence of internal deposits within Structure 8. This somewhat complicates the stratigraphic relationship of Blocks 1 and 2, since not all deposits of Block 2 need be earlier than all deposits of Block 1. Although this does not affect the attribution of these blocks in their entirety to Phase 3, it should be borne in mind as a potential constraint on any more detailed stratigraphic analysis.

The southern wall (C027) was generally less well-preserved than the northern, in part perhaps because of the slope in the pre-excavation ground levels, which had brought the top of this wall close to the modern surface, and partly because of its more extensive re-use of unstable wheelhouse masonry. This wall ran north-west to south-east, parallel to the north wall, and was formed of medium to large angular stones forming rough and often dangerously unstable dry-stone walling.

The south wall incorporated in its construction the upper remnants of two of the southern piers of Wheelhouse 1 (Piers F and G), with new walling inserted even under the collapsing corbelling between these piers in an effort to provide some stability, and above it, to increase the wall height (the distortions in this sector of walling are visible in Ill 2.37). This seems an extraordinary way to have gone about the process of construction, as it would presumably have been much easier and safer to dismantle this corbelling and build the wall from scratch.

Mixed sandy and rubble-clogged deposits behind the south wall (C027, C104) could not be safely excavated. They appear to represent either deliberate packing, or debris from the dismantling or collapse of the upper Wheelhouse 1 superstructure. There was no indication of multi-phase construction on this side of Structure 8, although its periodic collapse and instability made investigation extremely hazardous. The published section does not, therefore, extend through this wall (Ill 2.39). Nonetheless, the impression of ad hoc re-use of the collapsed or dismantled wheelhouse superstructure is clear enough.

At its west (entrance) end, the south wall curved outwards to the south, where the exterior ground level rose sharply. The wall, therefore, quickly reduced to a single course although it maintained the same absolute height as the internal wall-head. This short outward extension fringed a rough cobbled path (C135) which gave access to Structure 8 from the south (see Section 2.5.1.3). Its position suggests that it may have been intended to protect the butt-ends of the Structure 8 roofing timbers from damage by movement along the cobbled path. No such extension (or path) is present on the northern wall.

At the time of the initial construction of Structure 8, two internal features appear to have been built. These comprise an internal stone alignment (C151) which created a division between the inner and outer 'zones' of the interior, and a projecting stone 'bench' one stone wide, which adjoined the north wall in the outer zone. The former was formed of three long angular slabs laid across the interior from the north wall to just short of the south wall. This maintained the underlying spatial division at the end of the Wheelhouse 1 entrance bay. It would have been rendered invisible by the accumulation of sediments early in the occupation of the building (see Section 2.5.1.2), although some separation of the deposits to either side seems to have continued, suggesting that it may have supported a timber partition.

TABLE 2.5
Finds (excluding pottery) from Structure 8 (Phase 3).

Floor deposits	**Walls and wall-packing**
Worked antler (SF66, SF69a–d, SF69f, SF52, SF291)	Bone needle (SF42)
Whale bone plaque (SF41)	Bone pin (SF92)
Stone disc (pot lid?) (SF087)	Rotary quern (SF086)
Flint flake	Spindle whorl (SF279)
Roughout (SF27)	Human skull fragment (HB02)
Chopping board fragment (SF300)	
Flensing knife (SF297)	

The limited pottery assemblage associated with the construction episodes reinforces the field interpretation of these deposits as re-deposited domestic midden and, in a few cases, substantially unmodified but re-deposited natural sand.

2.5.1.2 Internal deposits: Block 1

The principal deposits within Structure 8 appear to represent a sequence of laid floor deposits interleaved with deposits of ash and other domestic debris (Ill 2.39). The sequence of deposits is slightly different in the eastern and western parts of the structure, separated by the internal stone partition (C151).

The earliest recognizable deposit in the eastern part of the structure is a layer of stained sand (C113) which forms a level surface extending into the corbelled cells. Despite its thickness (up to 0.2m) and extent, this deposit contained no pottery and little other domestic debris and is interpreted as a deliberately laid deposit of (initially) clean sand, which has become discoloured through exposure to heat and minor contamination with ash and organic material. It did, however, contain a cache of antler-working debris (SF52, SF66, SF69a–d, SF69f) and a stone disc (SF087) which, given the absence of other material, may have been deliberately deposited (indeed these objects make up a large proportion of the non-ceramic small finds from Structure 3, Table 2.5). The level surface of the deposit supports the hypothesis that it represents a laid floor rather than a deposit of windblown sand, which would have presumably lapped up against the walls. This deposit gave a radiocarbon date of AD 115–190, at one sigma (adjusted) (GU-2742).

A series of ashy, organic-rich deposits (C109, C112) formed immediately above this floor layer. These have a discontinuous distribution and appear to correlate with similar deposits (C091, C093) in the western part of the interior. These deposits do contain pottery and appear to derive from general domestic activity. C109 gave a radiocarbon date of AD 165–210, at one sigma (adjusted) (GU-2743).

This initial group of deposits was subsequently sealed by a second laid floor (C087, C088) similar in composition to the first, though less well-preserved and shallower. Over this second surface, a further series of ashy deposits formed. Analysis of the most extensive of these (C084) supported the field interpretation that it derived from a mixture of domestic sources, incorporating hearth waste and a high organic content. A high frequency of seaweed parasites suggests that this may have been a major source of fuel in this period. This single context also produced 90 sherds of pottery of which 35 per cent were large sherds. This, together with the sharp division between it and the laid floor surface, suggests that this material was deposited relatively quickly. A small, discrete deposit of small to medium stones laid against the middle of the north wall of Structure 8 was also deposited at around this time (C092). The deposit appeared structureless, but may nonetheless relate to some form of internal furniture subsequently levelled as occupation continued.

Above these deposits was laid a third floor level (C083) represented this time by a darker, more stained sand, possibly containing a more substantial midden component, or possibly simply more mixed by trampling. Analysis of a sample of this material revealed plant macrofossils of a number of wild species indicative of heathland and bog, presumably derived from the burning of peat or turves from upland areas. Seaweed parasites were also present in some numbers. This deposit covered the entire eastern area of Structure 8, and the two corbelled cells (where it acquired a bowl-like profile), lying up to 0.2m deep in places. This floor contained notable concentrations of limpet shells apparently trodden into its surface. A much less mixed, white sand deposit in the western entrance area (C400) may represent part of the same deposit which had undergone a different post-depositional history. A further intermediate deposit (C132), over the area of the stone partition, may represent a further manifestation of the same original floor level.

C083 provided two radiocarbon dates with ranges of AD 200–330 and AD 170–245, at one sigma (adjusted) ((GU-2744 and GU-2745 respectively). It also contained the only sherds from flaring rim vessels on the site (V991 and V993, see Section 3.2).

Two further deposits covering much of the eastern interior (C043, C061) represent the final coherent deposits across the structure. Analysis of samples suggest that C043 at least derives from a fourth laid floor level, again with hearth waste incorporated into an essentially inorganic sand body. A localized area of ash (C060) against the north wall represents the final layer that can unambiguously be linked with the occupation of Structure 8. The total depth of deposits from the base of the first laid floor (C013) did not exceed 0.45m.

Above these occupation deposits lay a further deposit of clean white sand (C042). This is probably best interpreted as naturally deposited, as it does not appear to have been used as a living area, but its relatively level surface, and inclusion of a small bone assemblage, seems unusual for a windblown deposit. It is perhaps best seen as a naturally accumulated sand layer formed when the building was de-roofed, but subsequently modified for small-scale, perhaps casual re-use. A radiocarbon date from this context suggested formation between AD 230 and 490, at one sigma (adjusted) (GU-2741). This may be taken as a terminus ante quem for the de-roofing of Structure 8.

Three localized patches of ash (C020, C046, C041) were the final anthropogenic deposits to be formed, and they were restricted to the southern of the two corbelled cells. They do not seem to be part of any wider use of the structure and may best be explained as single-episode dumps. Analysis of C020 supports the field interpretation that this was a single ash dump. The extremely high concentration of seaweed parasite marine molluscs (frequency of 73, by far the greatest concentration found in any sample on the site, see Section 4.5.1), strongly suggests that this ash derived from the burning of seaweed. The other two contexts seem to represent the incorporation of ash within generally inorganic sand, although C046 had the second highest frequency of seaweed parasites from any sample on the site, and probably also derived from the burning of seaweed.

The final deposit within Structure 8 was a deep (*c* 1m) deposit of clean windblown sand (C019) which filled the structure to its wall-head (Ill 2.39). Numerous striations within the sand seem to show the pattern of deposition, with sand having formed against both walls leaving a linear hollow along the centre of the building. On the basis of observation of sand movement in the modern machair it seems likely that this structure could have infilled entirely within a short time after its final de-roofing; perhaps within a single winter.

2.5.1.3 Entrance passage construction: Blocks 3, 4 and 20

The north-west facing entrance of Structure 8 was approached by a stone-lined path along the course of the former Wheelhouse 1 entrance passage. This

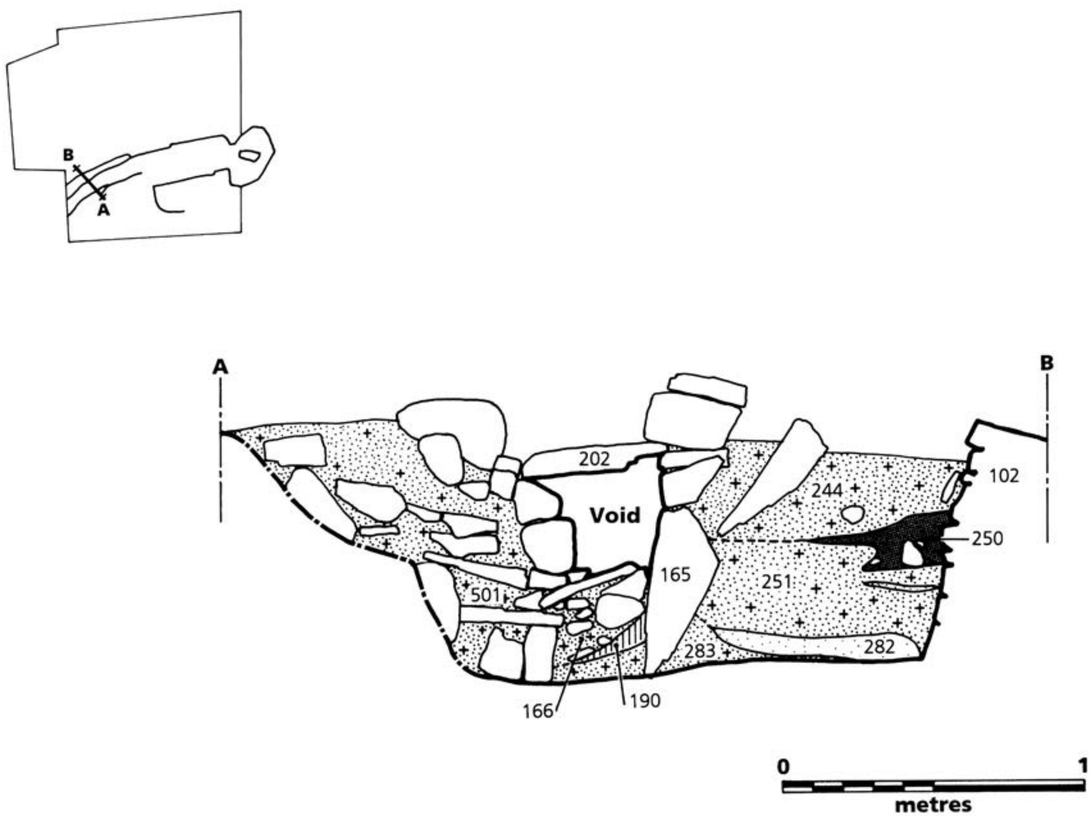


ILLUSTRATION 2.41
Section across sump in the entrance to Structure 8.

path directed movement towards the northern half of the entrance while a rough cobbled path (C135, this section) from the south led into the southern half of the entrance (Ill 2.36).

The major feature of this entrance area was a linear drain or sump (Block 20), which ran along the centre of the passage, stopping just over 1m from the entrance to Structure 8. It appears to have terminated close to the west section, although this area was not fully excavated and the observation is based on the plan view only. This presumed end point would give an overall length of approximately 5.5m.

This structure must presumably be envisaged as a sump rather than a drain since it ran downhill towards the Structure 8 entrance, which would have made it a peculiarly ineffective means of re-distributing unwanted water. Presumably the intention was simply to create a channel through which surface water could escape quickly through to the underlying natural sand. The material through which it was cut itself comprised mainly stained sands, but even the limited midden content of these deposits may have been sufficient to cause drainage problems in the constricted entrance passage. Conceivably, surface water may otherwise have found its way into Structure 8.

The section (Ill 2.41) gives a fairly clear picture of how this structure was built. Firstly it appears that material which had accumulated during Phase 2 outside the entrance to Structure 4 (C244, C251) was dug out from the south side, leaving a near-vertical face. This face was then revetted with large slabs and upper coursing (C165). The south side of the sump was then built up from smaller slabs and coursing, with disturbed material (C501) being replaced behind it as packing. The cut for the sump reached clean sand at least in places along its course, and elsewhere reached and used the primary wheelhouse paving (C302). No new basal paving appears to have been created.

Once the channel had been thus created, a row of capstones (C202) was placed over it, and this was apparently weighted with smaller stones, creating what appeared from the surface as a strangely narrow paved walk-way along the centre of the entrance passage. The space between these two rows of weighting stones was little more than 0.5m. The narrow voids between the capstones would have been sufficient to allow surface water to escape into the sump.

When first built, the sump was around 0.7m deep below the level of the capstones and between 0.25 and 0.35m wide. It appears to have filled almost half full before deposition ceased. The fills were unexceptional sandy deposits. Analysis of one of these (C166) suggested derivation from the usual domestic midden sources which pervade the site, mixed with inorganic sand. No mammal bone was present, although some fish bone was recovered.

The sump and its paving occupied the central portion of the passage which formed the most obvious route towards the entrance of Structure 8. Two further stone constructions lined the same path (Block 4), revetting the earlier deposits to the north and south, and creating a passage rather wider than that defined by the narrow band of paving above the sump (Ill 2.36).

Along the north side, the passage was lined by an irregular low revetment wall of water-worn boulders (C045) quite distinct in character from the usual angular blocks and slabs used elsewhere on the site. This alignment abutted the main wall of Structure 8 at its east end. Behind the stones was a deposit of sand and rubble (C094) which served to seal off the late Phase 2 entrance passage cell, Structure 7 (see Section 2.4.4).

On the south side, the path was defined by little more than a single course of irregular water-worn boulders (C044). While the north alignment disappeared into the main west section of the excavation trench, giving a minimum length of around 5m, this southern alignment could not be traced with any certainty for more than around 3.5m from the Structure 8 entrance. Both may have incorporated secondary additions and re-builds as the quality of construction was such that these could have been inserted without leaving any obvious trace. There is no positive evidence, however, that these revetments were other than primary to the construction of Structure 8 and thus at least broadly contemporary with the construction of the sump.

While the re-used wheelhouse entrance passage was the most carefully constructed route into Structure 8, a second option for access appeared for this first time in Phase 3. A rather less formal path, formed of rough cobbling (C135), was built up across the short slope to the south of the Structure 8 entrance, hugging the outward return of the structure's south wall. The path could be traced for no more than around 3m: any continuation would probably have been too close to the modern ground surface at this part of the site to have survived.

The material deposited within the entrance passage (Block 3) comprised mainly stained sand with inclusions of ashy material (C056, C057, C063). A small area of collapsed rubble (C062) towards the entrance probably represents collapse or slumping from the north entrance revetment (C045). Towards the west section was a restricted deposit of more organic-rich midden material (C059, C105) which also contained a correspondingly greater concentration of pottery (25 of the 41 sherds from Block 3). Nowhere were the deposits of Block 3 greater than *c* 0.3m deep.

The small ceramic assemblage from this block contained 0 per cent large sherds, indicating the degree to which these deposits had been disturbed.

2.5.1.4 Interpretation

There seems little doubt that Structure 8 was a domestic building built to replace Wheelhouse 1 which had become dangerously unstable by the end of Phase 2. No break in occupation is detectable between the two structures and the most likely explanation is that either Wheelhouse 1 suffered a catastrophic collapse which necessitated the immediate construction of a new domestic building, or else it was deliberately dismantled to make way for, and provide stone and structural support for, the new structure.

While aspects of the construction of Structure 8 appear opportunistic, such as the use of the remaining wheelhouse masonry to support its south wall, and the incorporation of the surviving wheelhouse cells, other features suggest that it marked a deliberate break with tradition. The new building was a semi-subterranean, passage-like structure, somewhat reminiscent of souterrains elsewhere in the Scottish Iron Age, but apparently a domestic structure in its own right. Its rectilinear form set it apart from all earlier structures on the site, and marks it out as an exceptional structure in the Iron Age of the Western Isles as a whole. Furthermore, the walls of Structure 8, although revetted at the base, did not use the technique of slab-revetting below a coursed upper wall, which had characterized the Phase 2 buildings. Possible parallels, such as they are, for this unusual structure, will be discussed in later sections of this report.

The move to rectangularity must indicate a radical shift in approach on the part of the inhabitants, in terms of the roofing mechanism as well as the more obvious changes in the use and division of space within the house. The roofing of Structure 8 was most probably achieved using a timber framework, as there is no sign of corbelling and the structure was too wide to have supported a slab roof. Presumably, therefore, the basis of the roof was a ridge pole running the length of the structure, terminating at the still-corbelled end cells left over from Wheelhouse 1.

The virtual absence of rubble in the infill of the building, together with the uniformity of the surviving wall-head, suggests that the excavated super-structure was more or less intact. This suggests an original wall height of around 1.5m, from which the timber roof would have risen a further 1m or more above the central spine of the building. The rafters would presumably have rested on the packing material behind the walls (presumably necessitating a timber wall-plate), or directly on the wall-head.

The arrangement of the roof at the north-west (entrance) end of the building is unclear. The structure seems to have been effectively open at that end, although perhaps it is likely that the door would have been set in some form of timber-built wall panel. Even if the latter was the case such a slight construction (too ephemeral to leave any archaeological trace) seems unlikely to have functioned effectively as a roof support. The implication, therefore, is that the building had, effectively, a non-weight-bearing gable end of timber, within which the door was set. This seemingly inescapable conclusion, however, simply reinforces the present uniqueness of this building in a Hebridean context. The ridge-pole would presumably have sloped down to the rear (east) of the building and resting on the pier between the two surviving corbelled cells, and supported by rafters to either side along its length, giving a distinctly sloping aspect to the finished roof.

From the rear and sides, the structure would, like its predecessors, have appeared as little more than a roof projecting above the machair surface, albeit a rectangular one. Approaching from the north-west, down the open entrance passage, however, one would presumably have encountered a timber gable set with a door. Even from the outside, therefore, this would have been a structure of markedly different character from those which it replaced.

The interior of the building seems to have been divided into three zones, each with some evidence of depositional variation. On entering, the first area encountered was some 1.7m long by 2.2m wide, defined at its east side by a stone alignment which probably supported a timber partition. This area has little overall depth of deposits and much less evidence of occupation debris than other parts of the building. It contained a projecting shelf or bench set along part of its north wall, less than 0.5m above the primary surface. It may be best interpreted as some form of ante-room, where little primary deposition of domestic debris occurred.

Passing through the presumed timber partition, one entered the next zone to the east. This was the largest sub-division with the building, measuring around 3.5m long by 2.2m wide. This area had a far greater concentration of domestic debris yet lacked any indication of a formal hearth or other built features. There was considerable evidence for the horizontal truncation of deposits (especially C042, C061, C083), suggesting periodic clearance of floor deposits, and it is possible that in situ hearth material was simply never allowed to accumulate for any length of time. This zone appears, on the basis of the depth and nature of the deposits, and the quantity and character of the finds, to have been the main domestic focus of the building.

Deposits from the central zone continued unbroken into the final zone, which comprised the two inter-connected corbelled cells at the south-east end of the building. It is not clear whether the re-use of the corbelled cells reflected sheer opportunism on the part of the builders, or some deliberate wish to retain the cells as part of the design of the new building. There appears to have been no formal partition between the cells and central zone of the building. Although there was a tendency for successive floor deposits to form slight hollows within each of the cells. This might suggest that they were used for specific purposes, such as sleeping or working, or perhaps that different floor coverings were in place.

In the later part of the occupation of Structure 8, headroom in the two cells would have been highly restricted. Nonetheless, the south cell is the part of the building which appears to have remained in use longest, having some evidence for activity when the structure as a whole had apparently been abandoned.

Radiocarbon dates suggest that Structure 8 was most probably occupied for around 150 years (see Section 6.3.1), during which time at least four laid floors were inserted, used and abandoned. Given that the floors were periodically cleared out, this must represent an absolute minimum indication of the likely re-flooring episodes. There is no indication for any changes of use between any of these events. The evidence for the major re-building of the north wall, and for minor patching elsewhere, has been discussed above and provides further indications of time-depth.

The small amount of material which accumulated within the entrance passage, despite the relatively long life of the building, suggests that this area too was kept clean. The deposits which do survive, including signs of collapse of the north entrance revetment, can be expected to relate predominantly to the later stages of Phase 3.

Eventually the structure was abandoned and left to fill with wind-blown sand. There is nothing in the post-abandonment layers which hints at the decay of a roof, and it must be assumed that the roofing structure was removed, possibly for re-use. The walls were left intact suggesting that there was no pressing need for building stone in the vicinity, or that social sanctions prevented the removal of the walling.

2.5.2 STRUCTURE 10: BLOCK 18

Structure 10 has already been mentioned briefly in the description of the earlier (Phase 2) Structure 6. It comprised a fragment of a probable enclosure wall dating to Phase 3 and was located to the north of Structure 8 (Ill 2.36).

2.5.2.1 Description

Structure 10 comprised the robbed foundations of dry-stone wall, formed of irregular water-worn stones (similar to those which lined the entrance passage to Structure 8), and running approximately north-west to south-east along the slight break of slope above the largely infilled Wheelhouse 2 and its entrance passage (Ill 2.36). Its total surviving length was around 8m although it may have continued to the north-west outside the excavated area, judging from the presence of rubble concentrations along its projected route. It was at most 1m wide and incorporated a break suggestive of an original entrance. An old ground surface (C068) was preserved under parts of the wall, suggesting that it had been built on a thin sandy soil of a type characteristic of modern machair soils in the vicinity.

The south-eastern terminal of Structure 10 butted against the surviving sand-revetted slabs of Structure 6. This left a gap between the wall terminal and the north wall of Structure 8 of around 3m (although it would have been less when Structure 8 was roofed; possibly little more than 1m).

2.5.2.2 Interpretation

Given the poor state of survival of this feature and the confines of the excavated area, it is impossible to be certain as to its function. It appears securely linked to Phase 3, as the midden deposits of this block seem to have formed around it, and it clearly could not have co-existed with Structure 6. The use of water-worn boulders provides a further, circumstantial link with Structure 8.

For the first time in the excavated area, therefore, we have an indication that the settlement was least partially enclosed, albeit by a wall of relatively slight construction. This enclosed area, as we shall see, seems to have served to define the area of disposal of midden material.

2.5.3 PHASE 3 MIDDEN DEPOSITS: BLOCK 18

Following the abandonment of Structures 3 and 4, at the end of Phase 2, a series of deposits formed within and around them, covering the majority of the excavated area, with the exception of Structure 8. Different context numbers were given to this series of deposits, divided principally on the basis of which earlier structures they covered, but in essence this series of deposits represents a broadly contemporary build-up of domestic refuse and sand.

2.5.3.1 Characterizing the midden deposits

The most extensive of these deposits (C018) formed over the remains of Structure 4 and lapped up against the north side of the entrance passage of Structure 8. Analysis of this deposit confirmed the field interpretation that it formed from a mixed series of sands and domestic debris with a significant ash content. Visual inspection in the field indicated that this context had a higher organic content than similar and contiguous deposits over the remainder of the excavated area. A sub-sample taken in the field proved to comprise a discrete deposit of boulder clay, perhaps intended for pottery manufacture or use in building.

2.5.3.2 Midden formation

C018 also contained the greatest density and quantity of pottery from this group of deposits (over 500 sherds) perhaps reflecting its convenience as an area for dumping domestic refuse, just outside the entrance to Structure 8. It also contained one of the few fragments of human bone from the site; a fragmentary tibia (HB04, see Section 3.4). A far lower density of pottery was recovered from the apparently contiguous deposits which formed within the hollow over the disused Structures 2 and 3 (the latter context, 012, is referred to in the description of Structure 3, above, and illustrated in Ill 2.25). These deposits formed further from the entrance to Structure 8, and were separated from it by the wall, Structure 10. A similar dearth of pottery was found in the material which formed just north of Structure 10, over the former entrance passage of Structure 2.

Perhaps surprisingly these midden deposits produced a rather small bone assemblage; only 173 bone fragments compared to 193 in Structure 8 (Block 1), although the midden deposits contained twice as much pottery. It seems most likely that this difference relates to the greater exposure of these midden deposits as they formed on the ground surface, compared to the more sheltered conditions prevalent within the buildings. The documented presence of pigs on the settlement (see Section 4.2) may be a further factor in the paucity of bone debris in surface deposits. Interestingly, one fragment of bone turned out to be a probable miniature sword (SF20, Ill 3.24d, see Section 3.5.7).

It appears therefore that much of this midden material derives from hearth waste and floor sweepings from Structure 8, with material being dumped preferentially close to the entrance, within the area defined by Structure 10. Possibly this area, the original extent of which is now unknown, was a zone where midden was deliberately accumulated for onward transmission to the fields. It is perhaps also possible that the enclosure and zoning of midden deposition in the immediate vicinity of the main domestic building, was part of a deliberate strategy to prevent the kind of soil erosion witnessed during Phase 2, which might otherwise have threatened to undermine the domestic building.

The derivation of the Block 18 midden from Structure 8 is reflected in the pottery data. The percentage of large sherds in Structure 8 is 30 per cent, presumably indicating the primary nature of the deposition within the building. By contrast, only 13 per cent large sherds were recovered from the midden deposits of Block 18, suggesting a rather different depositional history for this material.

The lack of any midden formation over the abandoned Structure 8 also appears to confirm that it was the principal source of the Phase 3 midden deposits. The implication is that midden deposition ceased with the abandonment of Structure 8, presumably also indicating that there was no off-site source for midden deposition within the immediate vicinity of the site. This would appear to support the hypothesis that the excavated structures comprised a complete settlement unit in themselves and not part of a more extensive complex.

2.6 LATER ACTIVITY

Post-abandonment activity on the site was extremely restricted in extent and the relevant contexts have been gathered together in a single block, Block 7. The predominant processes at work were those of natural machair formation and erosion.

2.6.1 WINDBLOWN SAND ACCUMULATION: BLOCK 7

After the abandonment of Structure 8 and the deposition of the surrounding midden material, the site was entirely covered by a thick deposit of windblown, largely sterile shell sand (C010). This ranged in depth from around 3m in the north-western part of the site, to less than 1m over the corbelled cells of Wheelhouse 1 and less than 0.5m over the extreme south-western part of the excavated area. Very occasional ashy lenses were the only indication of pre-modern human activity in the deposit.

The surface contours of this sand surface bore no relation to the topography of the underlying archaeological features (Ill 2.20 is slightly misleading in being the only part of the site where there was some correlation, as the modern ground surface rose slightly over the intact wheelhouse bay roofs). It is likely that the area had been exposed to multiple episodes of accretion and deflation, some of which may even have led to the re-exposure of the uppermost Phase 3 deposits. The Phase 3 midden deposit, C012, had clearly been horizontally truncated (Ill 2.25). At some stage, two shallow pits or scoops (C014, C015) had been cut into the upper surface of the Block 18 midden deposits. Their fill was indistinguishable from the windblown sand overburden.

A small quantity of pottery was recovered from the sand overburden but this represents an entirely opportunistic sample, recovered when cleaning areas left by the machine, or during the 1987 trial excavation. It is unlikely to be representative.

2.6.2 RECENT DISTURBANCE: BLOCK 7

A series of apparently recent, and certainly post-abandonment, features had been dug into the overlying sands. Most obvious was a water-pipe trench dug during the 1970s (C011), which cut across the southern part of the site, clipping the corbelled cells of Wheelhouse 1 (Ill 1.5). Other recent sheep burial pits etc were removed during the initial machine clearance of the site and were not recorded in any detail.

The removal of overburden by machine caused a degree of damage to the upper surface of the underlying midden material (Block 18) in the western part of the site. The resulting, disturbed material was recorded as C209, which yielded a small assemblage of pottery presumably derived from Phase 3 deposits.

Aside from these features, the surface of the Phase 3 deposits was undisturbed by later human activity.

2.6.3 INTERPRETATION

It would appear that human activity directly related to the settlement ceased after Phase 3. The site seems quickly to have been draped in a blanket of sterile, windblown sand. Over the succeeding centuries, the sand dune surface seems to have been reworked by wind action, creating a local topography entirely unrelated to that of the upper archaeological layers. Thus no trace of the settlement was visible from the surface above, and the site was hidden until exposed by tidal action as the coast advanced inland.

It is possible that the incursion of sand was part of the reason for the abandonment of the settlement at the end of Phase 3. However, it is equally possible that the sand cover might have built up more gradually over a period of several decades following abandonment. Structure 8, unsurprisingly, filled up with sand soon after abandonment, and the stones of the wall were apparently masked from later stone-robbers. The residual condition of the nearby wall (Structure 10), however, implies that it remained visible as a convenient stone source for some time after the disappearance of Structure 8. This suggests that problems with sand movement were not directly responsible for the abandonment of the site, and that the sand cover accumulated over a number of years, decades, or even centuries, after the last occupants had left Structure 8.

Chapter 3

Material Culture

3.1 INTRODUCTION

3.1.1 GENERAL

The following sections describe and discuss the various categories of finds recovered from the excavations, organized by raw material. Before looking at the finds in detail, however, it is worth considering the range of materials that were and were not recovered, either because of the conditions of preservation in the machair environment, or because of genuine absence.

The generally alkaline conditions of the machair environment have led to the excellent survival of bone and antler, added to a large pottery assemblage typical of virtually all Hebridean Iron Age sites. The collection of coarse stone artefacts is modest, perhaps due to the relatively small areas of external activity and midden which were excavated, and the chipped stone assemblage is also minimal. Iron survived in a fragmentary and heavily oxidized condition, although it is not clear whether the few pieces recovered depended on particular soil conditions within individual contexts. Copper alloy artefacts did survive, although they were extremely rare, while metal-working debris was also preserved.

A bronze ferrule from the wall-packing of Wheelhouse 1 (SF31, Ill 3.26a, see Section 3.9) may have come from a wooden artefact, while one or two of the bone and antler pieces may have been handles or fittings on wooden furniture or containers. Wooden artefacts and structural elements were preserved only where fortuitously charred (one unidentifiable piece in the infill of the Wheelhouse 2 entrance), or where oxidized (the haft of the spade-shoe (SF23, see Section 3.10). While structural wood was probably a scarce resource, it is nonetheless likely that smaller pieces were available for use as artefacts or elements of artefacts. The carved wooden red deer head from Dun Bharabhat (Harding & Dixon 2000, see Ill 7.10) gives a flavour of what we might be missing in this medium. Other wooden artefacts from the waterlogged midden deposits at the nearby Dun Bharabhat included spoons, scoops and probable loom fragments (ibid). There are enough hints to suggest that wooden objects would have been relatively common, and that wooden fixtures and furnishings should be added to our mental picture of the interior of the wheelhouse and other buildings, along with similarly perishable plant materials such as heather or straw rope, basketry, flooring, and bedding. Also absent are textiles, leather, hides, and other animal products which would presumably have been readily available and utilized on the basis of the range of animals exploited (see Section 4.2), although certain of the artefacts discussed below hint at spinning and weaving being practised within the settlement.

The recoverable finds assemblage is thus no more than a fragment of the range of material which would have been in use on the site. Some absences, however, are more likely to reflect the original situation. For example, there was a complete absence of glass, despite the ease with which small items like stray beads might have been expected to become incorporated into the floor make-up of the structures. Similarly, there were no objects of Roman influence or manufacture, such as coins or samian pottery.

3.1.2 RANGE OF ACTIVITIES REPRESENTED

The finds assemblage represents a wide range of activities, some of which cross-cut the material-based groups described below.

The cooking and serving of food is represented by the large ceramic assemblage and appears to have been, not unexpectedly, a major activity within the houses. The pottery vessels (see Section 3.2) were presumably also used for storage, although it is difficult to identify pots designated exclusively for this purpose. The small assemblage of rotary quern fragments (see Section 3.6.2) also represents the processing of grain for food, but the re-deposited contexts in which these objects were found makes it difficult to assess whether or not this crop processing was carried out within the buildings.

For textile-working we have a range of objects, notably spindle whorls (usually made from broken pot sherds, see Section 3.3), bone needles, and a beater (SF172, Ill 3.21b, see Section 3.5.3.3) and comb (SF204, Ill 3.21c, see Section 3.5.3.3). Hide-processing items may include an awl (SF40, Ill 3.20b), a polisher (SF124) and a flensing knife (SF297, Ill 3.20c) (see Section 3.5.3.2). Both activities seem to have been carried out indoors, within the buildings.

Antler-working is represented quite widely, mostly by off-cuts of cast antler or partially worked items (see Section 3.5.2.1). It appears to have been practised within the buildings, as was the working of whale bone. By contrast, debris relating to the working of land mammal bone is found only in a re-deposited context in the small, pit-like Structure 5, and was presumably not carried out within the buildings on the settlement (see Section 3.5.2.2).

A few tools relate to heavier work which would have been carried out on or around the settlement, most likely agriculture and/or construction. The most obvious are an iron-bladed spade (SF23, see Section 3.10) and a whale bone wedge or mattock (SF72, Ill 3.20a, see Section 3.5.3.1), both from exterior contexts.

The limited evidence for metal-working suggests that it was carried out off-site, as might be expected, although slag and other residues did find their way into principally structural contexts such as wall-packing (see Section 3.11). The lack of metal-working evidence within the buildings lends further support to their interpretation as continuously inhabited buildings, as episodes of metal-working within structures is most likely to signal permanent or temporary abandonment of dwelling places (eg Armit, Campbell & Dunwell forthcoming).

Aside from activities relating to subsistence practices and craft-working, certain items are suggestive of leisure pursuits, in particular the tuning peg from a lyre (SF50, Ill 3.24a, see Section 3.5.5) and gaming piece (SF145, Ill 3.24b, see Section 3.5.5). A series of bone and bronze pins (Ill 3.23, see Section 3.5.4.1) probably derive from clothing and the latter suggest some concern with the marking of status through personal appearance. Other enigmatic objects, such as an iron mount possibly with copper alloy fittings

TABLE 3.1
Number of sherds and vessels by block: all phased contexts.

		No sherds	No vessels	Sherds/Vessels	
Phase 1	***Block 5A1***	106	65	1.6	
	Block 6	139	88	1.5	
	Block 11	171	78	2.2	
	Block 12	20	10	2	
	Block 15	519	182	2.9	
	Block 16	5	2	2.5	
Phase 2	***Block 5***	1909	806	2.4	
	Block 8	1681	688	2.4	
	Block 9	129	70	1.8	
	Block 13	182	123	1.5	
	Block 14	16	13	1.2	
	Block 19	112	68	1.6	
	Block 21	5	4	1.3	
	Block 22	63	27	2.3	
Phase 3	***Block 1***	300	144	2.1	
	Block 2	179	85	2.1	
	Block 3	40	31	1.3	
	Block 4	99	46	2.2	
	Block 18	598	277	2.2	
	Block 20	97	75	1.3	
					Ratio of undecorated to decorated vessels
Phase 1		960	425	2.3	**Undec/dec**: 7.1
Phase 2		4097	1799	2.3	**Undec/dec**: 9
Phase 3		1313	658	2	**Undec/dec**: 10.8

TABLE 3.2
Number of sherds and vessels by block: key sequence.

		No sherds	No vessels	Sherds/Vessels	
Phase 1	***Block 5A1***	106	65	1.6	
	Block 15	519	182	2.9	
	Block 16	5	2	2.5	
Phase 2	***Block 5***	1909	806	2.4	
	Block 8	1681	688	2.4	
Phase 3	***Block 1***	300	144	2.1	
					Ratio of undecorated to decorated vessels
Phase 1		630	249	2.5	**Undec/dec:** 6
Phase 2		3590	1494	2.4	**Undec/dec:** 8.3
Phase 3		300	144	2.1	**Undec/dec:** 9

TABLE 3.3
Surface finish: all phased contexts.

		None	Smoothed	Burnished	Slipped	Wiped	Combed	Slipped/ wiped	Scraped	Polished
Phase 1	***Block 5A1***	12	34	0	0	19	0	0	0	0
	Block 6	21	54	1	2	8	1	1	0	0
	Block 11	1	41	1	0	27	0	8	0	0
	Block 12	0	8	0	0	2	0	0	0	0
	Block 15	26	103	0	5	44	0	4	0	0
	Block 16	2	0	0	0	1	0	0	0	0
Phase 2	***Block 5***	143	491	32	4	111	5	20	0	0
	Block 8	68	457	6	6	113	7	30	0	0
	Block 9	6	53	0	0	8	2	1	0	0
	Block 13	8	79	0	1	32	0	2	0	1
	Block 14	1	7	0	1	4	0	0	0	0
	Block 19	5	35	0	0	28	0	0	0	0
	Block 21	3	0	0	0	1	0	0	0	0
	Block 22	4	19	0	0	4	0	0	0	0
Phase 3	***Block 1***	30	83	0	12	16	1	2	0	0
	Block 2	17	54	0	0	13	0	0	1	0
	Block 3	6	22	0	0	2	0	1	0	0
	Block 4	10	31	0	0	4	0	1	0	0
	Block 18	33	169	1	0	73	0	1	0	0
	Block 20	12	52	1	0	10	0	0	0	0
Phase 1		62 (14.6%)	240 (56.3%)	2 (0.5%)	7 (1.6%)	101 (23.7%)	1 (0.2%)	13 (3.1%)	0 (0)	0 (0)
Phase 2		238 (13.2%)	1141 (63.5%)	38 (2.1%)	12 (0.7%)	301 (16.7%)	14 (0.8%)	53 (2.9%)	0 (0)	1 (0.1%)
Phase 3		108 (16.4%)	411 (62.5%)	2 (0.3%)	12 (1.8%)	118 (17.9%)	1 (0.2%)	5 (0.8%)	1 (0.2%)	0 (0)

(SF54, Ill 3.26b, see Section 3.10), and a toy or votive model sword (SF20, Ill 3.24d, see Section 3.5.7), also suggest activities unrelated to basic subsistence.

3.2 POTTERY

Ann MacSween

3.2.1 INTRODUCTION

The assemblage from Cnip comprises 6370 sherds from phased contexts, representing 2882 vessels. The number of sherds recovered from each block and phase are summarized in Table 3.1. Many of the sherds are of a similar colour and fabric, and as colour and thickness could vary considerably over a vessel, sherds were only matched with others from the same block. The vessel number does not strictly, therefore, represent the minimum number of vessels originally present.

The assemblage has been analysed on two levels. Initially, data for the pottery from all the blocks which could be phased was analysed. Following this, pottery from the 'key sequence', that is, blocks for which there was minimum risk of contamination (Phase 1: Blocks 5ai, 15 and 16; Phase 2: Blocks 5 and 8; Phase 3: Block 1) was analysed to see if any differences between phases could be determined by removing the 'background' of blocks for which there was a greater risk of contamination (Table 3.2). Although Blocks 15 and 16 may contain a small proportion of earlier pottery (Sections 2.3, 2.3.2.1, 2.4.2.1) they are most unlikely to be contaminated with any later material, and thus reflect, strictly speaking, Phase 1 and possibly earlier.

3.2.2 TECHNOLOGY

The technology was very similar in all phases. The vessels were handthrown, by the coil construction method, using diagonal (N-shaped) junctions. Overall, the relative proportions of surface finish are consistent for each phase with nothing to suggest a change in techniques during the life of the site. The vessels were often finished by smoothing (*c* 60 per cent) or wiping (*c* 20 per cent). Other finishes – burnishing, slipping, combing, scraping, and polishing – were used less frequently (Table 3.3). Analysis of the key sequence (Table 3.4) indicates that burnishing may have been characteristic of Phase 2 and that the use of wiping declined through the sequence.

Three different 'grades' of clay were used, categorized as 1 (sandy), 2 (fine micaceous clay) and 3 (very fine clay). Sometimes these clays were used on their own without any added temper, but more often temper seems to have been added. Table 3.5 summarizes the use of the various fabrics for each phase. 'A' signifies 10–50 per cent of rock fragments, and 'B' signifies more than 50 per cent of rock fragments. The summary shows that the more plastic the clay, the less likely it was to be used without the addition of temper. Clay 3, the finest clay, was seldom used on its own (1–3 per cent), while

TABLE 3.4
Surface finish: key sequence.

		None	Smoothed	Burnished	Slipped	Wiped	Combed	Slipped/ wiped	Scraped	Polished
Phase 1	***Block 5A1***	12	34	0	0	19	0	0	0	0
	Block 15	26	103	0	5	44	0	4	0	0
	Block 16	2	0	0	0	1	0	0	0	0
Phase 2	***Block 5***	143	491	32	4	111	5	20	0	0
	Block 8	68	457	6	6	113	7	30	0	0
Phase 3	***Block 1***	30	83	0	12	16	1	2	0	0
Phase 1		40	137	0	5	64	0	4	0	0
		(16%)	(54.8%)	(0)	(2%)	(25.6%)	(0)	(1.6%)	(0)	(0)
Phase 2		211	948	38	10	224	12	50	0	1
		(14.1%)	(63.5%)	(2.4%)	(0.7%)	(15%)	(0.8%)	(3.5%)	(0)	(0.1%)
Phase 3		30	83	0	12	16	1	2	1	0
		(20.8%)	(57.6%)	(0)	(8.3%)	(11.1%)	(0.8%)	(1.4%)	(0.2%)	(0)

TABLE 3.5

Fabric by block: all phased contexts, (1) sandy clay; (1A) with up to 50% rock inclusions; (1B) with over 50% rock inclusions; (2) fine sandy clay; (2A) with up to 50% rock inclusions; (2B) with over 50% rock inclusions; (3) fine clay; (3A) with up to 50% rock inclusions; (3B) with over 50% rock inclusions.

		1	1A	1B	2	2A	2B	3	3A	3B	3C
Phase 1	***Block 5A1***	0	5	0	4	31	0	2	23	0	0
	Block 6	16	13	0	6	29	0	7	17	0	0
	Block 11	17	10	0	7	36	0	1	7	0	0
	Block 12	3	1	0	1	5	0	0	0	0	0
	Block 15	43	25	0	20	80	0	3	11	0	0
	Block 16	1	0	0	1	1	0	0	0	0	0
Phase 2	***Block 5***	69	224	0	47	277	2	27	159	1	0
	Block 8	82	93	0	19	372	1	9	111	0	0
	Block 9	8	10	0	4	27	0	1	20	0	0
	Block 13	15	2	1	12	64	0	3	26	0	0
	Block 14	1	1	0	0	8	0	0	3	0	0
	Block 19	22	15	0	8	22	0	0	1	0	0
	Block 21	1	0	0	3	0	0	0	0	0	0
	Block 22	11	4	0	0	10	0	2	0	0	0
Phase 3	***Block 1***	29	30	0	12	65	0	1	7	0	0
	Block 2	11	19	0	6	33	0	2	14	0	0
	Block 3	3	7	0	2	10	0	0	9	0	0
	Block 4	17	8	0	9	10	0	0	2	0	0
	Block 18	73	30	0	25	101	0	2	45	0	1
	Block 20	32	1	0	13	24	0	0	5	0	0
Phase 1		80	54	0	39	182	0	13	58	0	0
		(18.8%)	(12.7%)		(9.1%)	(42.7%)	(0)	(3.1%)	(13.6%)	(0)	(0)
Phase 2		209	349	1	93	780	3	42	320	1	0
		(11.6%)	(19.4%)	(0.1%)	(5.2%)	(43.3%)	(0.2%)	(2.3%)	(17.8%)	(0.1%)	(0)
Phase 3		165	95	0	67	243	0	5	82	0	1
		(25.1%)	(14.4%)	(0)	(10.2%)	(36.8%)	(0)	(0.8%)	(12.5%)	(0)	(0.2%)

the sand naturally present in Clay 1 seems to have been enough to allow the clay to fire successfully without the addition of temper. Analysis of the fabric data shows very little difference in the general composition of the assemblages from each phase in either the overall summary or the key sequence (Tables 3.5 and 3.6). Again with firing, the assemblages from each phase are very similar, with the majority being either red or brown, or grey with a red or brown margin (Table 3.7 and 3.8), the colour patterning being indicative of fairly short, bonfire firing.

3.2.3 MORPHOLOGY

Although many of the sherds in the assemblage are small or undiagnostic, several profiles allow the whole or partial reconstruction of vessel forms. The predominant form seems to have been a shouldered vessel with an everted rim, tapering below the shoulder to a flat base (eg V1366 (Ill 3.5a), Phase 1 and V1367 (Ill 3.12a), Phase 2). The shoulder of the vessel was usually rounded rather than angled. A lesser number of vessels had flat or inverted rims and were probably barrel-shaped (eg V2148 (Ill 3.2f) and V2513 (Ill 3.3e), Phase 1). A few vessels were probably globular in profile (V1342 (Ill 3.1h), Phase 1; V2045 (Ill 3.10i) and V2346 (Ill 3.13f), Phase 2).

The number of rims of each type are summarized by block and phase in Tables 3.9 and 3.10. Everted rims (eg V39 (Ill 3.6b), Phase 2) are the most common rim form in each phase. Plain rims and necked vessels may be slightly more common in

TABLE 3.6

Fabric by block: key sequence. See Table 3.7 for key.

		1	**1A**	**1B**	**2**	**2A**	**2B**	**3**	**3A**	**3B**	**3C**
Phase 1	***Block 5A1***	0	5	0	4	31	0	2	23	0	0
	Block 15	43	25	0	20	80	0	3	11	0	0
	Block 16	1	0	0	1	1	0	0	0	0	0
Phase 2	***Block 5***	69	224	0	47	277	2	27	159	1	0
	Block 8	82	93	0	19	372	1	9	111	0	0
Phase 3	***Block 1***	29	30	0	12	65	0	1	7	0	0
Phase 1		44 (17.6%)	30 (12%)	0 (0)	25 (10%)	112 (44.8%)	0 (0)	5 (2%)	34 (13.6%)	0 (0)	0 (0)
Phase 2		151 (10.1%)	317 (21.2%)	0 (0)	66 (4.4%)	649 (43.5%)	3 (0.2%)	36 (2.4%)	270 (18.1%)	1 (0.1%)	0 (0)
Phase 3		29 (20.1%)	30 (20.8%)	0 (0)	12 (8.3%)	65 (45.1%)	0 (0)	1 (0.8%)	7 (4.9%)	0 (0)	0 (0)

TABLE 3.7

Sherd colour by block: all phased contexts. (1) oxidized; (2) reduced; (3) part oxidized; (4) part reduced; (5) oxidized with reduced margin; (6) reduced with oxidized margin.

		1	2	3	4	5	**6**
Phase 1	***Block 5A1***	41	7	5	0	1	11
	Block 6	47	7	6	0	0	28
	Block 11	19	6	9	0	3	41
	Block 12	6	0	0	0	0	4
	Block 15	55	14	16	2	2	93
	Block 16	1	0	0	0	0	2
Phase 2	***Block 5***	419	57	62	7	6	255
	Block 8	352	61	22	0	8	242
	Block 9	34	10	4	0	0	22
	Block 13	81	11	4	1	0	26
	Block 14	4	3	1	0	0	5
	Block 19	36	3	6	0	0	23
	Block 21	0	1	0	0	0	3
	Block 22	16	2	1	0	0	8
Phase 3	***Block 1***	45	8	17	1	0	73
	Block 2	36	7	6	0	1	35
	Block 3	15	3	2	0	0	11
	Block 4	27	3	4	1	0	11
	Block 18	129	18	11	1	1	117
	Block 20	50	4	2	0	0	19
Phase 1		169 (39.7%)	34 (8%)	36 (8.5%)	2 (0.5%)	6 (1.4%)	179 (42.0%)
Phase 2		942 (52.5%)	148 (8.2%)	100 (5.6%)	8 (0.4%)	14 (0.8%)	584 (32.5%)
Phase 3		302 (45.9%)	43 (6.5%)	42 (6.4%)	3 (0.5%)	2 (0.3%)	266 (40.4%)

TABLE 3.8

Sherd colour by block: key sequence. (1) oxidized; (2) reduced; (3) part oxidized; (4) part reduced; (5) oxidized with reduced margin; (6) reduced with oxidized margin.

		1	**2**	**3**	**4**	**5**	**6**
Phase 1	***Block 5A1***	41	7	5	0	1	11
	Block 15	55	14	16	2	2	93
	Block 16	1	0	0	0	0	2
Phase 2	***Block 5***	419	57	62	7	6	255
	Block 8	352	61	22	0	8	242
Phase 3	***Block 1***	45	8	17	1	0	73
Phase 1		97 (38.7%)	21 (8.3%)	21 (8.3%)	2 (0.8%)	3 (1.2%)	106 (42.7%)
Phase 2		771 (51.7%)	118 (7.9%)	84 (5.6%)	7 (0.5%)	14 (0.9%)	497 (33.4%)
Phase 3		45 (31.3%)	8 (5.6%)	17 (11.8%)	1 (0.7%)	0 (0)	73 (50.6%)

Phase 3 and inverted rims are most common in Phase 1, although the numbers from which the overall percentages have been calculated are small, especially for Phase 1. There are a few examples of more elaborate rim forms. A couple of the everted rims (V601 (Ill 3.5e) and V1752 (Ill 3.9i), Phase 2) are

TABLE 3.9

Rim types by block: all phased contexts.

		Plain	**Flat**	**Everted**	**Int bevel**	**Inverted**	**Necked**	**T-shaped**	**Rounded**
Phase 1	***Block 5A1***	0	1	1	0	0	0	0	0
	Block 6	0	1	5	0	0	0	1	0
	Block 11	1	1	1	0	4	0	0	0
	Block 12	0	0	0	0	0	0	0	0
	Block 15	0	7	7	0	4	0	1	0
	Block 16	0	0	1	0	0	0	0	0
Phase 2	***Block 5***	6	7	49	1	3	1	0	0
	Block 8	3	3	50	0	1	1	0	0
	Block 9	2	2	3	0	0	0	0	0
	Block 13	1	0	5	0	0	0	1	0
	Block 14	0	0	1	0	1	0	0	0
	Block 19	0	1	1	0	0	0	0	0
	Block 21	0	0	0	0	0	0	0	0
	Block 22	0	0	1	0	0	0	0	0
Phase 3	***Block 1***	0	0	8	0	1	0	0	0
	Block 2	1	1	5	0	0	1	0	0
	Block 3	0	0	1	0	0	0	0	0
	Block 4	0	0	2	0	0	0	0	0
	Block 18	3	7	8	0	1	4	0	1
	Block 20	5	1	1	0	0	0	0	0
Phase 1		1 (2.8%)	10 (27.8%)	15 (41.7%)	0 (0)	8 (22.2%)	0 (0)	2 (5.6%)	0 (0)
Phase 2		12 (8.3%)	13 (9%)	110 (76.4%)	1 (0.7%)	5 (3.5%)	2 (1.4%)	1 (0.7%)	0 (0)
Phase 3		9 (17.6%)	9 (17.6%)	25 (49%)	0 (0)	2 (3.9%)	5 (9.9%)	0 (0)	1 (2%)

TABLE 3.10
Rim types by block: key sequence.

		Plain	Flat	Everted	Int bevel	Inverted	Necked	T-shaped	Rounded
Phase 1	***Block 5A1***	0	1	1	0	0	0	0	0
	Block 15	0	7	7	0	4	0	1	0
	Block 16	9	9	26	0	2	5	0	0
Phase 2	***Block 5***	6	7	49	1	3	1	0	0
	Block 8	3	3	50	0	1	1	0	0
Phase 3	***Block 1***	0	0	8	0	1	0	0	0
Phase 1		0 (0)	8 (34.8%)	9 (39.1%)	0 (0)	4 (17.4%)	1 (4.5%)	1 (4.3%)	0 (0)
Phase 2		9 (7.2%)	10 (8%)	99 (79.2%)	1 (0.8%)	4 (3.25%)	2 (1.6%)	0 (0)	0 (0)
Phase 3		0 (0)	0 (0)	8 (88.9%)	0 (0)	1 (11.1%)	0 (0)	0 (0)	0 (0)

faceted on the interior of the neck and several others have finger impressed ridges (V195 (Ill 3.7h), V1383 (Ill 3.12i) and V2235 (Ill 3.13a), Phase 2). Ridging was also noted on the exterior of an inverted rim of a globular vessel, just below the lip (V2346 (Ill 3.13f), Phase 2).

TABLE 3.11
Sherd thickness by block: all phased contexts.

		0–5	6–10	11–15	16–20	21–25
Phase 1	***Block 5A1***	4	49	11	1	0
	Block 6	4	68	15	0	0
	Block 11	6	56	16	0	0
	Block 12	0	9	1	0	0
	Block 15	17	139	27	1	0
	Block 16	1	1	1	0	0
Phase 2	***Block 5***	46	634	126	0	0
	Block 8	32	549	103	1	0
	Block 9	5	53	12	0	0
	Block 13	10	102	10	0	0
	Block 14	2	10	1	0	0
	Block 19	4	52	12	0	0
	Block 21	0	1	3	0	0
	Block 22	1	23	3	0	0
Phase 3	***Block 1***	3	91	49	1	0
	Block 2	6	66	11	0	0
	Block 3	0	29	2	0	0
	Block 4	3	33	9	0	1
	Block 18	15	206	48	0	0
	Block 20	0	68	7	0	0
Phase 1		32 (7.5%)	322 (75.4%)	71 (16.6%)	2 (0.5%)	0 (0)
Phase 2		100 (5.6%)	1424 (79.3%)	270 (15%)	1 (0.1%)	0 (0)
Phase 3		27 (4.2%)	493 (76%)	126 (19.4%)	1 (0.2%)	1 (0.2%)

(NB: Abraded sherds not included)

TABLE 3.12
Sherd thickness by block: key sequence.

		0–5	6–10	11–15	16–20	21–25
Phase 1	***Block 5A1***	4	49	11	1	0
	Block 15	17	139	27	1	0
	Block 16	1	1	1	0	0
Phase 2	***Block 5***	46	634	126	0	0
	Block 8	32	549	103	1	0
Phase 3	***Block 1***	3	91	49	1	0
Phase 1		22 (8.7%)	189 (75%)	39 (15.5%)	2 (0.8%)	0 (0)
Phase 2		78 (4.9%)	1274 (80.5%)	229 (14.5%)	1 (0.1%)	0 (0)
Phase 3		3 (2.1%)	91 (63.2%)	49 (34%)	1 (0.7%)	0 (0)

Vessel thickness is summarized in Tables 3.11 and 3.12. Overall most vessels (*c* 77 per cent) have wall thicknesses between 6–10mm, with a smaller number (*c* 5 per cent) of thin walled vessels (less than 5mm thick) and *c* 17 per cent of thick walled vessels (11–15 mm). Again this does not vary markedly between phases (Table 3.11), although the key sequence shows a higher percentage of thicker-walled vessels in Phase 3 (Table 3.12).

3.2.4 DECORATION

The overall impression of the decoration on the Cnip assemblage is of a few 'standard' designs, such as an applied straight or zigzag cordon around the shoulder or the neck of a vessel, and outwith this a fairly wide range of motifs combined and arranged within 'accepted' limits. Where the position of decoration on a vessel could be determined, for example, it seems to be restricted to the upper part of the vessel, above the shoulder, or around the neck. Where decoration is, rarely, found on the lower part of the vessel, this is usually in the interior, either by combing on the wall surface or finger impressing the base.

A number of decorative techniques were used – incising, applying, impressing, wiping, combing, and one example of painting. The general sequence (Table 3.13) indicates that in all phases the most common type of decoration was applied (40–60 per cent), followed by incised decoration (*c* 20 per cent). The key sequence, however, indicates a marked increase in the amount of applied decoration through the sequence, with a corresponding decrease in incised decoration (Table 3.14). However, it should be noted that some of the blocks in the key sequence produced a relatively small number of sherds. The range of motifs is summarized in Table 3.15 (general sequence) and Table 3.16 (key sequence). By far the most common motif is a zigzag cordon. The greatest variety of motifs is in Phase 2 although this might in part be the product of it having by far the largest assemblage.

3.2.4.1 Applied decoration

The most usual form of applied decoration throughout the assemblage is the zigzag cordon, usually a single cordon around the shoulder of the vessel (eg V63 (Ill 3.6af) and V523 (Ill 3.8g), Phase 2). Some vessels have the zigzag cordon at the neck (eg V913 (Ill 3.1d), Phase 1; V48 (Ill 3.6ac) Phase 2; V993 (Ill 3.14c), Phase 3). While usually found in combination with everted rims, zigzag decoration is also found occasionally with other rim forms eg V1315 (Ill 3.1f) (Phase 1), where it occurs below the lip of an inverted rim. The numbers of occurrences of individual decorative elements are too low to allow a detailed analysis by phase.

Although a single zigzag cordon was most often used, there are examples of double zigzags (eg V1113 (not illustrated) and V1134 (Ill 3.15f), Phase 3) and occasional examples of its use in combination with another type of cordon (eg V928 (Ill 3.1b), Phase 1) where it is used with an obliquely incised cordon. Often the zigzag is the only decoration on a vessel although occasionally it appears to have served as the lower border for incised decoration in the area between the neck and the shoulder (eg V2385 (Ill 3.4b), Phase 1; V1387 (not illustrated), V1473 (Ill 3.11a) and V2335 (not illustrated), Phase 2); for wiped

TABLE 3.13
Decorative techniques: all phased contexts.

		Incised	Applied	Impressed	Wiped	Combed	Combination	Painted
Phase 1	***Block 5A1***	4	4	2	2	0	0	0
	Block 6	3	14	3	0	0	1	0
	Block 11	3	3	1	1	0	1	0
	Block 12	0	2	0	0	0	0	0
	Block 15	8	8	10	0	0	3	1
	Block 16	0	0	0	0	0	2	0
Phase 2	***Block 5***	17	51	3	6	3	0	0
	Block 8	16	71	3	8	0	2	0
	Block 9	1	0	0	0	0	0	0
	Block 13	5	5	0	0	0	0	0
	Block 14	0	0	0	0	0	1	0
	Block 19	1	2	0	0	0	0	0
	Block 21	0	0	0	0	0	0	0
	Block 22	0	3	0	0	0	0	0
Phase 3	***Block 1***	2	13	0	0	0	1	0
	Block 2	1	2	1	0	0	0	0
	Block 3	0	0	0	0	0	0	0
	Block 4	0	5	0	0	1	0	0
	Block 18	6	15	8	0	1	3	0
	Block 20	1	1	0	0	0	0	0
Phase 1		17 (24.3%)	28 (40%)	15 (21.4%)	2 (2.9%)	0 (0)	5 (10%)	1 (1.4%)
Phase 2		40 (20.2%)	132 (66.7%)	6 (3%)	14 (7.1%)	3 (1.5%)	4 (1.5%)	0 (0)
Phase 3		10 (16.4%)	36 (59%)	9 (14.8%)	0 (0)	2 (3.3%)	4 (6.5%)	0 (0)

decoration in the same area (V1633 (Ill 3.11d), Phase 2), or separating the two types of decoration (V2385 (Ill 3.4b), Phase 1). The only example of an incised zigzag cordon (V2724 (Ill 3.17f), Phase 3) also borders incised decoration. A variation on zigzag cordons is V2184 (Ill 3.2g) (Phase 1) which has been squared off to produce a geometric effect.

Of the other types of cordons found in the assemblage, all are decorated apart from two: a plain straight cordon, positioned at the neck of the vessel (V1691 (Ill 3.11g), Phase 2); and a flattened, 'ribbon' cordon (V1345 (Ill 3.1j), Phase 1). Decoration of the cordons was by incision, either straight (eg V1278 (Ill 3.15j) and V1337 (Ill 3.2b), Phase 1; V1580 (Ill 3.11e), Phase 2) or oblique (eg V1280 (Ill 3.15l), Phase 1; V301 (Ill 3.5g) and V1381 (Ill 3.12g), Phase 2), or by pinching (eg V1282 (Ill 3.15m), Phase 1; V1751 (Ill 3.9h), Phase 2). There is also one example of a cordon decorated on its upper side with impressed Vs (V1366 (Ill 3.5a), Phase 1) and one decorated with round impressions (V177 (Ill 3.8i), uncertain phase). More elaborate forms are rope effect cordons, formed from short oblique lengths of clay (eg V1369 (not illustrated), Phase 2), and chain effect cordons formed from adjoining small rings of variable size (V1153 (Ill 3.15b), Phase 3). There is also an example of an incised cordon incorporating an applied ring (V2531 (Ill 3.4e), Phase 1). The straight decorated cordons occupy similar positions on the vessels to the zigzag cordons, either round the neck (eg V865 (Ill 3.9a), Phase 2; V1006 (Ill 3.14f), Phase 3), or shoulder of a vessel (eg V521 (Ill 3.8f) and V1368 (Ill 3.12b), Phase 2; V2720 (not illustrated), Phase 3). Again, like zigzag cordons, decorated straight cordons are usually found on everted rim vessels although they do occur on other types, eg V304 (Ill 3.5i) (Phase 2) which has an obliquely incised cordon below an inverted rim. Usually decorated cordons form the only element of decoration on a vessel but there are a few examples where they border incised decoration (eg V1991 (Ill

TABLE 3.14
Decorative techniques: key sequence.

		Incised	Applied	Impressed	Wiped	Combed	Combination	Painted
Phase 1	***Block 5A1***	4	4	2	2	0	0	0
	Block 15	8	8	10	0	0	3	1
	Block 16	0	0	0	0	0	2	0
Phase 2	***Block 5***	17	51	3	6	3	0	0
	Block 8	16	71	3	8	0	2	0
Phase 3	***Block 1***	2	13	0	0	0	1	0
Phase 1		12 (27.9%)	12 (27.9%)	12 (27.9%)	2 (4.7%)	0 (0)	5 (9.3%)	1 (2.3%)
Phase 2		33 (18.3%)	122 (67.8%)	6 (3.3%)	14 (7.8%)	3 (1.7%)	2 (1.1%)	0 (0)
Phase 3		2 (12.5%)	13 (81.3%)	0 (0)	0 (0)	0 (0)	1 (6.2%)	0 (0)

3.10g), Phase 2) and one which is in combination with zigzag decoration (V928 (Ill 3.1b), Phase 1).

As well as cordons there are several other forms of applied decoration: one example each of an impressed boss (V2577 (Ill 3.16c), Phase 3); curved applied decoration (V684 (Ill 3.7a), Phase 2); applied geometric (V1373 (Ill 3.12d), Phase 2); horse-shoe decoration (V368 (Ill 3.7c), Phase 2); and several examples of applied rings (eg V87 (Ill 3.6ba), Phase 2), sometimes in rows (eg V1343 (Ill 3.1i), Phase 1; V1753 (Ill 3.9j), Phase 2).

3.2.4.2 Incised decoration

The incised decoration in the Cnip assemblage was mostly formed by fine incision although there are some examples of thicker grooving (eg V1312 (Ill 3.1e), Phase 1, geometric 'ridged' decoration; V1989 (Ill 3.10f), Phase 2, parallel grooves), sometimes in combination with finer decoration (eg V2336 (Ill 3.13e), Phase 2). The most simple form of incised decoration is parallel horizontal, vertical or oblique lines (eg V1398 (Ill 3.12j), Phase 2; V1250 (Ill 3.17h), uncertain phase) or combined with curved decoration (eg V570 (Ill 3.5c), Phase 2). Lines were sometimes formed from short incisions, eg V1474 (Ill 3.11b), Phase 2, a double row of short oblique incisions, and V575 (Ill 3.7i), Phase 2, a single row of short oblique incisions. Often these rows of short incisions are found around the neck of a vessel (eg V793 (Ill 3.5k), Phase 2, a row of vertical lines below a flat rim; or V611 (Ill 3.5f), Phase 2, short oblique incisions at the neck of an everted rim). Other forms of incised decoration in the assemblage are crossing lines forming lozenge decoration (eg V2137 (Ill 3.2d) and V2182 (Ill 3.2j), Phase 1), and single or multiple chevrons (V832 (not illustrated) and V2181 (Ill 3.2i), Phase 1; V1378 (Ill 3.12f) and V2385 (Ill 3.4b), Phase 1). Sometimes the decoration is apparently random, for example, V2147 (Ill 3.2e) (Phase 1) has a horizontal line around the neck with random short lines crossing it, and an apparently random incised pattern below. This contrasts with the examples of very structured, infilled geometric decoration (eg V302 (Ill 3.5h), V519 (Ill 3.8d) and V2301 (Ill 3.13b), Phase 2; V2576 (Ill 3.16b), Phase 3), the oblique incised lines placed in various directions, forming a basket weave pattern, the example of 'feather' decoration (V516 (Ill 3.8c), Phase 2), and the herringbone decoration on the exterior of an inverted rim (V774 (Ill 3.9f), Phase 2).

Sometimes the incised decoration is arranged in a band of panels below the neck of the vessel. These panels appear to have taken a number of forms, and do not appear to have conformed to any 'rules'. V584 (Ill 3.7j) (Phase 2), for example, has stabs forming panels with incised infilling. V1342 (Ill 3.1h) (Phase 1) has four remaining panels below a T-shaped rim – one panel with two sets of triple zigzags; a smaller panel of herringbone; a badly abraded panel which seems to include raised horizontal decoration; and a further panel with herringbone decoration. The panels are bordered beneath by two horizontal lines infilled with oblique lines. V2173 (Ill 3.2h) (Phase 1) has possible panels formed of vertical row of Vs and of short horizontal incisions in combination with apparently random incising. V2282 (Ill 3.13d) (Phase 2) has possible panelled decoration incorporating horizontal

TABLE 3.15

Decorative motifs: all phased contexts.

		Phase 1	Phase 2	Phase 3
Incised	*vertical*	1	1	2
	horizontal	0	1	1
	oblique	1	3	0
	short incisions	6	8	2
	single chevron	1	3	0
	lozenge	2	1	0
	random	3	0	1
	chevron (nested)	3	2	0
	infilled geometric	0	4	2
	herringbone	1	3	0
	feather	0	1	0
	basket weave	0	1	0
	incised panels	2	3	1
	grooved geometric	2	1	0
	grooved lines	0	5	0
Applied	*zig-zag*	14	83	17
	double zig-zag	0	1	2
	branching zig-zag	0	1	0
	incised zig-zag	0	0	1
	plain cordon	0	1	0
	ribbon cordon	1	1	0
	incised cordon	9	12	2
	pinched cordon	3	2	3
	impressed cordon	0	2	0
	geometric cordon	1	0	0
	incised cordon + ring	1	0	0
	rope effect cordon	0	5	0
	chain cordon	0	1	0
	applied geometric	0	1	1
	rings – various sizes	0	0	1
	adjoining rings	3	2	0
	horseshoe	0	1	0
	finger impressed boss	0	0	1
Impressed	*V-impressed*	3	0	1
	birdbone	1	0	0
	fingernail	0	1	1
	finger impressed base	3	0	1
	crescents/triangles	4	0	0
	lentoid	0	1	1
	circles (double or single) 2	1	2	
	finger impressed	1	1	1
	single short row imp	0	0	3
	double row short imp	4	0	0
Wiped	*linear*	1	1	1
	arcs	0	8	0
Stab and drag	*stab & drag*	1	1	1
Painted	*painted*	1	0	0

TABLE 3.16
Decorative motifs: key sequence.

		Phase 1	Phase 2	Phase 3
Incised	***vertical***	0	1	1
	horizontal	0	1	0
	oblique	1	2	0
	short incisions	2	7	0
	single chevron	1	3	0
	lozenge	0	1	0
	random	1	0	0
	chevron (nested)	1	2	0
	infilled geometric	0	3	0
	herringbone	0	2	0
	feather	0	1	0
	basket weave	0	1	0
	incised panels	0	2	0
	grooved geometric	1	1	0
	grooved lines	0	4	0
Applied	***zig-zag***	10	77	7
	double zig-zag	0	1	0
	plain cordon	0	1	0
	ribbon cordon	0	1	0
	incised cordon	5	11	0
	pinched cordon	2	2	1
	impressed cordon	0	2	0
	geometric cordon	0	0	0
	incised cordon + ring	1	0	0
	rope effect cordon	0	4	0
	chain cordon	0	1	0
	applied geometric	0	1	0
	adjoining rings	1	2	0
	horseshoe	0	1	0
Impressed	***V-impressed***	2	0	0
	fingernail	0	1	1
	finger impressed base	2	0	0
	crescents/triangles	2	0	0
	lentoid	0	1	0
	circles (double or single)	2	1	0
	finger impressed	0	1	0
	single short row imp	0	0	1
	double row short imp	1	0	0
Wiped	***linear***	0	1	1
	arcs	0	8	0
Stab and drag	***stab & drag***	1	1	1
Painted	***painted***	1	0	0

TABLE 3.17
Incidence of sooting: all phased contexts.

		None	ES	IS	Both
Phase 1	***Block 5A1***	5	16	6	38
	Block 6	14	32	12	30
	Block 11	30	19	9	20
	Block 12	2	3	0	5
	Block 15	52	42	34	54
	Block 16	1	0	1	1
Phase 2	***Block 5***	116	243	78	369
	Block 8	144	251	74	218
	Block 9	25	15	10	20
	Block 13	46	32	17	28
	Block 14	2	3	1	7
	Block 19	16	17	10	25
	Block 21	2	0	0	2
	Block 22	8	8	2	9
Phase 3	***Block 1***	35	49	11	49
	Block 2	20	22	10	33
	Block 3	13	6	2	10
	Block 4	11	9	5	21
	Block 18	61	85	42	89
	Block 20	28	26	5	16
Phase 1		104 (24.4%)	112 (26.3%)	62 (14.6%)	148 (34.7%)
Phase 2		359 (18.3%)	569 (29%)	355 (18.1%)	678 (34.6%)
Phase 3		168 (25.5%)	197 (29.9%)	75 (11.4%)	218 (33.2%)

and vertical rows of short incisions and herringbone decoration. V2721 (Ill 3.17d) (Phase 3) has two rows of short oblique incised lines possibly divided into panels by a vertical line of short horizontal lines – there is no decoration within the panels. The triangular panels of V38 (Ill 3.6aa) (Phase 2) are formed of impressed dots and infilled with incised lines.

Occasionally incised decoration is found in combination with applied decoration, eg V2667 (Ill 3.16g) (Phase 3) where oblique incisions are bordered by an incised applied cordon; V2724 (Ill 3.17f) (Phase 3) which has apparently random incisions above an applied zigzag; V1473 (Ill 3.11a) (Phase 2) which has a triple incised chevron above an applied zigzag; and V2387 (Ill 3.4c) (Phase 1) which has oblique incisions above a zigzag. Just as in these cases the cordon is used as the border for the incised decoration, in other cases a row of short incisions is used, eg V1581 (Ill 3.11f) (Phase 2) which has a row of short vertical incisions bordering incised lozenge decoration. Again the numbers of occurrences of individual motifs are too low to allow a phase by phase analysis.

3.2.4.3 Impressed decoration

Apart from a number of examples of fingertip impressed bases (eg V1303 (not illustrated), Phase 1; V2559 (not illustrated), Phase 3), impressed decoration is found on the exterior, usually as single or double rows comprising one type of impression, and usually, where position can be determined, below the rim. Various types of impression are represented – birdbone (V1302 (Ill 3.2a), Phase 1); > shaped (V325 (Ill 3.5j), Phase 2); Vs (V1281 (Ill 3.15k), Phase 1); inverted Vs (V2660 (Ill 3.16e), Phase 3; V1261 (Ill 3.17g), uncertain phase); fingertip (V2383 (Ill 3.3g), Phase 1); fingernail (V1142 (Ill 3.15g), Phase 3); lentoid (V1891 (Ill 3.10c), Phase 2; V2663 (Ill 3.16f), Phase 3; V281 (Ill 3.9c), uncertain phase); crescentic (V2382 (Ill 3.3f), Phase 1); and various less well defined impressions – a double row of short, deep impressions (V1328 (Ill 3.2c), Phase

TABLE 3.18
Incidence of sooting: key sequence.

		None	ES	IS	Both
Phase 1	***Block 5A1***	5	16	6	38
	Block 15	52	42	34	54
	Block 16	1	0	1	1
Phase 2	***Block 5***	116	243	78	369
	Block 8	144	251	74	218
Phase 3	***Block 1***	35	49	11	49
Phase 1		58 (23.2%)	58 (23.2%)	41 (16.4%)	93 (37.2%)
Phase 2		260 (17.4%)	494 (33.1%)	152 (10.2%)	587 (39.3%)
Phase 3		35 (24.4%)	49 (34%)	11 (7.6%)	49 (34%)

1); a single row of oblique stabs (V912 (Ill 3.1c), Phase 1); a double row of oblique stabs (V2376 (Ill 3.3e), Phase 1); and a row of oblong impressions (V2573 (Ill 3.16a), Phase 3).

Occasionally impressed decoration is found in combination with other forms of decoration, for example, on V1377 (Ill 3.12e) (Phase 2) a band of lentoid impressions was used as a border for incised

TABLE 3.19
Incidence of sooting on decorated vessels: all phased contexts.

		None	ES	IS	Both
Phase 1	***Block 5***	1	2	0	7
	Block 6	1	7	2	10
	Block 11	1	2	0	6
	Block 12	0	1	0	1
	Block 15	8	9	3	11
	Block 16	0	0	1	1
Phase 2	***Block 5***	14	34	1	31
	Block 8	11	50	5	33
	Block 9	0	1	0	0
	Block 13	3	4	0	3
	Block 14	0	1	0	1
	Block 19	0	0	1	1
	Block 21	0	0	0	0
	Block 22	0	1	0	2
Phase 3	***Block 1***	5	6	0	2
	Block 2	1	3	0	0
	Block 3	0	0	0	0
	Block 4	0	1	0	5
	Block 18	9	7	4	13
	Block 20	1	1	0	0
Phase 1		11 (14.9%)	21 (28.4%)	6 (8.1%)	36 (48.6%)
Phase 2		28 (14.2%)	91 (46.2%)	7 (3.6%)	71 (36%)
Phase 3		16 (26.3%)	18 (29.5%)	4 (6.5%)	23 (37.7%)

TABLE 3.20
Incidence of sooting on decorated vessels: key sequence.

		None	ES	IS	Both
Phase 1	***Block 5A1***	1	2	0	7
	Block 15	8	9	3	11
	Block 16	0	0	1	1
Phase 2	***Block 5***	14	34	1	31
	Block 8	11	50	5	33
Phase 3	***Block 1***	5	6	0	2
	Phase 1	9 (20.9%)	11 (25.6%)	4 (9.3%)	19 (44.2%)
	Phase 2	25 (13.9%)	84 (46.9%)	6 (3.4%)	64 (35.8%)
	Phase 3	5 (38.5%)	6 (46.2%)	0 (0)	2 (15.3%)

decoration. On V2659 (Ill 3.16d) (Phase 3) there is a row of short, stabbed impressions below the lip with horizontal wiping below it. Impressed dots formed the triangular panels of V38 (Ill 3.6aa) (Phase 2) which were then infilled with incised lines.

3.2.4.4 Other forms of decoration

Wiping, as well as being used as a surface finishing technique, also appears to have been used as a decorative technique, at least in Phases 1 and 2. Although wiping was used as a surface finishing technique in Phase 3 it does not seem to have been used decoratively. V2148 (Ill 3.2f) (Phase 1) has horizontal wiping below an inverted rim with vertical wiping below that. There are also various examples of wiping to form arcs, for example below an everted rim on V1892 (Ill 3.10d) (Phase 2) and V1535 (Ill 3.11c) (Phase 2). The decoration is shown to repeat on V89 (Ill 3.6bb) (Phase 2) and V831 (Ill 3.1a) (Phase 1).

Combing was most often used on the interior of a vessel (eg V2184 (Ill 3.2g), Phase 1, which has a geometric cordon on the exterior) but was also used occasionally on the exterior of a vessel, for example on V1097 (Ill 3.15h) (Phase 3) where it forms a possible chevron pattern.

There are a couple of examples of stab and drag decoration in the assemblage – V1922 (Ill 3.10e) (Phase 2) which has oblique stab and drag motifs in a row, and V2513 (Ill 3.3c) (Phase 1) which has long vertical stab and drag below a flat rim.

One example of painted decoration is included in the assemblage, V2411 (Ill 3.4d) (Phase 1), a body sherd painted on the exterior with black horizontal and oblique lines.

3.2.5 CHRONOLOGICAL CHANGE AND COMPARATIVE MATERIAL

As has been outlined in the preceding description of the Cnip assemblage, the variations in the pottery through the period represented on the site are subtle but appreciable. While many comparable assemblages in the Western Isles are from multi-period sites and useful in determining general trends over a longer period, the recovery of a chronologically restricted assemblage allows a more detailed look at one element in the sequence for the area.

A number of chronological trends are apparent in the tabulated ceramic data relating to the key sequence of deposits, although it should be remembered that the absolute numbers of vessels for Phases 1 and 3 are small. Vessels become generally thicker over time (Table 3.12), with a marked increase in applied decoration from Phases 1–3 (28 per cent → 67 per cent → 81 per cent, Table 3.14), and a corresponding decrease in incised decoration (28 per cent → 18 per cent → 12.5 per cent). From Phases 1–3 impressed decoration disappears (28 per cent → 3 per cent → 0 per cent), as does decorative wiping (5 per cent → 8 per cent → 0 per cent), although the latter was never a major feature of the assemblage.

Flat rims also decrease and disappear from Phases 1–3 (35 per cent → 8 per cent → 0 per cent, Table 3.10), while everted rims rise dramatically (39 per cent → 79 per cent → 89 per cent). Flaring rim vessels are present only in a late floor of Structure 8 in Phase 3; one of the latest deposits from the site. In relation to the volume of excavated sediment there also appears to be substantially less pottery present on site in Phase 3 than in Phases 1 and 2.

Even allowing for the smaller number of vessels available for study in Phase 3, it appears that pottery gradually declines both in quality and quantity, with less variety of form and motif and thicker, less accomplished vessels. The near total dominance of applied decoration in Phase 3 seems to result largely from the loss of variety in decorative techniques, rather than any innovation or the adoption of new motifs. Such changes are apparently gradual, however, and can be detected only by proportional changes in the assemblage from phase to phase.

The study of later prehistoric pottery from the Western Isles has been summarized in a number of papers, most recently by Patrick Topping (1985). Several sites with long sequences – the broch of Dun Mor Vaul, Tiree (MacKie 1974); the wheelhouses at Sollas, North Uist (Campbell 1991); the complex Atlantic roundhouse at Dun Vulan, South Uist (Parker Pearson & Sharples 1999); the burnt mound complex at Ceann nan Clachan, North Uist (Armit & Braby 2002); and the Early Iron Age settlement at Eilean Olabhat, North Uist (Armit, Campbell & Dunwell in press) – have been used to construct an overall sequence for the region. The generally accepted relative sequence is:

1. undecorated pottery with flat, rounded, or slightly inverted rims (MacKie's Dunagoil Ware).
2. the addition of pottery with slightly everted rims and decoration, mainly impressed and incised.
3. an increase in the variety of decoration with the addition of applied decoration and channelled decoration and sharply everted rims.
4. a decrease in the range of decorative motifs with applied cordons being most common, and a lengthening of the neck.

Ascribing dates to this general sequence is more difficult. MacKie suggested a date of 500 BC for the early part of the sequence at Dun Mor Vaul. The date of the earliest everted rim pottery is as yet unresolved. MacKie (1974, 159) saw it as the pottery of the broch builders and argued for a date of first century BC for its introduction. Campbell (1991), however, stressed that with the introduction of sharply everted rims in the Sollas sequence there was a marked change in vessel form which he put down to Roman influence, and argued for a date in the first or second century AD for this change. There were no radiocarbon dates for this phase at Sollas and the dating relies on a piece of Egyptian blue from the preceding phase being of Roman date, so the possibility of an earlier date should not be discounted. Parker Pearson (1999) in his summary of the sequence from Dun Vulan, raised the possibility of a second or third century AD date for the appearance of everted rims on that site. The evidence from Cnip, however, favours a rather earlier date for the inception of everted rims than is suggested from Sollas.

If everted rims were adopted as a result of Roman influence, however indirect, then they should not be present in the assemblage until around AD 80 at the earliest. The key sequence, however, appears to demonstrate that everted rims were present on the site in some quantity during Phase 1 (42 per cent, Table 3.9), although they do become even more dominant thereafter. Phase 1 almost certainly ends during the first century BC, and it seems extremely improbable that it extends as late as AD 80 (see Section 6.3.2). Thus the evidence from Cnip would appear to preclude a Roman inspiration for the sharply everted rim vessels of the Hebrides.

For the earlier flat rims, however, Cnip seems to confirm their place in the earlier part of the Iron Age sequence, but with their use extending as late as the first century BC, and possibly even into the first century AD, although the type seems to be out of use by the second century AD. They form 28 per cent of the Phase 1 assemblage, dropping to 9 per cent in Phase 2.

At the later end of the sequence, an AD 200 and later date is suggested by MacKie (1974) for the cordon-decorated, necked vessels with flaring rims, such as those from Dun Cuier (Young 1956). Similar pottery recovered from Dun Carloway was associated with the secondary use of the broch tower (Tabraham 1977). The occurrence at Cnip of two flaring rim vessels (V991 and V993), one with cordoned decoration (V993) is particularly helpful here. These vessels both derive from Context 083, a late floor in Structure 8 (Phase 3), and one of the latest deposits on the site. This floor level produced two radiocarbon dates, GU-2744 and GU-2745, with ranges of AD 200–330 and AD 170–245 respectively, at one sigma (adjusted). The overall dating of the site, as presented in Chapter 6, would suggest that their most likely date lies within this range, between around AD 200–250. The absence of such vessels elsewhere on the site suggests that their appearance in late Phase 3 is a genuine reflection of the period at which they were adopted, at least in this part of Lewis. This dating concurs with MacKie's proposed date of AD 200 for the emergence of this type of pottery elsewhere in the Hebrides (MacKie 1974).

Within the Western Isles, the radiocarbon dates for Cnip indicate contemporaneity with Sollas Phases B1 and B2 (Campbell 1991, 139–41) and Dun Vulan Phases 1b to 3 (Parker Pearson 1999 9.1). The pottery from these three sites has much in common. The decoration tends to be arranged on the vessel either as a cordon around the neck (least common), a cordon around the shoulder, or as incised decoration above the latter. A variety of decorated cordons such as incised, chain-link and zigzag cordons is found at all sites. Many of the incised motifs are also found at all sites, for example incised chevrons and herringbone.

However, looking at the assemblages in more detail, there is less similarity. Within the Dun Vulan and Sollas assemblages, for example, much of the decoration is based on the feather motif and parallel lines with incised dots while at Cnip incised dots were seldom used and there is only one example of feather decoration. In the Cnip assemblage there are a number of motifs such as applied circles, applied horseshoe and wiped arcs which were not noted at Dun Vulan and Sollas. The sequence of decoration noted at Sollas (Campbell 1991, 149, Ill 14) was not paralleled at Cnip, and many of the patterns attributed by Campbell to different periods occur within a single context at Dun Vulan (Parker Pearson & Sharples 1999, 239). At Dun Vulan (ibid, Ill 14) the incised designs seem to change through time – from a dominant use of infilled triangle and multiple zigzag in Period B1 to increased use of feather, infilled triangle and wavy lines in B2. At Cnip, there did not appear to be any strong differentiation in use of the various motifs through the life of the site.

Many of the decorative elements noted at Cnip can be paralleled on sites throughout the Atlantic zone – the incised linear decoration in the wheelhouse assemblage of A' Cheardach Bheag, South Uist (Fairhurst 1971, fig 8); the incised zigzag cordon in the assemblage from Sithean a Phiobaire wheelhouse, South Uist (Lethbridge 1952, fig 6); the finger-impressed boss with a sherd from Dun Flodigarry broch, Skye (Martlew 1985, fig 8.1); the long stab and drag on a vessel in the wheelhouse assemblage from Tigh Talamhanta, Barra (Young 1953, fig 8.78); the chain link cordons with examples from Tungadale souterrain, Isle of Skye (Roger Miket, pers comm); the zigzag cordon around the shoulder of the vessel in the assemblage from Baleshare midden, North Uist (MacSween 2003); the grass-wiped arc on a sherd from the fort of Dun Cul Bhuirg, Iona (Ritchie & Lane 1980, cat no 74); and the finger-impressed bases with examples from A Cheardach Mhor wheelhouse, South Uist. Endless comparisons are possible but study of the assemblages is not yet at the point where such comparisons will get us very far in terms either of chronology or of furthering our understanding of the societies which made and used the pottery.

It is perhaps more useful to draw attention to a couple of general observations which could be considered in the future study of other assemblages from the area. Firstly, where analysis of sooting patterns on assemblages has been carried out, there does not appear to be any correlation between sooting and decorative form, and it seems likely that at least some of the decorated vessels were used as cooking vessels. As well as being observed within the Cnip assemblage (Tables 3.17–3.20) this has also been remarked on in the discussions of other assemblages, for example, that from Dun Vulan, where LaTrobe-Bateman (1999) noted that there was no correlation between pot forms or decoration and sooting. Again, at Sollas, 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 very finely decorated examples, had been used as cooking pots (Campbell 1991, 150). In most assemblages, however, one or two vessels stand out because of the complexity of the decoration, or some other trait such as elaboration of the rim form, or the general level of care taken in their production. At Cnip V1342 (Phase 1, Ill 3.1h) would be an example of this with its thin walls, finely incised panelled decoration and elaborate, and seemingly impractical rim form. It is possible that some of these vessels, even if being used as cooking or serving vessels, were perhaps only used on special occasions. It is unlikely that such vessels would survive long in everyday service.

A second general point is that although the detailed changes outlined for the assemblages from Dun Vulan and Sollas cannot be replicated on other sites, it is possible that as more assemblages are analysed some aspects of these sequences may hold, although possibly on a very local level. Overall, the assemblage which is closest to that at Cnip in terms of decorative motifs is that from the earliest excavated phases of the nearby site of Loch na Beirgh which includes such relatively unusual motifs such as long stab and drag, applied circles and applied horseshoes (Melanie Johnson pers comm). Even where general similarities in decoration exist between assemblages there is a lot of variation in detail. The use of wiping as the method of creating arched decoration on the Cnip pottery is one example. Such decoration is usually formed by channelling using a blunt point. While this type of decorative technique was used at Cnip for other forms of decoration, it was not chosen for forming the arched motifs. Wiping was noted on many of the vessels at Cnip but is only mentioned as a characteristic of a few other assemblages such as Eilean Olabhat, North Uist where the exterior surfaces of some vessels seem to have been wiped or scraped with a pad of coarse organic material, with the marks of the direction of scoring being randomly oriented (Armit, Campbell & Dunwell forthcoming). Choice of surface finish and technique in producing a certain motif may in some cases reflect the preference of the potter and may be the cause of some differences between generally similar assemblages such as Cnip and Loch na Beirgh.

To summarize, then, while chronology may be a significant factor in the variations noted within the assemblages comparable to Cnip, more sequences with detailed, well-dated stratigraphy will be needed before this can be proven. It is possible that hidden within the assemblages are finer chronological changes in fashion than can be picked up with the available sequences – some of the less common motifs such as applied circles could, for example, have been introduced and gone out of favour in a relatively short time. From the information which is currently available it appears that in the first two centuries AD there was a general pool of motifs being used in different combinations, on different vessel types and possibly at different times, throughout the area. On a local level there may have been more similarities between contemporary assemblages, but even with geographically close assemblages it is probable, and would be expected, that the artistic ability and creativity of the potter will have led to subtle differences in the composition of the overall assemblage.

3.2.6 CATALOGUE OF ILLUSTRATED SHERDS

The following summary catalogue describes the sherds selected for illustration. A full catalogue of all rims, bases and decorated sherds is included in the site archive along with a spreadsheet detailing all sherds recovered.

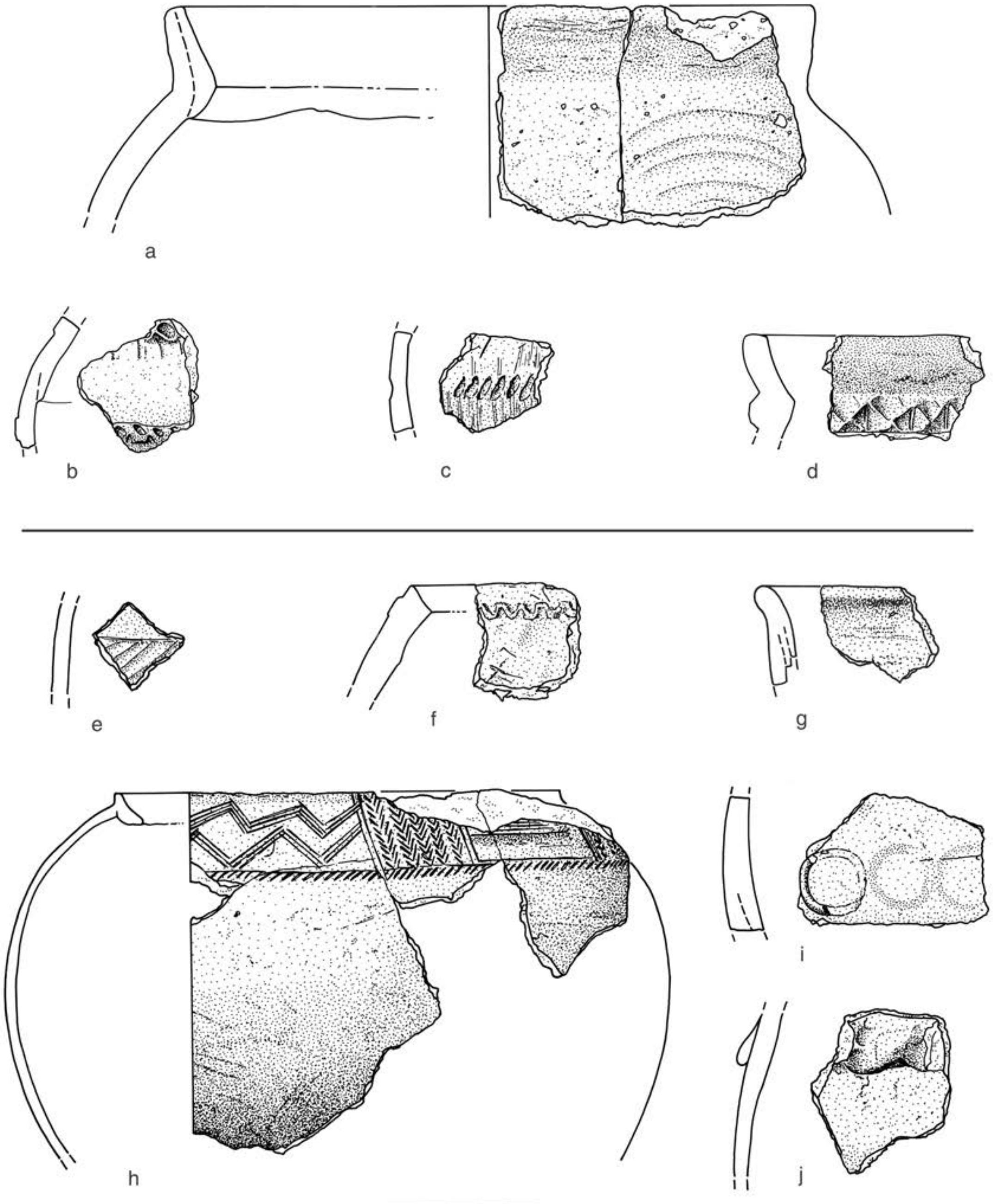


ILLUSTRATION 3.1
Phase 1, Block 5AI, (a) V831, (b) V928, (c) V912, (d) V913; Block 6, (e) V1312, (f) V1315, (g) V1316, (h) V1342, (i) V1343, (j) V1345.

PHASE 1

BLOCK 5A1

Context 290

V831 (Ill 3.1a)

Everted rim. Exterior wiped, forming a curving decoration. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 8mm long which has fired hard and is buff. Both surfaces sooted.

V832 (not illustrated)

Body sherd decorated with incised zigzag lines. Exterior smoothed. The fabric is fine sandy clay which has fired hard and is oxidized (brown). Residue in interior.

Context 293

V928 (Ill 3.1b)

Body sherd with an applied zigzag and a band decorated with oblique incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is brown. Both surfaces sooted.

Context 297

V912 (Ill 3.1c)

Body sherd decorated with a line of oblique impressions, perhaps made by the tip of a spatula. Exterior wiped. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is red.

V913 (Ill 3.1d)

Everted rim. At the point of inflection of the neck and the body is a band of applied zigzag decoration. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 6mm long which has fired hard and is red. Both surfaces sooted.

BLOCK 6

Context 022

V1312 (Ill 3.1e)

Body sherd with geometric decoration formed from thick shallow grooving. Exterior smoothed. Coil constructed – N-shaped junction on an undecorated sherd from the same vessel. The fabric is fine clay which has fired hard and is red. Both surfaces sooted.

V1315 (Ill 3.1f)

Inverted rim with an interior bevel. Decorated with an applied zigzag below the lip. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 10mm long which has fired hard and is grey with a red interior margin. Exterior sooted.

V1316 (Ill 3.1g)

Slightly everted rim. Both surfaces smoothed. Coil constructed – N-shaped junction. The fabric is fine clay which has fired hard and is brown. Exterior surface and interior of rim sooted.

Context 069

V1342 (Ill 3.1h)

Sherds from a finely made, probably globular, vessel with a splayed rim which has an exaggerated T-shaped profile. Below the rim is a band of incised decoration formed of a number of panels. Those represented on the remaining sherds are a panel of two sets of triple-incised zigzags; a smaller band of incised herringbone (bounded at each side by two vertical incised lines); a badly abraded panel which includes a raised horizontal band with horizontal incisions along its length; and possibly a further band of herringbone decoration. Below these panels is an incised line with a row of closely set oblique incisions directly beneath it. Exterior surface smoothed. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is red. Light sooting on both surfaces.

V1343 (Ill 3.1i)

Body sherds with applied circle decoration. Only part of one remains, but from the sooting patterns, there has probably been a row of circles. Exterior smoothed. Coil constructed. The fabric is sandy clay which has fired hard and is red with a grey core. Both surfaces lightly sooted.

V1345 (Ill 3.1j)

Body sherd decorated with a thick, wavy, band. Exterior smoothed. The fabric is fine sandy clay which has fired hard and is grey. Light sooting on both surfaces.

Context 108

V1302 (Ill 3.2a)

Flat rim decorated with a row of impressions, possibly made with a small bone. Exterior smoothed. The

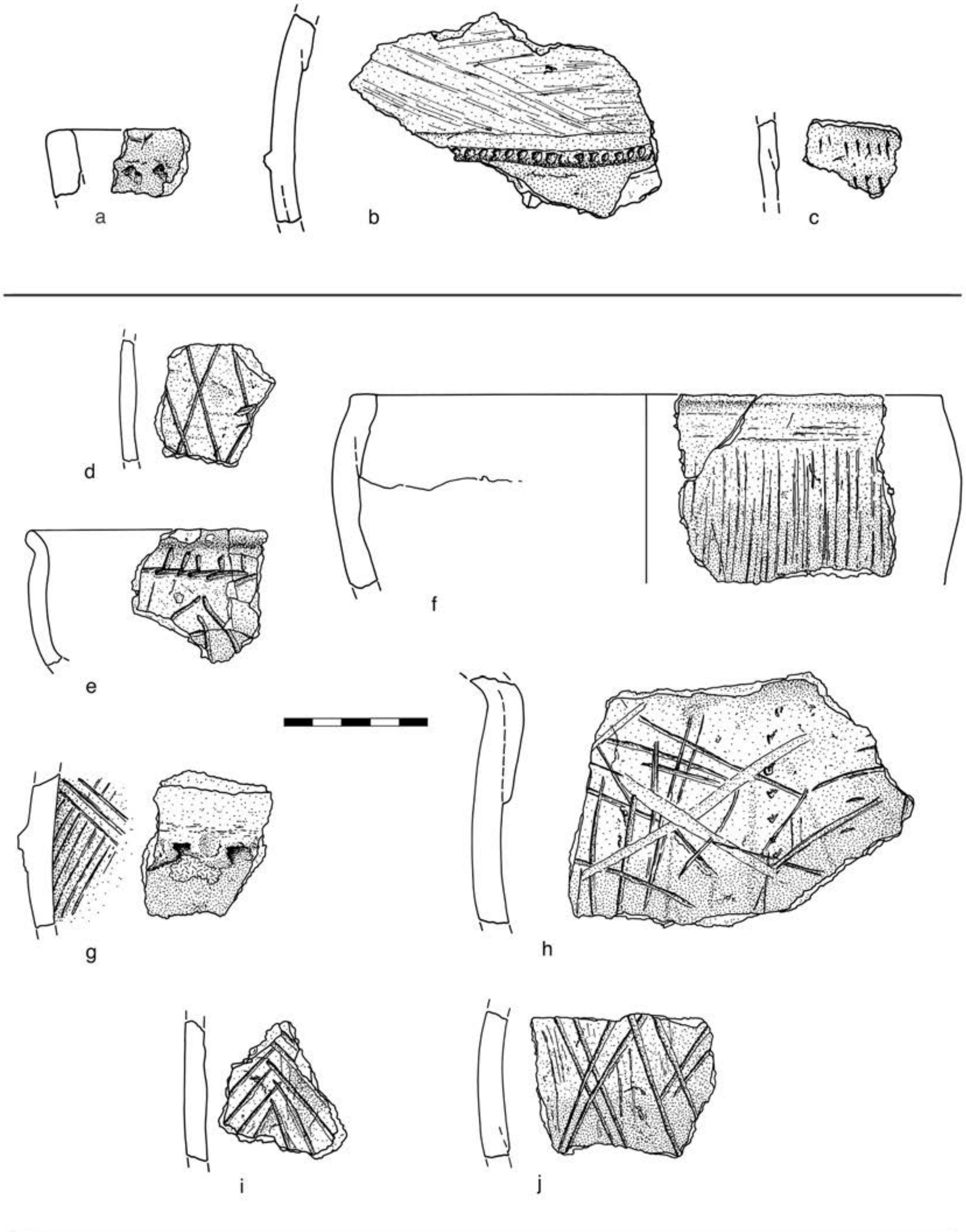


ILLUSTRATION 3.2
Phase 1, Block 6 continued, (a) V1302, (b) V1337, (c) V1328; Block 11, (d) V2137, (e) V2147, (f) V2148, (g) V2184, (h) V2173, (i) V2181, (j) V2182.

fabric is sandy clay which has fired hard and is red. Exterior sooted.

V1303 (not illustrated)
Flat part of base decorated with fingertip impressions. The fabric is fine sandy clay with *c* 10 per cent of rounded rock fragments up to 4mm long which has fired hard and is grey with buff margins. Exterior sooted.

Context 129

V1337 (Ill 3.2b)
Body sherd decorated with an applied band which has been thickly and closely incised. Exterior smoothed. Coil constructed – unsmoothed junction in interior. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 11mm long which has fired hard and is brown. Both surfaces lightly sooted. Heavier sooting around the band.

Context 203

V1328 (Ill 3.2c)
Body sherd decorated with two rows of short, deep, impressions. Exterior slipped. Coil constructed. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 6mm long which has fired hard and is brown.

BLOCK 11

Context 086

V2137 (Ill 3.2d)
Body sherd decorated with incised crossing lines forming a lozenge pattern. Exterior smoothed. The fabric is fine sandy clay which has fired hard and is grey with a red exterior margin.

V2147 (Ill 3.2e)
Everted rim decorated below the neck on the exterior with incised decoration comprising a horizontal line with vertical lines branching upwards from it and triangular-based decoration below it. Exterior smoothed and slipped. The fabric is sandy clay which has fired hard and is grey with a red exterior margin. Exterior sooted.

V2148 (Ill 3.2f)
Slightly inverted rim with a flat lip. Exterior wiped, probably decoratively – there is horizontal wiping in a 15mm wide band below the lip and vertical wiping below. Coil constructed – unsmoothed junctions in the interior. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is grey with brown margins. Both surfaces sooted.

Context 089

V2184 (Ill 3.2g)
Body sherd decorated with applied angular zigzag decoration. Exterior smoothed. Interior combed in a criss-cross pattern. Coil constructed – N-shaped coil junctions. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey. Sooting and residue on both surfaces.

Context 090

V2173 (Ill 3.2h)
Large body sherd including part of the neck of the vessel. The exterior is decorated with incised and impressed decoration – there is a vertical line of 'bird-foot' shaped impressions with random criss-cross incisions to one side and a vertical line of short horizontal impressions to the other. Exterior smoothed. Coil constructed – unsmoothed junction in the interior. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is grey with a brown exterior surface. Exterior sooted.

Context 110

V2181 (Ill 3.2i)
Body sherds with incised decoration. On the larger sherd this decoration is apparently a multiple chevron or lozenge. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 6mm long which has fired hard and is red.

V2182 (Ill 3.2j)
Body sherd decorated with incised crossing lines forming a lozenge pattern. Exterior slipped and wiped. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 8mm long which has fired hard and is brown. Exterior sooted, light sooting on the interior.

BLOCK 12

Context 111

V2202 (Ill 3.3a)
Body sherd decorated with a prominent wavy cordon. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is red. Both surfaces sooted. Residue on the exterior.

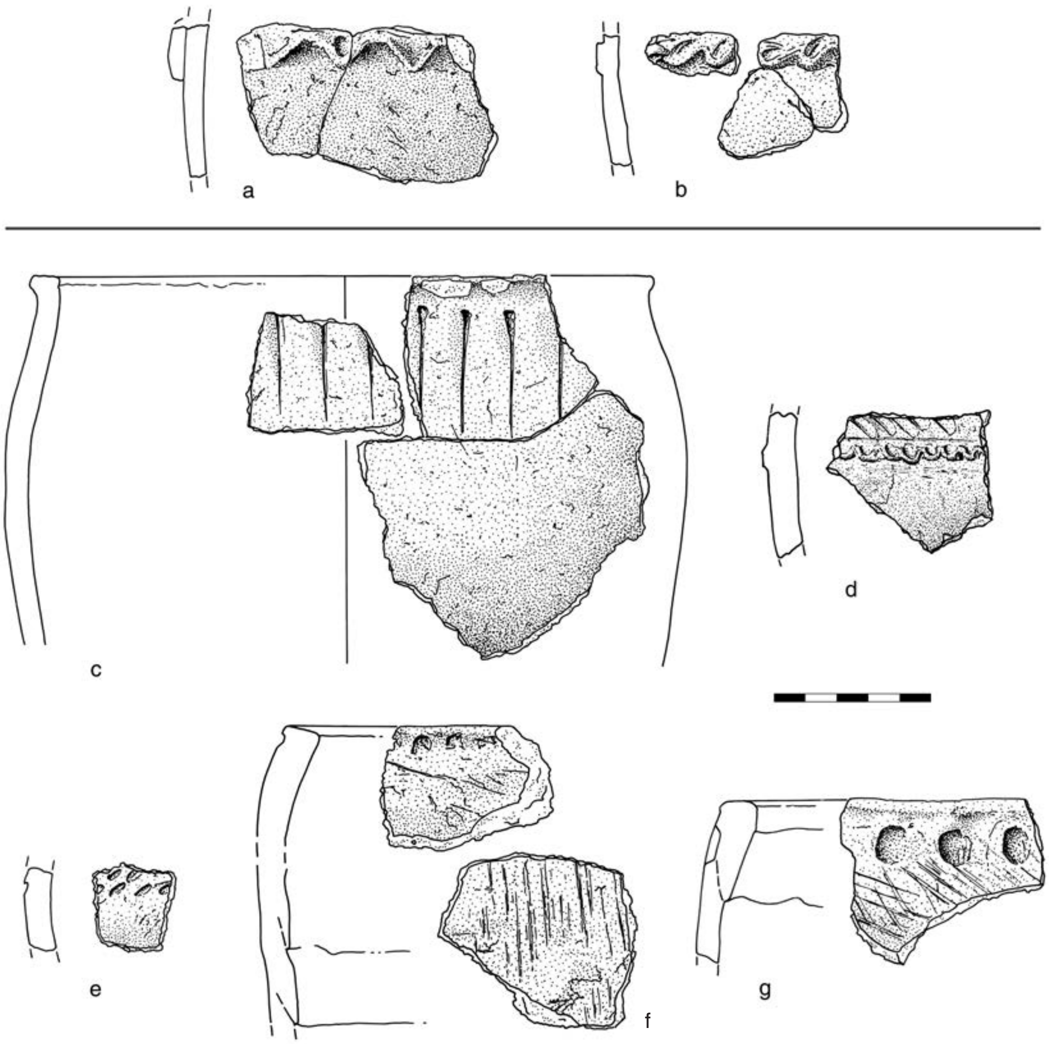


ILLUSTRATION 3.3
Phase 1 continued, Block 12, (a) V2202, (b) V2205; Block 15, (c) V2513, (d) V2454, (e) V2376, (f) V2382, (g) V2383.

V2205 (Ill 3.3b)
Body sherds decorated with obliquely zigzagging cordon. Exterior smoothed. The fabric is fine sandy clay which has fired hard and is red. Exterior sooted.

BLOCK 15

Context 031

V2513 (Ill 3.3c)
Flat-rimmed vessel decorated below the rim with a line of vertical stabs with incised 'tails'. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey. Both surfaces sooted (see Section 2.3.2.2 and 2.4.2.1.)

V2454 (Ill 3.3d)
Body sherd decorated with applied zigzag, above which are traces of shallow grooved decoration. The exterior of the vessel was smoothed before decoration. The fabric is sandy clay with *c* 10 per cent angular rock fragments up to 5mm long which has fired hard and is red with a grey exterior margin. Exterior sooted (see Sections 2.3.2.2 and 2.4.2.1.)

Context 130

V2376 (Ill 3.3e)
Body sherd decorated with two rows of oblique stab marks. The fabric is sandy clay which has fired hard and is red. Light sooting on exterior.

V2382 (Ill 3.3f)

Rim sherd with a slight interior bevel. Below the lip is a line of impressed crescent design. Coil constructed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is red. Sooting on the interior of some body sherds from the same vessel.

V2383 (Ill 3.3g)

Inverted rim with a flat lip. Below the rim on the exterior is a row of deep finger-tip impressions. Exterior wiped. Coil constructed with an unsmoothed junction in the interior. The fabric is sandy clay which has fired hard and is grey with brown margins. Both surfaces sooted.

V2384 (Ill 3.4a)

Splayed rim. Exterior smoothed. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 3mm long which has fired hard and is grey with brown surfaces. Both surfaces sooted.

V2385 (Ill 3.4b)

Upper profile of a decorated vessel. Everted rim. The top part of the vessel below the rim has been smoothed and decorated with crossing double incised lines forming a lozenge-based design. Below this is an applied wavy zigzag. The surface of the vessel below the zigzag is wiped. Coil constructed – unsmoothed junctions in the interior. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red. Both surfaces sooted.

V2387 (Ill 3.4c)

Everted rim decorated with an applied wavy cordon with oblique incisions above. Exterior smoothed. Coil constructed – unsmoothed junctions in interior. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 6mm long which has fired hard and is grey with a red margin. Light sooting on exterior.

V2411 (Ill 3.4d)

Body sherd painted on the exterior with black stripes. Exterior slipped and wiped. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is grey, with a red exterior margin.

BLOCK 16

Context 116

V2531 (Ill 3.4e)

Body sherds with decoration comprising an applied ring set into a cordon decorated with vertical incisions and a row of impressed dots about 3cm above the cordon. Coil constructed – unsmoothed junctions in the interior. The fabric is sandy clay which has fired hard and is grey with buff surfaces. Both surfaces sooted.

V1366 (Ill 3.5a)

Complete shouldered vessel, 111mm high. Slightly everted rim. Flat base with angled walls. Around the shoulder is a cordon, the upper side of which has been decorated with closely spaced incised or impressed chevrons. The fabric is fine sandy clay which has fired hard and is grey with buff/brown oxidized surfaces. The exterior of the vessel is sooted and there is light sooting in the interior. There is a creamy coloured deposit, probably post-depositional, over much of the exterior.

PHASE 2

BLOCK 5

Context 137

V287 (Ill 3.5b)

Everted rim with a flat lip. The fabric is fine sandy clay with *c* 10 per cent of angular and rounded rock fragments up to 11mm long which has fired hard and is red. Exterior sooted.

Context 146

V570 (Ill 3.5c)

Body sherd with two slightly curved, diverging incised lines, executed with a stem of grass or a twig. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is brown. Both surfaces sooted.

Context 172

V597 (Ill 3.5d)

Plain rim. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with red margins. Both surfaces sooted.

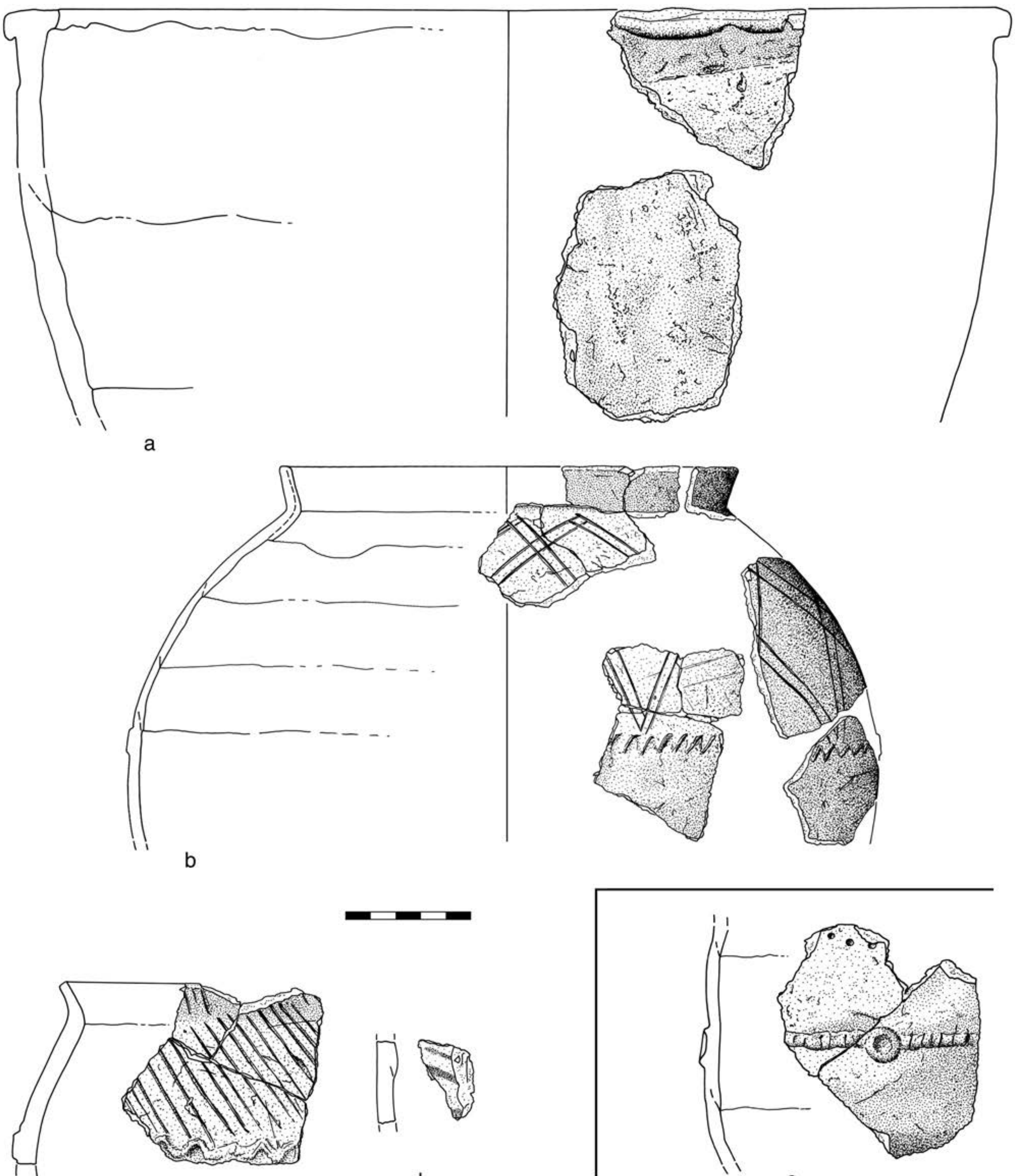


ILLUSTRATION 3.4
Phase 1, Block 15 continued, (a) V2384, (b) V2385, (c) V2387, (d) V2411; Block 16, (e) V2531.

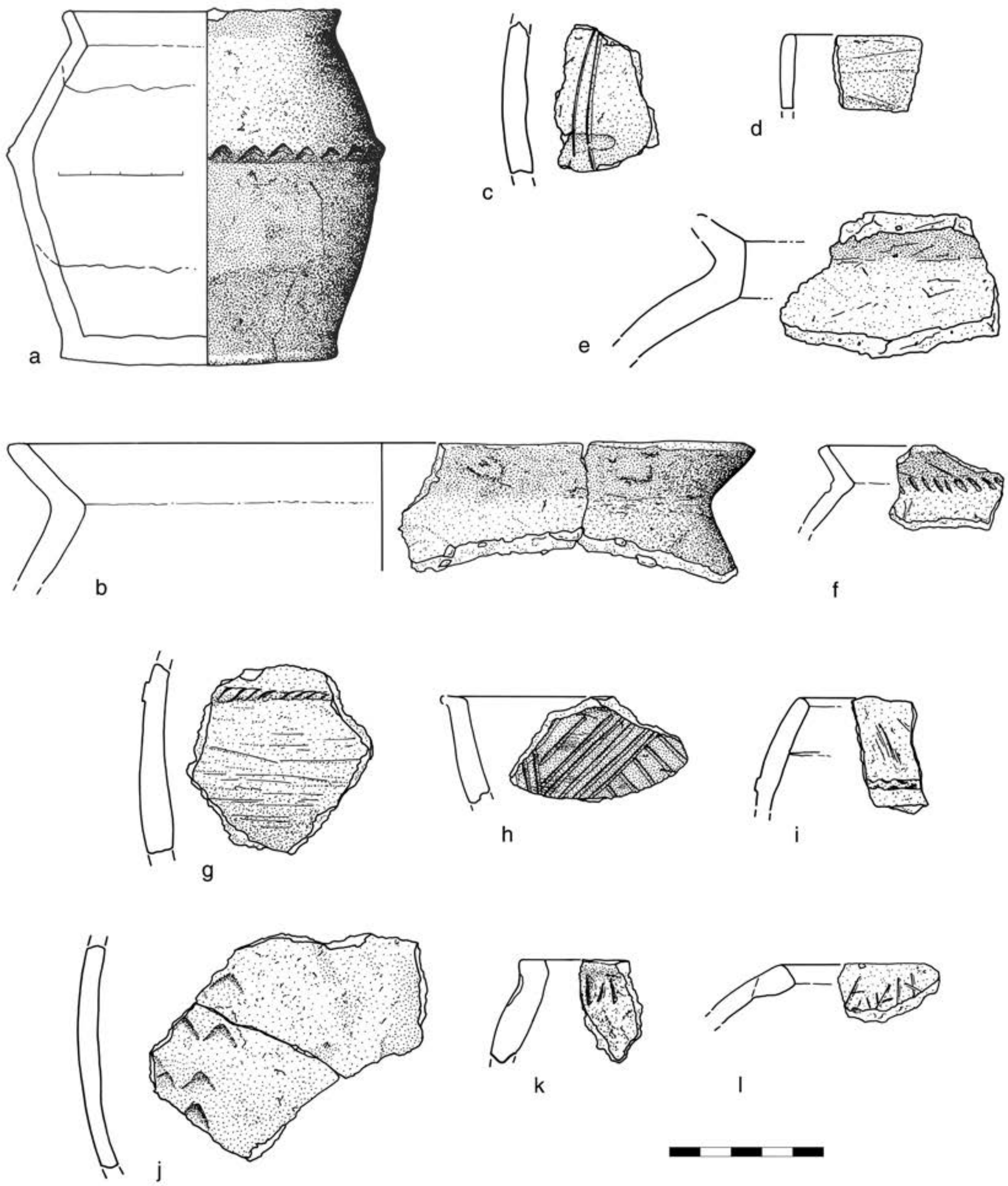


ILLUSTRATION 3.5
Phase 1, Block 16 continued, (a) V1366; Phase 2, Block 5, (b) V287, (c) V570, (d) V597, (e) V601, (f) V611, (g) V301, (h) V302, (i) V304, (j) V325, (k) V793, (l) V786.

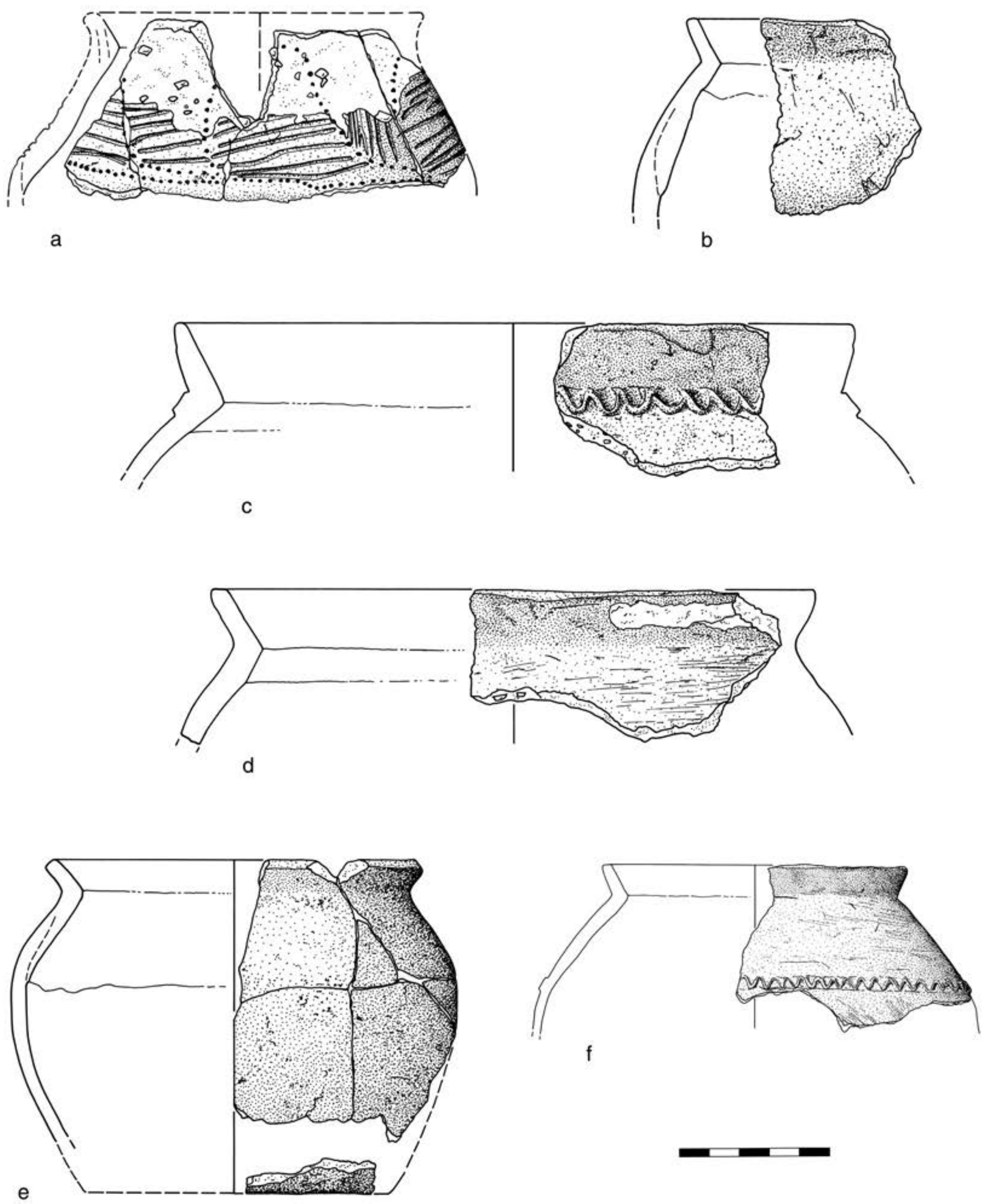


ILLUSTRATION 3.6(a)
Phase 2, Block 5 continued, (a) V38, (b) V39, (c) V48, (d) V53, (e) V62, (f) V63.

V601 (Ill 3.5e)

Sherd from the neck of a vessel with an everted rim. The neck is short and straight. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is grey with red surfaces. Exterior sooted.

V611 (Ill 3.5f)

Everted rim. Exterior smoothed. Just below the neck is a row of short, oblique incisions. The fabric is sandy which has fired hard and is red.

Context 173

V301 (Ill 3.5g)

Body sherd decorated with a fine applied cordon which has been slashed obliquely. Exterior wiped. The fabric is fine sandy clay with *c* 40 per cent of angular rock fragments up to 7mm long which has fired hard and is red. Both surfaces sooted.

V302 (Ill 3.5h)

Body sherd from the point of inflection with the neck. The exterior surface is smoothed and decorated with sets of oblique incised lines, forming a basket effect. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is oxidized (red/brown). Exterior sooted.

V304 (Ill 3.5i)

Inverted rim decorated with a fine applied cordon which has been slashed obliquely. Exterior smoothed. Coil constructed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 2mm long which has fired hard and is grey. Exterior sooted.

V325 (Ill 3.5j)

Body sherd (broken in two) decorated with a double row of impressed V-shaped motifs. Interior wiped. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and has a red exterior and grey interior. Both surfaces sooted.

Context 181

V793 (Ill 3.5k)

Flat rim with incised decoration – 7mm long perpendicular or slightly oblique incisions – on the neck. 11mm below the lip the vessel angles to the exterior. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is grey with brown surfaces. Both surfaces sooted.

Context 189

V786 (Ill 3.5l)

Inverted rim from a closed mouth vesssel. Exterior wiped (wiping striations). The vessel starts to angle to the interior 14mm from the lip (there are finger impressions on the interior at this point). The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red.

Context 196

V38 (Ill 3.6aa)

Body sherds from a decorated vessel. The sherds are from the area between the shoulder and the rim. The decoration comprises a row of closely spaced impressed dots, probably made with a point of around 1mm in diameter, just above the shoulder, with curving lines of dots above forming a triangular-based arrangement. These panels are decorated with either horizontal or vertical incised lines. The lines are fine and could also have been made with a point. The rim was probably everted. The vessel is coil constructed – unsmoothed coils are visible in the interior. Exterior smoothed. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is red with a grey core. Light sooting on exterior.

V39 (Ill 3.6ab)

Everted rim. The exterior surface and the interior of the rim just below the point of inflection have been smoothed. The vessel is coil constructed – unsmoothed coils are visible in the interior, and N-shaped junctions in the section. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is grey with a brown exterior margin. Light sooting on both surfaces.

V48 (Ill 3.6ac)

Everted rim, decorated at the point of inflection with an applied wavy zigzag. Exterior surface and rim interior smoothed. The fabric is fine clay with *c* 10 per cent angular rock fragments up to 8mm long which has fired hard and is red with grey patches. Sooting on exterior surface and rim interior.

V53 (Ill 3.6ad)

Everted rim. Exterior surface and interior of the rim well smoothed. In the interior the smoothing stops about 2cm below the point of inflection – below

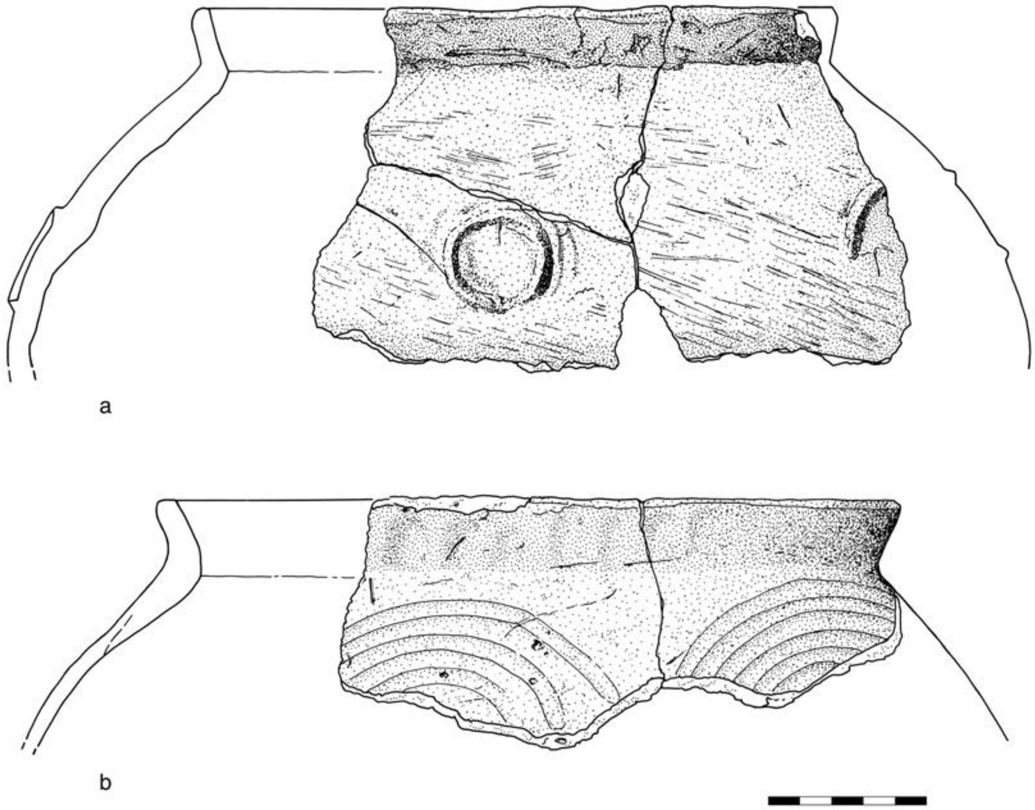


ILLUSTRATION 3.6(b)
Phase 2, Block 5 continued, (a) V87, (b) V89.

this thinning impressions are visible. The point of inflection is defined sharply in the interior – on the exterior it is more rounded. The fabric is sandy clay which has fired hard and is grey.

V62 (Ill 3.6ae)

Everted rim with a flat lip from a small vessel, probably globular, with a flat base. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with a red exterior margin. Both surfaces are sooted. White residue in interior which is flaking off.

V63 (Ill 3.6af)

Everted rim from a shouldered or globular vessel. 70mm below the rim is a fine line of applied zigzag decoration. Exterior smoothed. Coil constructed – N-shaped junctions are visible in the section and unsmoothed coils in the interior. The fabric is fine sandy clay which has fired hard and is grey with a red exterior margin. Both surfaces sooted. White residue in interior.

V87 (Ill 3.6ba)

Everted rim from a large vessel. *c* 40–50mm below the point of inflection of the rim and body the vessel is decorated with fine applied circular motifs of varying diameters. Exterior smoothed. Finger thinning marks in the interior. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is red. Both surfaces sooted.

V89 (Ill 3.6bb)

Everted rim from a large vessel with a flat base. Exterior smoothed and decorated with circular wiping. Coil constructed, unsmoothed coils and finger-thinning in the interior. The fabric is sandy clay which has fired hard and is grey with red surfaces. Both surfaces sooted.

Context 204

V684 (Ill 3.7a)

Body sherd with applied decoration, possibly in the form of zigzagging loops. Exterior smoothed. Coil

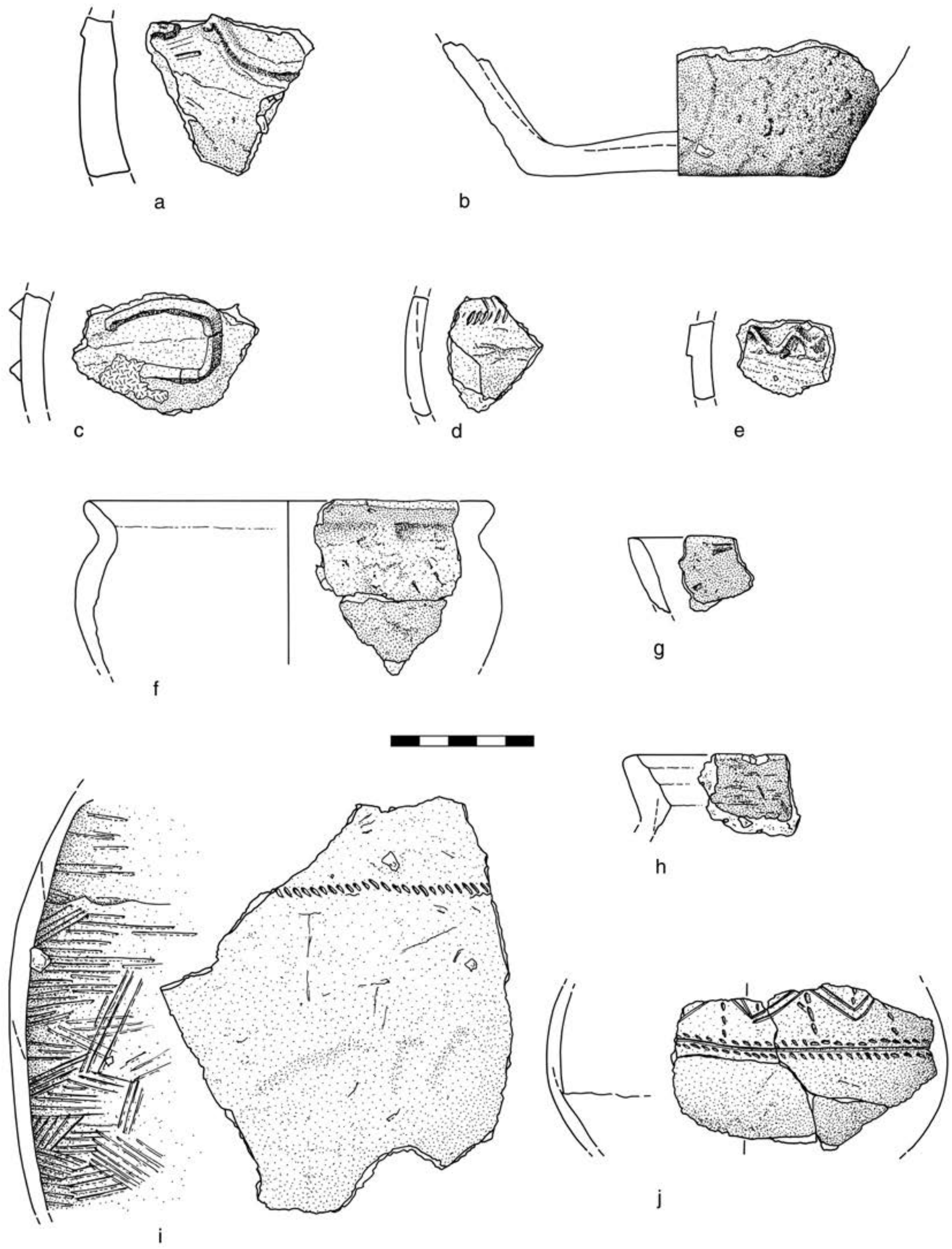


ILLUSTRATION 3.7
Phase 2, Block 5 continued, (a) V684, (b) V689, (c) V368, (d) V369, (e) V370, (f) V375, (g) V395, (h) V195, (i) V575, (j) V584.

constructed. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 7mm long which has fired hard and is red. Exterior sooted.

V689 (Ill 3.7b)

Basal sherds from a flat-based vessel with angled walls. Exterior slipped and wiped. Coil constructed – N-shaped junctions. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red. Sooting on both surfaces.

Context 232

V368 (Ill 3.7c)

Body sherd decorated with an applied horseshoe-shaped motif. The fabric is sandy clay with *c* 40 per cent of angular rock fragments up to 11mm long which has fired hard and is red. Heavy sooting on exterior, light sooting on interior.

V369 (Ill 3.7d)

Body sherd with incised decoration, possibly forming a herringbone pattern. Surface wiped prior to decoration. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 2mm long which has fired hard and is red. Exterior sooted.

V370 (Ill 3.7e)

Body sherd decorated with an applied zigzag which seems to be forming a circle at the broken edge. Exterior surface wiped. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is red. Exterior sooted.

V375 (Ill 3.7f)

Everted rim. The fabric is fine sandy clay with *c* 10 per cent angular and rounded rock fragments up to 8mm long which has fired hard and is red. Light sooting on both surfaces.

V395 (Ill 3.7g)

Plain rim. Exterior wiped. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with red surfaces. Light sooting on both surfaces.

Context 235

V195 (Ill 3.7h)

Slightly everted rim with a flattened lip. The rim interior has a couple of ridges made by finger smoothing which might be decorative. The fabric is sandy clay with *c* 10 per cent angular rock fragments up to 5mm long which has fired hard and is red.

Context 236

V575 (Ill 3.7i)

Body sherd decorated with a row of short, oblique incisions. Exterior smoothed. Interior combed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red. Exterior sooted.

V584 (Ill 3.7j)

Fine sherds (adjoining) with complex incised and stabbed decoration. A horizontal incised line is bounded by small oblique stabs. Vertical rows of stabs lead up from this line, presumably dividing the decoration into panels. Within these boxes is incised possibly triangle/chevron-based decoration. Exterior smoothed. Coil constructed – N-shaped junctions. The fabric is sandy clay which has fired hard and is grey. Both surfaces sooted.

Context 241

V158 (not illustrated)

Everted rim. Exterior smoothed. Coil constructed – N-shaped junctions. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is red. Sooting on the exterior and light sooting on the interior of the rim.

Context 242

V514 (Ill 3.8a)

Slightly everted rim with a flattened lip. Coil constructed – N-shaped junctions. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 5mm long which has fired hard and is grey with brown margins. Light sooting on exterior.

V515 (Ill 3.8b)

Everted rim from a globular or shouldered vessel. The fabric is sandy clay with *c* 50 per cent of angular rock fragments up to 5mm long which has fired hard and is grey with red margins. Exterior sooted.

V516 (Ill 3.8c)

Two body sherds with incised ‘feather-type’ decoration above a horizontal line. Exterior smoothed. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 4mm long which has fired hard and is red. Exterior sooted.

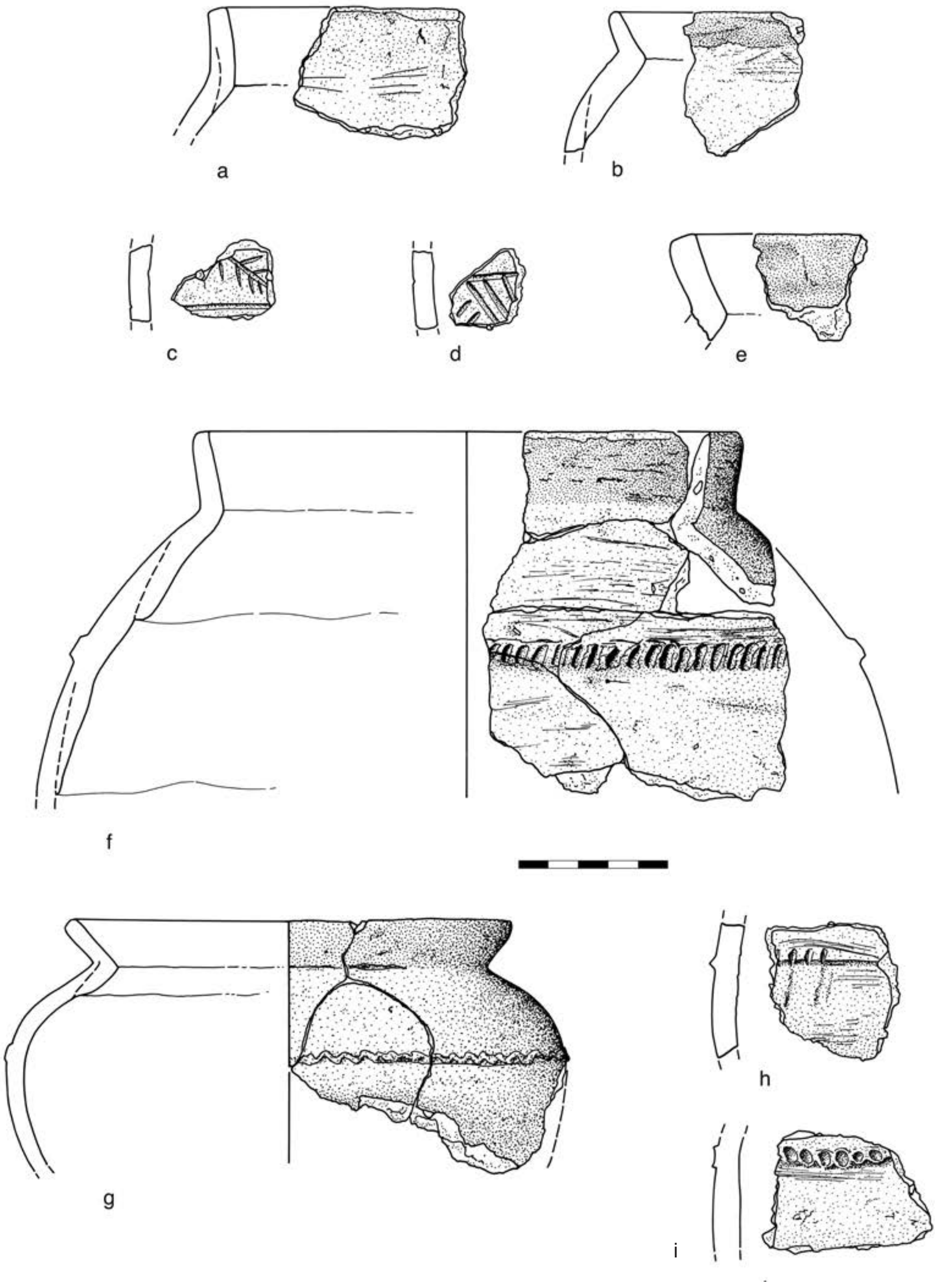


ILLUSTRATION 3.8
Phase 2, Block 5 continued, (a) V514, (b) V515, (c) V516, (d) V519, (e) V520, (f) V521, (g) V523, (h) V176, (i) V177.

V519 (Ill 3.8d)
Body sherd with incised decoration, possibly forming a basket-weave effect. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is red.

V520 (Ill 3.8e)
Everted rim with a flat lip. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is brown. Exterior sooted.

V521 (Ill 3.8f)
Sherds reconstructed to form part of the upper portion of a vessel with a slightly everted rim, from either a shouldered or globular vessel. Exterior smoothed. Unsmoothed coils in interior. Approximately 55mm below the neck of the vessel is an applied cordon, slashed obliquely. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is grey with brown margins.

V523 (Ill 3.8g)
Everted rim from a shouldered or globular vessel. Decorated 30mm below the neck with an applied, thin, neatly executed zigzag cordon. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is red.

Context 245

V176 (Ill 3.8h)
Body sherd decorated with an applied, pinched up cordon, a section of which has been incised across its width at regular intervals. Exterior smoothed. The fabric is sandy clay with *c* 20 per cent angular rock fragments up to 5mm long which has fired hard and is brown. Both surfaces sooted.

V177 (Ill 3.8i)
Body sherd decorated with an applied cordon which has been incised/impressed to give a 'chain' effect. Exterior smoothed. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 6 mm long which has fired hard and is grey with red margins. Both surfaces sooted.

Context 256

V865 (Ill 3.9a)
Everted rim. At the point of inflection with the body is an applied pinched band. Interior smoothed. The fabric is fine clay with *c* 20 per cent of angular rock fragments up to 7mm long which has fired hard and is grey with a red core. Exterior sooted.

V866 (Ill 3.9b)
Flat rim. The fabric is fine sandy clay which has fired hard and is buff.

Context 260

V281 (Ill 3.9c)
Inverted rim with an interior bevel. 7mm below the lip on the exterior is a line of oblique lentoid incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular and rounded rock fragments up to 3mm long which has fired hard and is buff. Both surfaces sooted.

Context 265

V250 (Ill 3.9d)
Body sherd decorated with an incised infilled pattern. Exterior smoothed. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is grey with brown surfaces.

Context 272

V773 (Ill 3.9e)
Rim sherd with an internal bevel from an open vessel. Slight indentation below the rim on the exterior. Exterior smoothed and scored vertically *c* 20mm below the lip, possibly to give a decorative texture. Coil constructed – unsmoothed coil junction on the interior below the bevel. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 7mm long which has fired hard and is red.

V774 (Ill 3.9f)
Inverted rim decorated with incised herringbone decoration which reaches up to the lip of the vessel. Exterior smoothed. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is red.

BLOCK 8

Context 067

V1743 (Ill 3.9g)
Body sherd decorated with an applied cordon which has been pinched to form a wavy line. Exterior smoothed. Coil constructed. The fabric is fine sandy

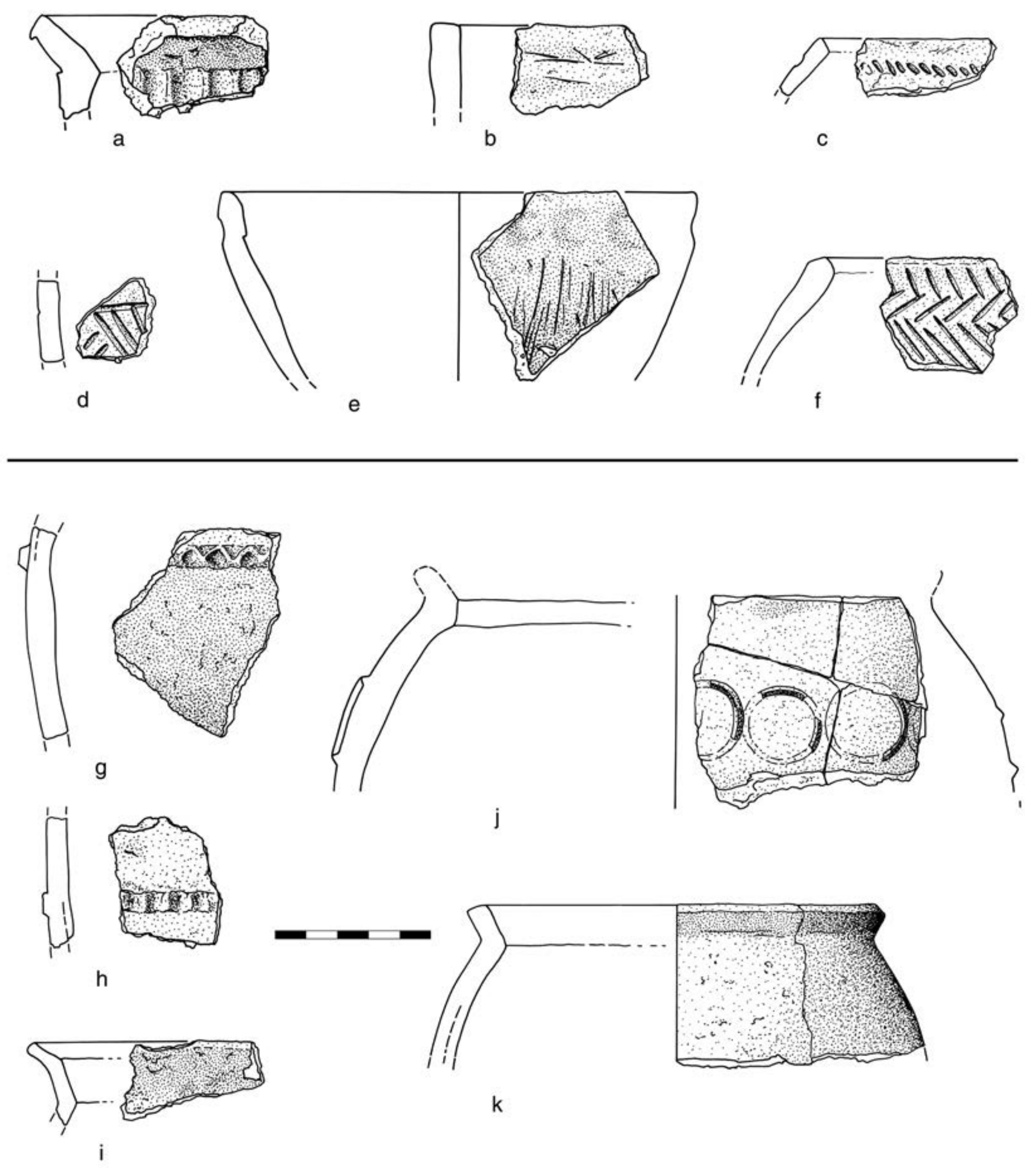


ILLUSTRATION 3.9
Phase 2, Block 5 continued, (a) V865, (b) V866, (c) V281, (d) V250, (e) V773; (f) V774 Block 8, (g) V1743, (h) V1751, (i) V1752, (j) V1753, (k) V1809.

clay with *c* 20 per cent of angular rock fragments up to 8mm long which has fired hard and is red. Exterior sooted.

V1751 (Ill 3.9h)
Body sherd decorated with a pinched applied band. Exterior smoothed. Coil constructed – N-shaped junctions. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey. Sooting on both surfaces.

V1752 (Ill 3.9i)
Everted rim with the neck faceted on the interior. Exterior slipped and smoothed. The fabric is fine sandy clay which has fired hard and is red with a grey core. Exterior sooted.

V1753 (Ill 3.9j)
Body sherds from below the neck, decorated around the shoulder with finely executed applied circles *c* 2mm in diameter. The circles have detached on some sherds leaving an unsooted impression. Exterior surface smoothed. Some sherds are from the neck of the vessel. Coil constructed – unsmoothed coil just below the neck in the interior. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red/brown. Some of the sherds are grey with a buff/red margin. Both surfaces sooted.

V1809 (Ill 3.9k)
Everted rim with a flat lip. Exterior smoothed. Coil constructed – N-shaped junction. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 2mm long which has fired hard and is grey with a buff interior margin. Exterior sooted.

Context 082

V1871 (Ill 3.10a)
Everted rim. Exterior smoothed. Coil constructed – unsmoothed junctions in the interior. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red with a grey core. Both surfaces sooted.

V1884 (Ill 3.10b)
Body sherd with applied zigzag/'rope effect' decoration. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with a red interior margin. Exterior sooted. Light sooting on the interior.

V1891 (Ill 3.10c)
Everted rim with a flat lip. Broken at the neck. Just below the neck is a row of lentoid impressions, probably made by impressing a fingernail. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with brown surfaces. Both surfaces sooted.

V1892 (Ill 3.10d)
Everted rim with a flat lip. On the interior the junction between the rim and body is pinched, probably to form a rest for a pot-lid. Exterior wiped – the wiping may have formed a circular pattern. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is brown. Light sooting on the exterior.

Context 103

V1922 (Ill 3.10e)
Body sherd decorated with two parallel, oblique, incised, tapering incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 6mm long which has fired hard and is red.

V1989 (Ill 3.10f)
Body sherd decorated with thick parallel lines on the exterior. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 10mm long which has fired hard and is red/buff. Exterior sooted.

V1991 (Ill 3.10g)
Body sherd decorated with an applied cordon cut with oblique incisions ?above which are incised lines. The fabric is fine sandy clay which has fired hard and is red. Exterior sooted. Interior lightly sooted.

Context 170

V2044 (Ill 3.10h)
Everted rim with possible incised decoration on the exterior and a flat base with angled sides. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red.

V2045 (Ill 3.10i)
Vessel with a short neck and a flat lip. 'Shelf' to the interior of the neck. The fabric is sandy clay which has fired hard and is grey with brown surfaces. Exterior sooted.

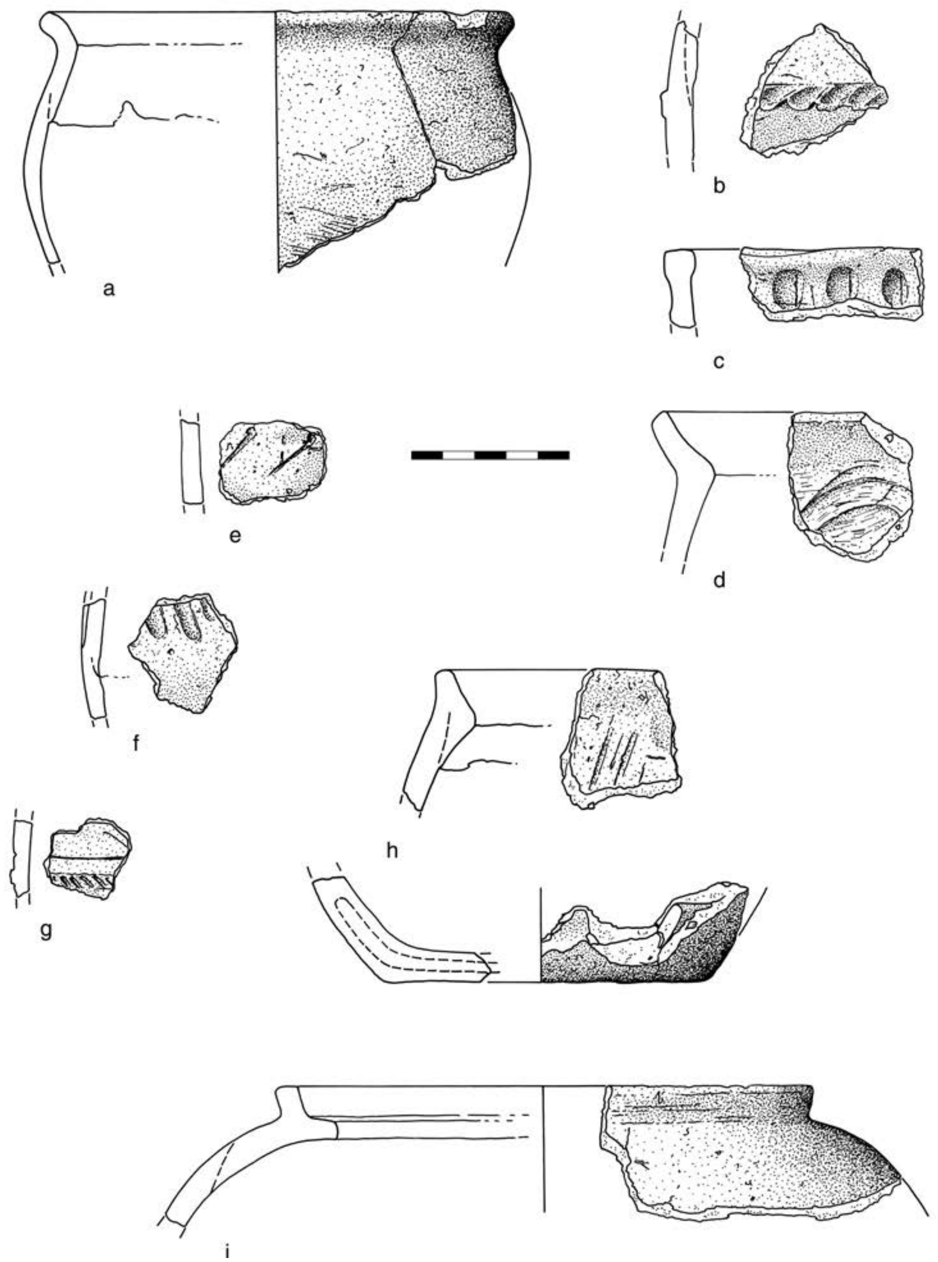


ILLUSTRATION 3.10
Phase 2, Block 8 continued, (a) V1871, (b) V1884, (c) V1891, (d) V1892, (e) V1922, (f) V1989, (g) V1991, (h) V2044, (i) V2045.

Context 223

V1473 (Ill 3.11a)

Everted rim. The vessel is decorated with an applied zigzag band *c* 45mm below the neck. Between the neck and the band are thick but shallow incisions forming a triple-lined zigzag. Exterior wiped. Interior scraped. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 6mm long which has fired hard and is brown. Both surfaces sooted.

V1474 (Ill 3.11b)

Body sherds decorated with a line of four short oblique incisions. On one sherd is a double row – this could be the overlap at the end of the circuit. Exterior smoothed. Interior combed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is buff. Exterior sooted.

V1535 (Ill 3.11c)

Everted rim decorated with wiped curving decoration. Exterior smoothed. Interior scraped. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is grey with red margins.

Context 244

V1633 (Ill 3.11d)

Body sherd decorated with an applied cordon. Below the cordon the surface is smoothed and above it the surface is textured, possibly to form a basket weave effect. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with red margins. Both surfaces sooted.

Context 251

V1580 (Ill 3.11e)

Body sherd decorated with an applied cordon which has been incised vertically. Exterior smoothed. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 7mm long which has fired hard and is red. Light sooting on the exterior.

V1581 (Ill 3.11f)

Body sherd decorated with a row of short vertical incisions below which are incised lines possibly forming a lozenge-based design. The fabric is sandy clay which has fired hard and is grey. Both surfaces sooted.

Context 253

V1691 (Ill 3.11g)

Everted rim decorated with a plain applied cordon around the neck. Exterior smoothed. The fabric is sandy clay which has fired hard and is red. Light sooting on the exterior.

Context 266

V1367 (Ill 3.12a)

Upper profile of a shouldered vessel with an everted rim. Exterior burnished. Interior surface scraped. Coil constructed. The fabric is sandy clay which has fired hard and is grey with red/brown margins. Exterior sooted. Patches of a creamy-coloured deposit on the exterior, probably post-depositional.

V1368 (Ill 3.12b)

Everted rim from a shouldered vessel. Around the shoulder is a pinched cordon. Exterior burnished. Coil constructed – unsmoothed coils in the interior. The fabric is sandy clay which has fired hard and is grey. Both surfaces sooted.

V1369 (not illustrated)

Sherd from the shoulder of a vessel. Around the shoulder is an applied cordon which has been incised obliquely forming a 'rope effect'. Coil constructed – unsmoothed junction in interior. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is red. Exterior sooted.

V1371 (Ill 3.12c)

Body sherd decorated with an applied wavy cordon. Exterior smoothed. The fabric is sandy clay which has fired hard and is red. Exterior sooted.

V1373 (Ill 3.12d)

Body sherd with part of what is probably an applied zigzag or triangle. Exterior smoothed. The fabric is sandy clay which has fired hard and is red. Exterior sooted.

V1377 (Ill 3.12e)

Body sherd decorated with incised chevron and lentoid-shaped impressions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with red/brown surfaces. Patchy sooting on the exterior.

V1378 (Ill 3.12f)

Body sherd decorated with nested chevrons formed of three chevrons. There are traces of a line of possible

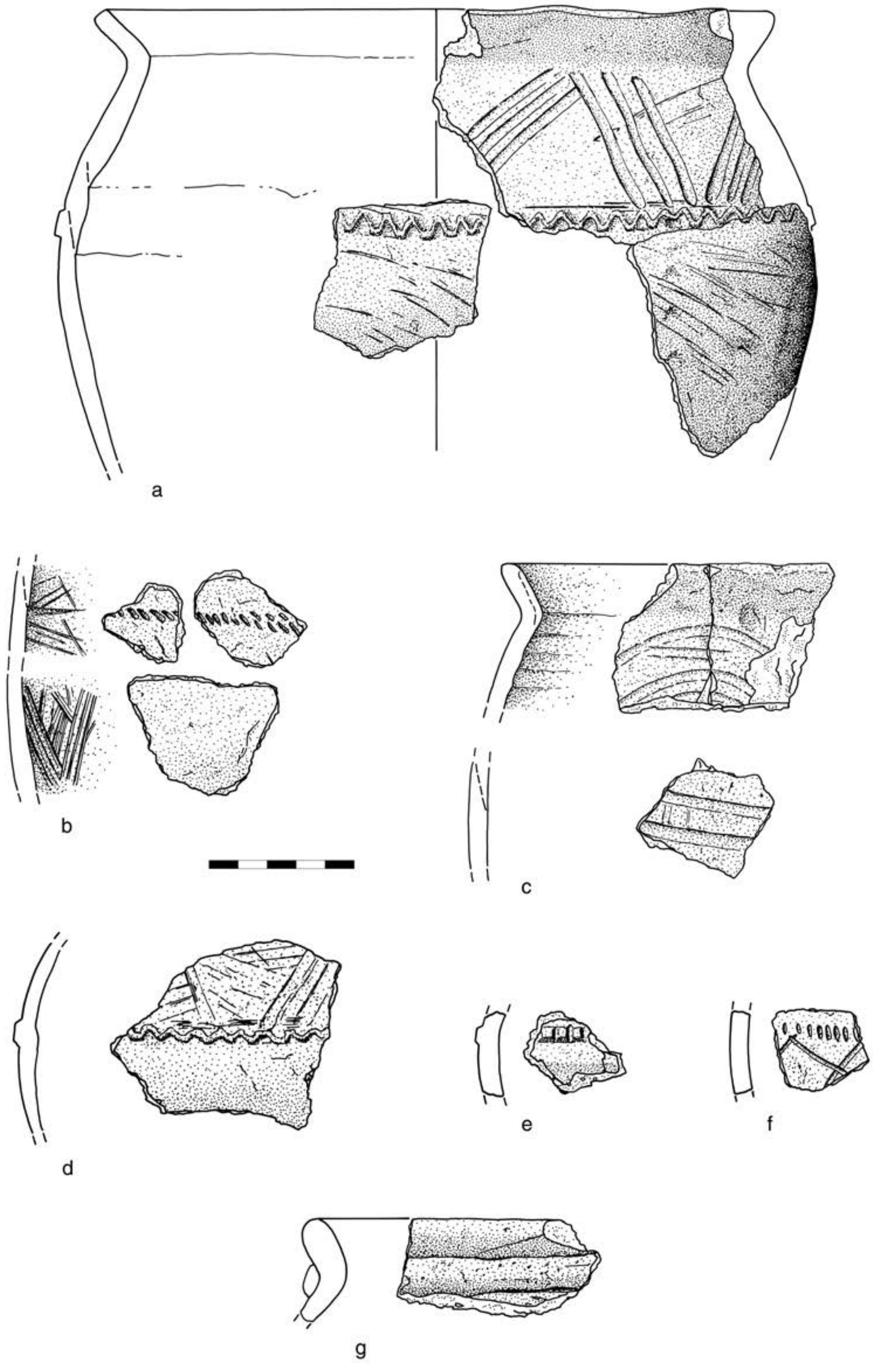


ILLUSTRATION 3.11
Phase 2, Block 8 continued, (a) V1473, (b) V1474, (c) V1535, (d) V1633, (e) V1580, (f) V1581, (g) V1691.

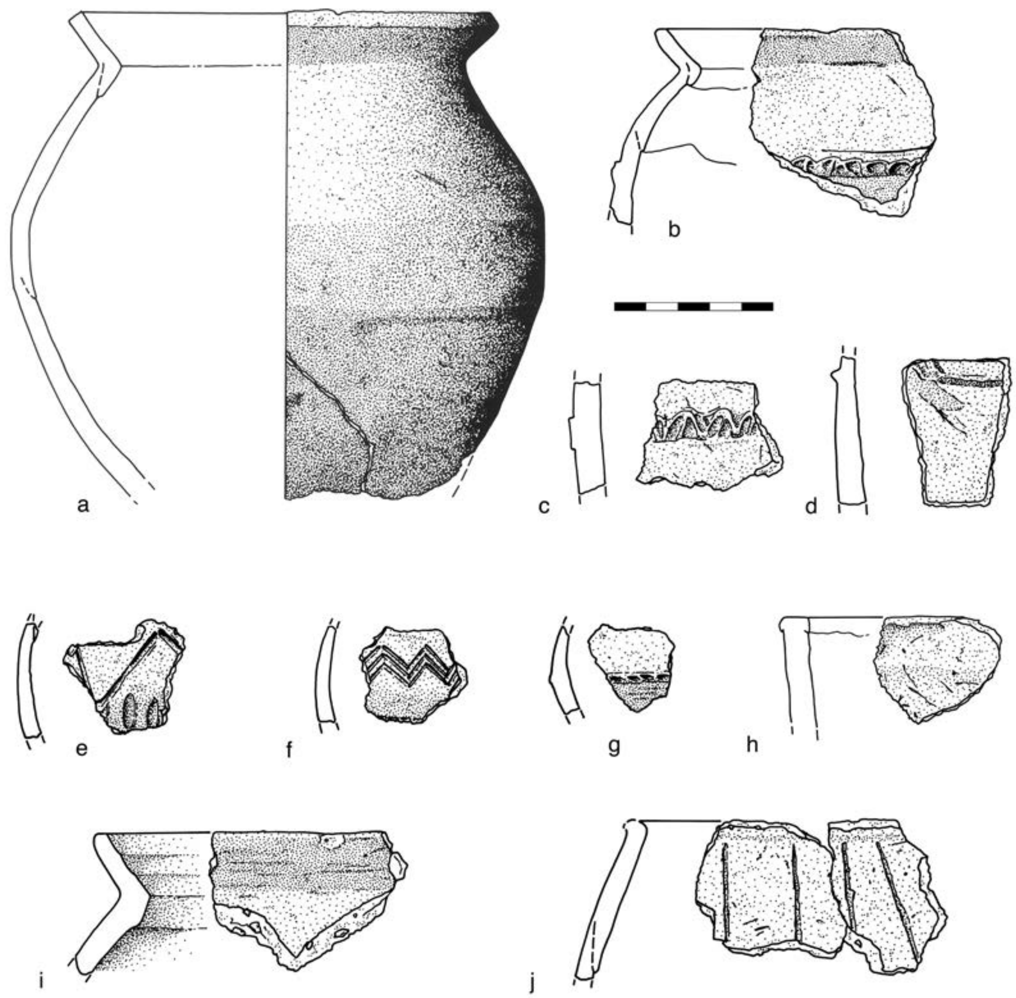


ILLUSTRATION 3.12
Phase 2, Block 8 continued, (a) V1367, (b) V1368, (c) V1371, (d) V1373, (e) V1377, (f) V1378, (g) V1381, (h) V1382, (i) V1383, (j) V1398.

oblique incisions below. Exterior smoothed. The fabric is sandy clay which has fired hard and is brown. Exterior sooted.

V1381 (Ill 3.12g)

Body sherd decorated with a slight cordon which has been incised obliquely. The fabric is fine clay which has fired hard and is red. Exterior sooted.

V1382 (Ill 3.12h)

Rim with flat lip. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular and rounded rock fragments up to 5mm long which has fired hard and is brown. Exterior sooted.

V1383 (Ill 3.12i)

Everted rim. The interior of the lip is decorated with ridges formed by finger impressing. Exterior smoothed. The fabric is fine sandy clay with *c* 60 per cent of angular rock fragments up to 9mm long which has fired hard and is grey with brown margins. Exterior sooted.

V1398 (Ill 3.12j)

Sherds from the neck of a vessel. Just below the neck the vessel is decorated with vertical incised lines, unevenly spaced. Exterior smoothed. Coil constructed, unsmoothed coil junction in the interior. The fabric

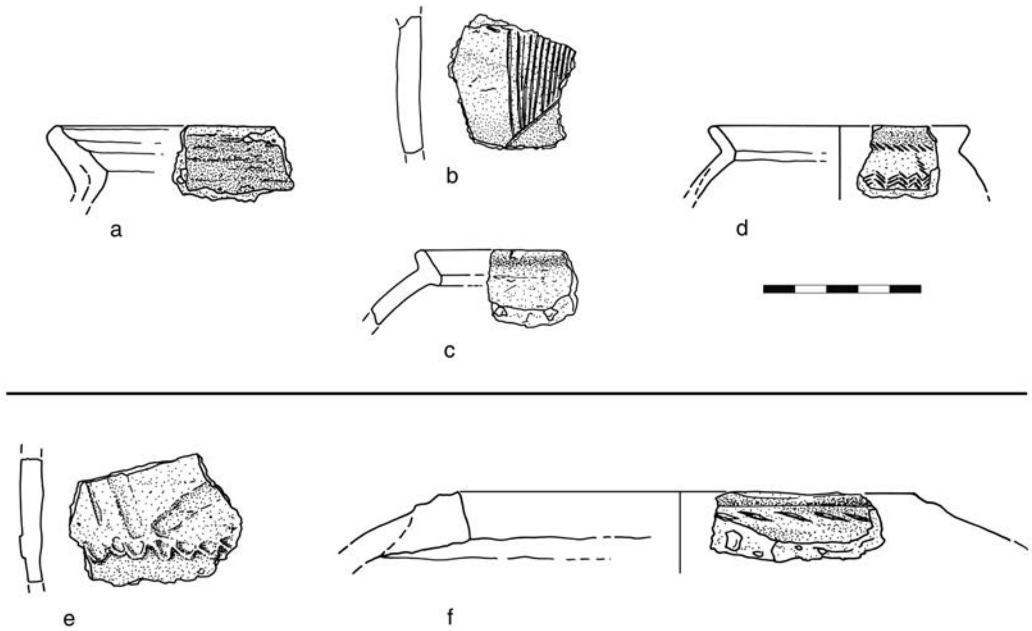


ILLUSTRATION 3.13
Phase 2 continued, Block 13, (a) V2235, (b) V2301, (c) V2302, (d) V2282; Block 14, (e) V2336, (f) V2346.

is fine sandy clay with *c* 10 per cent of angular rock fragments up to 9mm long which has fired hard and is red. Exterior sooted.

BLOCK 13

Context 143

V2235 (Ill 3.13a)

Everted rim with three finger-wide grooves in the interior. The fabric is fine clay with *c* 20 per cent of angular rock fragments up to 5mm long which has fired hard and is grey. Exterior sooted.

Context 144

V2301 (Ill 3.13b)

Body sherd decorated with an incised infilled triangle. Exterior slipped. The fabric is sandy clay with *c* 70 per cent of angular rock fragments up to 4mm long which has fired hard and is brown. Light sooting on exterior.

V2302 (Ill 3.13c)

Everted rim with an interior bevel. Exterior polished from just below the rim. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is buff.

Context 149

V2282 (Ill 3.13d)

Everted rim decorated with a horizontal row of short oblique incisions at the point of inflection. *c* 10 mm below this is a horizontal line of triple nested zigzags. Between the two is a vertical line of short oblique incisions. Exterior smoothed. The fabric is fine clay which has fired hard and is red. Hard fired.

BLOCK 14

Context 133

V2336 (Ill 3.13e)

Body sherd decorated with an applied wavy cordon above which are traces of incised lines and fingertip grooves. Exterior slipped. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with a red exterior margin. Exterior sooted. Patches of sooting on interior.

Context 154

V2346 (Ill 3.13f)

Heavily inverted rim. There are two ridges to the exterior of the lip below which is a row of oblique incised lines. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 4mm long which has fired hard and is grey. Exterior sooted.

PHASE 3

BLOCK 1

Context 043

V979 (Ill 3.14a)

Flared rim. Exterior smoothed. Coil constructed. The fabric is sandy clay which has fired hard and is grey with brown surfaces. Sooting on exterior and lower part of interior.

Context 083

V991 (Ill 3.14b)

Flared rim with incised lines just below the lip. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 7mm long which has fired hard and is grey with brown margins (see Section 2.5.1.2).

V993 (Ill 3.14c)

Flared rim decorated with an applied zigzag at the point of inflection of the rim and body. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 15mm long which has fired hard and is red with a grey core (see Section 2.5.1.2.)

Context 084

V1046 (Ill 3.14d)

Body sherd with applied zigzag decoration. Coil constructed, N-shaped junctions. The fabric is fine sandy clay with *c* 20 per cent of angular rock fragments up to 6mm long which has fired hard and is grey. Both surfaces sooted.

Context 100

V1077 (Ill 3.14e)

Body sherd decorated with a row of oblique incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is red. Interior sooted.

Context 141/136/100

V1006 (Ill 3.14f)

Everted rim with a pinched applied band at the point of inflection of the rim and body and an applied zigzag at the shoulder. Exterior smoothed. Coil constructed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 6mm long which has fired hard and is red. Exterior sooted.

BLOCK 2

Context 028

V1151 (Ill 3.15a)

Slightly everted rim with a flat lip. Exterior smoothed. The fabric is sandy clay with *c* 30 per cent of angular rock fragments up to 6mm long which has fired hard and is grey. Both surfaces sooted.

V1153 (Ill 3.15b)

Body sherd with applied decoration forming a 'chain' – one large circle with a row of small circles adjoining. Exterior smoothed. The fabric is sandy clay with *c* 30 per cent of angular rock fragments up to 5mm long which has fired hard and is grey. Exterior sooted.

V1154 (Ill 3.15c)

Body sherd decorated with incised lines, including a curved line. Exterior smoothed. Interior surface missing. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is red with a grey core. Exterior sooted.

Context 033

V1206 (Ill 3.15d)

Flat base with angled walls. The fabric is sandy clay which has fired hard and is grey with brown surfaces. Both surfaces sooted.

Context 034

V1213 (Ill 3.15e)

Flat rim. The fabric is sandy clay which has fired hard and is grey. Both surfaces sooted.

Context 104

V1134 (Ill 3.15f)

Body sherd decorated with two parallel lines of applied zigzag decoration. Exterior smoothed. Coil constructed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is brown. Exterior sooted.

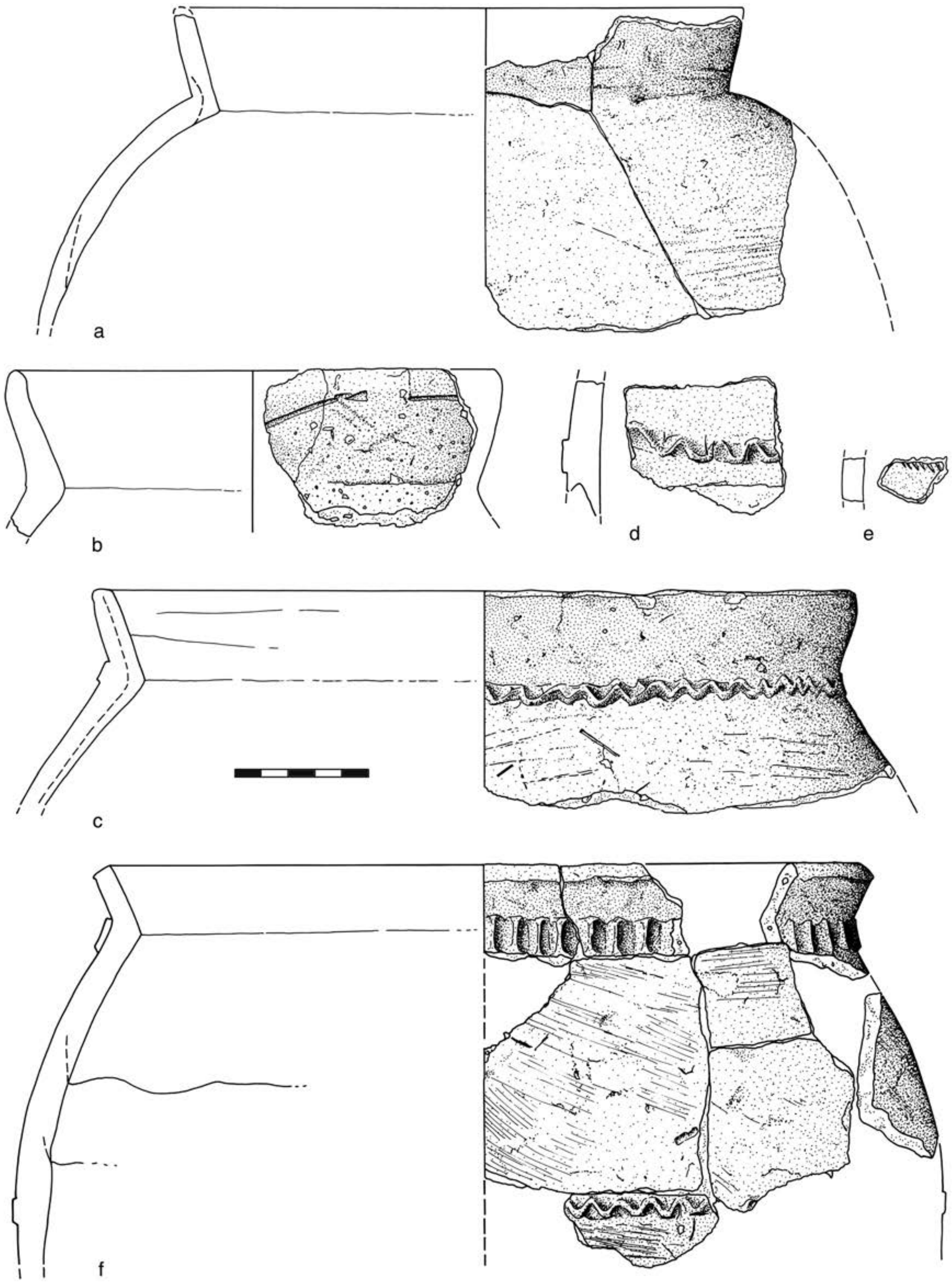


ILLUSTRATION 3.14
Phase 3, Block 1, (a) V979, (b) V991, (c) V993, (d) V1046, (e) V1077, (f) V1006.

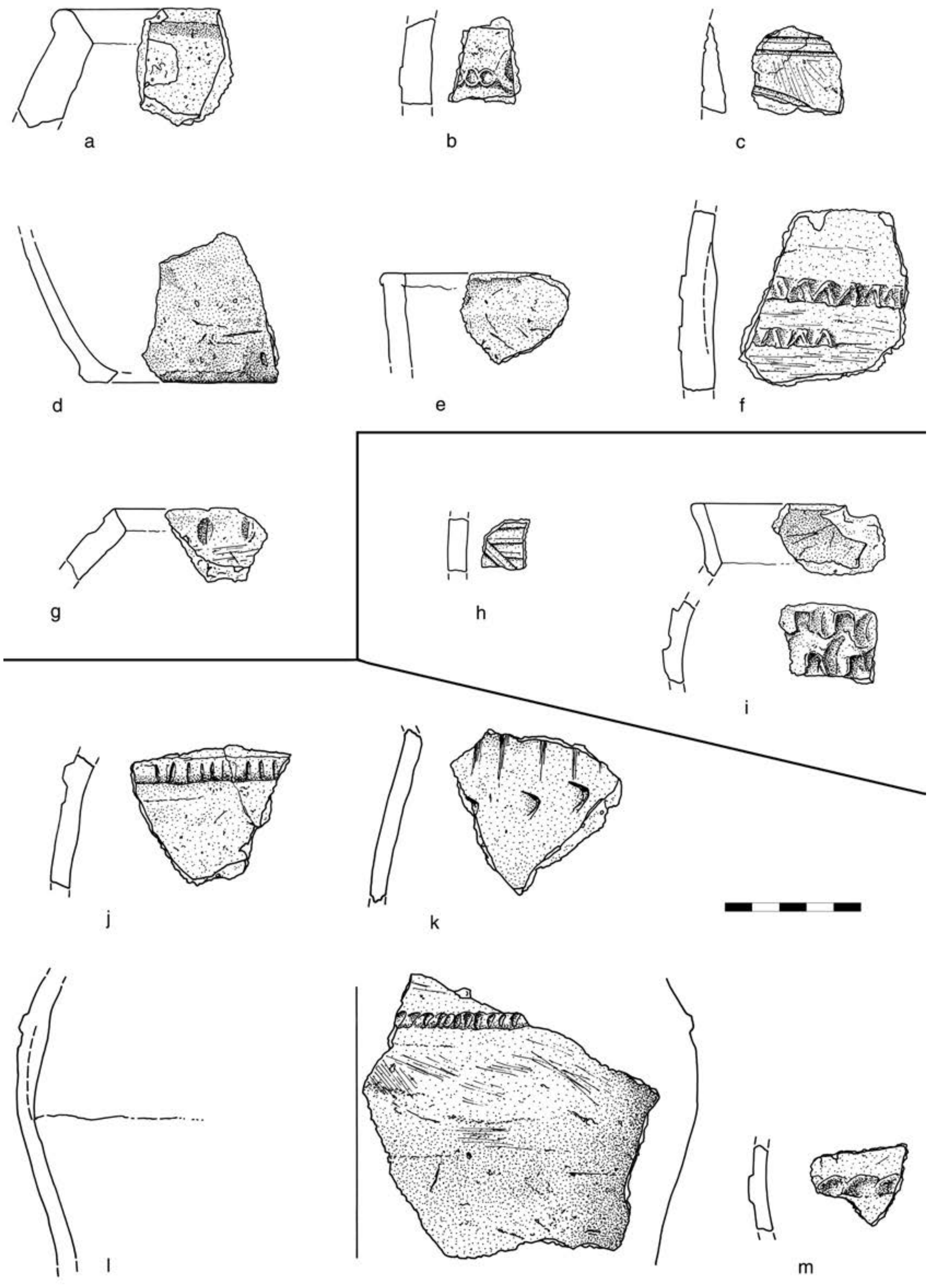


ILLUSTRATION 3.15
Phase 3 continued, Block 2, (a) V1151, (b) V1153, (c) V1154, (d) V1206, (e) V1213, (f) V1134, (g) V1142; Block 4, (h) V1097, (i) V1113; Block 6, (j) V1278, (k) V1281, (l) V1280, (m) V1282.

Context 147

V1142 (3.15g)
Bevelled rim with a line of finger-nail impressions below the lip. Exterior smoothed. The fabric is sandy clay which has fired hard and is red.

BLOCK 4

Context 094

V1097 (Ill 3.15h)
Body sherd with combed decoration, possibly forming chevron-style decoration. The fabric is sandy clay which has fired hard and is red.

V1113 (Ill 3.15i)
Everted rim. Body sherd with two rows of applied, squared-off, zigzag decoration. The fabric is fine sandy clay which has fired hard and is grey with red margins. Light sooting on both surfaces.

BLOCK 6

Context 123

V1278 (Ill 3.15j)
Body sherd decorated with an applied cordon cut vertically by incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 2mm long which has fired hard and is black with a brown exterior surface. Both surfaces sooted.

V1281 (Ill 3.15k)
Body sherd decorated with a line of V-shaped impressions. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with a red exterior margin. Interior sooted.

V1280 (Ill 3.15l)
Body sherd decorated with an applied cordon cut by closely spaced oblique incisions. Shouldered vessel. The fabric is fine sandy clay with *c* 20 per cent of angular and rounded rock fragments up to 7mm long which has fired hard and is red. Both surfaces sooted.

V1282 (Ill 3.15m)
Body sherd decorated with a cordon which has been obliquely pinched. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with a buff exterior margin. Light sooting in the interior.

BLOCK 18

Context 018

V2559 (not illustrated)
Flat part of a base decorated with deep finger impressions. The fabric is sandy clay which has fired hard and is grey with a red interior margin. Exterior sooted.

V2573 (Ill 3.16a)
Flat rim. Exterior wiped. Decorated with a row of oblong impressions just below the lip. The fabric is sandy clay with *c* 10 per cent of angular rock fragments which has fired hard and is brown with a grey core. Both surfaces sooted.

V2576 (Ill 3.16b)
Flat rim decorated with thick incised decoration, possibly infilled triangles. Exterior smoothed. The fabric is sandy clay which has fired hard and is grey with a red exterior and a brown interior.

V2577 (Ill 3.16c)
Body sherd decorated with an applied dimpled boss. Exterior smoothed. The fabric is sandy clay which has fired hard and red. Exterior sooted.

V2659 (Ill 3.16d)
Inverted rim with a flat lip. Below the lip is a row of short stabbed impressions. Horizontal wiping below the decoration. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with red margins.

V2660 (Ill 3.16e)
Slightly everted rim with a row of inverted V impressed decoration at the point of inflection of the rim with the body. Applied zigzag around the shoulder. Exterior wiped below zigzag. The fabric is sandy clay which has fired hard and is grey with buff margins. Sooting on both surfaces.

V2663 (Ill 3.16f)
Everted rim with lentoid impressions at the neck. Exterior smoothed. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is brown. Both surfaces sooted.

V2667 (Ill 3.16g)
Body sherds decorated with an applied cordon which is incised vertically. Above the cordon are oblique incised lines. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with red surfaces. Both surfaces sooted.

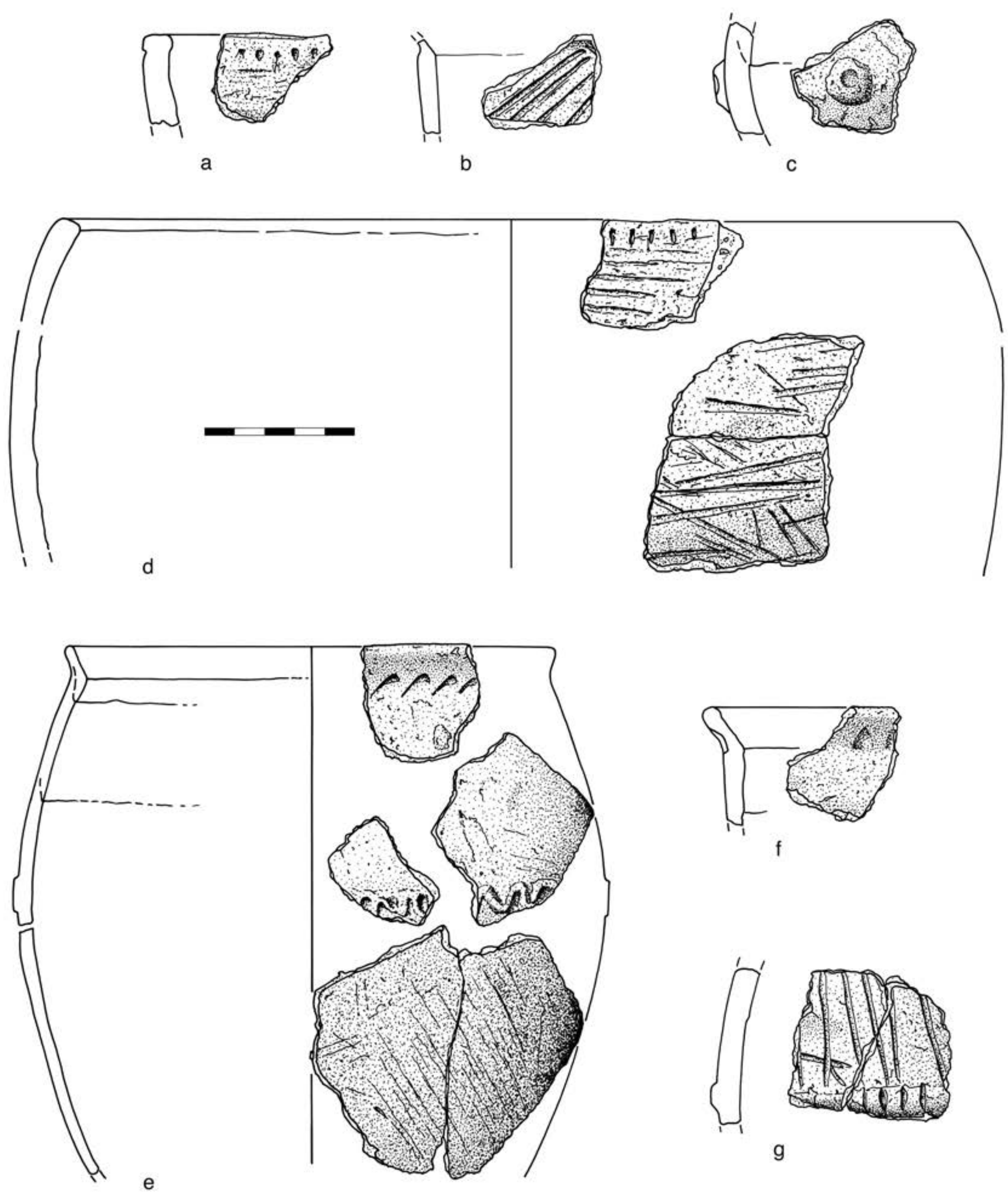


ILLUSTRATION 3.16
Phase 3 continued, Block 18, (a) V2573, (b) V2576, (c) V2577, (d) V2659, (e) V2660, (f) V2663, (g) V2667.

Context 038

V2761 (Ill 3.17a)

Body sherd decorated with an applied band decorated with closely spaced thick vertical incisions. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 3mm long which has fired hard and is brown. Both surfaces sooted.

Context 048

V2778 (Ill 3.17b)

Body sherd decorated with thick wavy cordon. Vertical wiping below. Coil constructed – N-shaped junction. The fabric is sandy clay which has fired hard and is grey with a red exterior margin. Interior sooted.

V2779 (Ill 3.17c)

Sherds from a flat-based, necked vessel with barrel-shaped sides. Cordon wih finger indentation (probably from applying the cordon) above shoulder. The rim has a flat lip. Exterior smoothed. Coil constructed – unsmoothed junctions in the interior. The fabric is sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with brown surfaces. Exterior sooted. Interior has light sooting and a creamy-coloured residue.

Context 068

V2720 (not illustrated)

Everted rim decorated with an applied pinched band 6cm below the neck of the vessel. Exterior smoothed. Interior wiped. Coil constructed – junctions visible in section. The fabric is sandy clay with *c* 20 per cent of angular rock fragments up to 8mm long which has fired hard and is oxidized and is brown. Both surfaces sooted.

V2721 (Ill 3.17d)

Body sherd decorated with rows made up of short incised lines – a horizontal line below the neck, one 4cm below, and a vertical one between. The fabric is sandy clay which has fired hard and is grey with brown surfaces. Both surfaces sooted.

V2723 (Ill 3.17e)

Body sherd decorated with a very thick applied zigzag. Exterior wiped. The fabric is sandy clay which has fired hard and is grey with a red exterior. Internal residue.

V2724 (Ill 3.17f)

Sherds from a decorated vessel with an everted rim. The decoration comprises an applied zigzag decorated with incised lines above which is deeply incised decoration, probably triangle-based. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 5mm long which has fired hard and is grey with brown surfaces. Both surfaces sooted.

PHASE UNCERTAIN

BLOCK 7

Context 010

V1261 (Ill 3.17g)

Body sherd decorated with V-shaped impressions. Exterior wiped. Interior combed. The fabric is fine clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and is grey with a buff interior surface. Exterior sooted. Interior lightly sooted.

Context 209

V1250 (Ill 3.17h)

Body sherds decorated with incised lines. Exterior smoothed. The fabric is fine sandy clay with *c* 10 per cent of angular rock fragments up to 4mm long which has fired hard and has a buff, grey exterior and a red interior.

3.3 CERAMIC ARTEFACTS

Fraser Hunter and Ann MacSween

A single purpose-made spindle whorl (SF284, Ill 3.18e) was found; the remainder were reworked from broken potsherds while an unfinished example (SF256, Ill 3.18b) illustrated the production process. The only other ceramic artefact was a lump of fired clay with fingerprints, perhaps a small portion of potter's raw material which was accidentally fired (SF285, not illustrated). Three of the sherd whorls come from Bays 1 and 2 of Wheelhouse 1 during its Phase 2 occupation (SF98 (Ill 3.18a), SF280 (Ill 3.18d) and SF281 (not illustrated)), while another had been jammed into the wall of Bay 2, during either Phase 1 or 2 (SF256, Ill 3.18b). The others appear to be from re-deposited contexts, most likely from Phase 2 occupation of Wheelhouse 1.

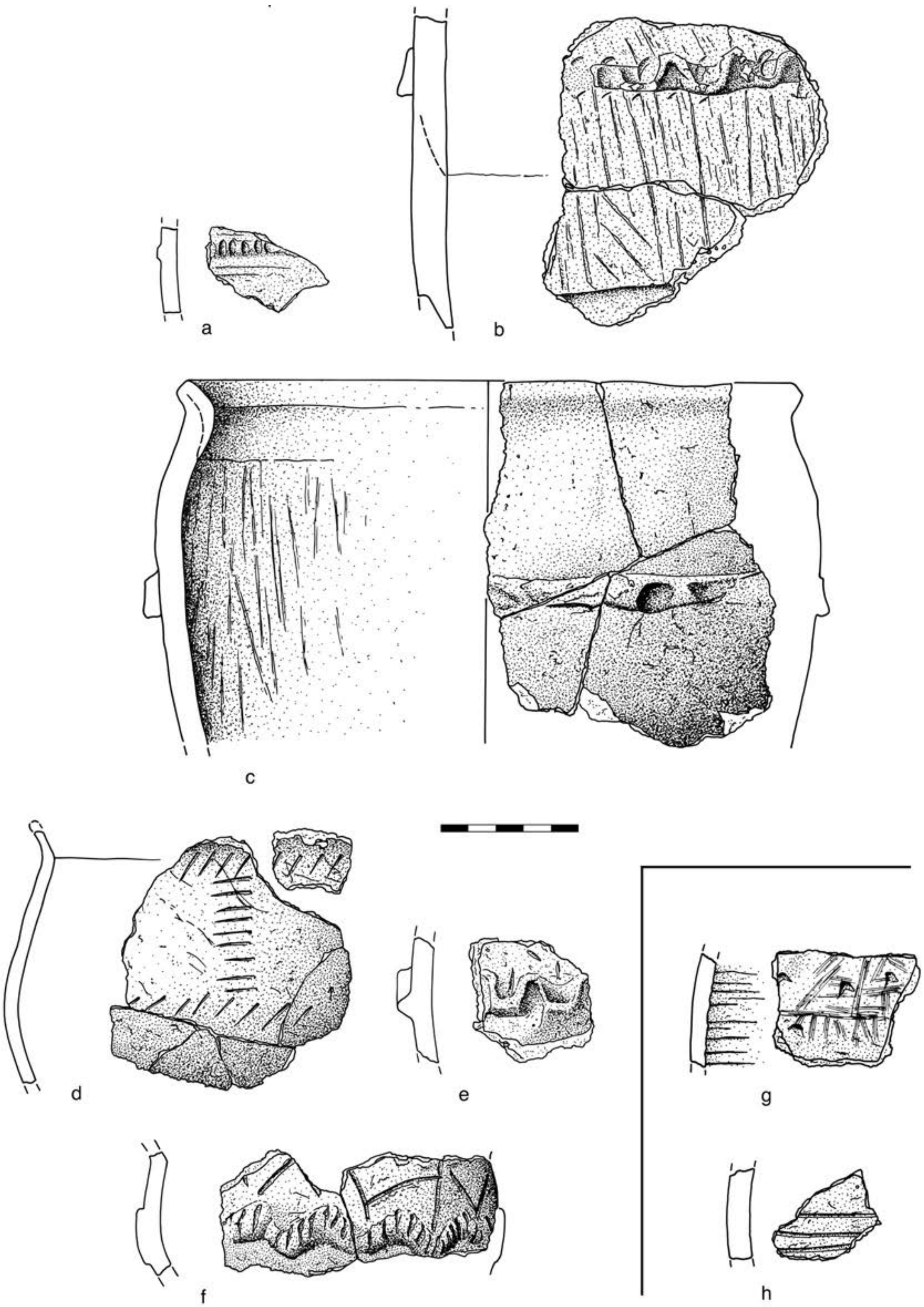


ILLUSTRATION 3.17
Phase 3, Block 18 continued, (a) V2761, (b) V2778, (c) V2779, (d) V2721, (e) V2723, (f) V2724; Phase uncertain, Block 7, (g) V1261, (h) V1250.

SF98 (Ill 3.18a)
Spindle whorl made from a potsherd worked into a sub-circular form with an approximately central, slightly waisted perforation. Surface wiped on the exterior. Sandy clay fabric, fired hard, grey with red surfaces. Exterior surface is sooted; sooting and residue on exterior. D 6.5mm, L 60mm, W 55mm, T 7–8.5mm, m 35.9g. Context 173, Block 5b, Phase 2 (Bay 2 of Wheelhouse 1).

SF256 (Ill 3.18b)
Unfinished spindle whorl. Potsherd with edges broken to form a crude circle, probably unfinished; perhaps abandoned because the central perforation was crude and non-central. Sandy clay fabric, fired hard, grey with red surfaces; sooting on both surfaces. L 56mm, W 55mm, T 7.5 – 9 mm, central perforation 8.5 × 5mm, worked bifacially but somewhat offset, m 32.4g. Context 080, Block 6 (within Wheelhouse 1 structural masonry, Bay 2).

SF278 (Ill 3.18c)
Spindle whorl (half surviving) with central slightly waisted perforation. Sandy clay fabric with *c* 20 per cent of angular rock fragments up to 4mm long, fired hard, red; exterior surface sooted. D 36mm, T 9mm, Central perforation D 5mm, m 8.3g. Context 067, Block 8, Phase 2 (midden material formed over Structure 4).

SF279 (not illustrated)
Spindle whorl fragment. Sandy clay fabric with *c* 20 per cent of angular rock fragments up to 4mm long, fired hard, grey with red exterior surface, both surfaces sooted. Original diameter *c* 65mm. L 28mm, W 19mm, T 10mm. Context 147, Block 2, Phase 3 (wall of Structure 8).

SF280 (Ill 3.18d)
Spindle whorl. Potsherd worked into an irregular circle, edges well-finished but broken in places. Sandy clay fabric, fired hard, grey with brown surfaces; both surfaces sooted. Approximately central tapering perforation, D 7mm. L 56mm, W 51mm, T 6–8.5mm, m 29.2g. Context 196, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

SF281 (not illustrated)
Spindle whorl fragment. Potsherd worked into a circle, original diameter *c* 60mm, with traces of an off-centre perforation preserved in the fracture surface. Sandy clay fabric, fired hard, red exterior, buff interior. Exterior surface burnished and sooted. L 50mm, W 24mm, T 10mm. Context 265, Block 5a, Phase 2 (Bay 2 of Wheelhouse 1) (see Section 2.4.1.5).

SF282 (not illustrated)
Spindle whorl, *c* 50 mm D, with a perforation *c* 9mm D. Fine sandy clay fabric with *c* 20 per cent of angular rock fragments up to 3mm long; fired hard, oxidized (red/buff). T 7–9mm. Context 140, Block 13, Phase 2 (dumped fill within Structure 5).

SF283 (not illustrated)
Spindle whorl or counter fragment, *c* 80mm D. Sandy clay fabric, fired hard, oxidized (red). L 41mm, W 22mm, T 9mm. Context 266, Block 8, Phase 2 (secondary floor deposits in Structure 4) (see Section 2.4.3).

SF284 (Ill 3.18e)
Biconical spindle whorl with a rounded profile. Around 40 per cent survives, with the remains of a cylindrical perforation (D 4.5mm). D 42mm, H 28mm. Unstratified.

SF285 (not illustrated)
Fired clay lump; irregular squashed ovoid grey lump with a deep finger mark on one edge, possibly others, and scattered organic impressions, perhaps straw. The inclusion of grits suggests this may be a lump of gathered and tempered clay which was accidentally fired. 116 × 100 × 57mm. Context 018, Block 18, Phase 3 (midden deposit formed over Structure 4 during Phase 3).

3.4 HUMAN BONE

Kath McSweeney

The four pieces of human bone recovered from Cnip comprise three skull fragments and a tibia fragment. The skull fragments belong to two adults, probably middle-aged, and one young adult. The only one for which sex is indicated (HB01) is male. Two of the skull fragments have clearly been modified, one after death (Context 171) and one possibly before (Context 071), while the third was found in a clearly votive context (Context 031). This suggests that the bias towards skull frag-ments reflects some deliberate selection on the part of the wheelhouse inhabitants. Modified human skull fragments are difficult to parallel in the Atlantic Iron Age. Although a chopped piece of human skull was recovered at Dun Mor Vaul (MacKie 1974, 214: plate XIV.B) it was found with a re-deposited burial

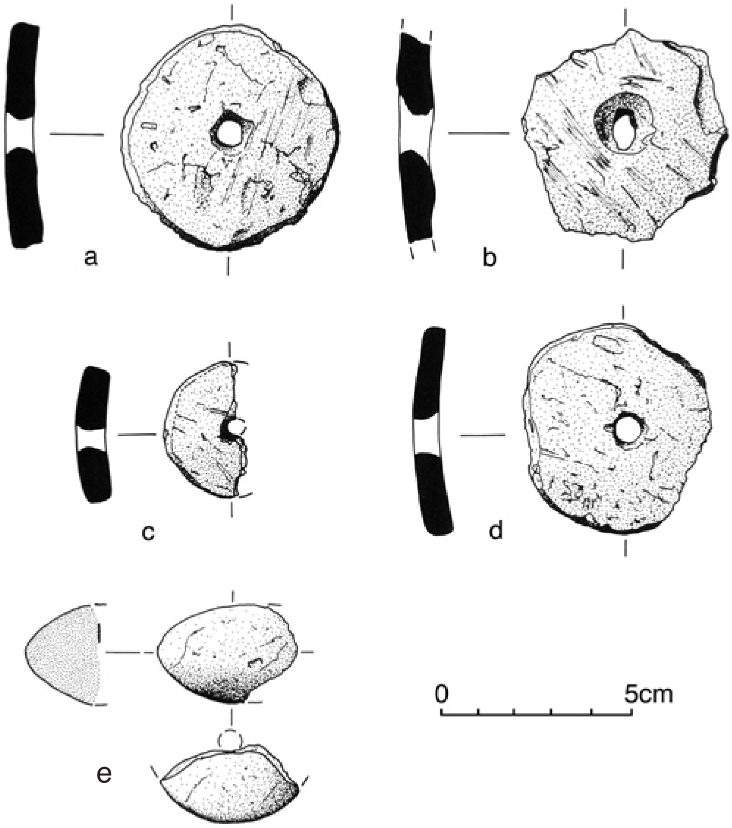


ILLUSTRATION 3.18
Ceramic artefacts, (a) SF98, (b) SF256, (c) SF278, (d) SF280, (e) SF284.

and may simply indicate that the individual had died violently. The possible significance of the curation and re-working of human remains is discussed further in Chapter 7.

HB01 (not illustrated)
Partial skull. This partial human skull consisted of an almost complete frontal bone with upper orbits and the upper part of the nasal bone, the anterior third of the left parietal and a small part of the right parietal. The coronal suture (the joint between the frontal bone and the parietals) had fused, being obliterated internally, although still visible externally. The degree of fusion suggests that this belonged to an adult, probably of middle age, although as the rate of cranial suture fusion varies greatly between individuals, the assessment of age must be considered as tenuous. The brow ridges on this individual were well pronounced and the forehead sloping suggesting that this was a male. No pathological lesions were noted.

Another fragment of cranium could not be joined to the remainder of the skull and was of a slightly different colour and texture. It is similar to part of a human temporal bone but may in fact be animal. If it is human it is unlikely to be part of this skull. Gnaw marks are visible on the external surface of the fragment. Context 031, Block 15, Phase 1/2 (hollow scooped into fill of Wheelhouse 2 prior to building of Structure 3) (see Section 2.3.2.2 and 2.4.2.1).

HB02 (not illustrated)
Cranial fragment. Triangular fragment of cranium, 65mm × 60mm × 55mm. The presence and position of furrows for the parietal branch of the middle meningeal vessels on the internal surface indicate that this is part of a left parietal bone, most likely from the superior anterior part of the bone, close to the sagittal suture. Cranial wall thickness is approximately 7.5mm. It is known that the cranium thickens with age, although the rate varies amongst

individuals and it is not possible to directly correlate age with thickness. However, it is likely that this fragment came from an adult. If so, the presence of open coronal sutures, which gradually fuse and eventually obliterate with age, albeit at a variable rate, would suggest that this was a young adult. There is no indication of sex. Fine pits over the external surface of the fragment indicate increased porosity of the vault and may be an indication of iron deficiency anaemia (Roberts & Manchester 1995, 167–9).

The longest edge of the fragment appears to have broken naturally, while the shortest edge has separated at the open coronal suture (the suture which joins the parietal bone with the frontal bone). The third edge is slightly curved and has been bevelled, possibly by a knife, along the length of the edge of the fragment, both on the internal and external surfaces, to form a shallow V-shape. Apart from the remodelling on the underside of the altered edge, no other modifications to the internal surface are visible. On the external surface, close to and parallel to the cut edge, an area approximately 10mm wide along the length of the fragment surface has been shaved. The shaving takes the form of five shallow scoops. This deliberate remodelling continues right up to the adjoining broken and sutural edges, indicating that it may originally have extended over a greater area.

Several cut marks, peripheral to the shaved area, are also visible. The longest is approximately 17mm long and *c* 1mm deep. Another shallower cut is *c* 8mm long. At least eight other fine cuts on the bone surface can be seen with the aid of a magnifying glass. The purpose of this alteration is not entirely clear. There is no indication of healing of the bone surface as would have occurred had this operation been carried out during life and the individual had survived, and so the changes must either been inflicted just prior to the time of death or at some subsequent point. Equally, the appearance of the changes suggest that they are not recent, and probably occurred in antiquity while the bone was still 'fresh'. One, although unlikely, possibility is that the marks were caused by scalping. Scalping involves the removal of the scalp using a sharp implement 'leaving short, straight or slightly curved cut marks on the frontal and parietal bones of the skull' (Olsen & Simpson 1994, as quoted by Roberts & Manchester 1995, 85). The shaving and cut marks on the outer surface of this fragment could be interpreted as evidence for scalping, although the internal and external bevelling of the cut edge would rule this hypothesis out.

Another possible explanation for the modifications is that they were the result of trepanation. This has been practised by various cultures throughout the world, including Britain, since very early times (although no other Scottish cases are known to the author). The operation involved the removal of an area of the skull, although the precise methods used and the extent of bone removed varied. The most common method was 'the careful scraping of the bone with a sharp implement to the desired depth' (Ortner & Putschar 1981, 97). Roberts and Manchester (1995, 93), in discussing the various methods of trepanation, describe the scraping method as involving the removal of the bone surface and the bevelling of the edges of the wound. Operations were mostly performed on the left side of the frontal or parietal bone. Ortner and Putschar (1981, 97), in reporting the findings of research carried out by TD Stewart, state that the incision into the overlying skin 'may produce scratches on the underlying bone and can occasionally be seen peripherally to the trephine'.

The evidence for the scraping of the bone surface, the cut marks, the positioning of the lesion at the left parietal, and the bevelled edge in the Cnip fragment do point to trepanation as a strong possibility. The fact that the bevelling appears to have been carried from both an internal and external direction would at first seem to dismiss the possibility of trepanation. However, McKinley's description of a possible case from Hertfordshire refers to both inner and outer bevelling of the edges of the wound (McKinley 1992).

Unfortunately, this is only one small fragment and without having the whole skull, it is not possible to state with any degree of certainty that this is a definite case of trepanation. One would also expect, if this were a case of trepanning, that the bevelled edge would be curved inwards and not outwards as in the Cnip fragment. However, trepanning was often carried out secondary to a skull fracture and this could be the case here. If this is indeed evidence for trepanation, the absence of bone healing suggests that the person died during or soon after the operation. It is also possible that this bone was modified after death, although for what purpose is very difficult to imagine. Context 074, Block 2, Phase 3 (wall-packing behind north wall of Structure 8) (see Sections 2.5.3.2 and 2.5.1.1).

HB03 (not illustrated)

Cranial fragment. This piece of cranium, sub-triangular in shape and measuring approximately

95mm × 60mm × 60mm, consists of the posterior part of the right parietal bone with a small part of the adjoining occipital bone. The section of lambdoidal suture (which joins the parietals and occipital bone) is almost completely obliterated internally but still clearly visible externally. The edges all appear to have been broken naturally, that is, they had not been cut. The degree of sutural fusion suggests that this bone was from an adult, probably of middle age. There is no indication of sex. A traumatic lesion in the form of a cut mark is visible on the external surface of the parietal part of the fragment. The cut, about 12mm long, was superficial, only penetrating the uppermost part of the outer surface of the bone. Some bone repair of this minor injury can be seen, confirming that it occurred during life. A series of striations along one edge on the external surface may be gnaw marks, but the lack of corresponding tooth marks on the underside of the fragment suggests that, if so, they were inflicted before the bone was fragmented.

Evidence of drilling can be seen on the longest edge, forming an 'hourglass-shaped' perforation. This appears to have been formed by drilling both from the external surface and at the same point from an internal direction, to approximately half-way through the thickness of the bone until both perforations met. The drill hole on the external surface is wider and deeper than that on the internal side. Another attempt at drilling can be seen on the internal surface very close to the first. It is quite possible that the fragment split upon drilling, either on the first or second attempt.

The purpose of the drill holes is not clear. One method of trepanation was to drill similar small holes in the skull and cut through the narrow connecting bars between them (Brothwell 1981, 123). However, the drilling on this fragment was partly carried out from the internal surface, ruling out trepanation as a possible cause. For whatever purpose, the bone must have been modified some time after death. Context 171, Block 8b, Phase 2 (deposits formed within entrance area to Structure 4) (see Section 2.4.3.4).

HB04 (not illustrated)

Tibia fragment. Section of distal half of right tibia, broken at each end. The distal end has fractured just above the distal articulation and, at the proximal end, about midshaft. Both breaks appear recent, possibly resulting from machine damage during the initial clearance of the site (as the context from which the fragment derives was the uppermost archaeological horizon in this part of the site). The external surface of the bone is somewhat eroded, in keeping with deposition in a midden but there is no evidence of gnawing. Size suggests that this belongs to an adult, although it could also be from an adolescent. There is no indication of sex, or evidence of trauma or disease. Context 018, Block 18, Phase 3 (midden accumulated over the abandoned Structure 4).

3.5 BONE AND ANTLER

Fraser Hunter
(with species identifications by Andrew Kitchener)

3.5.1 GENERAL

The great value of the Cnip assemblage is its close contextual dating. This gives it considerable importance in the wider study of bone and antler artefacts: so much of the wealth of bone from the Western and Northern Isles comes from early excavations where the stratification is unreliable, and the dating of individual types and working techniques is resultingly vague. While some types are undeniably long-lived, with others we may expect more chronological change, and the Cnip material will be of value for future studies in providing some fixed points. Many of the types represented here are common on wheelhouse sites, and frequent reference will be made to the important survey by Hallén (1994) of the large assemblages from the long-lived wheelhouse sites at Foshigarry and Bac Mhic Connain, North Uist, as her work summarizes much of the available literature. Only with more unusual items are wider parallels sought.

In total there are 81 bone and antler finds (55 objects or roughouts and 26 fragments of working debris). The catalogue attempts to classify the finds in functional terms using the following categories: manufacturing evidence; tools; ornaments; leisure; fittings; and uncertain (Table 3.21). This has the advantage of interpreting the data in more human terms, but there are some problems. In particular, it risks creating a certainty over use which is often lacking. Interpretation is hindered by a modern unfamiliarity with the uses of bone tools, and for many artefact types the suggested functions are little more than guesses or span a range of possibilities. This greatly inhibits any reconstructions of lifestyle, and is an area which deserves more thorough appraisal: Clarke (1971, 33–8) has highlighted the value of ethnographic analogy, but this has been little pursued.

The utilized whale bone suffers from particular difficulties. While it was clearly extensively used as

TABLE 3.21
Composition of the bone and antler assemblage; there appear to be no significant differences between phases.

Category	**Phase 1**	**Phase 2**	**Phase 3**	**Later / uncertain**	**Total**
Antler-working debris	2	10	10	1	23
Bone-working debris		3			3
Roughouts	2	6	3		11
Tools	4	10	8	1	23
Ornaments	2	5	1		8
Leisure		1	1		2
Fittings	1				1
Miniatures			1		1
Unidentified	1	4	1		6
Missing		3			3
Total	12	42	25	2	81

a resource, the surviving fragments are often insufficient to identify with certainty, and even with relatively intact pieces functions can be quite obscure (MacGregor 1974, 86). Some categories of whale bone artefact are well-defined and widespread (ibid, 86, 106), but many smack of expediency in the use of an occasional resource (cf Hallén 1994, 199). The species exploited at Cnip comprise sperm whale and baleen whales, including a definite minke whale. In most cases vertebrae, ribs and parts of the skull were used. All of these species commonly strand, offering resources of meat, blubber and bone.

The finds give us a number of insights into life at Cnip. Antler, land mammal and cetacean bone were all being worked on the site. The surviving products are everyday rather than specialist, and are dominated by a wide range of tools (see Section 3.5.3), with evidence of agriculture (see Section 3.5.3.1) and the working of hides (see Section 3.5.3.2), textiles (see Section 3.5.3.3), and either pottery manufacture or bronze casting (see Section 3.5.3.4). Two different forms of composite tools are also present (SF101, SF181, SF299, Ill 3.21h–j, see Section 3.5.3.6), where a bone or antler sleeve acted as a holder for an inserted tool tip. This has rarely been noted before, but a survey of NMS collections revealed similar examples to SF181 from Midhowe, Orkney; A' Cheardach Mhor, South Uist; and Bellochban, North Uist (Callander & Grant 1934, 493, fig 36:1–2; Young & Richardson 1960, 163, fig 7:15; Beveridge 1911, 230–1). Ornaments (see Section 3.5.4) are represented by simple pins (see Section 3.5.4.1), while a range of domestic fixtures and fittings were also being produced.

TABLE 3.22
Raw material by phase. wd = working debris.

Phase	**Antler + wd**	**Bone + wd**	**Cetacean**	**Uncertain**
1	5 + 2		2	3
2	8 + 10	2 + 3	16	4
3	1 + 10	4	5	4
Later / uncertain	0 + 1			1
Total	14 + 23	6 + 3	23	12

All the above are what would be expected in a wheelhouse. The most interesting aspect of the assemblage is a small number of unusual finds. Their identification is not straightforward, with detailed arguments rehearsed below. Two of the finds give some insight into leisure activities at the site. The gaming piece (SF145, Ill 3.24b, see Section 3.5.5) is an unusual find, although there is other evidence for board games at this time both in the Western Isles and elsewhere in Scotland. Its relatively elaborate shape suggests it may have been the equivalent of a king piece in a game of strategy. Burial evidence from elsewhere suggests board games were a pursuit of the wealthy, and this may be relevant to the occupiers of Cnip, although a wider study of games in the Scottish Iron Age is required. The ?lyre tuning peg (SF50, Ill 3.24a, see Section 3.5.5) is another unusual find which hints at occupants of some status. The putative sword model (SF20, Ill 3.24d, see Section 3.5.7), while more tentative, is another unusual but not unparalleled find, most likely to represent a votive miniature.

The osteological identifications are the work of Dr Andrew Kitchener (NMS, Natural Sciences Dept). His full report is in the site archive; Table 3.22 summarizes the results. It is notoriously hard to identify finely worked pieces, especially items such as pins where the original surfaces and features have been worked away, but it is likely that many of these are of bone: the natural form of bones such as ulnae and fibulae is well-suited to pin manufacture, while such ornaments do not require the structural strength of antler and cetacean bone. With this marked caveat, the assemblage is dominated by antler and cetacean bone, both noted for their structural properties (MacGregor 1985, 23–29). They are thus good choices for the tools which dominate the assemblage. There are patterns within this: anvils and working surfaces are all of cetacean bone, as these combine resilience with large bones offering flat surfaces; while all the identifiable handles are of antler, which again combines a convenient shape with good physical properties of strength and toughness. There are no clear patterns of raw material use by phase, although it is noteworthy that cetacean bone was available throughout the site's use.

3.5.2 MANUFACTURING EVIDENCE

3.5.2.1 Antler-working debris

The antler-working debris illustrates a typical production sequence, with removal of the base, tines and terminal points to create segments of beam for working into artefacts (Hallén 1994, 196). The surviving bases are all (bar one) from cast antlers, and all appear to be from young animals or deer with poorly developed antlers, typical of free-ranging Scottish red deer today. Some tines were subsequently used for artefacts such as handles (SF250, Ill 3.21g, see Section 3.5.3.5), but most were discarded. The main technique used in dismembering the antler was by circumferential sawing through the cortex and then snapping, a typical approach (Hallén, op cit; MacGregor 1985, fig 32), but circumferential knife-cutting is also represented (SF66, SF143), as is chopping by knife (for small tines eg SF202) and axe (SF52). In one instance there are crush-marks from (ineffective) use of a small hammer (SF292). There is no chronological patterning to the different techniques.

Some of the offcuts saw expedient use. There are examples used as working surfaces (SF170, Ill 3.22c, see Section 3.5.3.7 and SF69f), while on SF288 the fracture surface was hollowed, suggesting use as a convenient support or temporary handle.

Only pieces of antler with working evidence were studied; unworked antlers or fragmentary pieces with no surviving tool traces were not considered. The working debris is found throughout Phases 1–3.

BASES (N=7)

SF66 (not illustrated)

Proximal end of cast antler, broken at both ends. Bez tine removed by knife-cutting and snapping. Other working traces destroyed. L 160mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF69B (not illustrated)

Shed base and brow tine, detached by sawing and snapping. L 205mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF69F (not illustrated)

Shed base, detached above bez tine by sawing and snapping; tines removed by chopping. Scattered knife cuts over one surface suggest expedient use as working surface. 85 × 72 × 45mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF143 (not illustrated)

Cast antler base, detached from rest of antler by circumferential knife-cutting and snapping. 42 × 36 × 35mm. Context 196, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

SF286 (not illustrated)

Shed base and lower beam, the brow tine cut off, bez tine intact. Punch marks at beam-brow tine junction from expedient use as a working surface. Worn. L *c* 85mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF287 (not illustrated)
Shed antler base, broken, detached above the bez tine by chopping and snapping; the tines were left intact. 86×114mm. Context 109, Block 1, Phase 3 (Structure 8 walling).

SF288 (not illustrated)
Discarded base of a butchered antler, chopped and snapped below the tines. The fracture surface was partly hollowed out, perhaps to serve as an expedient handle or support. L 87mm, W 53mm, T 40mm. Context 048, Block 7, Later Activity (upper fill over Structure 2 entrance extension) (see Section 2.4.5.3).

BEAM SEGMENTS (N=3)

SF132 (not illustrated)
Beam segment, unused, with chopmarks at one end from detachment; other end broken. L 113mm, W 29mm, T 26mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF202 (not illustrated)
Beam segment, worn. Ends damaged; possible saw-cut at one end. Trez tine removed by knife-cutting. L 83mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF289 (not illustrated)
Beam portion, ends broken, trez tine removed by knife-cutting. Differentiated from the other find from *c* 204 on the grounds of its less worn condition. L 180mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

DETACHED TINES (N=7)

SF37 (not illustrated)
Brow tine, detached by circumferential sawing and snapping. L 180mm. Context 106, Block 6, Phase 1 (wall packing in Wheelhouse 1) (see Section 2.3.1.1).

SF114 (not illustrated)
Tine, detached by circumferential sawing and snapping. L 55mm. Context 201, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF138 (not illustrated)
Tine, broken. Faint knife-cut near base, otherwise working traces destroyed. L 65mm. Context 045, Block 4, Phase 3 (entrance area walling of Structure 3).

SF219 (not illustrated)
Brow tine, detached by circumferential sawing and snapping. L 100mm. Context 235, Block 5a, Phase 2 (central area of Wheelhouse 1) (see Section 2.4.1.5).

SF221 (not illustrated)
Terminal portion of tine, detached by circumferential sawing and snapping. L 105mm. Context 256, Block 5a, Phase 2 (Bay 2 of Wheelhouse 1) (see Section 2.4.1.5).

SF290 (not illustrated)
Tine detached by sawing and snapping. L 105mm. Context 123, Block 6, Phase 1 (Wheelhouse 1 wall-packing) (see Section 2.3.1.1).

SF291 (not illustrated)
Tine fragment, detached by sawing and snapping, some knife cuts on surface. L 62mm. Block 1, Phase 3 (Structure 8).

TERMINALS (N=4)

SF52 (not illustrated)
Terminal portion of antler, removed by angled chops with an axe. Tips of tines broken. L 165mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF69C (not illustrated)
Terminal, detached by sawing and snapping, with traces of incipient sawing round one of the branched tines. 59×56×25mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF69D (not illustrated)
Terminal with three points removed by sawing and snapping. 134×88mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF111 (not illustrated)
Terminal portion of antler, removed by circumferential sawing and snapping. L 120mm. Context 195, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

OTHER (N=2)

SF69A (not illustrated)
Shed antler, unmodified apart from some working of all the tine tips, for uncertain purposes, and removal of the terminal tines. The bow tine has a notch cut into it;

the bez tine has the tip removed in a concave facet; the trez tine has the tip removed, a deeper concave facet, and a shallow marginal groove incised on one side. The end of the beam is slightly hollowed. The purpose of this working is unclear. L 320 mm. Context 113, Block 1, Phase 3 (occupation deposits within Structure 8) (see Section 2.5.1.2).

SF292 (not illustrated)

Partly worked, poorly developed shed antler, the brow tine partly cut off and part of the crown removed in an angled cut. Upper end broken, but there were attempts to remove the trez tine with chop marks and, unusually, crush marks around its base. L 270 mm, crown D 43 mm. Context 287, Block 5a, Phase 2a (deposits in Bay 7, Wheelhouse 1) (see Section 2.4.1.5).

3.5.2.2 Bone-working debris

Animal bone-working debris is sparse and non-diagnostic, but enough to indicate on-site utilization of bone for tools. The few fragments are associated with Structure 5 (Phase 2) and Wheelhouse 1 (Phase 2).

SF83 (not illustrated)

Split longbone fragment, notch cut at one end, other worn. L 64mm, W 25mm, T 16mm. Context 134, Block 13, Phase 2 (fill of Structure 5) (see Section 2.4.5.3).

SF84 (not illustrated)

Split longbone fragment. L 67mm, W 15mm, T 5mm. Context 140, Block 13, Phase 2 (fill of Structure 5).

SF293 (not illustrated)

Proximal end of longbone shaft, with extensive knife-cuts where the rest of the bone was detached. This portion was then discarded, although a series of fine punch-marks at the articular end indicate it saw expedient use as a working surface. Slight charring at articular end. L 149mm, W 56.5mm, T 40mm. Context 173, Block 5b, Phase 2 (Bay 2 of Wheelhouse 1).

3.5.2.3 Roughouts

SF25 (Ill 3.19a)

Whale bone roughout or stopper. Approximately cylindrical block, covered in knife-trimming toolmarks. Could be either a blank for an uncertain object or a stopper for an organic container. L 54 mm, D 30×27mm. Context 074, Block 2, Phase 3 (wall packing of Structure 8).

SF27 (Ill 3.19b)

Whale bone roughout, the plano-convex section suggesting it was a rib. Surfaces trimmed by knife or gouge; one end roughly angled by a gouge (with blade 14mm W); the other sawn and sapped. Knife-trimming at this end after sawing indicates this was a roughout rather than an offcut. 52×35×20.5mm. Context 084 area D, Block 1, Phase 3 (occupation deposits within Structure 8).

SF71A (Ill 3.19c)

Unfinished handle? Antler beam segment, detached by circumferential sawing and snapping at each end; broken tine still attached; cancellous tissue crudely hollowed in beam and tine, suggesting use as handle. L 95mm. Joins SF71b. Context 031, Block 15, Phase 1 (fill of Wheelhouse 2) (see Section 2.3.3.3).

SF71B (Ill 3.19c)

Handle roughout. Antler beam segment, detached by circumferential sawing and snapping at each end. Cancellous tissue part-hollowed at one end to take tang, but abandoned before completion. L 100mm. Joins SF 71a. Context 031, Block 15, Phase 1 (fill of Wheelhouse 2) (see Section 2.3.3.3).

SF110 (not illustrated)

Unfinished worked whale bone fragment, with one face and both ends broken. Two perpendicular faces and one angled one bear knife-trimming facets. Broken off an unidentified artefact, perhaps unfinished. L 100mm, W 20mm, T 15mm. Context 173, Block 5b, Phase 2 (Bay 2 of Wheelhouse 1).

SF162 (not illustrated)

Worked length of whale bone, split from larger bone. Wear obscures working traces, and it is unclear if the splitting was deliberate or accidental. Ends worn and probably not original. One face is flat, with extensive knife-trimming facets; the curved cortical face is knife-trimmed flat at one end and bears three single chopmarks 45mm apart along the edge where it meets the cut face. Probably broken off an unidentified larger object, the chopmarks perhaps marking out the blank. L 250mm, W 37mm, T 25mm. Context 195, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

SF218 (Ill 3.19d)

Unfinished whale bone vessel. Fragment, probably of a vertebra, with the epiphyseal surface at one end; the other end is cut at an angle with a heavy bladed tool, with the centre being hollowed by heavy angular cuts when the object broke. H 133mm, surviving chord length 73mm, surviving radial width 58mm. Context 242, Block 5a, Phase 2 (Bay 2 of Wheelhouse 1) (see Section 2.4.1.5).

SF294 (Ill 3.19e)
Antler tine roughout. The end is now broken but shows slight hollowing of the cancellous tissue. There has been an unfinished attempt to cut the tine 17mm from the broken end by saw-cut circumferential grooving, snapped off in one area only. Some 10 mm above this groove are some shallow knife-cut notches, one quite large. It is unclear what the intended product was. L 82.5mm, D 16mm. Context 085, Block 8, Phase 2 (midden accumulation over Structure 4).

SF295 (not illustrated)
Sub-cylindrical faceted length of cetacean cancellous tissue, broken at one end, flat at the other. Perhaps a peg in course of manufacture. L 56mm, D 14.5mm. Context unknown, Block 15, Phase 2.

SF296 (Ill 3.19f)
Broken sub-oval cetacean bone object with natural cortex on one side, the other split through the cancellous tissue. The edge is bevelled by broad knife-cuts on two edges, and more crudely cut and snapped on the others; one corner is missing, apparently accidentally detached by an over-vigorous chop. No evidence of use; this is a roughout broken in course of manufacture. L 123mm, W 103.5mm, T 21mm. (Found with an amorphous lump of cortical tissue, apparently unworked, 120 × 81 × 40mm). Context 201, Block 5b, Phase 2 (central area of Wheelhouse 1).

3.5.3 TOOLS

3.5.3.1 Agriculture/construction

SF72 (Ill 3.20a)
Mattock or similar tool. Wedge of cetacean bone, broken and worn at the butt end with a curved blade edge at the other, asymmetrical through wear. A band of wear polish is visible along the edge on both faces, more developed on the cancellous face. The strength and resilience of whale bone made it appropriate for heavy-duty tools such as ard points (Rees 1979, 40), spades (Crawford 1967, 88–9), mattocks and hoes (Ballin Smith 1994, 181–2). Damage inhibits identification, but the morphology and wear are consistent with use in a chopping motion, suggesting it was a mattock for agricultural or construction purposes. L 150mm, W 60mm, T 28mm. Context 029, Block 18, Phase 3 (midden deposit formed in hollow next to wall, Structure 10).

3.5.3.2 Hide working

SF40 (Ill 3.20b)
Awl, created by making an angled cut across the shaft of a tibia and abrading the resulting point to shape: the abrasion scars are still clearly visible, although the tip itself shows some wear. A common Iron Age type (Hallén 1994, 205). L 110mm, W 24mm, T 17mm. Unstratified (section collapse above Structure 8, so most likely Phase 3).

SF297 (Ill 3.20c)
Flensing knife? Elongated thin blade made from split metatarsus. The naturally hollow proximal end, now broken, acted as a handle or handle socket. The blade is highly polished all over from use. Morphologically this is close to dagger beaters, used when weaving on an upright loom to beat the weft into place (MacGregor 1985, 188–9); the high degree of polish is consistent with this. However, this interpretation is unlikely as the sharpness of the edges would have damaged the threads (cf SF172, Section 3.5.3.3). It is better interpreted as a specialized knife, perhaps for flensing as it would have less risk of damaging the hide than an iron blade. There are comparable finds from Dun Mor Vaul (MacKie 1974, 145) and A'Cheardach Mhor (Young & Richardson 1960, 163 and fig 8, 18; the suggested function for scooping out shellfish seems unlikely). L 155mm, W 22mm, T 15mm. Context 100, Block 1, Phase 3 (deposit within Structure 8).

SF124 (not illustrated)
Tip of polisher of cetacean bone. Broken rounded tip of an implement, lentoid in section; use-polish on the cortical tissue suggests it functioned as a polisher, perhaps in hide-working (cf Hallén 1994, Ill 7, 1). L 48 mm, W 32 mm, T 11 mm. Context 204, Block 5a, Phase 2 (central area of Wheelhouse 1) (see Section 2.4.1.5).

3.5.3.3 Textile working

SF42 (Ill 3.21a)
Needle with broken tip. The shaft is ovoid in section, flattening at the squared head; biconical perforation D

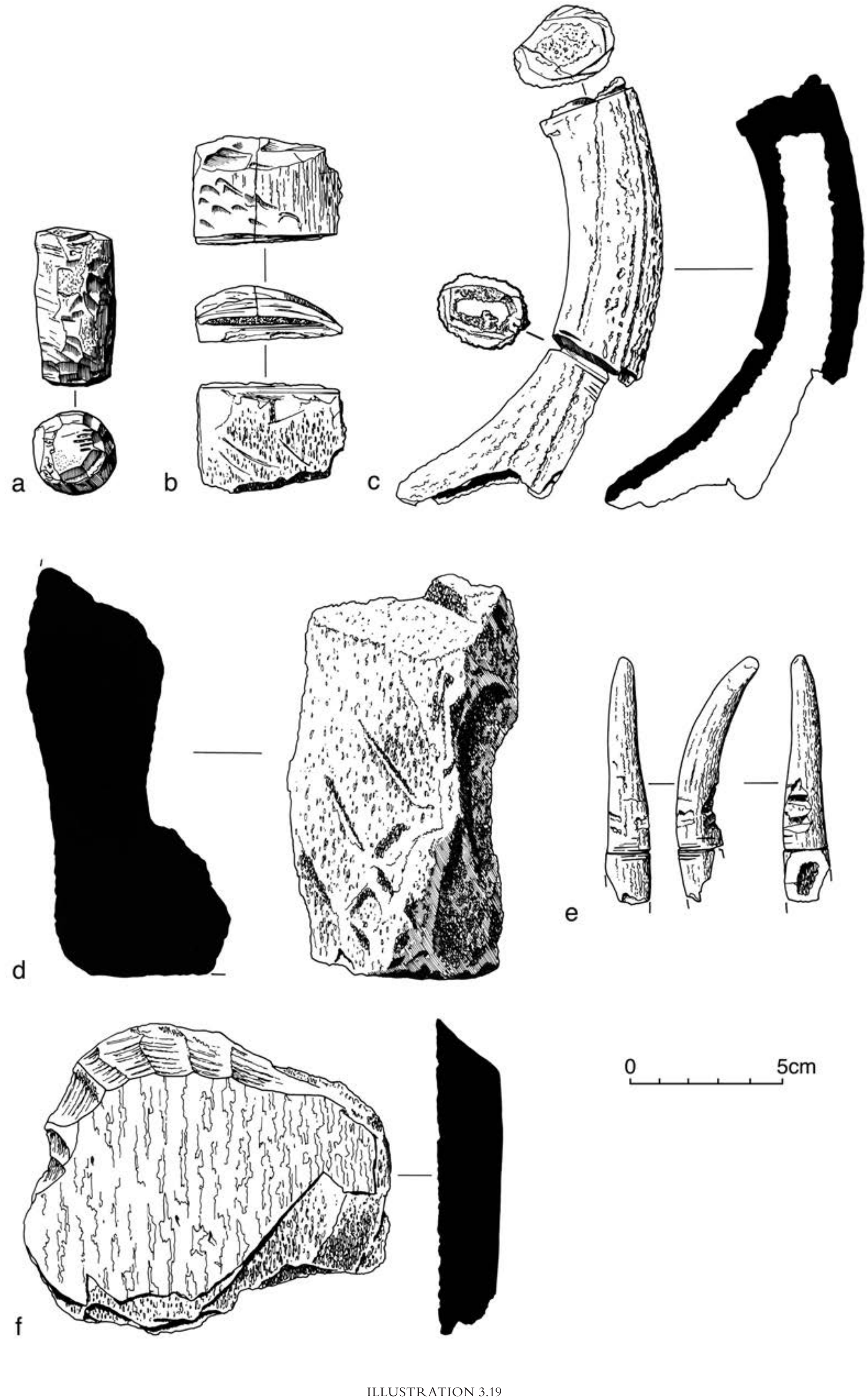


ILLUSTRATION 3.19
Roughouts, (a) SF25, (b) SF27, (c) SF71a and SF71b, (d) SF218, (e) SF294, (f) SF296.

2×2.5mm, with no traces of wear. L 55.5mm, head 2×4.5mm, shaft 3×3.5mm. Context 109, Block 1, Phase 3 (Structure 8 walling).

SF172 (Ill 3.21b)

Beater tip. Flat rectangular-sectioned shaft tapering to a flat point, highly polished all over and tip rounded. Although its fragmentary nature inhibits interpretation, the polish and lack of sharp edges suggest this was a beater used in weaving (MacGregor 1985, 188–9). L 40mm, shaft 6.5×3mm. Context 220, Block 19, Phase 3 (threshold deposit for Structure 3).

SF204 (Ill 3.21c)

Long-handled comb of cetacean bone, undecorated, with an expanded 'fish-tail' butt end. The toothed end is expanded and originally bore probably 11 teeth, with the outer one on either side now broken and two more lacking their tips. The surviving teeth lie in the same plane and are an almost constant length. They are rectangular in section, the tips being rounded from use and bearing wear-polish; one also has faint transverse grooves on one face.

There has been an extended and as-yet unresolved debate over the function(s) of long-handled combs, with the main options being hair-combs or a range of possible uses in textile manufacture (Hodder & Hedges 1977; Sellwood 1984, 371–8; Coles 1987, 105–6). No consensus has been reached, and indeed the range of shapes, sizes and wear patterns must imply a range of uses. The type is common in Atlantic Scotland (Hodder & Hedges 1977, 25–6; Hallén 1994, 222–4). L 133mm, W 40mm, T 15mm. Context 242, Block 5a, Phase 2 (Bay 2 of Wheelhouse 1) (see Section 2.4.1.5).

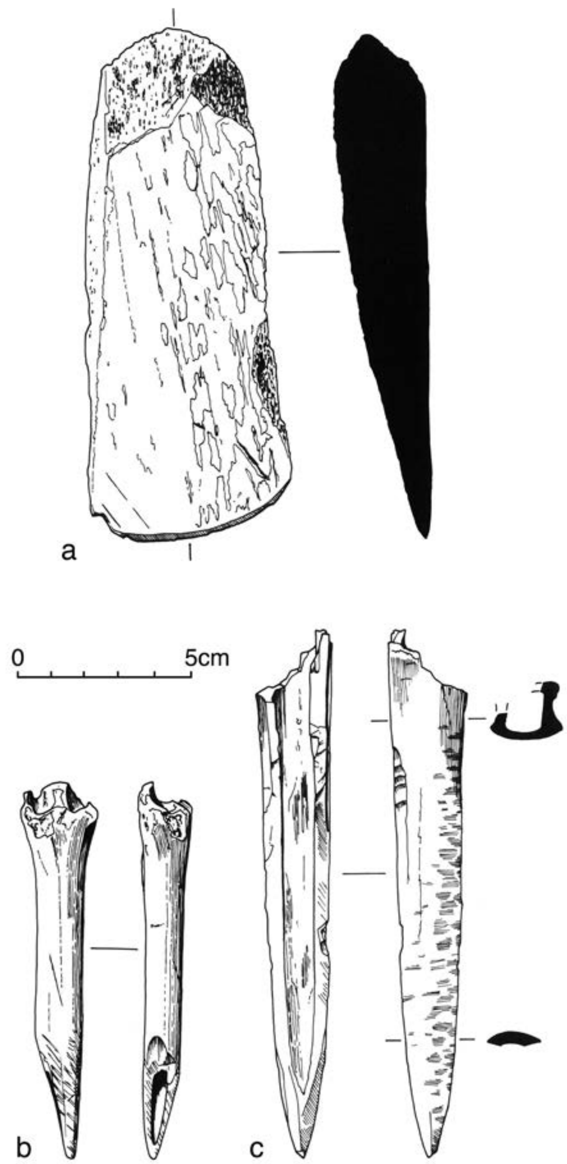


ILLUSTRATION 3.20
Tools, (a) SF72, (b) SF40, (c) SF297.

3.5.3.4 Pottery manufacture or bronze casting

SF10 (Ill 3.21d)

Modelling tool. Bone, highly polished, with one spatulate flattened end, the other terminating in a blunt point. It seems too fine for hide-working, and was probably used in forming wax models for lost-wax bronze casting or shaping and decorating pottery (Hallén 1994, 207). L 115mm, W 10mm, T 5mm. Context 025, Block 18, Phase 3 (within wall, Structure 10).

SF91 (not illustrated)

Modelling tool. Broken, with a thin sub-rectangular shaft expanding into a flat spatulate end. The working edge has slight use-polish and abrasion scars from repair or reworking. Toolmarks of knives and abrasives used in shaping the tool are visible. L 78mm, shaft 8.5×4mm, end W 11.5mm. Context 107, Block 6, Phase 1 (wall packing of Wheelhouse 1) (see Section 2.3.1.1).

3.5.3.5 Unattributed – handles

SF22 (Ill 3.21e)

Decorated handle, with a longitudinal perforation where the cancellous tissue has been hollowed out.

One end is well-finished and rounded off; the thinner end is more uneven, with saw cuts and ridges from cutting to shape, suggesting it was covered by the capping of the tang when in use. Decoration comprises three diagonal grooves near the thinner end, their shallow round section indicating use of an engraving tool such as a scorper (Maryon 1971, 64, 153). L 81mm, D 21 × 19mm, perforation D 9–9.5mm. Context 010, Block 10, post-abandonment (sand overburden).

SF250 (not illustrated)
Handle. Curved antler tine with tapering hollow for tang at curved end, 26mm deep and up to 6.5mm D. Cracks radiate from this hollow from stress during use. A slight surface depression at the far end may represent an abandoned hollowing attempt. Pronounced knife-cutting marks on two areas are presumably secondary. L 66mm, D 17mm. Context 069, Block 6, Phase 1 (jammed into pier on north side of entrance in Wheelhouse 1) (see Section 2.3.1.1).

SF298 (not illustrated)
Handle fragment? Antler beam fragment, sawn square at one end, with the interior hollowed; original form and length unclear. 41 × 18 × 8mm. Context 116, Block 16, Phase 1 (main enclosing wall of Structure 2).

3.5.3.6 Unattributed – composite tool heads

SF101 (Ill 3.21f)
Small pick with hollowed tip. Cast antler base and lower beam, chopped off from rest of antler. Bez tine removed by cutting and snapping. Tip of brow tine removed and a small socket hollowed, perhaps to take a (?metal) tip for use as a fine pick, perhaps for use as a punch. L 200mm. Context 172, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

SF181 (Ill 3.21g)
Socketed tool head? Cylindrical antler beam segment, split longitudinally. It is roughly finished, with knife facets unsmoothed apart from some limited filing, but the ends have been smoothed to remove the rough edges from cutting it to size. There is a sub-circular central transverse perforation (D 14mm) and a somewhat irregular longitudinal perforation, varying from 8–10mm D. The ends show slight edge-flaking and burring consistent with a striking function, and (although the round hole is unusual for this) it seems plausible that a handle was inserted in the transverse hole with tool points being fitted into the longitudinal hollows. L 65mm, W 29mm, T 21mm. Found in fragments in two different contexts, 219 and 224, both in Bay 7 of Wheelhouse 1 (Block 5b, Phase 2).

SF299 (Ill 3.21h)
Small pick with hollowed tip. Lower portion of a shed antler with a small hollow (D 5mm, depth 3.5mm) in the tip of the brow tine, perhaps to function as a delicate punch or to hold a fine tool tip, as with SF101. An angled cut across the shaft exposed the cancellous tissue; this was hollowed out to create space for a lentoid-sectioned handle (*c* 10 × 20mm in section). It apparently saw little use; surviving cancellous tissue in the interior is undamaged, and a hole below the tine suggests the handle split the socket here. Shaft L 125mm, tine L 132mm. Context 272, Block 5A Phase 2a (brown sand deposit across Bay 1, Wheelhouse 1) (see Section 2.4.1.5).

3.5.3.7 Unattributed – working surfaces/anvils

SF41 (Ill 3.22a)
Flat cetacean plaque. Split from skull, slightly curved and expanded towards one end where it is broken. Edges and surviving end are trimmed straight; notch cut into intact end. Area of wear at narrow end of cortical face suggests use as a working surface or support of some sort; there are some cut-marks at the opposite end. L 180mm, W 70mm, T 20mm. Context 109, Block 1, Phase 3 (occupation deposits within Structure 8).

SF149 (Ill 3.22b)
Chopping board. Cetacean left ulna, fragmented at distal end. Unmodified apart from a series of chop-marks at the distal end, typically 10–20mm long, implying use as some form of chopping board. L 380 mm. Context 103, Block 8, Phase 2 (dumped material sealing occupation within Structure 4).

SF170 (Ill 3.22c)
Support for chopping. Cetacean bone, with one end the natural epiphyseal surface and the other chopped at an angle. Surface covered in heavy chopmarks, some deep, probably from an axe. The quantity and extensive scatter indicates they are not from butchery, and suggests expedient use as a support for chopping. L 120mm, W 103mm, H 73mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF300 (not illustrated)
Chopping board fragment of cetacean bone. Flat slice split from a larger bone, with fine knife-marks across

the surface. The intact edge and triangular tip are knife-cut; other edges lost. The thickness tapers from the point. L 187mm, W 86mm, T 4–14mm. Context 091 Block 1, Phase 3 (layer covering western interior of Structure 8).

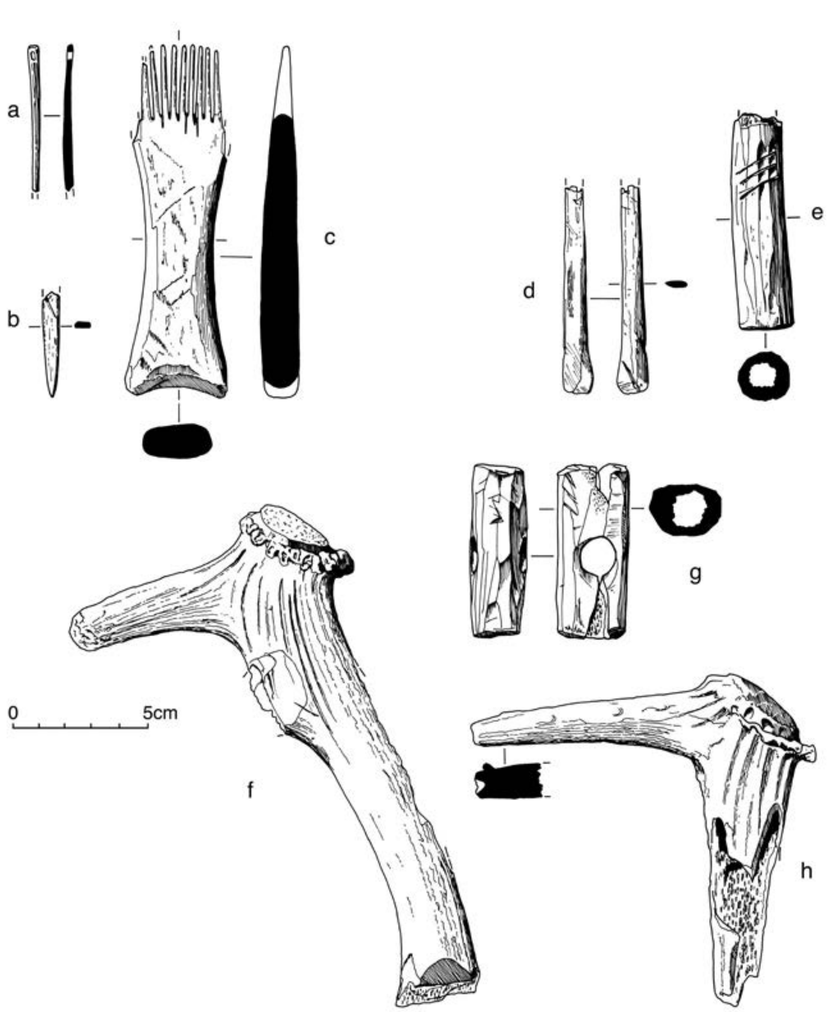


ILLUSTRATION 3.21
Tools continued, (a) SF42, (b) SF172, (c) SF204, (d) SF10, (e) SF22, (f) SF101, (g) SF181, (h) SF299.

SF301 (Ill 3.22d)

Cetacean limb bone used as an anvil or working surface; traces of rectangular slots or broken mortices at either end imply it was firmly held in an anvil or workbench. Knife-cuts are scattered over the surfaces; one surface is damaged (probably from use), while the opposite face has crush-marks from limited but heavy-duty use. L 235mm, W 52mm, T 42mm. Context 218, Block 11, Phase 1 (Wheelhouse 2 entrance) (see Section 2.3.3.3).

3.5.3.8 Unattributed – miscellaneous

SF100 (Ill 3.22e)

Double-ended forked implement, lacking one prong, made from a naturally hollowed bone. The prongs are some 35mm long: those at one end bear slight use-polish. This is a well-known but enigmatic type, with a range of suggested uses from twining threads to removing hooks from fish throats (Hallén 1994, 210). The generic wear on this example offers little help in interpretation. L 115mm, W 37mm, T 18mm. Context 173, Block 5b, Phase 2 (Bay 2 of Wheelhouse 1).

SF302 (Ill 3.22f)

Peg or punch? Tine with the end squared and the surfaces knife-trimmed and smoothed, creating an irregular cylinder with a broken tip. The squared end is flattened and compacted, suggesting use as a peg or a punch. L 81mm, D 16 × 18.5mm. Context 272, Block 5a, Phase 2a (sand deposit across Bay 1, Wheelhouse 1) (see Section 2.4.1.5).

SF303 (Ill 3.22g)

Peg or point? Tine, the end squared and the surface lightly trimmed in places. The tip has been sharpened by two cut facets, suggesting use as a peg or a point; there are no visible use-traces to support the latter function. L 75mm, D 14.5 × 16m. Context 272, Block 5a, Phase 2a (sand deposit across Bay 1, Wheelhouse 1) (see Section 2.4.1.5).

See Roughouts (Section 3.5.2.3) for SF25, a possible stopper.

3.5.4 ORNAMENTS

3.5.4.1 Pins

The only ornaments in the assemblage are fasteners in the form of pins and point/pins. The latter term is used for points which are well-finished all over but lack the fine finish of pins (Foxon 1991, 194, 224; Hallén 1994, 215). The fineness of the examples below suggests they were used as pins. Typically for the Middle Iron Age,

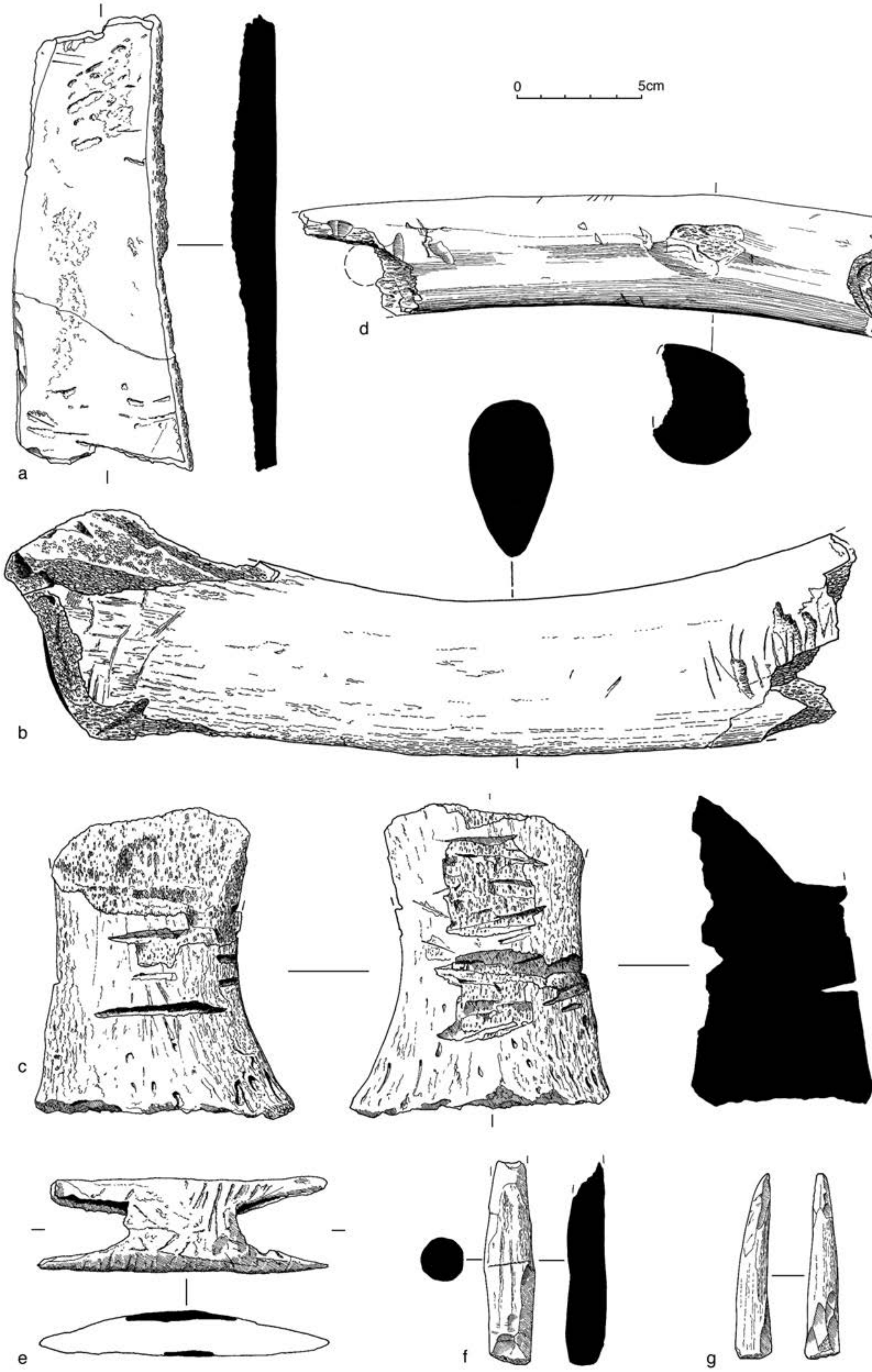


ILLUSTRATION 3.22
Tools continued, (a) SF41, (b) SF149, (c) SF170, (d) SF301, (e) SF100, (f) SF302, (g) SF303.

none of the pins are decorated. While the perforated example was undoubtedly a clothes fastener, the rest could function either in clothing or hair.

SF53 (Ill 3.23a)

Broken point/pin, lacking head. The shaft is sub-rectangular in section, tapering gradually to the tip. The finish is poor, with knife cuts and extensive abrasion scars from manufacture not polished away. However it is not unfinished, as the extreme end of the tip bears very slight use-polish, implying it was a coarse pin or point. L 72mm, shaft 6.5 × 4mm. Context 108, Block 6, Phase 1 (wall packing for Wheelhouse 1) (see Section 2.3.1.1).

SF73 (Ill 3.23b)

Pin tip, with ovoid section and slight polish all over. L 34.5mm, D 2.3 × 3.2mm. Context 131, Block 15, Phase 1 (fill of Wheelhouse 2) (see Section 2.3.3.3).

SF92 (Ill 3.23c)

Pin shank. Cylindrical rod, broken at both ends, well-finished but not polished – abrasion scars are still visible. Possibly starting to taper at one end. L 85mm, D 5mm. Context 034, Block 1, Phase 3 (wall packing for Structure 8).

SF96 (Ill 3.23d)

Pin. Fine, well polished and slightly curved; one end sharp, the other rounded. Made from an unidentified bone. L 95mm, D 4mm. Context 173, Block 5b, Phase 2 (Bay 2 of Wheelhouse 1).

SF115 (Ill 3.23e)

Tip of point/pin. Round section, more ovoid near break. Shaft faceted from knife-cutting with no attempt to smooth this off, but rounding and breakage of the tip shows it was not unfinished. L 49.5mm, shaft 4.5 × 3.5mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF187 (Ill 3.23f)

Pin tip. Very regular round section and polished finish. L 51mm, D 3.5mm. Context 223, Block 8, Phase 2 (occupation deposit in Structure 4) (see Section 2.4.3).

SF207 (Ill 3.23g)

Pin with perforated head. Broken across the perforation (D 3mm), where the section is flat, the shaft becoming ovoid and then circular towards the point. Well-finished; tip has slight use polish. There are two main types of such perforated points: kite-shaped ones, best seen as needles; and ones with an expanded head, interpreted as pins with the hole for a fastening cord (MacGregor 1974, 71; Hallén 1994, 213). As this example has broken across the perforation it cannot be securely identified, but the thinning of the bone suggests that the perforation was close to the end of the object and was not designed to survive the stresses involved in use as a needle. It is therefore classed as a pin. L 77mm, maximum W 9mm, shaft 6 × 4mm. Context 241, Block 5a, Phase 2 (Bay 1 in Wheelhouse 1) (see Section 2.4.1.5).

SF251 (Ill 3.23h)

Pin. The shape is slightly odd due to loss of outer cortical tissue at the point, which makes it look over-sharpened. Circular section, highly polished. The plain head is very slightly rounded at the end. L 101mm, D 4.5–5mm. Context 293, Block 5a, Phase 2 (Bay 7 in Wheelhouse 1) (see Section 2.4.1.5).

3.5.5 LEISURE

SF50 (Ill 3.24a)

Tuning peg from a lyre? Peg with round-sectioned shaft which expands into a faceted, approximately pentagonal head, tapered at the top. The shaft's tip is rounded, thinned and ribbed from circumferential abrasion for 4mm from the end, with some much slighter ribbing above this up to 11mm from the end. This implies the faceted head was designed to give a better grip when turning the peg. The obvious function is as a tuning peg for a stringed instrument. Pegs similar in size and shape are known from the Roman period onwards (Homo-Lechner & Vendries 1993, nos 77–81; Lawson 1978, 1996). The difficulty with the identification is the lack of a characteristic hole or slot at the end to take the string (Homo-Lechner 1996, 79–82). However, there seems no particular reason why the string could not simply be wrapped round or tied to the end, as the risk of it slipping off when held under tension is no greater than with a slot; the wooden pegs from the Sutton Hoo lyre, although distorted, also lack holes (Bruce-Mitford & Bruce-Mitford 1983, 636–7, 689–93; the argument that they were in damaged portions is incapable of proof). The wear marks are similar to other lyre pegs (Homo-Lechner & Vendries 1993, nos 79–81).

Assuming it derives from a stringed instrument, this is likely to have been a lyre, as the earliest evidence for harps is on ninth century AD sculptures (Ross 1998; MacGregor 1985, 146). In non-Mediterranean Europe, evidence for lyres is first found in the Hallstatt

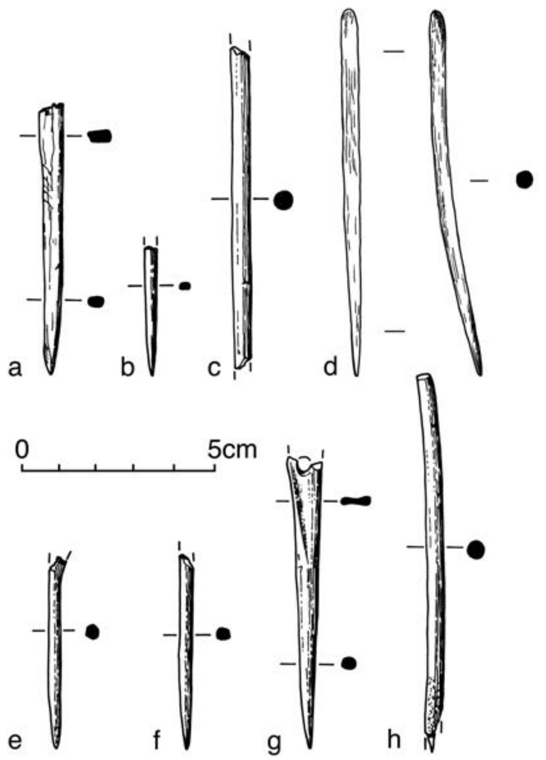


ILLUSTRATION 3.23
Pins, (a) SF53, (b) SF73, (c) SF92, (d) SF96, (e) SF115, (f) SF187, (g) SF207, (h) SF251.

C period in central Europe, and mid-late La Tène in northern Europe (Megaw 1968, 351–2; Vendries 1993, 30–1). The second-century BC statue from Paule, Brittany, provides the strongest evidence for the use of the lyre in the European later Iron Age, and tallies with the testimony of Classical authors (Vendries 1993, 30–1, 38; Ménez 1999). Surviving fragments are sparse: from Britain there is the third century BC lyre wrest plank from Dinorben (Savory 1964, 169–70) and a more dubious example from Dùn an Fheurain, Argyll (Megaw 1971), dated broadly to the first half of the first millennium AD; there is also a wrest plank of second century AD date from a Germanic settlement at Bremen-Habenhausen (Bischop 2002).

Without further clear examples of tuning pegs without string holes, the interpretation of this find must remain a little tentative: the literature is already clogged up with false flutes, whistles and other musical miscreants. However, the interpretation fits the observed morphology and wear of the object, and the parallels quoted above indicate there is contemporary evidence of such instruments. L 45.5mm, head W 6.5×5mm, shaft D 4.5–1.5mm (tip). Context 114, Block 18, Phase 3 (midden deposit sealed by Structure 10 wall).

SF145 (Ill 3.24b, colour plate 8)
Gaming piece. Antler beam segment, the base sawn flat to remove working marks. The beam has been tapered and worked into two thin prongs of cortical tissue, with the cancellous tissue hollowed between. Wear is limited and non-specific, the tips of the prongs are evenly worn and polished, but the cancellous tissue is unworn. The circumference of the base has very slight rounding and polish from wear, restricted to its very edge.

There would seem to be two main possibilities for this item's function, as a tool or a gaming piece. Two-pronged implements are well attested, and have a wide variety of possible functions (Hallén 1994, 210), but they generally have a handle or shaft. This example could be held between the fingers, but the restricted extent of the wear implies very delicate use; there is no obvious need to cut the base flat if it were hand-held. The shape is appropriate for a gaming piece, although one might expect the base to be more regular in plan. The wear restricted to the prongs could then arise from handling. This identification is proposed here.

Iron Age gaming pieces have not been well studied. From around the sixth century AD onwards relatively ornate gaming pieces are known, including anthropomorphic examples (eg Scalloway and Mail, Shetland: Sharples 1998, 172–80), phalanges with Pictish symbols (Burrian, Orkney; MacGregor 1974, nos 210–11), conical pieces (eg Dun Cuier, Barra: Young 1956, 319–20), and pieces similar to modern pawns (Gurness and Birsay, Orkney: Hedges 1987b, no 193; Curle 1982, no 275). The stone discs with Pictish symbols and other ornament (Thomas 1963, 45–7) may also be gaming pieces. Both pegged and incised gaming boards are known from Late Iron Age and Norse contexts (Curle 1982, no 274; Ritchie 1987, 60–3). However, board games are also attested earlier in the Iron Age, although the evidence awaits detailed study and many examples are poorly dated. There are counters, pegged pieces and a range of other, largely geometric, shapes. Simple circular stone and pottery counters are known from many sites (eg Dun Mor Vaul: MacKie 1974, 135, 151; Traprain Law: Cree 1923, figs 19.33–40; Howe: Ballin Smith 1994, 188–9), and there are a few rare cases of Roman glass gaming counters (see Hunter 1998; the glass counter from Dun Mor Vaul is a further example: MacKie 1974, 148). More ornate pieces are also

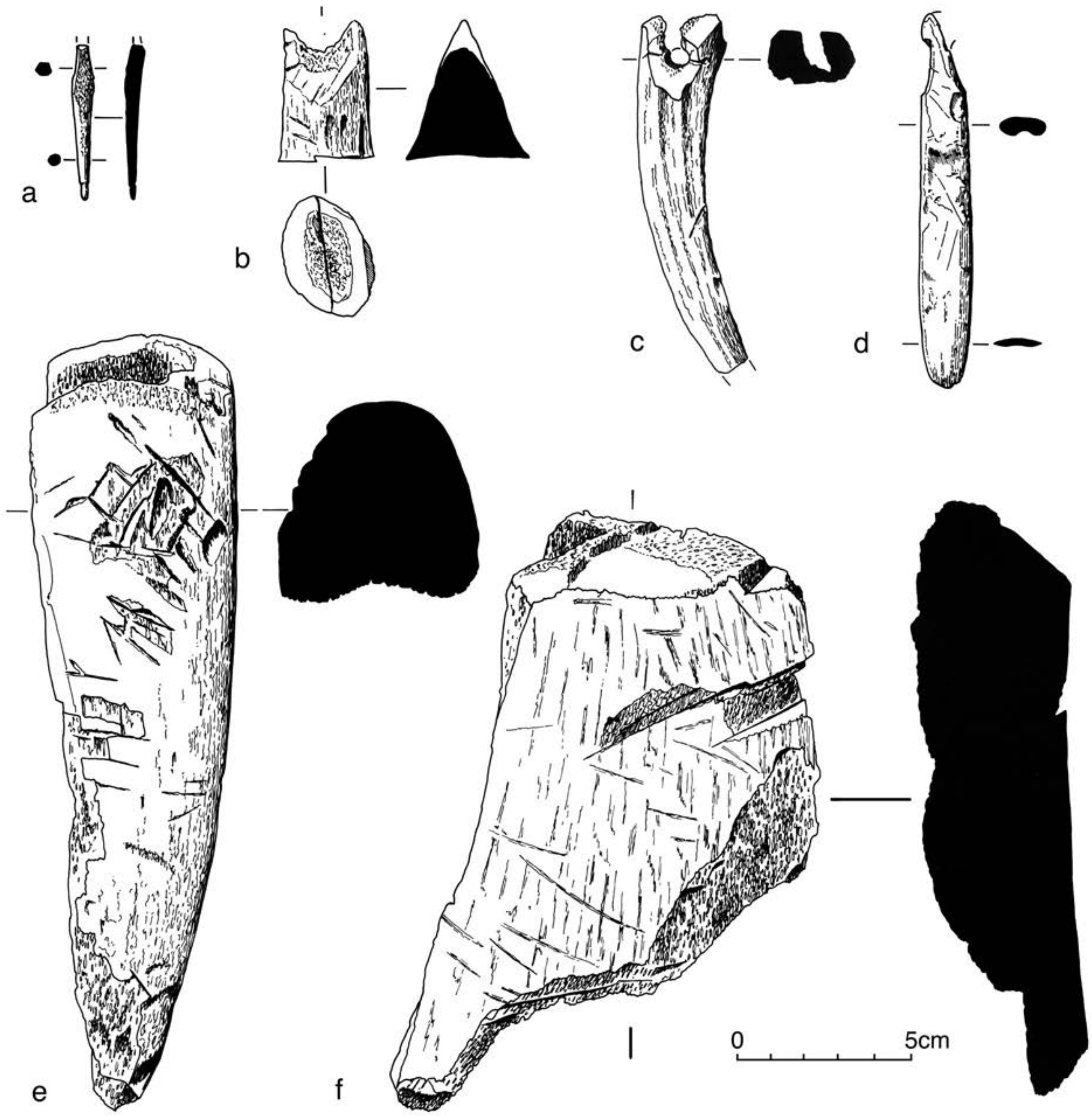


ILLUSTRATION 3.24
Various, (a) SF50, (b) SF145, (c) SF60, (d) SF20, (e) SF107, (f) SF118.

known: there is a pegged piece from Sollas, North Uist (Campbell 1991, 158, and Ill 21, 653), while Close-Brooks (1986, 166) has plausibly reinterpreted a widespread group of domed 'pin-heads' in both bone and jet-like material as gaming pieces, based on Irish sets of similar domed bone pegs (eg Knowth: Raftery 1983, 231). Other material is more diverse. Gurness has produced part of a truncated-cone gaming piece from broch levels (Hedges 1987b, no 194). Burrian has a range of pieces in addition to the Pictish decorated phalanges, although they are not well-dated (MacGregor 1974, 87–8, nos 207–9; 207 has traces of deliberate colouring). A shaped phalange from Midhowe, Orkney is another likely candidate (Callander & Grant 1934, 489); again the dating is poor, but there is no diagnostically Late Iron Age (Pictish) material from the site. From southern Scotland, certain Roman or pre-Roman Iron Age examples (equivalent to Atlantic Middle Iron Age) are the domed bone pieces from Borness Cave, Kirkcudbrightshire and Broxmouth, East Lothian, the former with ring-and-dot ornament on the centre, the latter stained dark (Corrie et al 1874, 497, no 114; unpublished).

The detailed use of such pieces is uncertain. Clarke (1970, 226) has highlighted the possible role of counters in dice-based games, while the traces in a few instances of colour differentiation suggest a game of opposing sides; burial evidence from the pre-Roman and early Roman Iron Age in southern Britain confirms the existence of such games (eg Stead 1967, 14–19; Crummy 1997). The morphology of the Cnip piece suggests it was intended as a king-piece or similar. These rich southern graves imply that board games were perceived as a status activity, a perception which persists into later centuries (Stratford 1997, 31–8) and in a Scottish context is supported by finds such as the rich Roman Iron Age burial from Waulkmill, Aberdeenshire, with its Roman gaming set (Callander 1915). However, a more detailed study of the wider Scottish evidence for games, including both dice and stone balls, is required to tease out conclusions as to their social standing. H 41.5mm, D 36 × 26mm. Context 204, Block 5a, Phase 2 (central area of Wheelhouse 1) (see Section 2.4.1.5).

See also long-handled comb SF204 classified under textile working; such objects have been interpreted as hair ornaments.

3.5.6 FITTINGS

SF60 (Ill 3.24c)

Handle or attachment. Tine, broken at base and tip, with a tapering irregular perforation (minimum D 5 mm) at the broad end, thinned with knife-cut facets. Damage inhibits interpretation: it may have been tapered to mount against item of furniture to act as a handle. L 105mm, W 27mm, T 19mm. Context 069, Block 6, Phase 1 (jammed into pier on north side of entrance in Wheelhouse 1) (see Section 2.3.1.1).

3.5.7 MINIATURE OBJECTS

SF20 (Ill 3.24d, colour plate 7)

Sword model? Round-ended spatulate blade with decorative end. It is straight edged, sub-rectangular in section, rounding and tapering to an edge at one end which bears minimal use-polish. The other end is damaged but was carved ornamentally with the blade tapering into a waist and then expanding into a double-lobed end, with one lobe now lost. The channel on the reverse is the natural medullary cavity of the bone, and bears traces of a red pigment. The shape of the blade relates it to spatulate polishers. However two factors argue against this: the lack of visible wear at the end and the ornamental terminal. This latter resembles a handle, although too small to be functional, and suggests it may be a model of a sword. While unusual, this is not without parallel – the top part of a rather larger ?sword model is known from Howmae, Orkney (Trail 1890, 460, no 31; NMS GO 186). Neither the Howmae nor Cnip example closely resemble known Iron Age sword types in blade shape or handle arrangement, but our knowledge is largely based on southern parallels and we know little or nothing of Atlantic Iron Age sword forms. It may of course be depicted in its scabbard: there are parallels on later Pictish sculpture for short, relatively wide swords in round-ended scabbards (see Wilson 1973, 121). The surviving evidence for colouring suggests details could have been provided by colour.

On balance it seems plausible that this is a miniature sword, intended either as a toy or a votive model. Miniatures are generally interpreted as votive models in the Iron Age and Roman periods, and are well attested. They were probably intended as token offerings in place of real objects. It has proved much harder to identify definite toys. Weapons are primarily represented by shields (eg Stead 1991), but a few swords are known from Frilford, Berkshire (Bradford & Goodchild 1939, 13–14); Woodeaton, Oxfordshire (Smith 1998, 151); Harlow, Essex (ibid, note 23); Castor, Cambridgeshire (Green 1975, 64); Chesters, Northumberland (Green 1978, plate 125); and London (Greep 1981); all are Roman except Frilford). Cnip and Howmae are the only possible Scottish examples. Indeed Iron Age votive miniatures in general are poorly attested in Scotland: an axe from Stelloch, Wigtownshire (Maxwell 1885, fig 36; for its Iron Age attribution cf Robinson 1995, especially fig 1, nos 1–3), a cauldron from Waulkmill, Aberdeenshire (Callander 1915), a Roman strainer from Traprain Law, East Lothian (Hunter 1993, 332–3), and a Roman terracotta bale of goods from Dun an Iardhard, Skye (Curle 1932, 395–6; Green 1981, 268). (Thomas's (1963, 48) identification of a bone miniature shield from Jarlshof is unconvincing.) L 109mm, W 16mm, T 6mm. Context 018, Block 18, Phase 3 (midden deposit formed over Structure 4 during Phase 3) (see Section 2.5.3.2).

3.5.8 UNIDENTIFIED

SF107 (Ill 3.24e)

Unfinished whale bone object? Split proximal rib portion, with cancellous tissue partly hollowed and two deeper hollows *c* 30mm in diameter, one in the split face, one at one end. Series of chopmarks on one face of cortical tissue. Function uncertain – may be unfinished. L 220mm, W 55mm, T 60mm. Context 190, Block 20, Phase 3 (fill of Structure 8 sump).

SF118 (Ill 3.24f)

Shaped fragment. Worked cetacean rib fragment split to reveal the cancellous tissue, which is shaped at the angled end and broken elsewhere. One end has been chopped square, while the other is cut irregularly at an angle, terminating in a blunt point. One edge may be original, but the other is not. There are chopmarks on the cortical tissue, perhaps from abortive earlier shaping attempts or later reuse. Insufficient evidence survives to determine its original form or function, although the lack of any working edge may suggest it derives from furniture or a domestic fitting. L 180mm, W 90mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF128 (not illustrated)

Utilized chunk. Large chunk of whale bone and fragments. One end carries chopmarks from detachment, and the surface bears a few other, apparently random, cutting marks. Too little of the original surface survives to indicate its use. L 210mm, W 110mm, T 100mm. Context 131, Block 15, Phase 1 (fill of Wheelhouse 2) (see Section 2.3.3.3).

SF163 (not illustrated)

Cetacean bone fragment split from a large flat object. The surviving edge is knife-trimmed and the surviving end bevelled by chop-marks; the rather crude shaping suggests expedient use. One surface is the natural cortex, the other cancellous tissue which has been cut flat. No use-wear evidence. L 145mm, W 29.5mm, T 21mm. Context 204, Block 5b, Phase 204 (central area of Wheelhouse 1).

SF169 (not illustrated)

Utilized fragment, cetacean bone, with cut facet at one end. Unidentifiable. L 60mm, W 20mm, T 20mm. Context 204, Block 5b, Phase 2 (central area of Wheelhouse 1).

SF304 (not illustrated)

Three fragments (two joining) from an unidentified cetacean bone object. Plano-convex section, with the flat face trimmed and some knife-trimming at the edges. No use-wear. L 85mm, W 12.5mm, T 16.5mm. Context 137, Block 5b, Phase 2b (Bay 7, disturbed deposits below Structure 8 walls).

3.5.9 MISSING ITEMS

Three bone and antler items are currently missing from the assemblage, and are known only from the original brief finds descriptions.

SF no	**Description**	**Context**	**Phase**
035	Antler point	071, Block 9, Structure 4 wall packing	2
156	Cetacean vertebra	204, Block 5b, central area	2
192	Worked cetacean bone	235, Block 5b, central area	2

3.6 COARSE STONE

Ann Clarke

3.6.1 GENERAL

The coarse stone assemblage consists of two faceted hammerstones (SF206 (not illustrated) and SF188 (Ill 3.25f), a stone disc (SF087 (Ill 3.25g)), four rotary querns (SF133 (Ill 3.25a), SF116 (Ill 3.25b), SF171 (Ill 3.25c), and SF086 (Ill 3.25e)), and a probable lower grinding stone for a quern (SF189 (Ill 3.25d)). This is a typical Iron Age assemblage, perhaps rather small in size, presumably because only limited external activity areas were excavated. It is in such areas that coarse stone tools, particularly cobble tools, were most commonly used and discarded.

The coarse stone assemblage represents a limited range of functions. The difference between the smaller, bun-shaped rotary querns (SF133 (Ill 3.25a) and SF086 (Ill 3.25e)) and the larger, flatter ones (SF171 (Ill 3.25b) and SF116 (Ill 3.25c)) may point to the processing of different foodstuffs. The smaller rotary querns are of interest and are similar in form to those at Kebister (Clarke 1999). The wear on the hammerstones suggests use in the grinding or reduction of, perhaps, a harder material. The stone disc was most probably used as a lid for some form of container.

All of the querns were recovered from structural contexts: the walls of Wheelhouse 2, Structure 7 and Structure 8; and paving and pit lining from Wheelhouse 1. This may be because querns, once past their useful life, through breakage or wear, were useful building stones. However, the association of querns with structural deposits is so common on Iron Age sites, that it may have been a deliberate act invested with a deeper meaning relating to the community or landscape, perhaps similar to the inclusion of stone arable tools and grain in the walls of earlier prehistoric houses in Shetland (Clarke 1999).

3.6.2 QUERNS

SF133 (Ill 3.25a)

Rotary quern upper stone. A small rotary quern of gneiss. The piece is broken in half across the perforation and most of the original surface is lost through weathering and subsequent decay of the stone. The lower grinding face was originally quite flat and the upper face domed in section. A biconical perforation has been worked in the centre of the quern. Slight smooth platform on upper edge, possibly used as a rubbing stone prior to breakage. Diameter *c* 192mm; maximum T 67mm; diameter of central hole 21mm at narrowest and 64mm at widest on the base; weight 2190.3g, Context 073, Block 12, Phase 1 (walling of entrance cell to Wheelhouse 2) (see Section 2.3.3.3).

SF116 (Ill 3.25c)

Rotary quern upper stone. The piece is broken across the middle. Sub-circular in plan and flat in cross section, with the broad opening on the upper face. A deep round-based stick-hole is located on the upper face. The lower face has a shallow, circular stick-hole

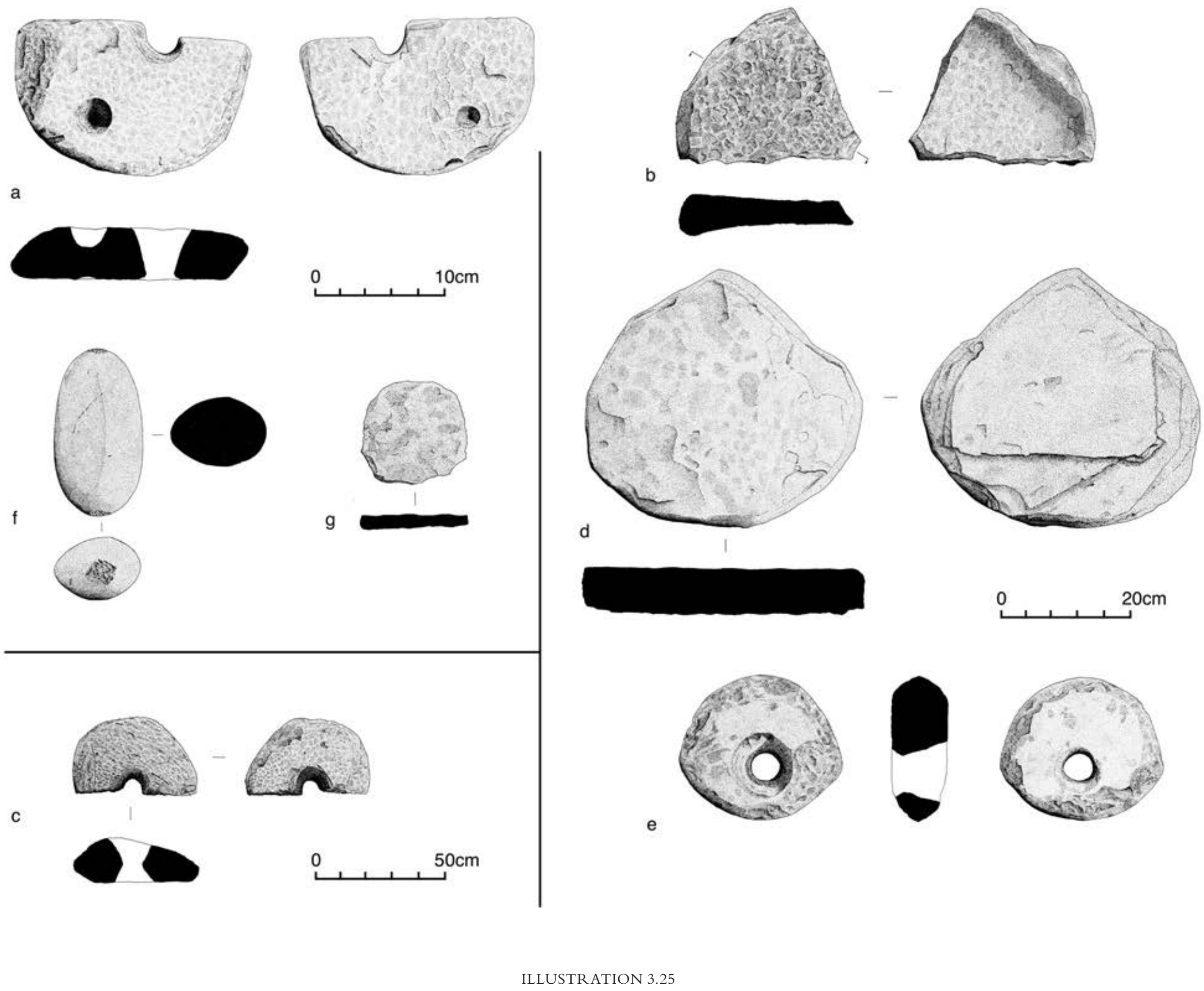


ILLUSTRATION 3.25
Coarse stone, (a) SF133, (b) SF171, (c) SF116, (d) SF189, (e) SF86, (f) SF188, (g) SF87.

worked opposite that which occurs in the upper face, which suggests that the quern may have been turned and the upper face used as a grinding surface. Radius *c* 220mm; MTh 80mm; diameter of hole 40mm at narrowest and 90mm at widest; stick-holes 56mm diameter and 30mm deep, 30mm diameter and 4mm deep (described from drawing). Context 215, Block 22, Phase 2 (walling of Structure 7).

SF171 (Ill 3.25b)
Rotary quern upper stone. A quarter fragment of a rotary quern. Flat cross-section. The central perforation has a wide funnel-shaped cross-section. The upper face is flat and the lower face slightly dished and smooth. Radius c 280mm; maximum T 60mm (described from drawing). Context 206, Block 5b, Phase 2 (lining of pit in Wheelhouse 1) (see Section 2.4.1.2).

SF189 (Ill 3.25d)
?Rotary quern lower stone. Flat slab, sub-circular in plan. Cannot determine whether the surfaces have been worn or not. Diameter *c* 430mm; MTh 70mm (described from drawing). Context 191, Block 5, Phase 2 (paving in Wheelhouse 1 entrance bay).

SF086 (Ill 3.25e)
?Rotary quern upper stone. A small rotary quern. Hole is made off-centre and slightly biconical in cross-section. Both faces appear to have been smoothed and then subsequently damaged. ML 250mm; MW 220mm; MTh 90mm; diameter of hole 58mm at narrowest and 90mm at widest (described from drawing). Context 147, Block 2, Phase 3 (north walling of Structure 8) (see Section 2.5.1.1).

3.6.3 HAMMERSTONES

SF206 (not illustrated)
Faceted hammerstone. Flattened ovoid cobble of quartz. Light facets formed by pecking and smoothing are located on either end and partially down either side. Possibly also some glossy polish residue over the central surface areas. ML 97mm; MW 50mm; MTh 31mm; W 214g. Context 230, Block 15, Phase 1 (internal deposits in Wheelhouse 2) (see Section 2.3.3.3).

SF188 (Ill 3.25f)
Faceted hammerstone. Ovoid cobble of black gneiss. Light single facets worn on either end by pecking. The narrow end has a smoother facet than the roughly pecked area on the broader end. ML 136mm; MW 74mm; MTh 51mm; W 869g. Context 191, Block 5, Phase 2 (entrance paving in Wheelhouse 1) (see Section 2.4.1.3).

3.6.4 STONE DISC

SF087 (Ill 3.25g)
Stone disc. Made on a thin slab of schist, roughly chipped around the exterior to give a sub-circular outline. ML 90mm; MW 87mm; MTh 10mm. Context 113, Block 1, Phase 3 (earliest laid floor in Structure 8) (see Section 2.5.1.2).

3.7 CHIPPED STONE

Bill Finlayson

A single broken flake of red-brown flint was recovered from the western part of the floor deposits within Structure 8, Phase 3 (Context 091, Block 1). One face shows evidence of shearing, which, combined with some edge-crushing, suggests that this is a bipolar knapping product. These are generally more typical of Late Neolithic or Early Bronze Age technologies, but were used in all periods, especially where flint sources are impoverished, as in Lewis. There is no retouch on the piece which measures 28mm long, 18mm broad and 4mm thick. It seems improbable that flint was utilized by the inhabitants at Cnip. It is probably more likely that the single flake derives from material brought into the house, perhaps peat or turf for fuel, or sand for flooring.

3.8 PUMICE

Anthony Newton

Three pieces of pumice were found at Cnip: from a secondary laid floor in Structure 4, Phase 2 (Context 266, Block 8); from midden which formed over the same structure when abandoned (Context 085, Block 8); and from midden dumped in the abandoned Structure 5 (Context 153, Block 13). Only the first of these seems likely to have been discarded in situ. All three pieces have flattened faces suggesting that they have been worked. They vary in size from 40–60mm and all are dark brown to grey in colour. Analysis showed that the pieces had erupted from the Katla Volcanic System in southern Iceland between 7000–2000 BP. They would have been collected locally from the beaches of the area and could have been used for a variety of smoothing and polishing tasks on various materials such as bone, wood and pottery.

3.9 COPPER ALLOY

Fraser Hunter

Three copper alloy items were recovered, none particularly diagnostic. In general, copper alloy objects are not common from wheelhouses. The objects were analysed by non-destructive qualitative X-ray fluorescence. All three (and the stud in iron object SF54 (Ill 3.26b)) are bronzes with a suite of impurities. The lack of similar analyses for comparison is regrettable, as it would be valuable to see if sites in the Western Isles were in the circulation area of the much more mixed alloys which became prevalent in southern Scotland as Roman metal became available (Dungworth 1996). Although these samples show no influence from Roman metal, the ring-headed pin mould (SF 270, Ill 3.27a, see Section 3.12) was used for an alloy with appreciable quantities of zinc, implying there was access to a supply involving Roman metal.

SF31 (Ill 3.26a)

Bronze fitting. Cast collar, expanded and sub-square at one end, sub-circular at the other. Wall thickness 0.35mm, thickened to 1mm at expanded end. As the object is complete and has no sign of any attachment mechanism, it is most likely to be a fitting or finial for an organic item around which it would be hammered. It may have been the terminal of a hollow pipe or stem, either for decoration or durability. Its detailed function, however, remains elusive. L 15mm, W 14mm, T 8.5mm. Leaded bronze with trace iron, zinc, arsenic, antimony. Context 095, Block 6, Phase 1 (Wheelhouse 1 wall-packing) (see Section 2.3.1.1).

SF142 (not illustrated)

Fine ring (according to field records; the surviving fragments are too small for meaningful comment). The only substantial piece is a curving strip 5mm long, 2.5mm wide and 1mm thick; overall dimensions cannot be ascertained. Bronze with trace lead, iron, silver, antimony. Context 103, Block 8, Phase 2 (dumped material sealing occupation in Structure 4).

SF193 (not illustrated)

Pin tip. Two fragments form a broken circular sectioned rod, bent and tapering to a slightly blunt tip. L 8mm, D 2.5mm. Leaded bronze with trace zinc.

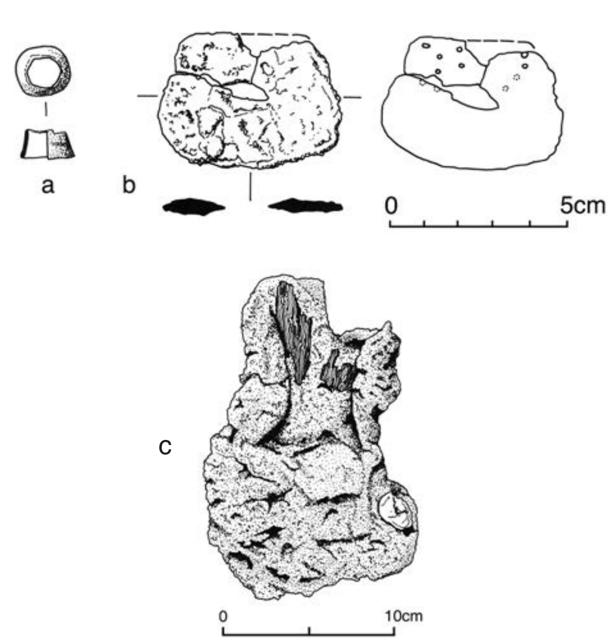


ILLUSTRATION 3.26
Copper alloy, (a) SF31, Iron, (b) SF54, (c) SF23.

Context 172, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

3.10 IRON

Fraser Hunter

Only two iron items were found. The spade blade is a highly significant find in view of the general rarity of such once-common artefacts.

SF23 (Ill 3.26c, colour plate 5)

Spade blade, with folded socket and rounded blade (a hemispherical item of uncertain character, D 38mm, has become attached by corrosion to one edge). The socket is 65mm long, 85mm wide, and a maximum of 30mm thick. A fragment of wooden shaft survives (maximum thickness 20mm): its species cannot be identified (Theo Skinner, pers comm). The folded edges of the socket are *c* 15–20mm broad. The blade is rounded and asymmetrically worn. It is slightly but distinctly angled upwards in section in relation to the socket.

Identification of such implements is always fraught with difficulty, as the boundaries between ard, plough and spade shares are not well drawn. This example is identified with some confidence as a spade on the basis of its short shaft and blade and the shaft/blade angle.

(I am grateful to Hugh Cheape and Sandy Fenton for advice on this). Iron Age spades are few and far between. Since Fenton's study (1963), the only other Iron Age find is from Leckie broch, Stirlingshire (MacKie 1989, plate 4). The Cnip example is particularly important as it is all but identical to the 'straight spade' or *cas-dhìreach* known ethnographically in the Western Isles in the recent past (Cheape 1993a) and characterized, apart from its general form, by the 'lift' of the blade towards the user which allowed extra leverage. The spade rather than the plough was the prime cultivating implement in the Islands in the recent past (ibid, 81). The only contemporary iron cultivation tool known in the Western Isles is the badly damaged spade blade or plough share from A'Cheardach Beag, South Uist (Fairhurst 1971, 102–3; Fenton 1963), although the use of whale bone for ards and spades is well-attested (Rees 1979, 40–1; Crawford 1967).

In view of the find's importance an AMS ^{14}C date was obtained directly from the preserved wood. This gave a date of 1910 ± 45 BP (AA–29767), which calibrates to AD 4–216 (2 σ), entirely consistent with its context. L 150mm. Context 072, Block 12, Phase 2 (upper infill of Wheelhouse 2 entrance passage) (see Section 2.3.2.2).

SF54 (Ill 3.26b)

Perforated sheet. Thin plate, sub-rectangular in plan, tapering on its short axis towards one edge, the corners rounded. Now in three fragments with a small part of one edge lost. It has a slightly off-centre angled lentoid perforation (15 × 5mm). A bronze stud with trace zinc and lead (H 2mm, D 2.5mm) has been inserted at the broken edge, while X-rays suggest there are a number of perforations in the narrower half of the plate. Details are unclear, but a series of at least three perforations along the edge seems quite certain, and there are suggestions of others which do not form a discernible pattern. All once probably held copper alloy studs.

The function of this plate is enigmatic. The stud and perforations suggest it may have been a decorative mount. However the only obvious means of attachment is the lentoid perforation, whose shape would suggest an organic rather than a metal fitting. Alternatively it could have been clamped in place, leaving the perforation free for some uncertain function. No obvious parallels can be quoted. L 53mm, W 35mm, T *c* 1mm. Context 108, Block 6, Phase 1 (wall-packing of Wheelhouse 1) (see Section 2.3.1.1).

3.11 THE VITRIFIED MATERIAL

Dawn McLaren and Andrew Heald

3.11.1 OVERVIEW

A total of 3.8kg of vitrified material was recovered from Cnip (one piece of slag (SF064; Context 108) is missing from the assemblage and is not catalogued here). Visual examination allows the material to be categorized based on morphology, density, vesicularity, and colour. A range of slag morphologies are produced during iron production although only a few, for example tapped slag and hammerscale, are truly diagnostic (of smelting and smithing respectively). A significant amount of material within most slag assemblages is unclassifiable, making the allocation of individual pieces – particularly small samples – to specific types and processes difficult (Crew & Rehren 2002, 84). Further scientific analyses would be necessary to refine the classification. The slag has been described using common terminology (eg McDonnell 1994; Spearman 1997; Starley 2000).

Although different types of slag were recovered, the majority fall into two main types: those indicative of ironworking, usually smithing; and those created during a range of pyrotechnic processes, and not necessarily indicative of metalworking. All of the vitrified material was recovered from secondary contexts; there is no evidence of in situ ironworking. A full catalogue of the material is given in the archive report.

3.11.2 CLASSIFICATION

3.11.2.1 Plano-convex hearth bottoms and slag amalgams

There are two main forms of evidence for the smithing of iron on archaeological sites: bulk slags and micro-slags. Of the bulk slags only 'plano-convex hearth bottoms' (PCHB) are unlikely to be confused with the waste products of smelting and are therefore diagnostic of smithing (Starley 2000, 338). Hearth bottoms are formed in the smithing hearth, and can come in a range of sizes. They are recognizable by their characteristic plano-convex form, having a rough convex base and a smoother, vitrified, upper surface which is sometimes hollowed.

Six plano-convex hearth bottoms and a further two possible fragments were recovered weighing a total of 2868g. The dimensions and density of these pieces, ranging between 85–110mm in diameter, suggest that they are the product of iron smithing

TABLE 3.23
Vitrified material classification.

Residue type	Weight (g)
Plano-convex hearth bottom (PCHB)	1121
Slag amalgam (SA)	1747
Unclassified slag (US)	326
Hearth lining/vitrified ceramic (HL)	418
Vitrified residue (magnetic)	5
Vitified residue (non-magnetic)	63
Fe conglomerate (FeC)	201

rather than smelting (which produces characteristically larger and heavier hearth bottoms, with large charcoal inclusions). Three are slag amalgams of more than one hearth bottom with one example consisting of two or possibly three superimposed hearth bottoms.

3.11.2.2 Unclassified slags – smithing?

The remaining bulk slags (326g) are fractured and small. Such slags are a common component within an assemblage and can be produced during both iron smelting and smithing. Differentiating between the two through visual examination alone is difficult, and for this reason such slags are often referred to as undiagnostic ironworking slags. As many were recovered from contexts with other evidence of smithing (Table 3.24) this does suggest that some were created during this process.

3.11.2.3 Vitrified hearth or furnace lining

A total of 418g of material is hearth or furnace lining with vitreous residues on the interior surfaces. This material forms as a result of a high-temperature reaction between the clay lining of the hearth/furnace and the alkali fuel ashes or, in some cases, iron slag. Often the material shows a compositional gradient from unmodified fired clay on one surface to an irregular cindery material on the other (Starley 2000, 339). One fragment has a large, distinct thumb print remaining on the burnt clay.

3.11.2.4 Other vitrified material

Many items classed as 'slag' during excavation cannot be directly related to ironworking and are best viewed as vitrified material or residues. This is slag formed when material such as earth, clay, stones, or ceramics is subjected to high temperatures, for example in a hearth. During heating these materials react, melt or fuse with alkali in ash, producing glassy (vitreous) and porous materials. These can be formed during any high-temperature pyrotechnic process including domestic hearths and are not necessarily indicative of deliberate industrial activity. They can be both magnetic and non-magnetic. Both are represented at Cnip.

TABLE 3.24
Range and weight of vitrified material associated with structures.
Key: wbs: wind blown sand; SA: slag amalgam; PCHB: Plano-convex hearth bottom; US: Unclassified slag; HL: hearth lining; VR1: vitrified residue (magnetic);VR2: vitrified residue (non-magnetic); FeC: Fe conglomerate.

Structure	Activity	Weight (g)	SA	PCHB	US	HL	VR1	VR2	FeC
1	Masonry + construction	901		×	×	×		×	
1	Occupation + fill	330		×	×		×		×
2	Infill	108			×	×			
4	Masonry + construction	48			×				
4	Occupation + fill	88				×			
5	Masonry + construction	2					×		
5	Occupation + fill	117			×				
5	Infill	44							×
8	Masonry + construction	142		×	×	×		×	
8	Occupation + fill	717	×					×	×
10	Midden/wbs	146				×			
unstrat		1238	×					×	

3.11.2.5 Fe conglomerate

Three random pieces of compact conglomerate with a significant Fe chemical component were recovered.

3.11.3 DISCUSSION

As is characteristic of many slag assemblages, a large proportion of material was unstratified. Another significant group was recovered from secondary contexts, particularly middens used as wall-fills during construction of various structures, other structural material, and rubble. Furthermore, the slag from 'floor layers' cannot be taken as evidence of in situ metalworking as the slag may derive from material deliberately brought in from elsewhere to make floors. The complete absence of micro-slags (hammerscale and slag spheres) – normally indicative of in situ metalworking – reinforces the interpretation that most, if not all, of the vitrified material from Cnip is residual.

However, further contextual analysis is fruitful. First, there is a marked concentration of slag from Phases 1 (the initial phase of the site's occupation, represented by the construction of two wheelhouses) and 3 (the final major construction phase, shown by Structure 8) (Table 3.24). Second, these concentrations are confined to specific structures, in particular, Wheelhouse 1 and Structure 8 (Table 3.24).

Wheelhouse 1 has the largest stratified slag collection, with the majority deriving from midden material used as packing during the wheelhouse construction. Given that the construction of wheelhouses is dated to around the last couple of centuries BC, the ironworking evidence, although residual, does indicate that metalworking took place in and around Cnip around this time and is a welcome addition to the meagre evidence for ironworking in the Early/Middle Iron Age (see MacKie 1971). Similarly, the second largest assemblage was associated with construction material and laid midden floors of Structure 8. While this cannot be related to use of this building, the material does show that ironworking took place in and around Cnip during the first two centuries AD. This contextual analysis raises wider interpretative issues, especially with finds from earlier excavations. In the past artefacts have been interpreted as relating directly to on-site activity. What the Cnip assemblage demonstrates is that such material, although indicative of craft in the vicinity, may be completely divorced from the structure and period in which it is found.

Despite these problems, the slag demonstrates that ironworking took place in and around Cnip sometime during the Iron Age. Yet our understandings of the chronology and role of iron production in the Scottish Iron Age is still ambiguous although valuable work has been done (eg MacKie 1971; McDonnell 1994, 1998; Hingley 1997). Thus, in his review of Iron Age Scottish society Hingley could only state that 'there is at present very little comprehension of the function of the household and the community in the context of agricultural and industrial production' (1992, 41). At present we have a blanket-approach to interpretations; there is a common perception that evidence for ironworking can be expected on many, if not all, Iron Age sites (eg Mortimer 2000, 271). This perception exists within the Atlantic Scottish domain, particularly those with structural characteristics similar to Cnip (eg Armit 1996, 151).

By studying the Cnip assemblage within its wider Hebridean context three points emerge. First, although it is true that many sites have evidence for ironworking, of the wheelhouse and cellular sites noted in Armit (1992) less than 50 per cent have such evidence. As slag collections were noted in some early excavations antiquarian recovery procedures are not entirely to blame for these patterns.

Second, there appear to be differences in the quantity of ironworking material recovered from sites broadly contemporary with Cnip. For example, no diagnostic ironworking debris was recovered from Sollas (Campbell 1991) and only very small traces of slag were recovered from Dun Vulan (Dungworth 1999, 230) and Dunan Ruadh (Mortimer 2000, 270–1). These totals are far smaller than that recovered from Cnip and from Cnip 3 (see below, this section). While issues of taphonomy, chronology and preservation may be skewing interpretation the emerging picture does indicate that different structures were backdrops for differing levels of ironworking during the Iron Age. On many of these sites the slag may represent little more than everyday repair or manufacture of prosaic, functional objects. However, on other sites, they may be indicative of more specialized activity.

As McDonnell (1998, 158) has emphasized, when slag is found it is essential to distinguish between an area or building used for occasional, intermittent smithing and a full-time working forge. In a Hebridean context this is hard to detect. However, there are tantalising hints. For example, the bronze- and iron-metalworking evidence from Cnip 3 suggests that the site was an arena for specialized industrial activities (Armit & Dunwell 1992, esp 147). Although the 'furnace-like structure' from A' Cheardach Bheag cannot be related to a specific industrial process it may be associated with ironworking (Fairhurst 1971, 90). Finally, the crucibles from the furnace at Bac Mhic Connain show that the structure was used for non-ferrous metalworking at some stage (Beveridge & Callander 1932, 43, 48, fig 2). Although the slag cannot be directly related to the furnace it too is part of a wider, probably specialized, on-site metalworking tradition. These examples suggest that different sites were home to different degrees of metalworking. Whether they relate to different parts of the ironworking cycle (smelting, primary smithing, secondary smithing) or form part of a wider network are difficult to answer at present. However, they do suggest that not all slag can be explained as object repair. If this is true of the Hebrides it is likely to be true of the rest of Iron Age Scotland.

Although the metalworking debris from Cnip is small in quantity and from secondary contexts it is a useful collection for stimulating pertinent questions regarding the scale, role and organization of ferrous metalworking in Atlantic Scotland. The ever-increasing Hebridean corpus has an important role to play in these discussions. As Armit and Dunwell (1992, 147) state, the possibility of well-preserved specialist workshops of Iron Age date surviving in their wider landscape gives these sites an importance in a far wider context than Atlantic Scotland.

3.12 NON-FERROUS METALWORKING DEBRIS

Andrew Heald and Fraser Hunter

3.12.1 MOULDS

Six objects from Cnip were associated with non-ferrous metalworking. All are valves of bipartite moulds (for the general process see Curle 1982, 35–9 and Lane & Campbell 2000, 201–3). None of the moulds are complete, nor do they preserve the full extent of the object manufactured. However, where discernible, all appear to be associated with the manufacture of pins. They are made from a fine brown oxidized clay with few inclusions, reduced to grey at the casting face. Three of the moulds are upper valves, the others lower valves. Rather than having keys to hold the halves together, the face of each upper valve is dished on either side of the object impression to act as keying for the corresponding convex area on the lower valve. Four of the moulds have surviving in-gates, where the metal was poured into the mould. These are always at the bottom of the pin shaft. All moulds have remnants of a skin of clay that was applied to the exterior to hold the two halves of the mould together. These technological aspects are used consistently by the Cnip smiths. The casting surfaces were analysed non-destructively using energy dispersive X-ray fluorescence (EDXRF) by the Conservation and Analytical Department at NMS.

SF270 (Ill 3.27a)

Ring-headed pin mould. Upper valve with ingate. Broken at the head. The shaft of the pin (width *c* 3mm) is defined by two prominent ridges. Sadly the broken area contained the crucial details for identifying the pin type. It is a projecting ring-headed pin, with the plane of the head 4.5mm in front of the shank. The face is lost, but the edge is preserved up to about half the head's original height and is plain, indicating it was not a beaded or rosette-headed pin. It could be either a plain ring-headed pin or a proto-handpin, where the crescent in the lower half is plain (Stevenson 1955, 289, fig B, nos 2, 12): it is not possible on this evidence to discriminate between them. Extrapolating the full extent of the head gives a pin of L some 75mm, with a head of W 19mm and H 20mm, and a shank of L 55mm and D 2.5–2.7mm. EDXRF analysis revealed highly enhanced values of zinc and lead, and traces of copper. L 83mm, W 33.5mm, T 20mm. Context 172, Block 5b, Phase 2b (sand deposit in Bay 1, Wheel-house 1).

SF271 (Ill 3.27b)

Pin mould. Upper valve fragment with ingate. Broken at one end. Only the shaft survives. The shaft of the pin is defined by two prominent ridges which are very irregular and bowed in places (width *c* 2–4mm). Probably associated with SF272. EDXRF analysis revealed traces of zinc and copper. L 48mm, W 27mm, T 18mm. Context 181, Block 5b, Phase 2b (sand deposit in Bay 7, Wheelhouse 1).

SF272 (Ill 3.27c)

Pin mould. Lower valve fragment with ingate. Broken at one end. Only the shaft of the pin survives (width 3mm). Probably associated with SF 271. EDXRF analysis revealed no significant metal traces. L 46mm, W 21mm, T 15mm. Context 181, Block 5b, Phase 2b (sand deposit in Bay 7, Wheelhouse 1).

SF212A (Ill 3.27d)

Pin mould. Upper valve fragment with ingate. Broken at one end. Only the irregular shaft of the pin survives (width *c* 2–3mm). Probably associated with SF212b. EDXRF analysis revealed no significant metal traces. L 44mm, W 28mm, T 18mm. Unstratified.

SF212B (Ill 3.27e)

?Pin mould. Lower valve fragment. None of the original casting surface survives. However, the object has the fabric characteristics of a mould and as it was found associated with SF212a it is likely to be part of a mould. L 27mm, W 16mm, T 17mm. Unstratified.

SF 273 (Ill 3.27f)

Pin mould. Lower valve fragment. Broken at both ends. Remnants of a pin shaft width *c* 3mm. The part of the mould with the pin head does not survive. EDXRF analysis revealed no significant metal traces. L 43mm, W 25mm, T 18mm. Context 173, Block 5b, Phase 2b (sand deposit in Bay 2, Wheelhouse 1).

3.12.1.1 Other

Four other fragments (SF274–277) from the site may also be moulds. However not enough survives to be sure of function or product. EDXRF analysis revealed no significant metal traces. L 24mm, W 22m, T 16mm. L 26mm, W 17m, T 15mm. L 21mm, W 16m, T 13mm. L 26mm, W 18m, T 10mm. Context 289, Block 5a, Phase 2a (deposit of peat ash in Bay 7, Wheelhouse 1) (see Section 2.4.1.5).

3.12.2 DISCUSSION

While only one valve (SF270 (Ill 3.27a)) has evidence for a pin-head, all of the diagnostic moulds are for the manufacture of pins. Although it is difficult to relate the upper and lower valves some appear to be part of the same two-piece mould (see Section 3.12.1). This suggests that at least four pins were made by the Cnip smiths. Only the largest surviving fragment allows a closer identification. As noted, the pin was either a projecting ring-headed pin or a proto-handpin. The former were in use throughout the Iron Age (see Stevenson 1955) and an example from Scalloway, Shetland suggests the type survived in use into the fifth century AD although not necessarily in manufacture (Sharples 1998, 185). Proto-handpins normally date to around the third-fourth century AD (Youngs 1989, 23). The context from which the mould derives suggests that the mould may be for the manufacture of a projecting ring-headed pin – it is from one of the latest deposits in Phase 2, which is dated to around AD 100 (see Section 6.3.3). Ring-headed pins are found across Scotland (Stevenson 1955, 288–92; Clarke 1971, 49–54), although manufacturing evidence is

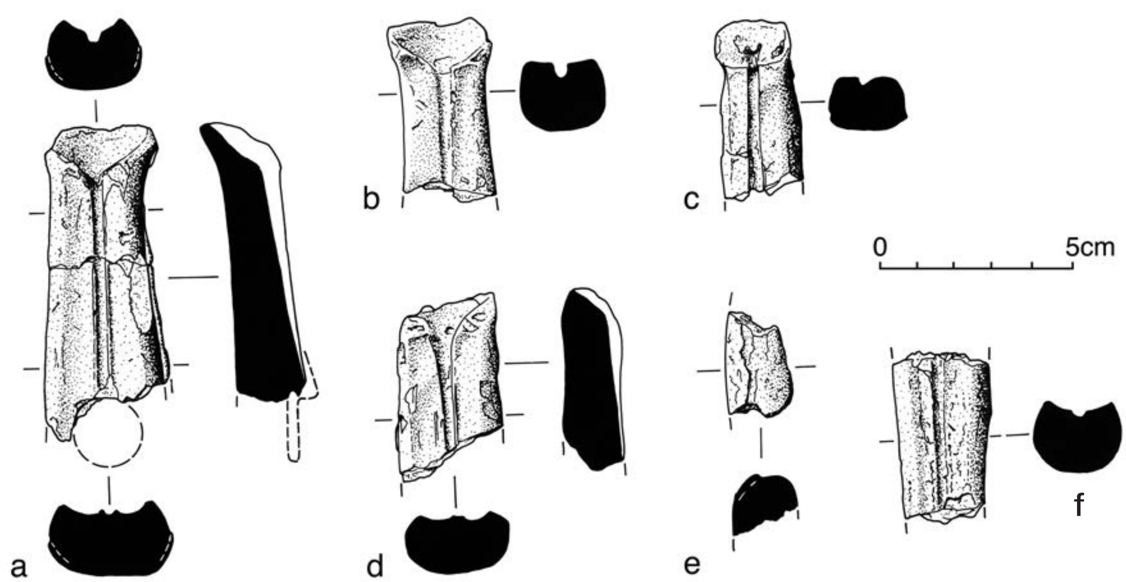


ILLUSTRATION 3.27

Moulds, (a) SF270, (b) SF271, (c) SF272, (d) SF212a, (e) SF212b, (f) SF273.

rarer. Moulds for various types are known from a variety of sites including Sollas, North Uist (Campbell 1991, 164), Gurness, Orkney (Hedges 1987b, 158–9, figs 2.84–5; Close-Brooks 1987), Lingro, Orkney (Stevenson 1955, 290), and Traprain Law, East Lothian (Burley 1956, 219–20; Stevenson 1955, 290). Given the type's wide distribution, this concentration of manufacturing debris in the Atlantic area is more to do with the survival of artefact-rich deposits than a real cultural phenomenon.

Although the interpretation of EDXRF spectra of moulds is problematic (see Barnes 1983; Dungworth 2000) the high zinc reading may be noteworthy. While the original alloy is uncertain the analysis suggests that the ultimate source of the metal was from a supply drawing on Roman sources, as zinc is unknown in any quantity in Iron Age alloys (Dungworth 1996, 403). This may also have chronological significance: the presence of zinc suggests that the mould does not predate *c* AD 80. This seems to fit well with the radiocarbon dates from Cnip (see Section 6.3.3).

All stratified mould fragments are associated with the occupation and infill of the Wheelhouse Structure 1 (Phase 1–2, Block 5). The moulds were found during the excavation of three different bays (1, 2, 7). All of these bays saw various periods of use making the recognition of in situ metalworking areas and episodes difficult. That said, the moulds do indicate that non-ferrous metalworking took place at Cnip around the turn of the first millennium and is a welcome addition to our scant knowledge of non-ferrous metalworking in the area.

As with ironworking (see Section 3.11) our understanding of the scale and organization of non-ferrous metalworking across Atlantic Scotland during the Middle Iron Age is limited. Implicit within many discussions of non-ferrous metalworking throughout the first millennium BC/AD is the association between the craft and sites of high status and/or central places. At one level this seems a perfectly reasonable argument, as the quantity of moulds and crucibles from important Early Historic sites, such as Dunadd, Argyll illustrates (Lane & Campbell 2000, 106–47). Analysis of the evidence for non-ferrous metalworking in Atlantic Scotland during the Middle Iron Age suggests that sites argued to have some wider importance within the community – for example Orcadian nucleated settlements – were foci for the craft (Heald 2005). In this light the non-ferrous metalworking evidence from Cnip could easily be viewed as part of the goods and expertise circulating during the Middle Iron Age.

At present, it is difficult to interpret the role and organization of non-ferrous metalworking in the Western Isles. Moulds and crucibles have been recovered from around 18 sites of probable Iron Age date. These include the wheelhouse complexes at Bac Mhic Connain (Beveridge & Callander 1932, 49, 61–2, fig 17); Garry Iochdrach (ibid, 42); Sollas (Campbell 1991, 163–4, Illus 22); Cnoc a' Comhdhalach (Beveridge 1911, 200–6; Campbell & Heald forthcoming); and Clettraval (Scott 1948, 67–8) (all North Uist); A' Cheardach Mhor, South Uist (Young & Richardson 1960, 155–6, fig 13); and Tigh Talhamanta (Young 1953, 100–1, fig 9); and Alt Chrisal, Barra (Gowans 2000, 189). On the one hand this appears to suggest that non-ferrous metalworking was actually a common activity. However, many of these sites were reused after the primary occupation, and the metalworking debris may be much later. This is demonstrated by the recovery of a mould for the manufacture of an eighth-century penannular brooch from Cnoc a' Comhdhalach (Campbell & Heald forthcoming).

While not disputing the social importance of the craft, research into the Later Iron Age metalworking tradition offers a word of caution. This shows that non-ferrous metalworking, often including the use of precious metals and the manufacture of ornate objects, took place on a wider range of sites than hitherto appreciated, including sites argued to be at the lower end of the social spectrum. It is, therefore, an oversimplification always to equate non-ferrous metalworking with sites of high status or central places (Heald 2005; Campbell & Heald forthcoming). The Scottish Iron Age is typified by regional variation in structures and artefacts, which presumably reflect varying social and economic trajectories in different areas at different times. Thus, we cannot automatically assume that the non-ferrous metalworking evidence from Cnip attests to high status or specialist occupants. At present the Hebridean Middle Iron Age dataset is unable to reveal whether the craft was a high-status activity, an occasional and rare activity carried out by itinerant specialists or a commonplace and habitual one carried out by the community. That said, the deliberate burial in a pit of a complete crucible containing mica plates from Sollas (Campbell 1991, 144) and the relative rarity of copper alloy ornaments compared to bone ones strongly suggests that metalworking and metal items were viewed as items of some importance in the Hebridean Middle Iron Age. Perhaps the smith was viewed in equally high regard.

Chapter 4

Subsistence and environment

4.1 INTRODUCTION

The excavations at Cnip produced considerable evidence for the subsistence strategies and environmental exploitation practised by the Iron Age inhabitants of the site. As is to be expected on the alkaline machair, the survival of bone was good, including bird and fish bone as well as mammal bone, so it is possible to provide a reasonable picture of Iron Age husbandry and the exploitation of wild animals. The main limitation relates to the focus of the excavation on the deposits contained within the buildings themselves. Thus there are no extensive midden deposits which might expand the quantitative data available or perhaps widen our insights into food selection and preparation beyond those yielded by the deposition of food remains within accumulating floor deposits. Within similar limitations some insights have also been possible into agricultural practices and the exploitation of plant resources.

The nature of the project did not enable any wider analysis of the palaeoenvironmental background of Cnip. There have, however, been a number of pollen and related studies within the Bhaltos peninsula and these have been quarried for relevant insights as appropriate in the sections which follow.

4.2 ANIMAL BONE

Finbar McCormick

4.2.1 INTRODUCTION

The excavations at Cnip produced a relatively small, but interesting, assemblage of animal bone. The 14 blocks which yielded bone were analysed separately and the bones from the separate blocks are listed in tables held in the site archive. The fragments numbers and minimum numbers of individuals (MNI) from each block and phase are summarized in Table 4.1 and 4.2 of the present report. The MNI for each context was based on the most commonly occurring skeletal element, left or right, but no attempt was made to modify MNI values on the basis of bone size or stage of fusion. Tables 4.11–4.14 list the measurements of the bones of each of the main species.

Nearly all of the material came from domestic contexts, especially floors, passage-ways and middens, and for the most part represents discarded food refuse.

TABLE 4.1
Fragment distributions from different blocks.

Block	Phase	Cattle	Sheep	Pig	Dog	Red deer	Common seal	Cetacean	Otter
1	3	81	48	14	–	31	–	16	3
3	3	4	3	2	–	9	1	2	–
4	3	11	5	4	–	6	–	–	–
5a	2	70	55	4	1	34	–	4	–
5b	2	215	174	26	–	128	1	39	–
6	1	24	12	2	–	31	–	6	–
8	2	99	38	11	–	70	4	10	–
11	1/2	10	6	2	–	3	1	–	–
15	1	17	18	6	–	10	2	–	–
18	3	69	51	10	–	41	–	2	–
19	2	21	18	–	–	2	–	–	–
19(F220)	2	–	30	–	–	1	–	–	–

TABLE 4.2
Minimum numbers of individuals (MNI) values from different blocks.

Block	Phase	Cattle	Sheep	Pig	Dog	Red Deer	Common Seal	Cetacean
1	3	4	3	1	0	2	0	1
3	3	1	1	1	0	1	1	1
4	3	2	1	1	0	1	0	0
5a	2	2	4	1	1	3	0	1
5b	2	7	8	2	0	8	1	1
6	1	1	2	1	0	1	0	1
8	2	2	2	1	0	5	2	1
11	1/2	1	1	1	0	2	1	0
15	1	2	2	1	0	2	1	0
18	3	2	2	1	0	3	0	1
19	2	2	2	0	0	1	0	0
19(C220)	2	0	2	0	0	1	0	0

The only exceptions were two semi-complete sheep skeletons. The first was from Phase 1 (Context 090) and was found in the infilled entrance to Wheelhouse 2, while the second was below the entrance passage connecting Structure 3 to Wheelhouse 1 (Context 220). Cattle, sheep, pig, dog, red deer, common seal, otter, and cetacean were the only species represented on the site. There was no evidence of horse or domesticated cat.

The fragments and MNI values of the main meat-bearing species from the individual blocks were combined to give overall MNI values by phase, and the results are shown in Table 4.3 and 4.4. With the exception of a reduction in pig numbers during Phase 2, there is general consistency in the distribution between the three phases. Cattle and sheep are the principal domesticates, being present in roughly equal numbers, with pig being of much lesser importance. The most surprising aspect of the assemblage, however, is the important role played by red deer. They are as prominent, in terms of MNI, as sheep and cattle and clearly played a vital role in the provision of meat for the inhabitants.

In order to place the Cnip distribution in context, data from a series of Hebridean sites was compiled in Table 4.5. The data was confined to fragments

TABLE 4.3
Distribution of the fragments from main phases.

	Cattle	Sheep	Pig	Red Deer	No.
Ph1	41	30	8	41	122
Ph 2	435	285	41	235	996
Ph 3	165	107	30	87	389
Total frag	641	422	79	363	1505
Ph 1 %	33.6	24.6	6.6	33.3	
Ph2 %	43.7	28.6	4.1	23.6	
Ph 3 %	42.4	27.5	7.7	22.4	
Total frag %	42.6	28	5.2	24.1	

TABLE 4.4
MNI distribution of main species from Phases 1–3.

	Cattle	Sheep	Pig	Red Deer	No.
Ph 1	2	2	1	2	7
Ph 2	13	17	4	18	52
Ph 3	9	7	4	7	27
Overall MNI	24	26	9	27	186

	Cattle	Sheep	Pig	Red Deer	No.
Ph 1 %	28.6	28.6	14.3	28.6	7
Ph2 %	25	32.7	7.7	34.6	52
Ph 3 %	33.3	25.9	14.8	25.9	27
Overall MNI %	27.9	30.2	10.5	31.4	186

distribution as the use of MNI data greatly reduces the data base. The table shows that the high incidence of deer noted at Cnip is also recorded in both the Beaker period and Iron Age levels at Northton, in Harris. Between these phases, and in an earlier Neolithic phase, the importance of deer is considerably less. In a series of phases ranging from the early Iron Age to the Norse period at Dun Mor Vaul, Tiree, deer also maintain a predominant role in all but one of the phases. At Dun Ardtreck, on Skye, deer also played a prominent role. In contrast to this, however, deer played an insignificant role in a series of sites from the Uists.

It is difficult to provide a convincing explanation for the contrasting role of deer on the various sites. It might be noted that the amount of machair land at Northton and especially Cnip is relatively limited compared with the extensive machairs in the vicinity of the Uist sites. Limited agricultural land resources may have led to a higher dependence on wild animals for meat. Furthermore, both Cnip and especially Northton are closer to areas of extensive highlands which are more conducive to higher deer densities. It has also been noted that proximity to agricultural land and the presence of large numbers of lochs, indicating poorly drained habitat (Clutton-Brock & Albon 1989, 30–4), tend to coincide with lower deer densities. All these factors may contribute to the low incidence at the Uist sites.

This deterministic model cannot be applied, however, when one considers Tiree. This area has very limited areas of upland, extensive machair and few lochs, yet the incidence of deer at Dun Mor Vaul is consistently high in a period ranging from the early Iron Age to the Norse period. The physical environment and the small size of the island created a situation which should have been unsuitable to the co-existence of human settlement and a viable population of wild deer. Therefore, the economy indicated by the bone assemblage at Dun Mor Vaul could only have been maintained if deer were treated almost as a domesticated animal.

This careful 'farm' management is especially demonstrated by the presence of roe deer at Dun Mor Vaul. Nearly half the cervid bones were of roe and they are present in all of the Iron Age phases of the site. The species is now extinct on the island, the nearest being present on Mull (Clutton-Brock & Albon 1989, 172). The roe deer is essentially a woodland animal but Pilcher (1974, 207), on the basis of the palynological evidence, found no evidence for woodland near Dun Mor Vaul during the Iron Age. Even if small pockets of woodland were present on other parts of the island, the maintenance of a population over so long a period must represent careful conservation, and sensitive culling, of the deer population.

It also seems almost certain that deer, like the other domesticates, were deliberately introduced to Tiree and other islands of the Outer Hebrides although it will not strictly ever be possible to prove this hypothesis. The occasional treatment of deer as

TABLE 4.5

Percentage distribution of fragments from Hebridean sites (after Finley 2006; Halstead 2003; McCormick 1981; Mulville 1999, Tables 10.5, 10.6 and 10.33; Noddle 1974, 1980, 1981; Sergeantson forthcoming. X indicate that a species is present but in negligable quantities. *At some sites the deer bones are comprised of a mixture of red and roe. Roe deer comprise 30% of the cervid bones at Dun Mor Vaul, 7% at Dun Vulan and Dun Ardtreck, and 5% in the vallum, Iona. The Hornish and Baleshare values are of 'anatomical units' rather than fragments

		Cattle	Sheep	Pig	Red Deer	N.
Lewis + Harris						
Northton:	Neolithic	28	68		4	608
	Beaker Phase 5–6	40	43	1	16	140
	Beaker Phase 7	35	32		32	580
	Iron Age Phase 1	39	47	4	10	114
	Iron Age Phase 2	9	8	0	82	333
Cnip	Iron age Ph. 1–3	43	28	5	24	1505
Loch na Beirgh	Sub-phase 1	37	27	2	34	132
	Sub-phase 1 and 2 Iron Age	34	24	4	38	1889
Dun Bharabhat	Iron Age	27	21	4	48	327
North Uist						
Sollas	Site A Iron Age	34	59	6	1	775
	Midden B Iron Age	57	37	5	1	100
Udal	Phase 11–13 *c* AD 300–800	39	59	2	x	6689
Baleshare	Early/middle Iron Age	34	59	6	1	2040
South Uist						
Hornish Point	Late Bronze/early Iron Age	28	59	12	1	440
Dun Vulan	Adjacent to Broch	28	48	22	3	569
	Platform	47	39	14	1	2313
	Overall	41	43	15	1	3597
Tiree						
Dun Mor Vaul	Period 1. Pre-broch	19	32	2	47	81
	Phase 2. Construction	18	67	3	13	440
	Phase 3a. Broch	30	36	5	29	234
	Phase 3b. Broch	32	27	12	29	73
	Phase 4. Post-broch IA	35	31	2	32	376
	Phase 5. Norse	23	24	9	45	139
Skye						
Dun Ardtreck	Iron Age	51	8	13	28	1303
Iona						
Dun Cul Bhuirg	Iron Age	44	19	20	17	180
	Monastic Vallum AD seventh century	81	15	2	10	210
	Guest House upper AD ninth century	28	12	12	48	685
	Guest House lower AD ninth century	33	11	11	44	733

TABLE 4.6
Relative proportions of carcass meat provided by mammals (all phases).

	Cattle	Sheep	Pig	Red Deer	Common seal
Number	24	26	9	27	4
Estimated live weight (kg)	450	19	80	87	91
Estimated carcass weight (kg)	225	9.5	64	52.6	68.3
Total carcass weight (kg)	5400	247	576	1420.2	273.2
Percentage carcass weight	68.2	3.1	7.3	17.9	3.5

TABLE 4.6a
MNI Distribution from Outer Hebridean sites after Finley (1991) and Mulville (1999). The MNI values for deer at Dun Vulan were not estimated but deer bones accounted for only 1.1% of the fragments total at the site.

		Cattle	Sheep	Pig	Red Deer	No
Cnip	Ph. 1%	28.6	28.6	14.3	28.6	7
	Ph. 2%	25	32.7	7.7	34.6	52
	Ph. 3%	33.3	25.9	14.8	25.9	27
	Overall MNI %	27.9	30.2	10.5	31.4	186
Sollas	Site A Iron Age	20	70	5	5	20
	Midden B Iron Age	18.2	63.6	9.1	9.1	11
Dun Vulan	Adjacent to broch	20	55.6	24.4	–	23
	Platform	36.7	48.2	15.1		70

an almost domesticated livestock is also supported by documentary evidence from medieval Scotland. In 1288–90 there are records of deer being fed on hay at Stirling Park, although in this case it was in order to maintain fallow deer primarily for sport rather than as a food resource (Gilbert 1979, 220) while the feeding of hay to red deer in the Highlands occurs today during harsh winters.

The high incidence of red deer at Cnip and some other Hebridean sites must therefore be considered in terms of the farming rather than simply the hunting of deer. The widening of one's livestock range to include wild species allowed more effective exploitation of the grazing resources in areas of such extreme climate as the Hebrides and Northern Isles. Red deer on Lewis and Harris, despite needing 30 to 40 per cent more energy per unit of body weight for maintenance than sheep (Clutton-Brock & Albon 1989, 99), would have been able to exploit higher altitudes than hill sheep throughout the year. Careful exploitation of the deer therefore allowed the inhabitants of the islands to exploit more of the vegetation, by way of conversion to meat, than by simply limiting themselves to managing domesticated species.

Table 4.6 attempts to provide some indication of the relative importance of red deer by converting the data in Table 4.2 to dressed carcass weight. Estimating the weights of early animals can be problematical and the values used in the calculations are as follows. Cattle live-weight is based on the value used by Legge (1981, 99) in his study of Bronze Age Grimes Graves. The ewe live-weight is that of a modern adult Soay (Boyd et al 1964, 145). In both cases a dressing-out proportion of 50 per cent is assumed. The deer weight is the average of modern dressed hind carcass weights noted by Clutton-Brock and Albon (1989, 60), as the deer from Cnip are similar in size to modern types. The pig weight used is based on that used by van Wijngaarden-Bakker (1986, 71) and used for Beaker material in Ireland and assumes a dressing out proportion of 80 per cent. Finally, a common seal weight of 91kg is assumed being 20 per cent less than the maximum adult size stated by Hewer (1974, 169). White (1953, 398) suggests a dressing out proportion of 75 per cent for seal. No attempt was used to take the meat of cetacean species into consideration.

Table 4.6 indicates that cattle were clearly the most important provider of meat but that red deer provided much more than either pig or sheep. Indeed, apart from during Phase 1, sheep appear to have provided even less meat than common seal.

4.2.2 CATTLE

Although the bones from Cnip survived in good condition they tended to be extremely fragmented and the metrical data is fairly limited (Table 4.11). The sample of cattle bones was too small to allow the sex distribution to be estimated, and none of the cattle bones displayed pathological anomalies.

Two complete metatarsals, with greatest lengths of 175.9mm and 178.1mm, were present. These provide estimated wither's heights of 95.9cm and 97.1cm, using the mean of the male and female multiplication factors devised by Fock (quoted in von den Driesch and Boessneck 1984, 336). These are extremely small cattle. They are for instance smaller than cattle from Iron Age Dun Vulan, South Uist, where the average metatarsal greatest length was 194.3mm (Mulville 1999, 255). Published comparative material from contemporary mainland Scottish sites is extremely rare but two metatarsals from Roman Iron Age levels at Edinburgh Castle have greatest lengths of 202.3mm and 211.6mm (McCormick 1997, 207), while a single example from the Roman *vicus* at Inveresk in East Lothian has a greatest length of 229.1mm, although the latter is a very large example by any prehistoric or early historic standards.

TABLE 4.7
State of cattle manibular eruption and wear after Case (1967) and Grant (1982). Estimated ages are approximate and potentially inaccurate and are provided only as a guide.

Higham stage	Stage of tooth eruption	Approx age in months	Number
3	PM4 erupted, M1 not	1–4	1
4	M1 in primary eruption	5–6	3
6	M1 in tertiary eruption	7–9	1
8	M2 in primary eruption	15–16	1
13	M3 in secondary eruption	24–30	1
20+	M3 erupted, wear stages G × 3: K × 1	40+	4

TABLE 4.8
Cattle fusion data based on Silver (1969, 285–6). (Data in site archive table 5)

Approx age (in months)	% killed
0–10	40
10–18	0
18–36	0
36–42	16
42–48	13

The Cnip data also indicates cattle smaller in height than noted in Iron Age Orkney, where the lengths of the metatarsal at Howe range from 189–203mm (M=7) with a mean of 195.3mm (Smith 1994). The single complete metacarpal from Cnip (GL=158.5mm) also demonstrates the small size of the cattle present as those from Howe range from 169mm–191mm.

Smallness of animals can be attributed to poor nutrition as well as isolated breeding (see Section 4.2.5). The immediate hinterland of Cnip was fairly isolated and certainly not ideal for the raising of cattle. There is a very limited area of machair and Lewisian black earth, a fertile mixture of peat and shell sand, which is suitable for the production of grass, but it seems likely that much of this land would have been reserved for tillage. The necessity of fallow would, however, have made some machair grassland available. nineteenth-century data from the Uists, for instance, indicates that machair was tilled for three years and then allowed to return to grassland (Carmichael 1916, 253). At Cnip, however, it seems likely that most of the grazing would have occurred on the peatlands and uplands. This was certainly the case on the Uists when cattle were kept in larger numbers than at present. During the nineteenth century, the cattle were brought to the heath and hill grazing areas at the beginning of June (ibid, 364) where they were overseen from shielings throughout the summer.

Grazing would have been extremely limited during the winter and spring. Walker, quoted in McKay (1980, 97), states that in the absence of hay (winter forage), cattle were left to graze outdoors throughout the year. This leads to very low stocking rates and a generally low standard of cattle husbandry. It also seems unlikely that hay was saved during the Iron Age, if for no other reason than that the land available for hay production in the vicinity of Cnip was extremely limited. It would not be surprising, therefore, if the extremely poor environment accounted for the small size of the cattle at Cnip as they, unlike sheep, do not thrive well on poor grazing and the extreme weather conditions, which are the norm in the Western Isles during the winter.

Small size, however, had one great advantage in the Cnip area. With so much of the grazing having to be undertaken in boggy areas, and especially with the necessity of leaving cattle outdoors during the wet winter period, small cattle were much less likely to sink and become trapped in boggy areas.

The cattle ageing data from Cnip is very limited. Only a small number of mandible fragments with their innermost teeth in site were present and the data is shown in Table 4.7. This, admittedly rather limited data, indicates that about 45 per cent of cattle were less than one year at time of death, 36 per cent were old animals with the remaining 18 per cent being between one and two and a half years at time of slaughter.

The epiphyseal fusion data also shows the same age/slaughter distribution data as the tooth eruption data (Table 4.8). This bimodal cattle slaughter distribution, with an emphasis on very young and very old animals, has also been noted on other Iron Age sites in the Western Isles such as the Udal, Baleshare and Dun Vulan (Halstead 2003, 145; Mulville 1999, 25; Serjeantson forthcoming). At these sites the majority of the younger peak represented neonatal or calves of under one month of age. At Baleshare 36 per cent of the cattle were neonatal while 33 per cent were less than two or three weeks of age at the Udal. At Dun Vulan some 49 per cent were calves of less than one month of age (Mulville 1999, 246). Mulville (ibid, 271) argues that this age/slaughter pattern is a direct result of a dairying strategy but it unlikely that such a strategy would have been advantageous to dairying in the Hebrides. McCormick (1991) has shown that early literary evidence demonstrates that early cows could not be milked unless their calf was present. Martin Martin (1716, 155) indicates that this was still the case in Skye during the seventeenth century and probably the latest evidence of the trait is from the Western Isles in 1884 when Crawford states that:

> Occasionally a calf dies, and the mother cow is restive, and will not give the milk. To quiet her, and obtain milk from her, the skin of her dead calf is placed on a skeleton frame calf, made for the purpose. This is placed before the cow, and the deception has the desired effect. (Crawford quoted in Lucas 1989, 54)

McCormick (1998) has instead argued that the high incidence of calf slaughter was simply a product of poor grazing. Cows produced more calves than the land could support. The Uist proverb '*Is fearr aon laogh na da chraicionn*' (Carmichael 1916, 256) – one calf is better than two skins – succinctly summarizes the predicament facing early livestock rearers in this part of the world. A high incidence of juvenile mortality has also been noted on Atlantic Irish sites of different periods, an age slaughter pattern that is not repeated in contemporary inland sites. This again suggests that it is environmental rather than economic factors that determined this rather extreme slaughter pattern.

This does not mean, however, that cattle were not milked on the Hebrides at this time. Solinus, writing in the third century AD, states that the inhabitants of the Hebrides (*Ebudae*) lived on fish and milk (quoted in Legge 1981, 220). Additionally, lipid analysis of Late Bronze and Early Iron Age pottery from Cladh Hallan, South Uist, has produced evidence for cattle dairy fat (Jaqui Mulville pers comm) while elsewhere in Britain there is similar evidence dating back to the early Neolithic (Copley et al 2003). The presence of cattle dairy fats on early pottery, however, should not be equated with a food economy that is heavily dependent on dairy foods. The early Egyptians, for instance, milked cows but milk was only used for feeding infants and occasional medicinal usage (Darby et al 1977, 764, 771–2). Neither is there any definite evidence that they produced secondary products such as butter or cheese.

It is possible that the high incidence of cattle dairy fats in prehistoric pottery is more a reflection of attempting to make the unglazed pottery less porous than of a widespread dairying food economy. John Walker notes the use of milk for this purpose on the Hebridean island of Coll during the late eighteenth century. In his description of pottery-making he notes the following:

> In some parts of the Island, there are pits of a reddish Clay, which the Inhabitants manufacture into different kinds of Earthen Vessels which they call Crokans. This sort of ware, the most rude and simple that can be anywhere made, they frame in the following manner. The clay, without any mixture, they form by the Hand, into the Shape of the Vessel required, and then place them in the Sun, till they are thoroughly dry. After this, they are filled with Milk and set upon a strong Fire, where they

TABLE 4.9
State of sheep mandibular teeth eruption and wear after Higham (1967) and Grant (1982).

Higham Stage	State of tooth eruption	Approx Age in months	Number
4	M1 in primary eruption	3	2
6	M1 in tertiary eruption	5	2
7	M1 in wear, M2 unerupted	5–9	7
9	M2 in primary eruption	9–10	2
10	M2 in secondary eruption	10–11	1
11	M2 in tertiary eruption	11–12	1
12	M2 in wear, M3 unerupted	12–21	6
13	M3 in eruption	21–24	33
14	M3 in wear, cusp 3 unworn	24–26	1C
15+	M3, cusp 3 in wear	26+	8DEGGGGGG

> are kept till the milk be entirely be boiled away, which finishes the Operation. (McKay 1980, 171)

One should be careful of equating positive lipid results of cattle dairy fat with widespread dairy food consumption. It is likely that the analysis of early modern condoms would produce similar positive results. A handwritten label dated 1813 on a condom in Lund University Historical Museum notes the following: 'In order to protect themselves against venereal disease, those who are inclined to have sexual intercourse should cover the penis with a thin membrane softened in warm milk [*late tepid*], and use this sheath when they fornicate with prostitutes' (quoted in Gaimster et al 1996, 140).

4.2.3 SHEEP

4.2.3.1 General

There was no evidence for goat being present at Cnip, nor indeed on any archaeological site in the Western Isles (Serjeantson 1990, 14), so it can be confidently assumed that all the caprovine remains were of sheep. Sheep played a relatively minor role at Cnip in comparison to Sollas, North Uist and Dun Vulan, South Uist, sites for which data is available on the minimum numbers of individuals. Indeed, Table 4.2 makes clear that sheep also played a much less important role at Cnip than most other Hebridean sites of the period. It is difficult to understand this dichotomy. The Uist sites were all located within large, relatively fertile machair areas compared with the limited area of machair available at Cnip. This, as already stated, probably accounted for the higher reliance on red deer at Cnip but it is difficult to see how limited good grazing land would account for a lower incidence of sheep.

The sheep measurements from Cnip are presented in Table 4.13. Comparative material from the Western Isles for the period is rare but material from other areas indicates that the sheep from Cnip are generally of similar size to those noted on other Scottish Iron Age sites.

The age/slaughter pattern for sheep, on the basis of tooth eruption, is shown in Table 4.9 (the epiphyseal fusion data is contained in the site archive). In Table 4.10 the data are summarized and compared with those from the Udal, North Uist and Dun Vulan. The distributions are remarkably similar in many ways. Both show a high peak in the second half of the first year, representing the slaughter of lambs that have been fattened over the first summer and autumn.

The slaughter pattern diverges for the second and third years but the incidence of older animals killed demonstrates reasonable correlation between the three

TABLE 4.10
Sheep age slaughter patterns from Cnip, Udal and Dun Vulan after Mulville (1999, 250) and Serjeanston (forthcoming).

Higham Stage	Approx Age in months	Cnip (all phases) %	Udal (*c* AD 300–800)%	Dun Vulan %
0–6	0–5	12.1	10.8	11.4
7–11	5–12	33.3	30.8	42.1
12–13	12–24	27.2	12.3	5.3
14	24–48	6.1	20	29.8
14+	48+	21.2	26.1	11.4

TABLE 4.11
Cattle bone measurements (mm) (abbreviations after von den Driesch 1976).

Bone	Measurement	N	Min	Max	Mean	SD
Scapula	GLP	6	53	62.1	58.5	3.03
	SLC	4	39.5	46.1	43.6	3.14
Humerus	Bt	3	64.9	69.2	66.6	2.27
Metacarpal	GL	1			158.6	
	Bp	3	44.9	51.8	48.9	3.58
	Bd	3	42.1	53.1	48.9	5.96
	SD	1			22.5	
Tibia	Bp	1			72.5	
	BD	5	51.9	55.7	53.5	1.81
Calcaneus	GL	1			119.1	
Astralagus	GLI	3	57.9	58.5	58.2	3.05
	BD	3	35.9	37.3	36.8	0.78
Metatarsal	GL	2	175.9	178.1	177	
	Bp	2	40	41.9	41	
	Bd	3	45.9	48.5	47.6	1.47
	SD	1			25.3	

sites (Table 4.10). The data suggests that a similar proportion of older sheep for breeding, wool and possibly milk was present on the three sites but because, perhaps, of the limited good grazing lands available at Cnip surplus sheep tended to be slaughtered in their second year, rather than fattened until their third year as at Dun Vulan. It should also be noted that a small number of neonatal sheep bones were present at Cnip but were not represented by mandibulae.

There were two examples of polled sheep in Block 5a and Block 5b, the Phase 2 occupation deposits inside the wheelhouse.

4.2.3.2 Sheep burials

Two concentrations of bone were identified that could be interpreted as burials. The first (Context 090, Block 11) was deposited directly over the stack of stone in the entrance to Wheelhouse 2 (see Section 2.3.2.2). It consisted of most of the fore and a small part of the hind limb of a lamb. None of the toe bones were present. The animal was about six months of age at time of death. No chop marks were noted.

The second group (Context 220, Block 19) came from within the entrance passage between Structure 3 and Bay 2 of Wheelhouse 1 (see Section 2.4.2.1). It contained the skulls of two individuals and the post-cranial remains of one adult individual. Again the toe bones were missing. Many of the long bones were deliberately broken for the removal of marrow and one distal humerus displayed knife marks. None of the bones had been gnawed.

4.2.4 PIG AND DOG

Pig played a minor role in the diet not only at Cnip but also at all other Hebridean sites of the period. Considering the lack of trees, which could supply them with mast, their low incidence is hardly surprising. Serjeantson (1990, 13) has also noted that pig, because of their rooting habits, would rapidly destabilise the machair surface leading to soil erosion.

Nonetheless, a neo-natal pig mandible was found within Wheelhouse 1 in the early part of Phase 2 (Block 5a), indicating that pigs were bred at the site.

The pig metrical and ageing data are presented in Table 4.14, but are too limited to warrant comment.

Only one dog bone, from within Wheelhouse 1 in the early part of Phase 2 (Block 5a), was present on the site, but the presence of gnawing, though not very common, suggests that they were present during all phases of occupation.

4.2.5 RED DEER

The sample from Cnip constitutes the largest available body of metrical data from the Hebrides (Table 4.12) and indicates that the deer were of a very small size.

TABLE 4.12
Red Deer bone measurements (mm) (abbreviations after von den Driesch 1976).

Bone	Measurement	N	Min	Max	Mean	SD
Scapula	GLP	7	43.6	49	44.8	3.56
	SLC	5	24.9	30.6	28	2.71
Humerus	Bd	6	42.1	49	45.2	2.84
	Bt	8	39.5	45	41.9	1.62
Radius	Bp	1			45.1	
	Bd	9	37.9	45.1	40.7	2.92
Metacarpal	Bp	2	33.1	33.3	33.2	
Femur	Bd	3	50.9	61.1	54.6	5.62
Tibia	Bp	2	59.5	64.3	61.9	
	Bd	20	31.4	42.3	38.3	2.22
Astralagus	GLI	18	40.9	47.5	43.9	1.81
	BD	17	25.9	30.1	28.3	1.25
Metatarsal	Bd	2	29.5	29.7	29.6	

Illus 4.1 shows that the red deer from Cnip falls completely below a sample from mainland Iron Age and Dark Age deer from Edinburgh Castle.

Grigson and Mellars (1987, 254–62) noted the small size of the deer population on Oronsay during the Mesolithic period and demonstrated that they were smaller than any contemporary deer population. Only a few measurements were available for the Oronsay material but these are all still greater than the mean values at Cnip, and many are greater even than the Cnip maximum values. This suggests that the Cnip deer were generally smaller than the Mesolithic Oronsay population. They were also smaller than the early Christian deer found at Iona (McCormick 1981), which are most likely to have originated on the nearby large island of Mull (Ill 4.1).

Small size in deer can be due either to poor nutrition or the 'more long-term effects of genetic

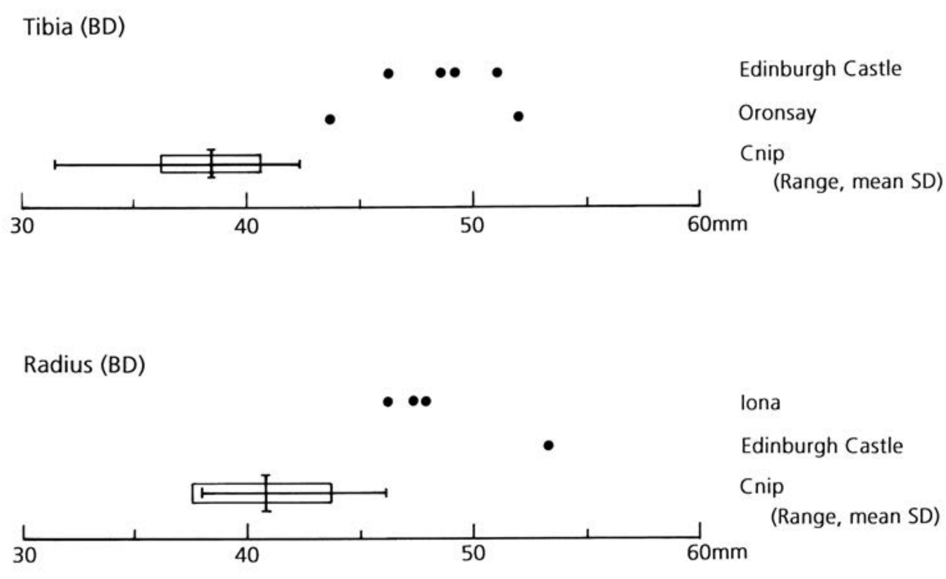


ILLUSTRATION 4.1
Red deer size ranges at Cnip compared with those from Edinburgh Castle, Oronsay and Iona.

TABLE 4.13
Sheep bone measurements (mm) (abbreviations after von den Driesch 1976).

Bone	Measurement	N	Min	Max	Mean	SD
Scapula	GLP	3	29	32.1	30.1	1.76
Humerus	Bd	10	25.1	28.4	26.4	1.2
	Bt	10	24	28.3	25.6	1.4
Radius	GL	1			135.6	
	Bp	5	25.9	29.1	27.5	1.46
	Bd	1			22.3	
	SD				14	
Metacarpal	GL	3	113.5	122.5	118.6	4.62
	Bp	6	20.2	25.1	21.6	1.87
	Bd	5	21.4	23	22.2	0.59
Femur	Bd	1			30.7	
Tibia	Bd	4	22.1	24.3	23.9	1.28
Astralagus	GLI	6	252	27.5	26.4	0.91
	BD	6	16.8	19	17.4	0.86
Metatarsal	GL	2	129.2	130.1	129.7	
	Bp	4	17.5	18.6	18.1	0.52
	Bd	5	20.5	22.2	21.2	0.63
	SD	2	9.7	10.5	10.1	

selection acting on relatively small, isolated specimens' (Grigson & Mellars 1987, 260). As outlined above, it seems most likely that deer were deliberately introduced to the Hebrides by human populations. If they had been introduced from the mainland, this decline in size must have occurred after their arrival, as deer of this small size are unknown from prehistoric or early historic mainland sites. The limited woodland available in the Western Isles may quickly have led to a decline in deer size.

The larger deer from Iona indicate that there were areas more favourable for deer on the Inner Hebrides during the early Christian period. Grigson and Mellars (ibid.) concluded that the occasional big bone present on Oronsay, represents venison imported to the island. In Orkney, the good quality of the grazing is reflected in the larger size of the Iron Age deer at Howe compared with those of the Western Isles.

It is difficult to estimate the age at which the deer at Cnip were slaughtered because no complete mandibles were present and the age at which cervid bones fused has not been published. The fusion data has, however, been recorded in the site archive, and on the basis of this some observations can be made.

Few young or fully mature animals were killed. The majority, approximately 60 per cent in age stages 3–6, were semi-mature animals. On the basis of epiphyseal data from sheep and cattle this would suggest an age of approximately from one year to two and a half to three and a half years of age. Modern Scottish deer do not reach maximum weight until about five years but the rate of weight growth begins to decrease after about three years (Clutton-Brock & Albon 1989, 63). The inhabitants of Cnip therefore seem to have undertaken a very careful hunting strategy, generally avoiding very young and old animals but concentrating on those animals that were undergoing their fastest period of growth. By avoiding the indiscriminate killing of old breeding stock, and the very young, they were able to conserve the deer herds in their area.

Red deer antler was commonly used as a raw material on the site. This was not, however, simply a by-product of hunting. The great majority of the burrs present (eight out of nine) were shed, indicating that antler was collected separately and brought to the site.

4.2.6 OTHER WILD ANIMALS

Seal bones were present in four of the blocks (Table 4.2). In all cases where they could be identified they were of common seal (*Phoca vitulina*). Common seal

TABLE 4.14
State of pig teeth eruption and wear after Higham (1967) and Grant (1982) and pig bone measurements (mm) (abbreviations after von den Driesch 1976).

Higham stage	State of tooth eruption	Approx age (in months)	N
3	Milk Pm4 in secondary eruption	0–4	1
8	M1 in tertiary eruption	6–7	2*
23	M3 erupted	27–29	2DD

* 2 sides of single mandible

Bone	Measurement	
Humerus	Bd	38.1
	Bt	29.5
Radius	Bp	23.8
Pelvis	LA	25.9

were also noted at Baleshare, while grey seal were noted at A Cheardach Mhor, on South Uist (Clarke 1960, 169). A few otter bones were also present in the occupation deposits within Structure 8 (Block 1).

Whale bones were present throughout the assemblage (Table 4.2). In only one case (a phalanx from Context 189, Block 5), could the bone be identified, and this was a Right whale, almost certainly *Balaena glacialis*. This is one of the largest whales and probably represents the exploitation of stranded animals rather than hunting. There is, however, evidence for the hunting of this whale in western Europe during the early historic period (Clarke 1989, 89).

The whale bones range from large fragments, displaying part of the bone surface, to large quantities of the internal 'honeycombed', part of the bone. Many displayed butchering marks and a few were burnt.

Since the meat can be quite easily cut away from the carcass of a large whale, it must be concluded that most of the material does not represent discarded food refuse. There is much evidence for the use of whale bone as a raw material during the Iron Age and other periods in the relatively treeless Northern and Western Isles of Scotland, and most of the Cnip fragments probably derive from such usage (see Section 3.5). Whale bones also contain much oil and by breaking the bone exposing the honeycombed interior this can be easily acquired. Clarke (1989, 94) also provides medieval literary evidence for the use of bones as fuel and the few burnt pieces may represent its use for this purpose.

4.3 BIRD REMAINS

Sheila Hamilton-Dyer

The methods used for identification and recording of the bird remains were based on the FRU (Faunal Remains Unit, Southampton) method 86 system, with some modifications. Identifications were made primarily using modern comparative collections of the FRU and the author, with reference to the Natural History Museum collections at Tring where necessary. The measurements follow von den Driesch (1976).

Most of the 48 bird bones were of auks and other sea-birds, particularly shag (*Phalacrocorax aristotelis*) and the great auk (*Alca impennis*) (Table 4.15). Other auks represented in the material were the common guillemot (*Uria aalge*), black guillemot (*Cepphus grille*) and puffin (*Fratercula arctica*). There were two fragments of gannet (*Sula bassana*) and two of a diver (probably *Gavia immer*, the great northern diver), on site. Three fragments could not be identified further than goose, as the bones were insufficiently complete for precise identification. There are several species possible, including the greylag (*Anser anser*), the white-fronted (*Anser albifrons*), the pink-footed (*Anser brachyrhnchus*), brent (*Branta bernicla*), and barnacle (*Branta leucopsis*).

The only representatives of entirely land-based birds were two bones of a grouse species, and a third which was probably also of grouse. The willow grouse (*Lagopus lagopus*), or its British sub-species, red grouse (*L l scoticus*), is probably the most likely candidate on size and morphology, but black grouse (*Lyrurus tetrix*) cannot be ruled out entirely.

None of the bird bones contained the extra medullary bone associated with females in lay (Driver 1982). Although this does not necessarily exclude breeding birds, the great northern diver today breeds only in Iceland and many of the geese found in the area are winter visitors which breed further north. Excepting the great auk, the other sea birds are common coastal residents.

The great auk material is of special interest, as this species holds the dubious distinction of being the only British bird to have become completely extinct in historic times. Although the last pair were killed in Iceland in 1844 this flightless, penguin-like relative

TABLE 4.15
Numbers of bird bones from each block, by species.

Phase	**Block**	**Diver**	**Gannet**	**Shag**	**Goose**	**Grouse**	**Guille-mot**	**Puffin**	**Great Auk**	**Unident**	**Total**
1	6			5						4	9
1	15				1			5		2	8
1	16								2		2
2	5a								1		1
2	5b	1	1	1						3	6
2	8					2			7	3	12
2	13			1							1
3	1	1			2						3
3	3		1						1		2
3	4			1							1
3	18						2				2
3	20										1
Total		**2**	**2**	**9**	**3**	**2**	**2**	**5**	**11**	**12**	**48**
MNI		**2**	**2**	**5**	**2**	**1**	**2**	**2**	**4**		

of the razorbill is also known to have bred on St Kilda and Papa Westray until the nineteenth century (Cramp 1985; Lea & Bourne 1975). It has occasionally been recorded from archaeological sites along the north-western Atlantic coast, including the Pictish and Norse site at Buckquoy, Orkney (Bramwell 1976), and as far south as Oronsay (Grieve 1882).

Although slightly different morphologically, the bones are similar to those of the razorbill but about twice the size. Seven of the 11 bones were from a trampled secondary sand floor deposit in Structure 4, Phase 2 (Context 266, Block 8), and are probably all from one bird. These included a pair of humeri with pronounced bicipital furrows, which may be unusually deep (Serjeantson pers comm). It is possible that this feature relates to the age or sex of the specimen, but the limited comparative material does not provide a definitive answer. Detailed measurements of the great auk bones are tabulated in the site archive.

Butchery evidence on the bird bone is restricted to knife cuts on a shag femur and a grouse humerus. Both were cut near the proximal articulation, consistent with limb excision.

The anatomical distribution of the fragments is considerably biased. Most of the fragments are of major leg and wing bones, the coracoid, and the cranial portion of the sternum. There are no head bones apart from the complete head and beak of a great auk recovered from behind the wall of Wheelhouse 2 (Context 116, Block 16).

Although the best-represented elements are those which would yield most meat, they are also large and sturdy bones. The lack of skull, pelvis and synsacrum may be due to their fragility, while other bones may be unrepresented partly because their small size can count against their preservation and recovery. However, if the birds had been dressed, these waste parts may have been discarded elsewhere. Two goose fragments and two of shag showed evidence of carnivore gnawing, another source of taphonomic loss.

The fragment numbers are too small to detect any spatial or temporal changes. As can be seen from the MNI (Table 4.15), the great auk bones are numerically the most frequent, but in fact, like the rest of the species, the bones represent only a few individuals. Shag is the most common species, the nine fragments representing five individuals. The great auk is the next best represented with 11 bones from a minimum of four individuals.

4.4 THE SIEVED FISH REMAINS

Ruby Cerón-Carrasco

4.4.1 METHODS

The fish remains from Cnip discussed in this section were recovered by wet-sieving through a 1mm mesh.

TABLE 4.16
Block 1: NISP and fish bone concentration.

Species	Contexts 20	43	46	83	84
Saithe		1	2	16	1
Pollachius sp					
Cod	1		1		
Poor cod					
Rockling	1				
Gadidae				8	
Stickleback		1			
Pleuronectidae				2	
Salmonidae				1	
Unidentified		1		3	
Total	**2**	**3**	**3**	**30**	**1**
Volumes of soil sieved (litres)	**3.5**	**2**	**2**	**7**	**4.5**
Concentration/fish bone per litre	**0.6**	**1.5**	**1.5**	**4.3**	**0.2**

30 contexts from 12 blocks produced fish remains. The analysis of the material was done by block. The summary of species representation by NISP (Number of Identified Species per fragment count) and the concentration of fish remains per volume of soil (litres) sieved, of the contexts analysed by block, are listed in Tables 4.16–4.27. Table 4.28 gives the summary of species representation and NISP for each phase.

Identification of species was made using modern comparative reference collections of fish skeletons and by reference to standard guides (Roselló-Izquierdo 1988; Watt et al 1997). All fish bone elements were identified to the highest taxonomic level possible, usually to species or to the family group, but otherwise classed as unidentifiable when these consisted of mainly broken fragments. Nomenclature follows Wheeler and Jones (1989, 122–3). Where appropriate, all major paired elements were assigned to the left or right side of the skeleton. All elements were examined for signs of butchery and burning. The colour of burnt bone

TABLE 4.17
Block 2: NISP and fish bone concentration.

Species	Contexts 33	34
Saithe	23	2
Cod	2	
Cod ?	1	
Gadidae	9	
Stickleback	6	
Unidentified fragments	4	
Total	**45**	**2**
Volumes of soil sieved (litres)	**3**	**1.5**
Concentration/fish bone per litre	**15**	**1.3**

TABLE 4.18
Block 5: NISP and fish bone concentration.

Species	Contexts 173	187	201	224
Saithe	1	2	16	3
Gadidae		1	2	6
Stickleback			2	
Sandeel				1
Unidentified fragments			3	7
Total	**1**	**3**	**23**	**17**
Volumes of soil sieved (litres)	**0.01**	**3**	**1**	**1.5**
Concentration/fish bone per litre	**100**	**1**	**23**	**11.3**

TABLE 4.19
Block 7: NISP and fish bone concentration.

Species	**Context 10**
Pollachius sp	1
Total	**1**
Volumes of soil sieved (litres)	**3.5**
Concentration/fish bone per litre	**0.2**

was recorded to allow investigation of the nature of burning, that is, cooking, rubbish disposal and so on.

Measurements were not taken on the identified elements; instead, elements were classified into size categories for total body length. This was done by reference to modern specimens of known size. For specimens belonging to the *gadidae* (cod family group), some elements were categorized as 'very small' (15–20cm), 'small' (20–30cm) and 'medium' (30–60cm). For some of the non-gadoid species a classification of either 'juvenile' or 'mature' was made or the total body length given by comparison to modern species' vertebrae.

The recording of preservation of the bone was based on two characters: texture on a scale of 1 to 5 (fresh to extremely crumbly) and erosion also on a scale of 1 to 5 (none to extreme). The sum of both was used as an indication of bone condition; fresh bone would score 2 while extremely poorly preserved bone would score 10 (after Nicholson 1991). All the above information is recorded in the catalogue contained within the site archive.

4.4.2 DISCUSSION BY BLOCK

Block 1: Structure 8 occupation and infill (Table 4.16)
Contexts 020, 043, 046, 083 and 084 all contained fish remains. Of these, 083 had the highest concentration. Saithe (*Pollachius virens*) was the most abundant species followed by other unidentified *gadidae*. Flatfish (*Pleuronectidae* group) and salmon/trout (*Salmonidae*) were also present.

Block 2: Structure 8 masonry and construction activity
Contexts 033 and 034 contained fish remains. Context 033 had the higher concentration (15 per litre of soil compared to 1.3 from Context 034). Context 033 also had the largest species representation. Saithe (Pollachius virens) was the most common species, cod (Gadus morhua), other unidentified gadidae, and the tiny stickleback species (Gasterosteus aculeatus) were also present.

Block 5: Structure 1 occupation and infill (Table 4.18)
Contexts 173, 187, 201, and 224 contained fish remains. Due to the very small volume of soil sieved from Context 173 (0.01ml), this context has been left out of the general analysis as the results may be misleading. Context 187 had the highest concentration of fish remains (23 per litre of soil sieved) followed by Context 224 (11.3 per litre). The most common

TABLE 4.20
Block 8: NISP and fish bone concentration.

Species	**Contexts 103**	**175**	**243**	**251**	**266**	**279**	**280**	**284**
Saithe	998			52	8	3		1
Pollack	13							
Pollachius sp	1330			1				
Gadidae	2		1	12		2	1	
Poor cod ?		1						
Unidentified fragments	1500							
Total	**3843**	**1**	**1**	**65**	**8**	**5**	**1**	**1**
Volumes of soil sieved (litres)	**0.3**			**3**	**2.5**	**2**	**3**	**2**
Concentration/fish bone per litre	**12810**			**21**	**3.2**	**2.5**	**0.3**	**0.5**

TABLE 4.21
Block 9: NISP and fish bone concentration.

Species	Context 71
Saithe	25
Pollachius sp	3
Gadidae	6
Total	**34**
Volumes of soil sieved (litres)	**1.5**
Concentration/fish bone per litre	**22.6**

species was saithe and other unidentified gadidae. Skeletal elements of sand-eel (*Ammodytes tobianus*) and stickleback were also present.

Block 7: Upper windblown sand deposits and disturbance (Table 4.19)
Context 10 produced a single vertebra assigned to the genus *Pollachius*, that is, saithe (*Pollachius virens*) or pollack (*Pollachius pollachius*). The concentration of fish remains was only 0.2 per litre of soil sieved.

Block 8: Structure 4 occupation and infill (Table 4.20)
Contexts 103, 175, 243, 251, 266, 279, 280, and 284 all contained fish remains. The highest concentration of fish remains was found in Context 103, with the most abundant species assigned to species of the genus *Pollachius*, that is, saithe (*Pollachius virens*) or pollack (*Pollachius pollachius*). Definite identifications for saithe and pollack were also possible.

It is interesting to note the high concentration of fish remains in Context 103 which has been calculated as 12,810 per litre from the total number of fish bone present in the total volume of soil sieved which only amounted to 0.3 litres. This context was a dump of mixed sand, midden and rubble, which had formed up to 0.45m thick against the north wall of Structure 4, apparently immediately after the structure ceased to be used for domestic occupation (see Section 2.4.3.2).

TABLE 4.22
Block 11: NISP and fish bone concentration.

Context Species	90
Saithe	12
Pollachius sp	7
Total	**19**
Volumes of soil sieved (litres)	**1**
Concentration/fish bone per litre	**19**

TABLE 4.23
Block 13: NISP and fish bone concentration.

	Contexts	
Species	**153**	**157**
Saithe	9	7
Pollachius sp		2
Poor cod		1
Gadidae	2	
Stickleback	4	
Unidentified fragments	10	
Total	**25**	**10**
Volumes of soil sieved (litres)	**1.5**	**1**
Concentration/fish bone per litre	**16.6**	**10**

Block 9: Structure 4 masonry and construction activity (Table 4.21)
Context 071 contained fish remains with an average concentration of 22.6 per litre. The most common species was saithe (*Pollachius virens*).

Block 11: Structure 2 entrance fill (Table 4.22)
Context 090 contained fish remains with an average concentration of 19 per litre. The main species identified was saithe and some elements were assigned

TABLE 4.24
Block 15: NISP and fishbone concentration.

	Contexts	
Species	**131**	**296**
Saithe	6	15
Poor cod		2
Gadidae	2	3
Sandeel		5
Total	**8**	**25**
Volumes of soil sieved (litres)	**0.05**	**2**
Volumes of soil sieved (litres)	**160**	**12.5**

to *Pollachius*, that is, saithe (*Pollachius virens*) or pollack (*Pollachius pollachius*).

Block 13: Structure 5 infill (Table 4.23)
Contexts 153 and 157 contained fish remains. Context 153 had the higher concentration. Saithe (*Pollachius virens*) was the most common species present with unidentified gadidae and elements from stickleback (*Gasterosteus aculeatus*) also present.

Block 15: Structure 2 infill (Table 4.24)
Contexts 131 and 296 contained fish remains, however, only 0.05ml of soil were sieved from 131 and this context was not incorporated into the main analysis as it may give a misleading interpretation. Context 296 had a fish bone concentration of 12.5 per litre, with saithe being the most common species. Poor cod (*Trisopterus minutus*) and the sand-eel (*Ammodytes tobianus*) were also present.

Block 18: Upper midden, Structure 10 and windblown sand deposits (Table 4.25)
Context 018 contained fish bone, the fish bone concentration for this context was only 1.5 per litre; elements were assigned to *gadidae*, *cottids* and *ammoditae* (sand-eels).

Block 19: Structure 3 infill (Table 4.26)
Contexts 182 and 193 contained fish remains, and these had almost equal concentrations of fish bone. Context 182 had 28.6 per litre while Context 193 had a concentration of 29 per litre. The most abundant species was saithe (*Pollachius virens*), and some elements were assigned to the genus *Pollachius* (saithe or pollack). Rockling (*Gaidropsaurus mediterraneous*), butterfish (*Pholis gunellus*), the sand-eel (*Ammodytes tobianus*), and freshwater eel (*Anguilla anguilla*) were also present.

Block 20: Structure 8 sump masonry, construction and infill (Table 4.27)
Context 166 contained fish remains with an average concentration of 6 per litre. The most common species were saithe (*Pollachius virens*) and cod (*Gadus morhua*), other unidentified gadidae were also present.

4.4.3 DISCUSSION BY PHASE (TABLE 4.28)

Phase 2 had the highest concentration of fish bone at 54.8 elements per litre. Phase 1 had a concentration of 12.6 fish bone elements per litre, while Phase 3 had a concentration of only 3. These concentrations appear to suggest a decline in the importance of fishing during Phase 3. The species representation was similar in all phases, saithe being the most abundant species.

TABLE 4.25
Block 18: NISP and fish bone concentration.

Species	**Context 18**
Gadidae	1
Scorpionidae	1
Ammoditae	1
Total	**3**
Volumes of soil sieved (litres)	**2**
Volumes of soil sieved (litres)	**1.5**

4.4.4 THE HAND-RETRIEVED FISH REMAINS

Sheila Hamilton-Dyer

A total of 26 fragments of hand-retrieved fish remains was recovered. As hand-retrieved bone material is biased against very small skeletal parts these fragments cannot be incorporated into the overall quantification and analysis of the fish remains. The fragments derived from a variety of species including cod, hake and ballan wrasse; the most frequent of which was hake (*Merluccius merluccius*), represented by both vertebrae and head bones. The small number of fragments

TABLE 4.26
Block 19: NISP and fish bone concentration.

Species	**Contexts 182**	**193**
Saithe	35	44
Pollachius sp	6	3
Rockling		1
Gadidae		4
Butterfish	1	
Sandeel		1
Eel	1	
Unidentified fragments		5
Total	**43**	**58**
Volumes of soil sieved (litres)	**1.5**	**2**
Concentration/fish bone per litre	**28.6**	**29**

TABLE 4.27
Block 20: NISP and fish bone concentration.

Species	**Context 166**
Saithe	5
Cod	1
Gadidae	6
Total	**12**
Volumes of soil sieved (litres)	**2**
Volumes of soil sieved (litres)	**6**

prevents any analysis of spatial and temporal changes although hake was identified from all phases and appears to be randomly distributed. Further details are located in the site archive.

4.4.5 NOTES ON THE SPECIES IDENTIFIED

Saithe (*Pollachius virens*): also known as coalfish, is a common fish in northern inshore waters that usually forms small shoals. For the first two years the immature fish live near the surface. Their annual growth averages 15cm for their first three years. Immature fish then move offshore and continue to live near the surface for a further 1–2 years. Saithe feed on small crustaceans, sandeels, herring, and other smaller fish. They may reach about 100cm in length by their eleventh year (Wheeler 1969; Smith & Hardy 1970).

Pollack (*Pollachius pollachius*): also known as lythe, or green cod because of its greenish colour, is mainly an inshore fish found in the proximity of rocks; a common species found in Scotland's western coastal waters. It has been estimated that it reaches 13–17cm in its first year, 26–31cm in its second year and may attain a total length of between 80 cm and 100 cm (Wheeler 1969; Ellis 1995).

Cod (*Gadus morhua*): In the North Sea this species can grow to an average of 18cm in their first year, 36cm in their second year, 55cm in their third year and 68cm in their fourth year. A mature cod can reach 150cm in length and weigh up to 40kg. Cod is found in a great variety of habitats: only immature fish, however, tend to live close inshore. Cod in the North Atlantic exist as

TABLE 4.28
Phases 1, 2 and 3. Fish species representation by fragment count (NISP) and fish bone concentration.

	Phase 1	**Phase 2**	**Phase 3**
Saithe	28	1204	45
Pollack		13	
Saithe/Pollack	9	1346	
Cod			4
Cod ?			1
Rockling		1	1
Poor cod?	1	1	
Gadidae	2	39	18
Butterfish		1	
Sandeel		2	1
Stickleback	4	6	
Cottids			1
Pleuronectidae			2
Salmonidae			1
Eel		1	
Unidentified fragments	10	1525	8
Total	**54**	**2939**	**83**
Volumes of soil sieved (litres)	**3.5**	**25.8**	**25**
Concentration/identified elements only per litre	**12.6**	**54.8**	**3**

a number of more or less isolated populations (Garrod 1977; Gulland 1977; Wheeler 1978).

This species has spawning grounds on the Hebridean shelf where they feed largely on sand eels (*Ammoditae*). The sea areas around Cape Wrath to the Butt of Lewis and North Rona are still abundant with cod over half a metre in length; in these areas sand eels are found in large numbers throughout the year but especially so during the summer months (Rae 1966; Boyd 1997).

Hake (*Merluccius merluccius*): This is a moderately deep-water fish but may be found in shallower water during summer. It may attain up to 180cm in total length (Wheeler 1978).

Shore Rockling (*Gaidropsarus mediterraneus*): This is a shore-dweller, found on rock pools, and under algae on rocky shores. It may attain up to 25cm. Although it has no economic importance, being a common habitant of rock pools it is frequently caught while fishing for other rocky dwellers such as saithe or pollack (Wheeler 1969).

Poor cod (*Trisopterus minutus*): A common species in Northern coasts, it is mainly an offshore species but is found close to the coast in the first year. In their first year males measure up to 6cm, in their second year up to 11cm. It is usually preyed on by other fishes such as cod (Wheeler 1969).

Right-eyed flatfishes (*Pleuronectidae*): This group of flatfishes have both eyes on the right side of the body. Widely distributed in Scottish waters, most are shallow-water, bottom-living fishes. The species present at Cnip may be plaice (*Pleuronectes platessa*) or flounder (*Platichthys flesus*) which are found on sandy bottoms and gravel inshores (Wheeler 1978).

Ballan wrasse (*Labrus bergylta*): this is a common fish in northern Scotland and is found primarily in rocky substrates mainly close inshore from 2–3m depth but also at depths of down to 200m. This species attains up to 28cm in total length (Wheeler 1978; Miller & Loates 1997).

Stickleback (*Gasterosteus aculeatus*): The stickleback is widely distributed, often abundant in lakes, rivers and coastal waters where it is frequently found in tidal pools. It is often 5cm, but can grow up to 10cm, in length (Wheeler 1978).

Sand-eel (*Ammodytes tobianus*): An extremely common inshore fish, it is found close to clean, fine sand. It is a popular bait-fish and an important food to a wide variety of other fish in particular gadoid fishes. In the Hebrides the sand-eel is found on sheets of tidal waters on sandy flats (wheeler 1978; Boyd & Boyd 1996a).

Butterfish (*Pholis gunnellus*): A common fish in Northern waters, it is found in a variety of habitats from mud to sand and rocks, and also frequently among kelp (*Laminaria*) holdfasts. The skin is very slimy (hence the name butterfish) and they are extremely difficult to catch (Lythgoe et al 1971).

Cottids (bull-rout *Myoxocephalus scorpius*/sea scorpion *Taurulus bubalis*): inhabit very shallow water or tide pools and they can measure up to 30cm. They are often found among rocks (Wheeler 1978).

Salmonidae (salmon *Salmo salar*/trout *Salmo trutta*): Salmon and trout are indigenous freshwater fish in the Hebrides. Salmon have remained anadromous (spawn in fresh waters and feed at sea), while trout have become divided into an anadromous form, the sea trout, and a non-migratory form, the brown trout (Boyd & Boyd 1996b).

Eel (*Anguilla anguilla*): Elvers born in the Sargasso Sea make the astounding journey to the fresh water systems of Europe arriving in the Hebrides in April and May. They are ubiquitous in inland waters. The movement of eels into the estuaries and stream systems is often marked by the appearance of predators (herons, gulls and otters). The eels spend over 30 years in fresh water before migrating to spawn and die (Boyd 1996b).

4.4.6 DISCUSSION

Fishing at Cnip appears to have been of a small-scale domestic nature, the most likely fishing technique used being that of rock or 'craig fishing' as it is known in the Northern Isles (Orkney and Shetland). This would have been the easiest way to catch young saithe and pollack and possibly immature cod which can also be found by rocks. On close examination of fishing on Galson Beach in Lewis, it was possible to observe that in a space of an hour three people fishing from rocks with line and small hooks, would fill a bucket of 12 litres in volume with second year saithe measuring 15–17.5cm in length (Cerón-Carrasco 2005). Most of the saithe and pollack recovered at Cnip were 15–20cm in length.

The other gadoid species recovered must have been accidental catches while fishing for young saithe and pollack. These species can be eaten whole (once gutted) or with the liver, they can also be smoked and thus preserved for later use. This has been a practice in the Hebrides where small fish were simply hanged inside the blackhouses where they would be smoked by the domestic peat fire (Cerón-Carrasco 2002)).

It is also interesting to note that young saithe were traditionally used in Scotland for the extraction of fish liver oil (Smith 1984). It is recorded that the oil used for lamps or 'crusies' was that extracted from the liver of fish caught for domestic use (MacGregor 1880, 145).

The flatfish would have been caught close to the beach on sandy bottoms and may have easily been speared, although there is no artefactual evidence for this fishing method. Flatfish can also be caught using line.

Although salmon, and other freshwater fisheries have not so far been detected as a specialized industry in the Scottish ichthyo-archaeological record (Barrett et al 1999) this is due to the lack of sufficient archaeological remains of freshwater species.

The fishing of freshwater fish in the Hebridean islands has long been recorded. Martin Martin (1716) describes how the freshwater lakes in Lewis abounded with trout and eel and that the baits used to catch them were earthworms or parboiled mussels and cockles. Salmon were also abundant in several rivers of the island (ibid, 89). In Harris for instance, salmon would arrive at the beginning of May (ibid, 111).

In view of these early ethnographic accounts, it must be assumed that freshwater sources, as well as marine sources, were also being exploited in prehistory although this is less evident in the archaeological record. Salmon, trout and eel would have been easily caught at burn entrances using traps or by simple line.

4.4.7 CONCLUSION

The analysis of the fish bone assemblage from Cnip suggests that fishing was primarily of a small-scale, domestic nature. The main species exploited were saithe and pollack, the other marine species present in this assemblage would have been caught accidentally when fishing for these. Fishing for freshwater species was also being practised.

The presence of hake in the hand-retrieved material (initially analysed by Hamilton-Dyer) may suggest that fishing could also have involved the use of boats. However, as no remains of large specimens were recovered in the sieved material, it is not possible to expand on this probability and it is best to assume that these remains were the results of accidental by-catches.

The results of the analysis of the fish remains recovered by sieving suggest that fishing may have been more intense during Phase 2 than in Phase 3, where there appears to be something of a decline. However, it is possible that this could be largely accounted for by the absence in Phase 3 of sheltered midden environments, like the disused Structure 4, in which high densities of fish remains survived from Phase 2.

4.5 THE MARINE MOLLUSCS, WITH NOTES ON THE ECHINOIDEA REMAINS AND TERRESTRIAL SNAILS

Ruby Cerón-Carrasco

4.5.1 THE MARINE MOLLUSCS

4.5.1.1 Methods

The marine molluscs from Cnip were recovered from bulk soil samples by sieving through a 1mm mesh. A total of 20 contexts from 11 blocks contained marine molluscs. The apical fragments were identified to species using standard guides (Campbell 1989; Moreno-Nuño 1994a). Frequency was estimated by counting shell apices for gastropods and valve umbos for bivalve species (Moreno-Nuño 1994b).

4.5.1.2 Results

The results are presented in Table 4.29. The limpet (*Patella vulgata*) and the periwinkle (*Littorina littoralis*) were the most common species represented at Cnip. *Patella vulgata* is the most common limpet and is widely found on all rocky shores throughout the Scottish coast. *Littorina littoralis* is widely distributed and is usually found on rocks and on seaweed (*Fucus vesiculosus* and *Ascophyllum nodosum*).

Patella vulgata have long been used as a food source in Lewis, especially in times of hardship as early ethnographical records indicate. Although the flesh is quite 'rubbery', this mollusc can be boiled and the broth drunk. Martin Martin (1716, 201) describes how the milky broth from parboiled limpets was given to nursing mothers as nourishment. The broth of boiled limpets and periwinkles was also given as an astringent for infants.

Other edible molluscs recovered at Cnip were the edible mussel (*Mytilus edulis*), oyster (*Ostrea edulis*) and the razor shell (*Sollen marginatus*). Mussels were also used as bait to attract trout and eel (Martin Martin 1716, 89).

Another important function which molluscs have played in the Hebrides is that of fertilisers, which, as also described by Martin Martin (1716), were applied to the soil every seven years. Sea weeds were also used in this manner (ibid 119; Boyd & Boyd 1996b,

TABLE 4.29
Marine mollusc representation by context.

Species	Contexts 10	18	20	34	46	71	83	84	90	103	153	157	166	182	193	201	279	280	284	296
cf Calyptrea chinensis							1b				1									
Cingula cingulus	4 + 1b		34 + 14b		2		10 + 1b		1					3 + 5b			1			
Lasarea rubra			3 + 3b		1		8 + 1b													
Littorina littoralis	1b			1		1		2		1			1	2	2		2	1	1 + 1b	
Lutraria lutraria																	2			
Margerites helicinus			4 + 4b				2							7						
Mytilus edulis						2	1 + 27b	1		7				1	2		1		1	
Nassarius reticulatus												1								
Ostrea edulis											1		1			1		2b		
Patella vulgata	1	2		1	3		12	7 + 1b	2		24	1			4	1	3	5		3
Rissoa parva			8 + 5b					5 + 1b							7					
Solen marginatus											3									
Spinorbis borealis			4b		2 + 15b		4 + 4b		1					4 + 4b		2 + 8b				
Crushed shell	*b	*			*		*	*b		*	*					*		*b	*	*b

Key
b burnt   * present

51) and it is of particular interest in this context to note the presence of the tiny marine shell species *Cingula cingulus*, *Rissoa parva* and *Margerites helecicus* (these species are of a maximum size of 4mm) which, like *Littorina littoralis*, are found attached to seaweed. Likewise, the coiled remains of *Spinorbis borealis* (Serpulidae) which are tube-dwelling polychaetes are also found encrusted in sea weed. It may be important that in many of the contexts, these species had been subject to burning and it is interesting that as well as fertiliser, the ashes of burnt seaweeds have also served as an alternative salt type, particularly for preserving foodstuffs (Ceron-Carrasco 2005).

4.5.1.3 Conclusion

The marine molluscs at Cnip probably constituted an important source of nourishment, as a food supplement, as well as having additional uses, such as fertiliser and medicinal purposes. There is a strong suggestion also that several of the species arrived on the site through the burning of seaweed, that presumably was used as a fertiliser and/or seaweed ash salt for the preservation of foodstuff such as meat or for diary products such as cheese.

4.5.2 A NOTE ON THE ECHINOIDEA REMAINS

A number of contexts from all phases contained remains of the edible sea urchin *Echinus esculentus* which is abundant in the Hebrides (Boyd & Boyd 1996b). Sea urchin remains have also been recorded for the Bronze Age site of Northton, Harris (Renfrew 1993, 18). The manner of cooking these sea creatures is by boiling or roasting on hot stones (ibid), although they can also be eaten raw. Sea urchin, like most marine species, is a food rich in iron and must have been important to the diet of the inhabitants of coastal areas in prehistory. The fact that it has not been more widely recorded may be due to poor retrieval practices or other taphonomical loss.

4.5.3 A NOTE ON THE TERRESTRIAL SNAILS

The results of the analysis of terrestrial snails from Cnip are summarized in Table 4.30. Identification to species was done by comparison to reference collections and to standard guides (Beedham 1972; Cameron and Redfern 1976; Kerney & Cameron 1979).

Eighteen contexts contained land snails. Most of these contexts are sandy deposits and it is therefore not surprising that the land snail species identified are present at Cnip. For instance, *Candidula intersacta*, *Helicella itala*, *Vallonia excentrica*, and *Vertigo pygmea*, inhabit sandy environments, while *Cochlicopa lubrica* and *Cochlicopa lubricella* are usually found in mixed populations, often in dry exposed habitats. *Lauria cylindracea*, *Oxichillus alliarus*, *Oxichillus celarius*, and *Clausilia bidentata* are found on stone walls or under rocks.

Carychium minimun is often found in marshes but it is predominantly of coastal distribution.

Succinea oblonga is also found on marshes and among rocks. *Punctum pygmaeum* is found in well-vegetated places, often in marshes.

4.5.4 CONCLUSION

Terrestrial molluscs are generally studied in archaeology to investigate the nature of the local environment that these organisms inhabit. In many parts of the Scottish islands little or no recording of these molluscs has been done prior to the recovery of the archaeological material and this may be, in most cases, the only means of surveying and recording their distribution.

Most terrestrial molluscs in the Hebrides are found mainly among dunes and on limestone. The landsnails recovered at Cnip are found in such habitats. The snail species present in this assemblage are taxa typical of disturbed but shaded habitats associated with stone buildings or rubble and/or sand. It is therefore assumed that these accumulated over a period of time and are likely to be modern intrusions.

4.6 CARBONIZED PLANT MACROFOSSILS AND CHARCOAL

Mike J Church and Mike Cressey

4.6.1 SUMMARY

This report describes and discusses the charcoal and carbonized plant macrofossils recovered from the bulk samples taken during the excavations. A total of 44 samples were submitted for analysis, most of which produced carbonized remains. The sampling strategy, processing, sorting, and identification procedures are outlined and the results presented below.

The charcoal and carbonized plant macrofossils allow a limited insight into the exploitation of plants on the site. Charring of this material is likely to have occurred within domestic hearths, most likely through incorporation of plant material as fuel or through cooking accidents. The material was subsequently

TABLE 4.30

Terrestrial snail representation by context.

	Contexts																				
Species	**18**	**20**	**28**	**33**	**34**	**43**	**46**	**47**	**67**	**71**	**84**	**90**	**131**	**153**	**166**	**182**	**187**	**193**	**224**	**226**	**279**
Candidula intersacta				4								1	5			1		5			
Carychium minimun	2			3	1		2														
Carychium minimun (Juv.)	3																				
Catinella arenaria				3																	
cochlicopa lubrica	1			3	2		4		1	1	1	2		1	1	6	2	6	1	1	
Cochlicopa lubrica (Juv.)	2			16			5														
Cochlicopa lubricella																7					
Collumella aspera				3												2					
Clausilia bidentata														1							
Hellicea italica					2																
Lauria cylindraea	2						4	1													
Lauria cylindraea (Juv.)	4	2					9														
Oxichillus alliarius			1	4	1	3	18	1				1		1	3		1	5			1
Oxichillus alliarius (Juv.)																					
Oxichillus celarius	3			2		1						2	12		1	2				1	
Oxichillus celarius (Juv.)	1															1					
Oxichillus sp		1																			
Punctum pygmaeum				3																	
Vallonia excentrica	6	2		33		3	5	2						1							
Vertigo pygmea						4															

incorporated into the internal domestic contexts through the discard of hearth material.

The subsistence scale arable economy seems to have been dominated by six-row hulled barley (*Hordeum vulgare* (L) var *vulgare*), with the identification of a single caryopsis of possible emmer wheat (*Triticum* cf *dicoccum*) interpreted as a weed contaminant. The existence of barley as a locally grown crop is reinforced through local pollen and other contemporary site-based plant macrofossil assemblages.

Other useful plants include Bear berry (*Arctostaphylos uva-ursi* (L) Spreng.), heathers (*Calluna vulgaris* (L) Hull, *Erica/Calluna* spp) and grasses (*Poaceae* undifferentiated, *Poa* sp and *Danthonia decumbens* (L) DC) whilst wood litter, dung, seaweed, peat and turves were used as fuel. Overall, the assemblage has contributed to the emerging picture of plant exploitation by humans throughout prehistory in the Western Isles.

4.6.2 SAMPLING STRATEGY

Bulk samples were initially taken of all contexts where a sufficient volume of material was available, although the attempt at complete coverage of such contexts had to be abandoned in the face of time pressures during the final days of the excavation when a purely 'judgement sampling' approach was adopted. 'Judgement sampling' (Jones 1991) does not statistically represent the sampled population (ie the archaeological contexts across the site) so the results presented in this report will be biased to some degree in favour of stratigraphically important and perceived 'rich' contexts. However, the samples processed can present a qualitative picture of the type of plant macrofossils found across the site. A sub-sample of approximately 0.25 litres was removed from the bulk samples for routine soil tests (results contained in site archive).

4.6.3 METHODS

4.6.3.1 Carbonized plant macrofossils

The bulk samples were processed using a flotation tank (Kenward et al 1980) with the residue held by a 1.0mm net and the flot caught by 1.0mm and 0.3mm sieves respectively. All the flots and residues were dried and sorted using low-powered stereo/binocular microscope at x15-x80 magnification. All identifications were checked against botanical literature and modern reference material from collections in the Department of Archaeology, University of Edinburgh. Nomenclature follows *Flora Europaea* with ecological information taken from Clapham et al (1989), Stace (1991) and Pankhurst and Mullin (1994).

4.6.3.2 Charcoal

Identifications were made using a binocular microscope at magnifications ranging between x10-x200. Generally identifications were carried out on transverse cross-sections on charcoal measuring between 4–6mm. Anatomical keys listed in Schweingruber (1992), in-house reference charcoal and slide mounted micro-sections were used to aid identification. Asymmetry and morphological characteristics were recorded. In Table 4.32 roundwood is used as a term of reference for branch wood and non-timber material.

4.6.4 RESULTS AND DISCUSSION

4.6.4.1 Data presentation

Tables 4.32–4.36 present the carbonized plant macro-fossils and charcoal recovered from the site. Charcoal fragments are presented by species weight. The concentration of carbonized plant macrofossils (QC/litre) was calculated by dividing the total number of quantifiable components by the volume of the bulk sample. The quantification of the carbonized plant macrofossils followed the criteria in Table 4.37.

The overall assemblage was dominated by cereal components (282 components representing approximately 75 per cent of the assemblage) with many of these components comprising caryopses or monocotyledonous culm bases/rhizomes. Only 91 components were wild species. The preservation of the plant macrofossils was poor, demonstrated by the preservation profile for the cereal caryopses (Ill 4.2) and the relatively high proportions of indeterminate cereals and wild species.

Radical shifts in plant exploitation are perhaps unlikely to have occurred during the relatively short occupation represented by Phases 2–3 which provide the vast majority of the excavated sediments (approximately 200–300 years). Also, there are insufficient numbers and concentrations of plant macrofossils to present meaningful comparisons between the blocks and phases. Therefore, the results will be analysed as a single phase assemblage.

4.6.4.2 Species represented

Charcoal

Tree and shrub taxa included birch (*Betula*), hazel (*Corylus*), pine (*Pinus*), oak (*Quercus*), and willow (*Salix*

TABLE 4.31
Charcoal species composition.

Sample/context (block)	Species	Weight (g.)	Comment
1/20 (1)	*Salix* type	0.21	very small twig
9/46 (1)	*Salix* type	0.26	small round wood (na)
9/46 (1)	*Corylus avellana*	0.016	small roundwood (na)
9/46 (1)	*Betula* sp	0.4	small roundwood (na)
12/43 (1)	*Quercus* sp	2.5	non round fragments (na)
12/43 (1)	*Salix* type	0.08	small roundwood (na)
12/43 (1)	*Quercus* sp	0.014	single fragment (na)
13/83 (1)	Indet	n/a	(a)
16/83 (1)	*Corylus* sp	0.21	small roundwood
4/34 (2)	Indet	n/a	below id range
63/187 (5)	Indet	n/a	below id range
70/201 (5)	*Salix* type	0.95	(na)
xx/224 (5)	Indet	n/a	(a)
22/103 (8)	*Salix* type	0.23	small round wood (na)
23/103 (8)	Indet	n/a	below id range
83/251 (8)	Indet	n/a	(a)
89/284 (8)	Dung?	0.9	amorphous, large voids
90/279 (8)	Indet	n/a	(a)
90/279 (8)	*Betula* sp	0.4	small roundwood
91/280 (8)	*Salix* type	0.36	small frags (a)
91/280 (8)	*Salix* type	1.26	small roundwood (na)
91/280 (8)	Dung?	n/a	
xx/266 (8)	Indet	n/a	root wood
11/71 (9)	*Betula* sp	0.04	single fragment (na)
11/71 (9)	*Salix* type	0.05	single fragment (na)
24/71 (9)	*Salix* type	1	root wood/woodworm tracks (na)
24/71 (9)	*Pinus sylvestris*	0.65	small roundwood
20/90 (11)	*Pinus sylvestris*	1.2	fragmented roundwood (na)
xx/218 (11)	*Pinus sylvestris*	14.3	2.5cm diameter roundwood (na)
32/153 (13)	*Salix* type	0.014	single fragment (na)
88/296 (15)	Indet	n/a	
6/18 (18)	*Salix* type	0.015	(na)
8/47 (18)	Indet	n/a	(a)
64/193 (19)	*Salix* type	0.19	(a)
61/166 (20)	Indet	n/a	(a)

(na) non abraded (a) abraded Salix type = White willow (Salix alba), common osier (S. viminalis), goat willow (S. caprea) or bay willow (S. pentandra). The wood of willow trees cannot be differentiated on the basis of anatomical characteristics.

type). This relatively wide variation is at odds with the extremely limited woodland found in the Western Isles today, though all the species are represented. This open landscape has been suggested throughout the Holocene for the island chain by Birks (1994), but recent work in both Lewis (Edwards et al 1994) and the Uists (Branigan & Foster 1995; Gilbertson et al 1997) point to a more complex tapestry of isolated forest cover in certain areas at certain times within the wider open landscape. Such an area may have been still managed in the pollen catchment surrounding Loch Bharabhat during the Iron Age (Edwards et al 1994),

TABLE 4.32
Carbonized plant macrofossils (samples by Blocks 1, 2 and 5).

Sample details														
Sample number		1	9	10	12	13	16	2	4	63	70	xx	xx	xx
Context number		20	46	41	43	83	83	33	34	187	201	173	201	224
Block		1	1	1	1	1	1	2	2	5	5	5	5	5
Sample volume (litres)		3.5	2	2	2	2	7	3	1.5	3	1	0	1	2
Cultivated species	**Plant part**													
Hordeum														
H. sp	caryopsis					2	1				2			
H. cf hulled	caryopsis				1			1		1				
H. hulled	caryopsis						2	3			4			
H. hulled symmetric	caryopsis						1				2			
H. hulled asymmetric	caryopsis					2	3	1						1
H. vulgare	rachis internode									1				
H. cf vulgare	rachis internode													
Triticum cf dicoccum	caryopsis													
Cereal indeterminate	caryopsis						2				3			
Cereal/monocotyledon (>2 mm.)	culm node						1							
Cereal/monocotyledon (>2 mm.)	culm node	1												
Cereal/monocotyledon (>2 mm.)	culm base	1	1			2	5				1			
Cereal/monocotyledon (>2 mm.)	culm base	6			4	8	3		1	5				
Indeterminate (>2 mm.)	rhizome	2												
Indeterminate (<2 mm.)	rhizome					1								
Wild species														
Polygonum sp	fruit						1							
Rumex sp	fruit		1											
Rumex cf crispus	fruit	5												
Brassica cf rapa	seed													
Brassica/Sinapis	seed							1						
Cruciferae undiff.	capsule base	1												
Viola sp	seed	1												
Erica/Calluna	capsule/ovary													
Calluna vulgaris (L.) Hull	capsule	1												
Calluna vulgaris	stem/leaf	1F												
Arctostaphylos uva-ursi (L.) Spreng.	seed													
Hypericum pulchrum L.	seed					4								
Poa sp	caryopsis													
Danthonia cf decumbens	caryopsis		2			1								
Poaceae undiff. (small)	caryopsis				1									
Poaceae undiff. (medium)	caryopsis			1		2	1							
Cladium mariscus (L.) Pohl	fruit													
Carex sp (biconvex)	fruit	4			1	3								
Carex sp (trigonous)	fruit	6	1			2				1				
Indeterminate	seed/fruit	2				5								
Fungal sclerotia	sclerotia					5								
Totals														
Total cereal components		10	1	0	5	15	18	5	1	6	13	0	0	1
Total wild species		20	4	1	2	17	2	1		1				
Total quantifiable components		30	5	1	7	32	20	6	1	7	13	0	0	1
Quantifiable components/litre		8.57	2.5	0.5	4	16	3	2	0.7	2.33	13	0	0	0.67

TABLE 4.33

Carbonised plant macrofossils (samples by Blocks 6, 7, 8 and 10).

Sample details														
Sample number		3	41	14	22	80	83	89	90	91	xx	xx	11	24
Context number		32	10	67	103	243	251	284	279	280	103	266	71	71
Block		6	7	8	8	8	8	8	8	8	8	8	9	9
Sample volume (litres)		6	4	2	2	1	3	2	2	3	0.3	2.5	2	2
Cultivated species	**Plant part**													
Hordeum														
H. sp	caryopsis	5									1		1	
H. cf hulled	caryopsis	7			4		2					1		
H. hulled	caryopsis	18							1			2	1	2
H. hulled symmetric	caryopsis	6												
H. hulled asymmetric	caryopsis	18												
H. vulgare	rachis internode						1						1	
H. cf vulgare	rachis internode													
Triticum cf dicoccum	caryopsis												1	
Cereal indeterminate	caryopsis	6					2							1
Cereal/monocotyledon (>2 mm.)	culm node													
Cereal/monocotyledon (<2 mm.)	culm node													
Cereal/monocotyledon (>2 mm.)	culm base		1				2		2	3		1		
Cereal/monocotyledon (<2 mm.)	culm base	2	2					1		1				
Indeterminate (>2 mm.)	rhizome	1	2							1				
Indeterminate (<2 mm.)	rhizome													
Wild species														
Polygonum sp	fruit													
Rumex sp	fruit													
Rumex cf crispus	fruit		1											
Brassica cf rapa	seed												1	
Brassica/Sinapis	seed					2	5					1	1	
Cruciferae undiff.	capsule base													
Viola sp	seed													
Erica/Calluna	capsule/ovary						1							
Calluna vulgaris (L.) Hull.	capsule													
Calluna vulgaris	stem/leaf													
Arctostaphylos uva-ursi (L.) Spreng.	seed													
Hypericum pulchrum L.	seed													
Poa sp	caryopsis		1											
Danthonia cf decumbens	caryopsis													
Poaceae undiff. (small)	caryopsis													
Poaceae undiff. (medium)	caryopsis													
Cladium mariscus (L.) Pohl	fruit													
Carex sp (biconvex)	fruit													
Carex sp (trigonous)	fruit		4			1		1		1		2		
Indeterminate	seed/fruit											1		
Fungal sclerotia	sclerotia													
Totals														
Total cereal components		63	5	0	4	0	7	1	3	5	1	4	4	3
Total wild species			6			3	6	1		1		4	2	
Total quantifiable components		63	11	0	4	3	13	2	3	6	1	8	6	3
Quantifiable components/litre		11	3	0	2	3	4	1	1.5	2	3.3	3.2	3	2

which was within easy reach (at least geographically speaking) of the occupants at Cnip.

Driftwood would have been a prime resource throughout the Iron Age, especially for construction purposes, and some of the charcoal may represent the remains of beach scavenging. As Dickson (1992) and Boardman (1995) outlined, much of the driftwood would have derived from North America depositing some non-native species on the Lewis coast. However, no such species are represented at Cnip and there is thus no positive indication of the use of driftwood.

Cultivated plants

The overwhelmingly dominant species is that of barley (*Hordeum* sp), represented by caryopses and a few rachis internodes of six-row hulled barley (*Hordeum vulgare* (L) var *vulgare*). All of the caryopses of sufficient preservation to be identified were hulled and the proportions between symmetric and asymmetric grains also point to the six-row species dominating. The single grain of possible emmer wheat (*Triticum* cf *dicoccum*) could be indicative of wheat consumption but is more likely to be a weed contaminant in the barley crop. Also, the sample from which the wheat grain was recovered was not directly associated with any occupation levels and so its importance should not be overstated (Context 071, Block 9, packing material behind the wall of Structure 4).

Wild edible species

These are represented by a single seed of Bear berry (*Arctostaphylos uva-ursi* (L) Spreng) and seeds of brassicas (*Brassica* spp), though the fruits of the latter are usually eaten prior to seeding (Boardman 1995). The Bear berry generally lives on cliffs or upland bogs and so may represent the discard from opportunistic gathering or accidental incorporation of other material from these habitats, such as peaty turf for fuel.

Useful wild species

Ling (*Calluna vulgaris* (L) Hull) and other heathers (*Erica/Calluna* spp) are represented by seed capsules and stem/leaves. The heathers have had a variety of uses throughout the highlands and islands including fuel kindling, bedding, general furnishing and thatching. The grasses (*Poaceae* undifferentiated, *Poa* sp. and *Danthonia decumbens* (L) DC) could also have served similar internal domestic uses.

Straw or grass culms are represented by cereal/monocotyledon culm nodes and bases. Straw would have been particularly useful with a variety of uses similar to heather. The monocotyledon culm bases and rhizomes, coupled with the relatively high levels of amorphous plant material (APM), point to turves and peat being also used as fuel (Dickson 1998). Other possible fuels are suggested by the presence of possible carbonized dung (Table 4.31) and the presence of certain molluscan parasites on seaweed (see Section

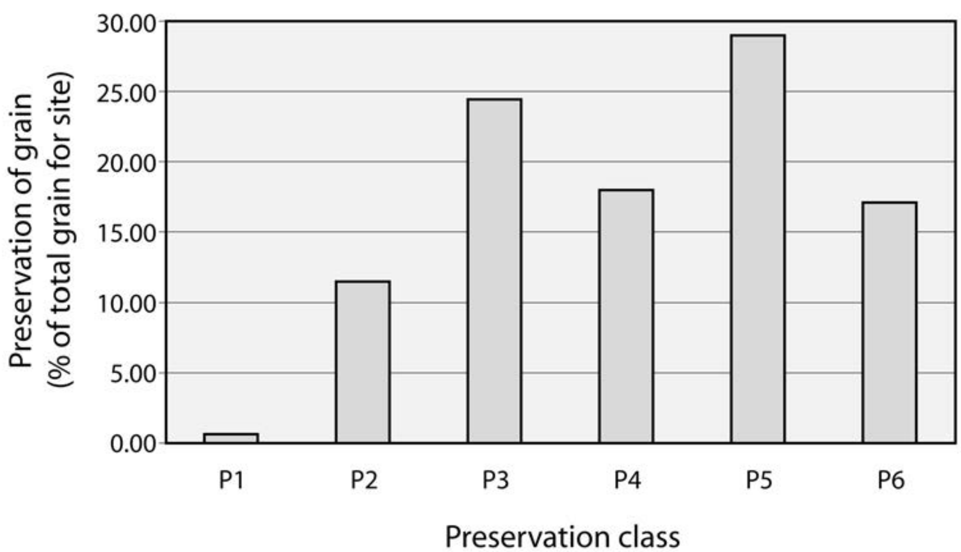


ILLUSTRATION 4.2
Preservation classes for total grain from Cnip.

TABLE 4.34
Carbonized plant macrofossils (samples by Blocks 11, 13, 14 and 15).

Sample details										
Sample number		15	20	xx	32	33	30	79	87	88
Context number		86	90	90	153	157	131	230	269	296
Block		11	11	11	13	14	15	15	15	15
Sample volume (litres)		5	1	2	2	1	0.1	3	3	2
Cultivated species	**Plant part**									
Hordeum										
H. sp	caryopsis	4								1
H. cf hulled	caryopsis	8								
H. hulled	caryopsis	8	1				1	2		1
H. hulled symmetric	caryopsis	2						1		
H. hulled asymmetric	caryopsis	5				1			1	
H. vulgare	rachis internode									
H. cf vulgare	rachis internode									
Triticum cf dicoccum	caryopsis									
Cereal indeterminate	caryopsis	1		1				2		
Cereal/monocotyledon (>2 mm.)	culm node									1
Cereal/monocotyledon (<2 mm.)	culm node									
Cereal/monocotyledon (>2 mm.)	culm base	4			1					2
Cereal/monocotyledon (<2 mm.)	culm base									3
Indeterminate (>2 mm.)	rhizome									
Indeterminate (<2 mm.)	rhizome									
Wild species										
Polygonum sp	fruit									
Rumex sp	fruit									
Rumex cf crispus	fruit									
Brassica cf rapa	seed									
Brassica/Sinapis	seed									
Cruciferae undiff.	capsule base									
Viola sp	seed									
Erica/Calluna	capsule/ovary									
Calluna vulgaris (L.) Hull.	capsule									
Calluna vulgaris	stem/leaf									
Arctostaphylos uva-ursi (L.) Spreng.	seed					1				
Hypericum pulchrum L.	seed									
Poa sp	caryopsis									
Danthonia cf decumbens	caryopsis									
Poaceae undiff. (small)	caryopsis									
Poaceae undiff. (medium)	caryopsis									
Cladium mariscus (L.) Pohl	fruit				1					
Carex sp (biconvex)	fruit									
Carex sp (trigonous)	fruit									
Indeterminate	seed/fruit									
Fungal sclerotia	sclerotia									
Totals										
Total cereal components		32	1	1	1	1	1	5	1	8
Total wild species					1	1				
Total quantifiable components		32	1	1	2	2	1	5	1	8
Quantifiable components/litre		6	1	1	1	2	20	1.7	0	4

TABLE 4.35
Carbonized plant macrofossils (samples by Blocks 17, 18, 19 and 20).

Sample details										
Sample number		17	6	8	xx	xx	62	64	66	61
Context number		84	18	47	18	30	182	193	193	166
Block		17	18	18	18	18	19	19	19	20
Sample volume (litres)		5	1.5	3	1	1	1.5	2	2	2
Cultivated species	**Plant part**									
Hordeum										
H. sp	caryopsis	1								2
H. cf hulled	caryopsis						6	2		3
H. hulled	caryopsis	2	2				4	1		7
H. hulled symmetric	caryopsis		1	2						1
H. hulled asymmetric	caryopsis			1			1			2
H. vulgare	rachis internode							1		1
H. cf vulgare	rachis internode									
Triticum cf dicoccum	caryopsis									
Cereal indeterminate	caryopsis	2		1				2		3
Cereal/monocotyledon (>2 mm.)	culm node									
Cereal/monocotyledon (<2 mm.)	culm node									
Cereal/monocotyledon (>2 mm.)	culm base	3					1			
Cereal/monocotyledon (<2 mm.)	culm base							1		1
Indeterminate (>2 mm.)	rhizome	2								
Indeterminate (<2 mm.)	rhizome									
Wild species										
Polygonum sp	fruit									
Rumex sp	fruit		2							
Rumex cf crispus	fruit		1							
Brassica cf rapa	seed									
Brassica/Sinapis	seed		1							4
Cruciferae undiff.	capsule base									
Viola sp	seed									
Erica/Calluna	capsule/ovary		1							
Calluna vulgaris (L.) Hull.	capsule	1								
Calluna vulgaris	stem/leaf	1F								
Arctostaphylos uva-ursi (L.) Spreng.	seed									
Hypericum pulchrum L.	seed									
Poa sp	caryopsis									
Danthonia cf decumbens	caryopsis		1							
Poaceae undiff. (small)	caryopsis	1								
Poaceae undiff. (medium)	caryopsis		1							
Cladium mariscus (L.) Pohl	fruit									
Carex sp (biconvex)	fruit									
Carex sp (trigonous)	fruit							1		
Indeterminate	seed/fruit	2	1				1			
Fungal sclerotia	sclerotia		1							
Totals										
Total cereal components		10	3	4	0	0	12	7	0	20
Total wild species		4	8				1	1		4
Total quantifiable components		14	11	4	0	0	13	8	0	24
Quantifiable components/litre		3	7.3	1	0	0	8.7	4	0	12

TABLE 4.36
Quantification criteria for carbonized plant macrofossils.

Plant part	Quantifiable portion on part	Count of 1
Caryopsis	Embryo end	For each end counted
Rachis internode	Shoulder	For each shoulder counted eg count of 4 for 4 attached internodes
Fruit/seed/capsule	Whole fruit/seed/capsule or embryo end (if applicable)	For each whole fruit/seed/capsule counted
Culm node	Entire node	For each node counted
Culm base	Entire circumference of base (denoted here as a 'cylinder')	For each 'cylinder' counted
Rhizome	Entire circumference of rhizome	For each rhizome fragment
Nutshell fragment or leaf/stem	n/a	Not included in quantification

4.5.1.2). However, no carbonized seaweed was recovered.

Cultivated fields and grasslands

The poor preservation of the plant macrofossils meant only a few wild species are represented from the different habitats on Lewis. Weeds of cultivated fields and grasslands are represented by seeds of knotgrass (*Polygonum* spp), docks (*Rumex* spp), brassicas (*Brassicas* spp), violets (*Viola* spp), Slender St. Johns Wort (*Hypericum pulchrum* L), and grasses (*Poaceae* undifferentiated, *Poa* sp and *Danthonia decumbens* (L) DC). The single seeds of wild turnip (*Brassica* cf *rapa*) and Slender St Johns Wort (*Hypericum pulchrum* L) hint at damp arable fields but this could come from drainage ditches in rigging from modern observation of traditional farming practices in Lewis. This is also true of the sedges (*Carex* spp). These seeds could have been brought on to site as part of crop processing debris or were deliberately gathered for domestic use (eg the grasses and brassicas).

Heath and moor species

Due to the poor preservation of the plant macrofossils many of the specimens were only identifiable to genus. Hence, almost all of the wild species on site could be attributable to the heath and moor habitats covering much of Lewis in the Iron Age. These include the knotweeds (*Polygonum* spp), docks (*Rumex* spp), violets (*Viola* spp), heathers (*Calluna vulgaris* (L) Hull, *Erica/Calluna* spp), grasses (*Poaceae* undifferentiated, *Poa* sp and *Danthonia decumbens* (L) DC) and sedges (*Carex* spp). These species could represent exploitation of the drier heaths at the fringes of the blanket bogs, though indicators of very damp conditions are represented by species such as the sedges (*Carex* spp), Great Fen-Sedge (*Cladium mariscus* (L) Pohl) and Bear berry (*Arctostaphylos uva-ursi* (L) Spreng). These species could have been brought to site with items removed deliberately from the heath such as heather and turf and peat blocks (see above, this section).

4.6.4.3 Distribution and origin of carbonized material

Charcoal

Almost all of the charcoal fragments seem to relate to the incorporation of hearth material discard with sand and organic refuse across the site, with many of the fragments relating to the occupation and infill of Structures 4 and 8, and a rather smaller amount from Wheelhouse 1. A hand retrieved sample of Scots pine (*Pinus sylvestris* L) was taken from Context 218, which was of sufficient size to be used as for internal furnishing or construction (its context is a re-deposited midden infill within the entrance to the disused Wheelhouse 2). However, the context was identified as a structural fill and so the charcoal represents re-deposited material, perhaps an artefact fragment.

Carbonized plant macrofossils

One of the key issues to assess when considering carbonized plant macrofossil taphonomy is the charring process itself (Hillman 1981). Generally, charring occurs during certain stages of crop processing, the burning of plant material as fuel (deliberate or accidental), cooking accidents and conflagrations. The soil test results (details in site archive) have suggested that most of the carbonized material resulted from the incorporation of hearth discard with sand and organic refuse across the internal domestic contexts of the site.

Hence, charring is likely to have occurred within domestic hearths as fuel or cooking accidents, the main taphonomic transform for carbonized plant material in Atlantic Scotland (Church & Peters 2004).

Cereal remains are likely to have been incorporated through cooking accidents of the cleaned crop (represented by cereal caryopses, for example Sample 3) or the burning of crop processing debris as fuel (suggested by presence of rachis internodes and possible straw, for example Sample 83). The latter process would be very hard to identify due to the nature of the assemblage and the mixing of other plant material used for fuel. Indeed, the heterogeneity, size and preservation of the assemblage in general precludes any in-depth analysis of crop processing (cf Church & Peters 2004; Hillman 1984). However, the presence of cereal sized culm nodes and bases tentatively points to uprooting as a harvesting technique to conserve as much of the straw as possible.

These culm nodes and bases, coupled with the presence of rhizomes and APM, may well have been incorporated into the site through the discard of hearth material resulting from the burning of turves and peat for fuel (Dickson 1998) For example, Sample 13 (Context 83, Block 1, from the floor of Structure 8) has some culm bases and rhizomes, with relatively high concentrations of APM, and a number of wild species indicative of heathland and bog.

Overall, the carbonized plant macrofossils seem to have been not only mixed when burnt but also during deposition and discard into the internal contexts, producing a very heterogeneous assemblage which is difficult to both interpret and pinpoint specific domestic uses of plants.

4.6.4.4 Other sites

Bhaltos peninsula

A number of archaeological and palaeoenvironmental sites have been investigated in the Bhaltos peninsula, which can contribute to our understanding of the plant macrofossil assemblage at Cnip. Three pollen profiles have been taken; the first from Loch Bharabhat (Edwards et al 1994; Lomax & Edwards 2000) with the second and third taken from the infilled loch basin of Loch na Beirgh (Lomax 1997).

The profile from Loch Bharabhat covers most of the Holocene and points to the existence of forest cover, within the pollen catchment of the loch, possibly well into the Iron Age. All the charcoal species recovered from Cnip are represented in the profile. The profiles from Loch na Beirgh, although not yet dated, seem to relate to the progressive infilling of the loch, the bulk of which can be attributed to the Iron Age judging by the 'make-up' sequence within the broch (Harding & Armit 1990; Harding & Gilmour 2000). The first profile seems to have been disturbed but the second is more coherent, with its pollen catchment relating to the valley and machair expanse in which Loch na Beirgh is situated. This machair expanse may even have extended round Cnip headland from Traigh na Beirgh, having been subsequently lost through rising sea levels. The pollen in this second profile contained significant levels of *Hordeum* type pollen with a strong association of brassicas (*Brassica* spp) and other grasses and weeds of cultivated land. Hence, it is likely that the machair supported fields of barley and could well point to the area of cultivation for the complex at Cnip.

Analysis of the carbonized plant macrofossil assemblage from the cellular phase (a period thought to slightly post-date the occupation at Cnip) at the broch in Loch na Beirgh is also dominated by six-row hulled barley (Church 2002a). There was also an association of wild turnip (*Brassica rapa* L) seeds with the carbonized grain which, when considered with the pollen evidence and presence of *Brassica* sp seeds at Cnip, points to this species being a feature in the arable expanse on the machair. Wild turnip may have been allowed to grow with the crop to stabilise the sandy soil, or could have been used as a fallow crop. This fertilization and stabilization of the machair is particularly important if the uprooting technique was used for harvesting as this would destabilise the sandy soil very quickly. With this in mind, it is interesting to note that many cereal-sized culm bases were found in a sample of crop processing debris at Beirgh (S171) which supports the evidence from Cnip.

The results from the carbonized plant macrofossils from the Iron Age sites of Loch na Beirgh (Church 2002a) and Loch Bharabhat (Church 2000, 2002b), together with the results from Cnip, present an ideal opportunity for comparison of the three sites with overlapping periods of occupation. This sort of comparison would conventionally focus on issues of crop consumption and production which can provide evidence for site function and status (Jones 1985; van der Veen 1991).

Superficially, the assemblages from Cnip and Bharabhat are very similar, with cereal caryopses dominating a small assemblage with limited species and plant part diversity. In contrast, the remains from the cellular phase at Beirgh are much more diverse, with other cereal parts, such as rachis internodes and culm nodes/bases, present in greater quantities than at Cnip. It is therefore tempting to speculate on an economic differentiation between Cnip and Bharabhat on one hand and Beirgh on the other. However, these differences could alternatively be explained through differences in sampling procedure and site formation processes than through site function and status.

For example, whilst Bharabhat and Cnip were sampled on a 'judgement' basis with only limited sample volumes of up to 7 litres, the cellular phase contexts at Beirgh were sampled on both a 'random' and 'judgement' (Jones 1991) basis with samples of at least 28 litres. Hence, the sampling from Beirgh is much more likely to pick up any diversity. Also, the site formation processes between the sites are very different, with most of the contexts sampled from Cnip and Bharabhat coming from internal domestic contexts whilst many of the 'make-up' contexts sampled from Beirgh represent the mixing of internal domestic discard with deposits brought into the broch which could have contained crop processing debris discarded externally.

Western Isles and Atlantic Scotland

The recent research projects of the Sheffield University Environmental and Archaeological Research Campaign in the Outer Hebrides (SEARCH) and Callanish Archaeological Research Project (CARP) in the late 1980s and 1990s have both produced archaeobotanical assemblages from Iron Age sites across the Western Isles (see Church 2002a and Smith & Mulville 2004 for detailed syntheses). The excavations of the radially partitioned structure at Hornish Point, middens and structures at Baleshare (Jones 2003) and Kildonan III (Valamoti unpublished) in the Uists, have all produced similar, mixed assemblages to that from Cnip. These all presumably result from the dispersal of carbonized plant material from domestic hearths across the interior of the structures, and thence to the external middens. All were dominated by cereal remains, largely of six-row hulled barley (*Hordeum vulgare* (L) var *vulgare*), with relatively small proportions of 'wild' species.

Another important site for comparison is the Iron Age multi-phase settlement at Dun Vulan, South Uist (Smith 1999) Again, six-row hulled barley (*Hordeum vulgare* (L) var *vulgare*) was the predominant crop, but there were also had rare occurrences of possible emmer wheat (*Triticum* cf *dicoccum*), oats (*Avena* sp) and possible rye (cf *Secale cereale*). Like the single caryopsis of emmer recovered from Cnip, these have been interpreted as weed contaminants. All four sites also yielded macrofossils relating to the burning of peats, turves, seaweed, and peat as well as the gathering of grasses, seaweed and heather.

At Dun Vulan, attempts were also made to locate the zone in which the crops were grown, but again the low numbers and diversity of ecological data recovered allowed only limited insights. However, Smith has argued that the most suitable zone for a barley crop would be in the blacklands rather than the adjacent machair plain. She further proposed that the perception of the machair being more fertile than the blacklands was based on the post-medieval strategy of 'easy' production of fodder, rather than the more complex arable agriculture of the Iron Age. Hence, alluding to the relatively high proportion of 'damp' wild species present in the assemblage, she proposed that the barley crop was as likely to be grown in the blacklands as the machair.

This interpretation is at odds with the tentative conclusions of machair cultivation made for Cnip, but the latter has supporting evidence from the detailed pollen analysis from Loch na Beirgh. The area of cultivation is obviously an important question when considering prehistoric landscape and land use, especially when considering the position of settlements, such as Cnip and Dun Vulan, within possible agricultural machair. These questions are difficult to answer with the recurrent problems of low numbers and diversity of 'wild' species and the mixed assemblages which have been sampled.

Ideally, what is needed are assemblages from contexts which relate to single behavioural episodes of discard from the early stages of crop processing with relatively high proportions of indicator 'wild' taxa. These are unlikely to be recovered from the excavations focused on the interiors of structures or the external middens made up of the sweepings from buildings, both of which will produce mainly fully processed crop debris. The initial analysis of the detailed sampling of interior floor levels and external stratigraphy employed at recent excavations of both SEARCH and CARP has highlighted a number of potential deposits relating to single behavioural episodes of discard. This should eventually allow more detailed analysis of Iron Age cultivation practises in the Western Isles than is possible from the present published evidence.

Turning to the wider Atlantic Scottish Iron Age, a number of trends of plant use and exploitation can be seen from the archaeobotanical assemblages, similar to those from Cnip. Firstly, barley and in particular six-row hulled barley (*Hordeum vulgare* (L) var *vulgare*), seems to dominate the arable economy which is similar to the pattern noted for the rest of Scotland (Boyd 1988; Greig 1991; Dickson & Dickson 2000). Emmer (*Triticum dicoccum* Schubl) is occasionally recovered but rarely in significant quantities and so is interpreted as a weed contaminant. This is also true of rye (*Secale cereale* L) and surprisingly oats (*Avena* sp.) which appears in significant numbers on the mainland during the Iron Age (Boyd 1988) but only seems to come to prominence in the Norse period in the Atlantic zone.

Timber would have been a valued resource, with much of the charcoal recovered relating to root or small roundwood from small trees and shrubs such as birch (*Betula* sp) and hazel (*Corylus* sp). Some pollen diagrams, such as Dun Bharabhat (Lomax & Edwards 2000), show mixed deciduous forest in the Iron Age but most profiles show a largely open landscape across much of the Atlantic zone by the Iron Age, with few significant expanses of the mixed, fully developed forest canopy which still existed in some parts of the mainland. Hence, strong structural timbers, for roofing for example, would have been a very valued resource and may well have been procured from specific managed areas in the Atlantic zone through exchange networks from the mainland (cf Fojut 2005) and from driftwood, such as spruce (*Picea* sp) from North America and Scandinavia (cf Church 2002b).

Due to the scarcity of timber, other sources of fuel were sought throughout the Iron Age, resulting in specific suites of carbonized plant macrofossils (Church & Peters 2004). These included dung, seaweed, peat, and turves (for example, see Dickson 1994). A wide variety of other useful plants were gathered from specific ecological zones, with heather being an important resource taken from the wide expanses of heath and bog and utilized in a variety of ways.

In conclusion, the archaeobotanical evidence from Cnip is in many ways typical of Iron Age assemblages from across Atlantic Scotland, and provides some specific insights into the use of tree and plant species on the site. The heterogeneous nature of much of the excavated material, however, reflects the derivation of most of the assemblage from highly mixed domestic debris. This undoubtedly obscures more detailed patterns of use which might have been recognizable had more deposits relating to single episodes of use and discard been available.

Chapter 5

Anatomy of a wheelhouse

5.1 THE NATURE OF THE EVIDENCE

The excavated structural elements of Wheelhouses 1 and 2 have been described in Chapter 2. From the partial dismantling of Wheelhouse 2, and the recording of the surviving superstructure of Wheelhouse 1, it is possible to reconstruct in large measure, how these structures were built, at least to the top of the stone corbelled roofs which covered each peripheral bay. The further evidence of building debris left within the unfinished Wheelhouse 2 provides insights into the organization of the building process. Evidence from each of these sources is combined here to provide an interpretation of how these wheelhouses were built. Following a discussion of the building process as reconstructed on the basis of Cnip, the applicability of this model to other wheelhouses in the Western Isles and elsewhere, will be considered.

5.2 RECONSTRUCTION DRAWINGS

The following discussion of the construction sequence is accompanied by a series of four reconstruction drawings, drawn by Alan Braby in discussion with the author, which show a series of broadly sequential stages in the construction of a wheelhouse. The drawings were funded by Comhairle nan Eilean for an exhibition in Lewis in 1995 and, inevitably, some changes in interpretation have been made since then. The broad principles of construction are, however, unchanged.

Although the evidence for construction has been drawn from both Wheelhouses 1 and 2, the reconstruction drawings show only one wheelhouse (Wheelhouse 1) under construction. This is simply a device to add clarity to the drawings, which should be regarded as essentially diagrammatic, and an aid to discussion, rather than an attempt to recreate any actual scene from the construction work at Cnip. Each drawing also combines a series of activities which would probably in reality have been sequential. The text should make clear, where known, the order in which these various activities were carried out.

A scale model of the wheelhouse constructed by Peter MacDonald, supported the structural viability of the reconstruction, although building up from the excavated floor plan produced a structure rather less symmetrical than that shown in the reconstruction drawings (MacDonald pers comm).

5.3 HOW TO BUILD A WHEELHOUSE?

5.3.1 STAGE 1 (ILL 5.1A)

1. The first stage in the process of construction, once the site had been selected, was presumably the gathering or quarrying of stones for the walls and other materials, such as timber for the roof. Stone must have been stacked ready for use at a convenient distance from the site. In the case of Cnip, there is no indication as to whether this material was newly gathered, or derived from an earlier settlement in the vicinity. Although there were querns present within various walls on the site, none were unambiguously primary to the original construction. Either way, the collection and transport of this material would have been a labour-intensive exercise, although not one requiring particular skill. The provision of elongated slabs for lintels (of which there were many in the finished building) may have required considerable ranging in search of suitable materials.

In recent centuries sleds pulled by the hardy local breed of small pony have been employed in Lewis to shift the large stones required for construction purposes (see, for example, plate 18 in MacDiarmid 1939), and similar methods may have been available during the Iron Age.

2. Once the building materials were in place, the process of construction would have begun with the excavation of a large circular pit to take the main body of the wheelhouse, and a linear trench to form the basis of the entrance passage. At Cnip, the site selected seems to have been a consolidated sand dune some distance back from the coast. The pit was positioned in such a way that the trench for the entrance passage cut through the north-west facing slope of the dune to enable the passage to exit at ground level. The pit was dug to a maximum depth of at least 1.5m. The

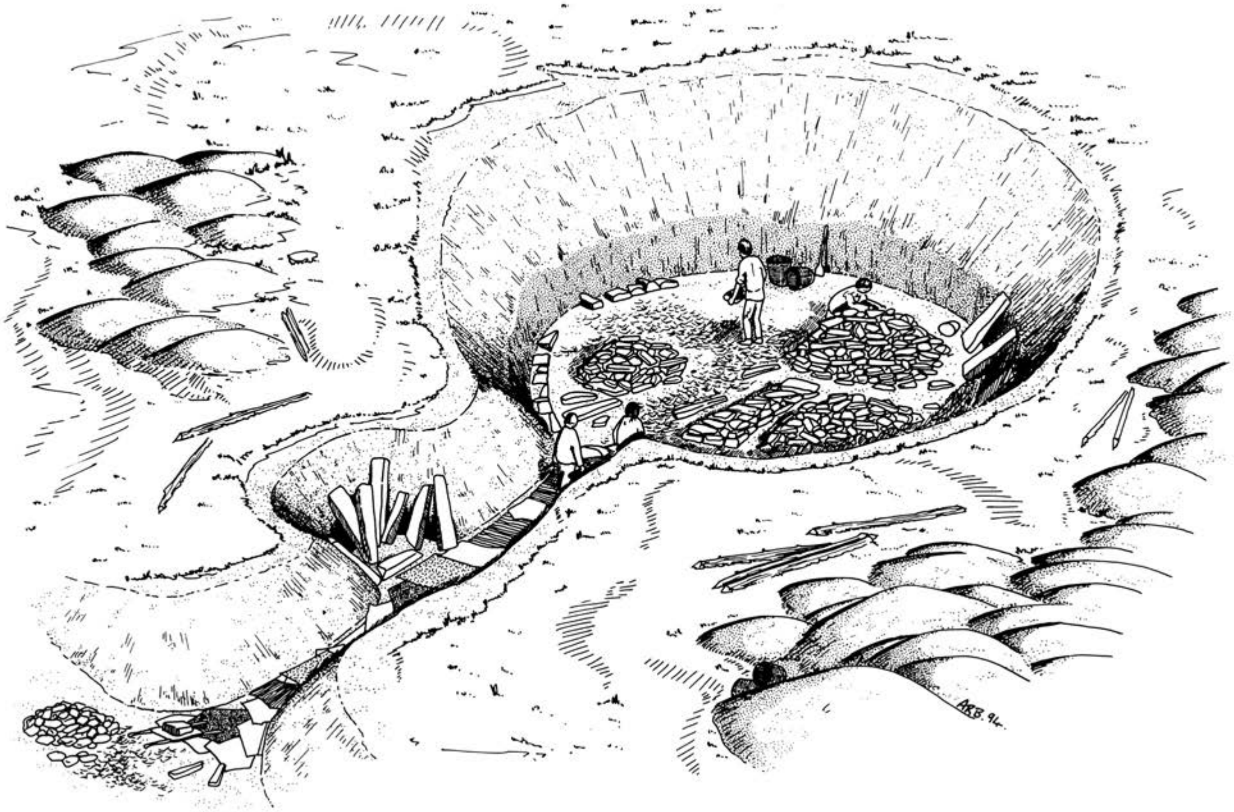


ILLUSTRATION 5.1(a)
Wheelhouse construction: Drawing One.

removal of sand would have been labour-intensive, but relatively straightforward, using simple spades of bone or metal, and baskets to remove the waste.

There are two ways in which this preparatory work could have been carried out. Version 1 (Ill 5.1a) is shown in the accompanying drawing. This shows the pit and trench being dug initially as 'rough-outs', since vertical sides of sand would have been prone to collapse. The straightening of the sand edges to take the dry-stone wall of the wheelhouse and its entrance passage would, according to this version of events, probably have come at a secondary stage.

Version 2 would have involved the excavation of sand and the construction of the lower wall being carried out together in a series of stages. Short lengths of pit or trench would have been dug and immediately lined with dry-stone walling to the top of the vertical sand face, before moving on to the next length. This seems to have been the technique employed for the rather later structures at Bostadh, on nearby Great Bernera (Tim Neighbour pers comm), and there is no obvious reason why it could not have been done at Cnip. Thus, for example, the entrance passage may have been built first by progressively cutting a series of short lengths of trench in towards the body of the dune, lining each length with stone, before proceeding to the next. The main pit for the wheelhouse could then have been dug out in similar piecemeal fashion, removing the sand along the already stone-lined entrance passage. This would have been considerably easier than working from above, as in Version 1, which would probably have created difficulties in the removal of spoil.

This alternative technique might explain the occasional near-straight joins running vertically down the dry-stone walls of various structures on the site, which do not appear to represent re-builds or multi-phase construction. It would also explain the peculiar features of the small cell in the entrance passage to Wheelhouse 2 which contained a well-built, low doorway with a weight-relieving void above. This seemed to have been built with the intention of giving

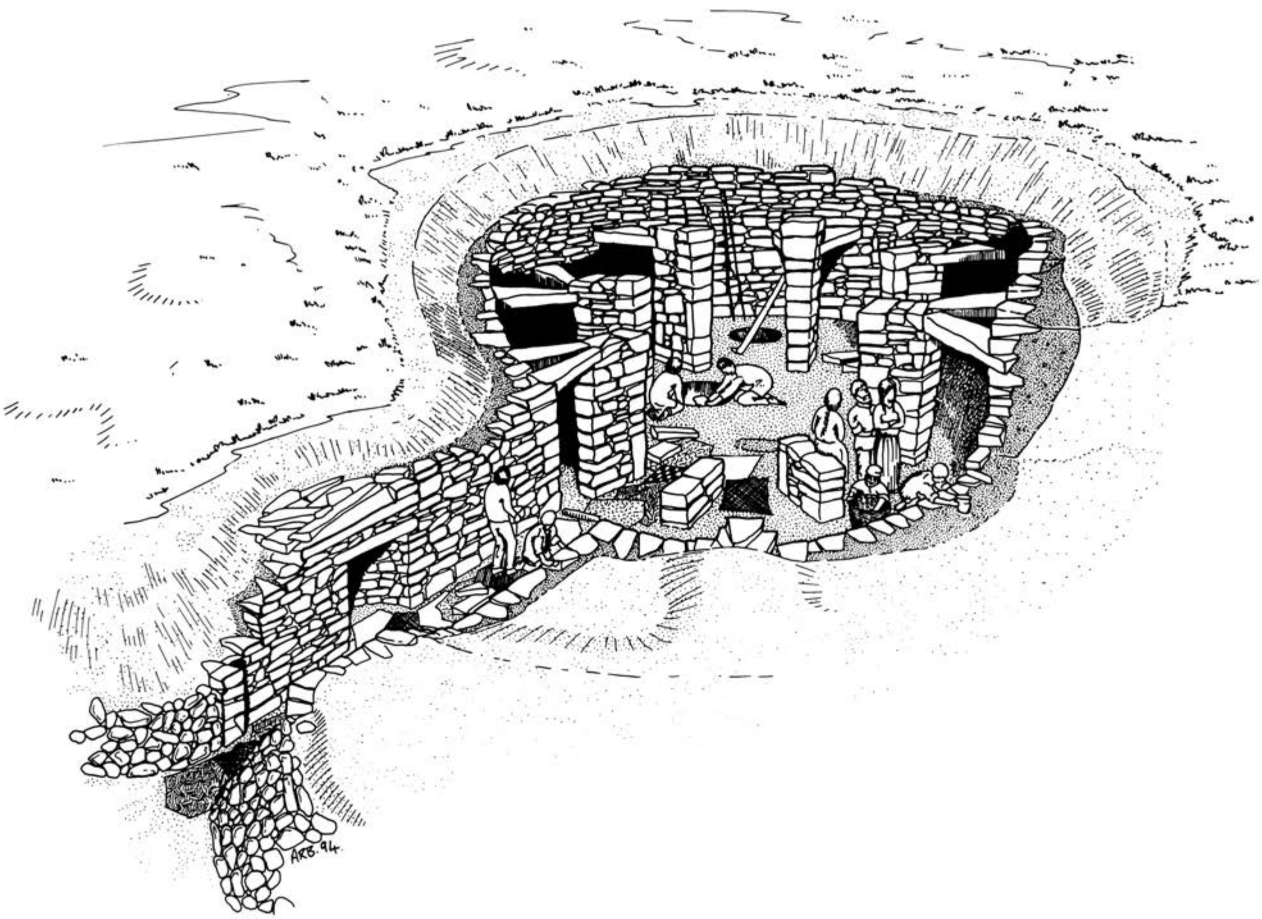


ILLUSTRATION 5.1(b)
Wheelhouse construction: Drawing Two.

access to a passage or cell behind, but the latter was never subsequently constructed. In the present context it is important to note that this 'false entrance' was built in its entirety before the proposed cell or passage was even dug out of the sand.

On balance, therefore, Version 2 is probably more likely to have been used at Cnip than the method shown in Version 1 (Ill 5.1a).

It is perhaps significant that Version 2 could have been achieved by a single skilled dry-stone mason, with non-specialist assistance for sand removal and manoeuvring of stone. Version 1, by contrast, would inevitably have been a rather frantic exercise which would have called for a larger skilled labour force if it were to be completed without major sand collapses. Indeed, assuming a method of construction similar to Version 1 at Sollas, Campbell stressed that the process of construction would have been carried out in 'a short space of time with a large workforce' (Campbell 1991, 126), and that it was, therefore, a 'communal effort' (ibid, 167). This is certainly true for Version 1, but clearly not the case for Version 2, although the less skilled parts of the operation, such as the initial stone gathering, might have been performed communally. The nature of the construction process is, therefore, important to our understanding of the nature of the societies that built and used wheelhouses, as it would seem to relate closely to the question of specialization of labour and the nature and organization of communal activity.

It is worth stressing that the confirmation of the use of Version 2 at Bostadh came from practical experiment, that is, the full-scale reconstruction of the cellular structures at Bostadh (Jim Crawford pers comm). Until someone tries to build a full-scale wheelhouse, using the original materials and technology, it is unlikely that we will have a true grasp of the complexities and practicalities involved.

5.3.2 STAGE 2 (ILL 5.1B)

1. Whichever method was favoured for the initial excavation, the dry-stone walls were clearly constructed reasonably rapidly against vertical sand sides of up to around 1.5m. Above this the sides of the sand pit sloped back at around 45 degrees, although the maximum total depth of the original pit is not clear due to later sand erosion. In Version 1, the stone could have been stacked in the centre of the roughly excavated pit ready for construction. In Version 2, it would have been brought in along the entrance passage as needed.

A section through the wall of Wheelhouse 2, just to the south of its entrance, shows the nature of this walling (Ill 5.2). Although only one stone in thickness, the wall widened as it rose, through the use of progressively larger stones. The inner face at this level appears to have been essentially vertical. No packing is visible in the section, although it is possible that some of the excavated clean sand was replaced to pack the stones securely. This is unlikely to be detectable archaeologically, but it could explain the position of the small stone, angled steeply downwards, to the rear of the wall, visible in the section (Ill 5.2). This must either have been forced into clean sand, or else held in a matrix of re-packed sand indistinguishable from the natural sand dune backing.

In reconstructing the later Iron Age house at Bostadh, Jim Crawford (pers comm) found that the liberal application of water, and the compression of the clean sand packed behind the walls, added immeasurably to the stability of the construction. This form of mortar used to secure the stones of the wall, set against a face of undisturbed clean sand, would be entirely consistent with the evidence in the wall section of Wheelhouse 2 at Cnip.

None of the walls contained any evidence for clay coatings or mortar such as have been sporadically reported from other wheelhouse sites.

During the construction of this initial, relatively low wall, a series of apparently votive deposits were inserted behind the dry-stone walling against the side of the sand dune. These have been mentioned briefly in Chapter 2 (see Section 2.3.2.2), and comprised cattle vertebrae, the head (not skull) of a great auk and a small but complete pot, all within the limited area (a length of some 1.2m) excavated. The large pit in the centre of Wheelhouse 2 also appears to have been excavated at this time, as a substantial stack of building stone had subsequently been placed over it. There may well be other such deposits behind the walls or beneath the floors of the unexcavated parts of the complex.

ILLUSTRATION 5.2
Section through the wall of Wheelhouse 2 (*c* 1.2m south of the main entrance).

When this initial, lower walling had been emplaced, the part-built structure would have been relatively stable. It would by now have appeared as a stone-lined circular pit and entrance passage up to 1.5m deep, set into a rather deeper hole in the sand dune. The depth would of course have varied around the circuit and along the entrance passage, depending on the surface contours of the original sand dune. At the entrance to Wheelhouse 1, and along the entrance passage, for example, it may have been as low as 0.5m at this stage (judging from the height at which the stone piers were joined to the enclosing wall, see below, this section). Above the level of the walls, the sides of the cut into the sand dune would have sloped back at a shallower angle, to allow a degree of stability while the later stages of construction progressed.

As an aside, it is interesting that even in wheelhouses where the piers are generally not bonded to the enclosing wall, the piers at the entrance often are, eg Kilpheder in South Uist (Lethbridge 1952, fig 2) and Eilean Maleit in North Uist (Armit 1998). This may reflect a tendency for the entrance to face the lowest part of the sand dune, where the outer wall needs to be built only a few courses at most to stabilize the sides of the cut in the sand dune.

ILLUSTRATION 5.3
The marker stone for the 'missing pier' in Wheelhouse 2, seen from the interior.

2. Once this stage had been reached, quantities of stone seem to have been brought into the interior of the wheelhouse and stacked ready for the construction of the upper levels. The lower part of the passage of Wheelhouse 2, when excavated, was found to be entirely filled with a closely packed but unstructured deposit of building stone, including substantial slabs, such as would have been used for the construction of lintels and weight-bearing corbels. A further such stack was identified over the central part of the interior of Wheelhouse 2. The periphery of Wheelhouse 2, where actual construction of the upper levels would have taken place, was free of stone, presumably to provide a clear working area.

3. The next stage appears to have been the construction of the lower parts of the stone piers which divided the periphery of the building into a series of bays. Each was around 1.4m long, and as narrow as 0.2m wide at the base, which was often only one stone wide. The lower parts of these piers were free-standing, up to a height of between 0.5–1.5m. At this level the rear of each pier was linked to the enclosing wall by a pair of stone lintels (note that on the reconstruction drawing, the lintels are set rather too high).

The lintels tended to be large stones, some over 1m in length, but all could probably have been lifted into position by two or three people working from the interior of the building. They are unlikely to have required any specialized equipment for this stage of construction.

It seems that the intention at this stage was to build each of the piers up to the height at which it was joined to the enclosing wall, before embarking on the construction of the upper levels. This was the stage, however, at which the construction of Wheelhouse 2 was abandoned. Indeed at least one of the Wheelhouse 2 piers was apparently never built at all, its position being marked by a single boulder (Ill 5.3). Indeed, it is possible that the positions of all of the intended piers were marked in this way during the early stages of construction.

Once the lower parts of the piers had been built and linked to the enclosing wall, the structure would again have been relatively stable, and ready for what was probably the most demanding of all of the building stages: the construction of the stone superstructure.

5.3.3 STAGE 3 (ILL 5.4A)

1. Seen in plan view, once each pier had been connected to the enclosing wall, each individual bay was now effectively semi-enclosed by a 'horseshoe'

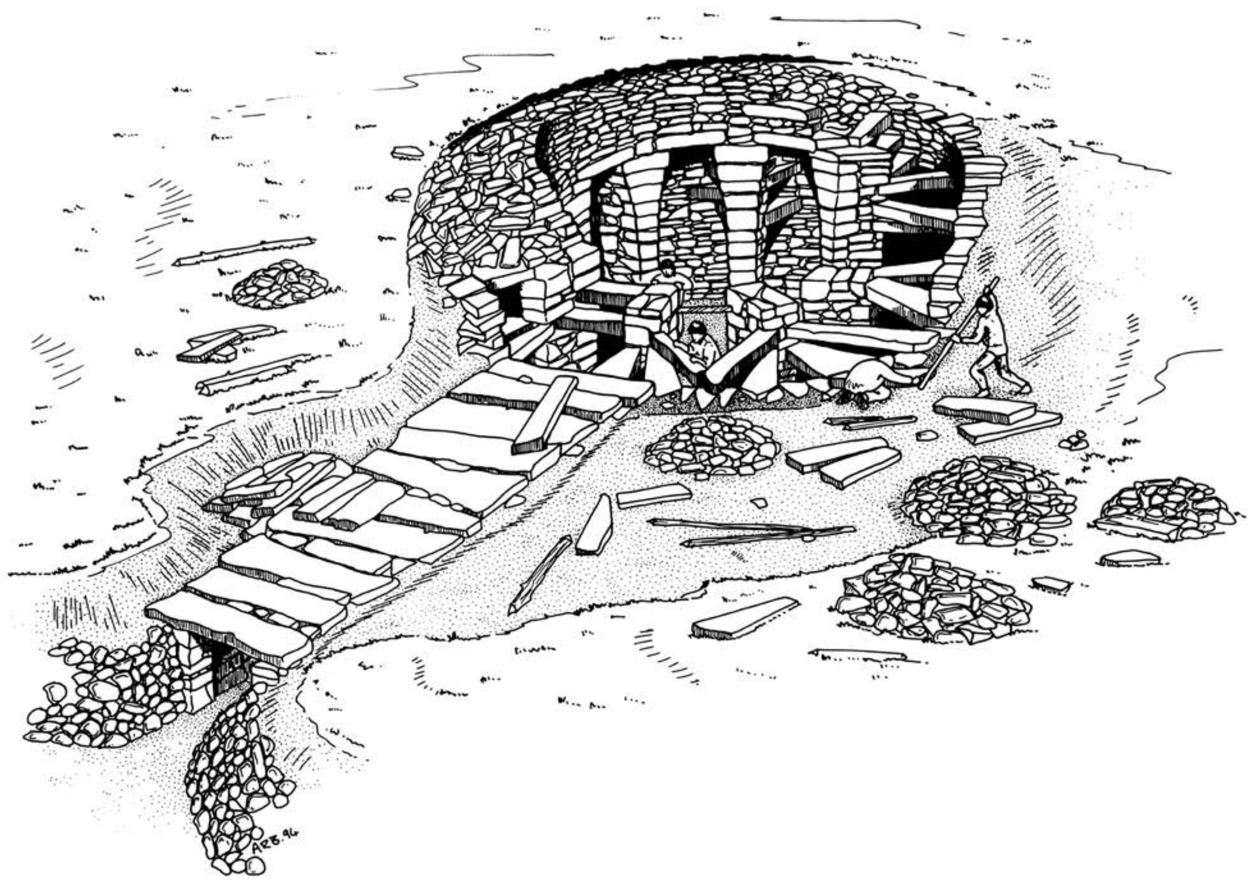


ILLUSTRATION 5.4(a)
Wheelhouse construction: Drawing Three.

of walling, open to the interior. The 'horseshoe' was formed by the piers, the lintels which linked the pier to the enclosing wall, and the enclosing wall itself.

The next stage in construction was to progressively raise the level of the walls around this 'horseshoe', each course over-sailing the one below, in order to gradually reduce the open area above the bay. This process was represented at Cnip by the two surviving corbelled bays (Bays 4 and 5), and can be reconstructed with reference to the other bays and piers which survived to expose various stages in the construction process. The stones used for corbelling were generally among the best on the site in terms of shape and size, but were still by no means ideal for this intricacy of the construction. The stones which formed the interior of the walls and roofs were of all shapes and sizes, and generally used only to provide sufficient weight to hold the structure together.

John Barber provides a useful discussion of the principles of corbelling in the context of Neolithic chambered tombs in Orkney (Barber 1992), and many of the same principles can be applied to wheelhouse construction. In order to maintain the stability of the corbelled bay roofs as they rose, it would have been necessary to build up the walls behind and between them in tandem with the corbelling itself. It was the weight of stone in this wall-backing and core which held the corbels in place, with the mass of the sand dune absorbing the weight of this stone superstructure through the piers and the outer wall. As the stability of each bay roof depended on the existence of the adjoining bays, it seems probable that the mason would have had to work in a more or less continuous circuit, raising each bay only a couple of courses before moving around to the next one.

By this stage many of the stones could not have been emplaced by anyone working from the floor of the structure. It is possible that the corbelling was set in place from above, working from the top of the enclosing wall, or else that wooden scaffolding was used. An alternative, and perhaps more attractive possibility, is that mounds of sand were used to provide support for the rising piers and corbelling. Vast quantities of sand were certainly readily available from the initial excavation of the pit to contain the wheelhouse; mounds and ramps could have been established at various points as required during construction. Similar use was made of sand quarried from the reconstructed house at Bostadh (Jim Crawford pers comm) thus avoiding the need for any timber scaffolding or bracing.

Following the principles expounded by Barber for megalithic corbelling (Barber 1992) it seems probable that the corbelling was built up in such a way that it would have been stable at each level. Clearly, this stage of construction was one which required great familiarity with dry-stone construction and consummate skill in its execution.

2. Eventually, the open area above each bay was reduced sufficiently to be capped by lintels, creating a ring of conjoined and individually corbelled bays around an open central area. The walling would probably have been taken several courses above the level of this stone capping in order that the weight of stone could produce a sufficient downward pressure to keep the roofs of the corbelled bays in place.

This elaborate stone superstructure would have risen substantially above the level of the initial pit dug to receive the wheelhouse (contra the impression from Ill 5.4a), although the extent to which this was the case is impossible to reconstruct at Cnip due to later soil erosion around the wall tops. Above the vertical, stone-lined cut which formed its lower courses, the enclosing wall increased in thickness and was packed behind with midden material apparently brought from off-site.

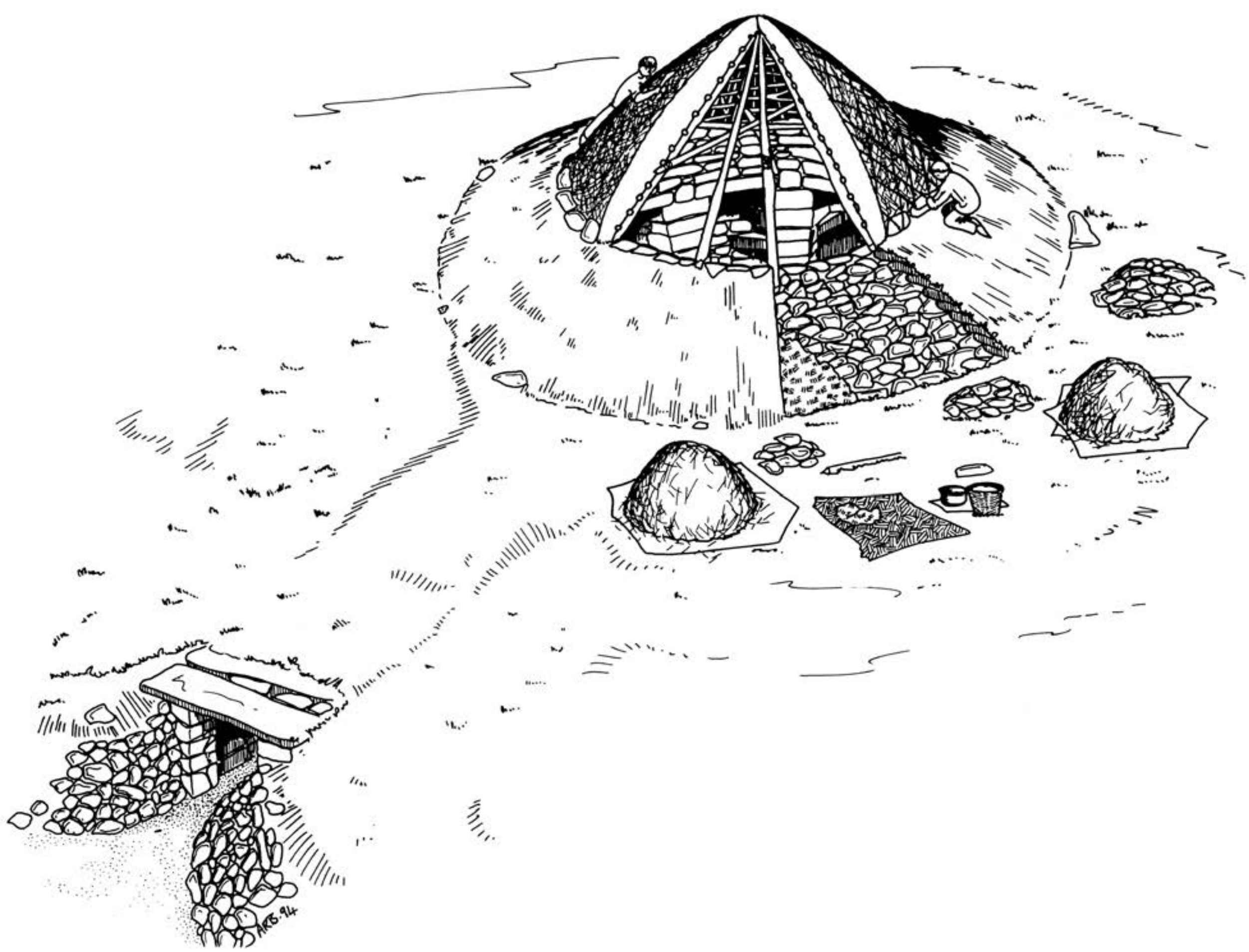


ILLUSTRATION 5.4(b)
Wheelhouse construction: Drawing Four.

The upper sides of the sand pit were angled back to receive this widened wall and its packing, although it would not have been possible to record this feature in section without the partial dismantling of Wheelhouse 1. The wall-packing material, excavated only partially in the upper levels of the Wheelhouse 1 wall, contained quantities of metal-working debris entirely uncharacteristic of the occupation debris found within the structures on the site. This material was presumably derived from occupation or midden deposits associated with a settlement or specialist activity area nearby. The prehistoric metal-working site of Cnip 2/3, just along the beach from the wheelhouse complex, is an obvious candidate (Armit & Dunwell 1992).

One element of this superstructure which remains vague is the form of the fronts of the bays at the level of closure. The open side of the bays should have made them inherently unstable by creating a major weak point within the structure of each corbelled segment. The frontal parts of Bays 4 and 5 had fallen away before excavation and were highly unstable (Ill 5.5). Piers D and F showed clear signs of angling inwards in their upper levels, but this could have been due to instability and movement.

If the inner ends of the piers in their original form rose vertically, corbelling only laterally, to be capped with a lintel at their inner end, this would seem to create a situation whereby the weight pressures from the stone corbels over the back and sides of the bay were not counteracted by any corresponding pressure from the front (ie from the interior of the building). The implication would appear to be that the bays should have collapsed forwards into the interior.

ILLUSTRATION 5.5
Bays 4 and 5, Wheelhouse 1: the frontal portions of the bays had not survived (although a few stones which had been preserved had fallen away before this photograph could be taken and are visible in Ill 1.5).The internal deposits shown are elements of the post-abandonment sand infill of Structure 8.

Clearly this did not happen, but unfortunately the missing frontal portions of the surviving bays make it impossible to tell how this apparent flaw was overcome. It is possible that the outward thrust of the timber central roof (see Section 5.3.4) was important in counter-acting the inward thrust of the corbelled bays, but this would presumably have made the whole structure highly unstable during periods of re-roofing and roof maintenance. Again, it is likely that, with a structural form so alien to modern constructional techniques, only practical experiment will clarify the issues and illuminate likely solutions.

3. The final act in this stage of construction was probably to render the roofs of the bays water-tight. The careful arrangement of the upper stones to cast off water into the surrounding dune would probably have been complemented by some form of capping or caulking, perhaps of clay, although there is little direct evidence to support this, other than a series of individually thin 'midden' deposits recorded in section above the surviving corbelled bays. Clay sealing layers some 0.1–0.05m thick were used to render the wall-heads of Hebridean blackhouses water-tight into recent times (Walker & MacGregor 1996, 4).

4. The entrance passage is shown on Ill 5.4a as lintelled, although in fact there is no evidence, either positive or negative, for this from Cnip itself. It is possible that the passage could have been covered using a timber-framed roof. Given its narrow dimensions, however, a capping of stone lintels, perhaps on a partly corbelled upper wall, would have been relatively easily achievable and in keeping with the rest of the building's stone architecture. The lintels would probably have been rather smaller than those shown on Drawing 3.

5.3.4 STAGE 4 (ILL 5.4B)

1. So far, there has been archaeological evidence from Cnip to support each stage in the reconstruction. This is not the case for the roofing of the central area, although the stone superstructure arrived at as a result of the above stages limits the possibilities available. The internal deposits within Wheelhouse 1 clearly demonstrate that it was a roofed building throughout its occupation.

There is no indication whatsoever of the collapse of any stone roofing into the central area, and it is extremely unlikely that stone corbelling would have been used to roof such an expanse. The evidence for stone corbelling over the central area of wheelhouses is restricted to a rather speculative early drawing by Captain Thomas of a wheelhouse at Usinish in South Uist (Thomas 1870). The main difficulty with this drawing is the elevation which shows a stone corbelled roof over the central area as well as over the individual bays.

Although Lindsay Scott took this reconstruction drawing at face value (1948), justifiably claiming that Thomas' experience as a surveyor made him hardly likely to invent such features, the evidence suggests otherwise. The state of preservation at Usinish, even when Thomas visited, was such that had such a roof ever existed, it could not have been observable at that time. Thomas was used to recording the beehive sheilings of the Hebrides (cf Thomas 1857) and therefore quite likely to invoke a similar roofing method to interpret such an unfamiliar structural form as a wheelhouse. The remains of corbelling in the bays would have encouraged such a reconstruction. All in all, it seems highly improbable that Usinish, or any other wheelhouse, ever had an interior spanned by a stone corbelled roof.

As with other excavated wheelhouses, therefore, it is probable that the central area at Cnip was covered by a timber-framed conical roof, of the type familiar from Iron Age roundhouses throughout the British Isles (although we should not forget the possible use of whale bone for roofing purposes). A good deal of work has been done on the structural reconstruction of Iron Age timber roundhouses, in southern Britain in particular, and the work of Peter Reynolds in reconstructing the Pimperne roundhouse has been especially instructive. Stressing that a roundhouse is, in essence, a cone supported by a cylinder, Reynolds has proposed that:

> The essential requirement of a cone set upon a cylinder in building terms is for the cylinder to be in itself a powerful and complete entity. The upper rim of the cylinder must be itself level, whatever the contours of the ground may be like. (Reynolds 1993, 94)

Wheelhouse 1 at Cnip, as has been discussed, seems to fulfil this basic requirement. Despite its revetted construction into an undulating sand-hill, the completed stone superstructure presented a level ring of masonry, supported by the radial piers and by an enclosing wall held in place by the natural sand accumulations behind it. It was clearly an extremely elaborate cylinder but it seems to have been quite capable of supporting a conical timber roof.

2. The roof would have been supported by a series of rafters which could have rested on, or been bedded into, the upper part of the ring of masonry

which formed the roofs of the individual bays. Peter MacDonald has suggested that the principal rafters would have been set into open sockets in the upper masonry to restrict rotation of the roof (pers comm). A ring beam would have been required around the base of the principal rafters. An alternative might have been to attach the ends of the rafters to a timber wall-plate resting on the upper masonry, thus spreading the weight of the roof rather than concentrating it at specific points at the base of each principal rafter. This technique was used successfully in the reconstruction of the Conderton roundhouse in Worcestershire (Reynolds 1982, 195).

The rafters would presumably have had to have been positioned above the piers to avoid increasing the pressure over potential weak-points such as the open fronts of the bays. As has been suggested above (see Section 5.3.3), the weight directed downwards and outwards from these timbers would have helped to hold the corbelled bay roofs in place. With a pitch of around 45 degrees, the main rafters need have been only some 2.8m in maximum length. This method of construction, therefore, was well suited to communities where high quality structural timber was a scarce resource.

From the interior, the apex of the roof would have risen around 5m above the central hearth in the primary phase of occupation of the wheelhouse. The constructional techniques do not appear to allow for an upper floor of any kind, and thus the interior would have taken on a markedly monumental aspect, with a roof rising higher even than the width of the central area.

3. The roof would have been thatched at an optimum pitch of around 45 degrees (for the reasons identified by Reynolds (1982, 180) in reconstructing the Pimperne roundhouse at Butser Farm). If we invoke techniques common in Hebridean vernacular architecture of more recent centuries, we might expect that the finished roof would have appeared as a slightly domed or flattened cone (as indicated in Ill 5.4b), which is better suited to the escape of smoke than a pure conical roof.

The thatching material may have been heather, although Holden (1998) has described the complex range of materials and techniques that may have been employed. Bruce Walker has suggested (pers comm) that, prior to the growth of the local kelp industry, seaweed would have been a common thatching material in the Hebrides, and one presumably readily available to the inhabitants of Cnip.

It is also probable, although it cannot be either supported or contradicted on the basis of the evidence from Cnip, that the roof had a covering of turf under the thatch, reflecting the form of roofing later found in Hebridean blackhouses like that at Arnol (Walker & MacGregor 1996).

It is most unlikely that the roof, whether turfed or not, would have had a smoke-hole. Experiments at Butser Farm have shown that, in the absence of a smoke-hole, smoke rises gently and percolates through the thatch, keeping the roof dry and free of vermin and insects (Reynolds 1982, 188). Apart from the rather obvious disadvantage of letting in the copious Hebridean rain, a smoke-hole would have created serious dangers of sparks from the central hearth igniting the thatch. The gap of some 5m between floor and apex of the roof in Wheelhouse 1 is such that the interior was probably not unduly smoky, at least no more so than a nineteenth-century blackhouse, although it would undoubtedly have been dark and airless. As in the later Hebridean blackhouses, meat and fish could have been dried and smoked by simply hanging them from the roof timbers in the smoky upper reaches of the roof space (cf Walker & MacGregor 1996, 27).

The reconstruction at Bostadh incorporates a series of small vents at the base of the thatched roof, which could be opened or closed by moving blocks of turf. As well as letting a modicum of light into the house, these vents also act to provide some circulation of air, although the majority of the smoke from the central hearth still rises into the roof space. Hebridean blackhouses incorporated similar vents for similar purposes, and there seems no reason to suppose that this simple expedient was not also adopted in wheelhouse architecture. It cannot, however, be demonstrated archaeologically.

4. Finally the thatch would probably have been held in place with a series of ropes weighted by stones. This method was common in the Hebrides until relatively recently when the use of netting became more common for this purpose.

5. It is unclear whether the thatch would have carried down over the roofs of the bays. If it did not, the bays may have required some form of slanted turf capping to prevent the percolation of water from the roof into the interior of the building. The reconstruction at Bostadh has demonstrated that turf could be relatively easily secured even on slopes of around 50 degrees, so it would have been quite possible to have carried the turf roof covering over the sloping backs of the corbelled bays at Cnip.

Assuming that Wheelhouses 1 and 2 at Cnip were intended to be roofed contemporaneously, it seems most likely that the thatch would not have been brought down over the bay roofs, as insufficient room would seem to have been available between the two roofs. The issue is probably not resolvable on the present evidence but, whatever the precise mechanism, water must somehow have been directed into the body of the sand dune.

6. The final appearance of the structure would probably have been quite unimposing; little more than a conical roof, and perhaps a metre or so of upper walls, projecting above the natural sand dunes.

5.4 HOW TYPICAL IS CNIP?

Although the wheelhouses at Cnip are among the smallest in the Western Isles, with mean internal diameters of around 7.5m, they are nonetheless strikingly similar on plan to the largest Hebridean wheelhouses, such as Sollas, with an internal diameter if around 11m (Campbell 1991). Indeed all of the wheelhouses within the Western Isles are remarkably close in overall proportion and design, suggesting similar modes of construction and similar patterns of use (Armit 1992).

The principal observable distinctions among excavated examples relate to the nature of pier construction (ie whether the lower parts of the radial piers are bonded to the enclosing wall, or separated, as at Cnip, by a gap or ‘aisle’) and to whether the building is revetted or free-standing. Data on wheelhouse structural features were collated in Armit 1992, Chapter 11, and will not be rehearsed in detail here. Nonetheless, it is worth outlining some key points relating specifically to the Hebridean examples.

5.4.1 PIERS: BONDED AND UNBONDED

In the majority of Hebridean wheelhouses, as at Cnip, the lower parts of the radial stone piers are not bonded into the surrounding wall, but are linked at various heights by paired lintels, leaving a gap or ‘aisle’ around the periphery of the structure. It is not clear to what degree this aisle was used for movement around the building. In some cases it was so low as to be virtually impassable, at least by the time at which deposits had begun to accumulate within the structure. At Cnip, the aisles of Wheelhouse 1 seem to have gone out of use by the start of Phase 2 and were in some cases blocked with rough walling (as was common on other wheelhouse sites, eg Sollas (Campbell 1991), A’ Cheardach Bheag (Fairhurst 1971), and Allt Chrisal, T17 (SEARCH 1998)). It has been suggested above (see Section 5.3.2) that the gaps between the pier and enclosing wall were essentially a constructional device to enable the completion of the enclosing wall to the surrounding ground level or thereabouts, before work began on the piers. This may in some cases account for the variability in the height at which the piers are joined to the enclosing wall. From a structural point of view the aisles would appear to be serious weak points within the structure and indeed they often display indications of cracking or collapse.

Two excavated Hebridean wheelhouses appear to have been built with piers which were bonded into the outer wall from the outset; Foshigarry A (Beveridge 1930) and Bac Mhic Connain (Beveridge 1931), both in North Uist. At Foshigarry there appears to have been a progression from wheelhouses with unbonded piers to one with piers which were bonded into the enclosing wall from ground level (cf Armit 1992, Chapter 11). A similar progression is even more obvious at Jarlshof in Shetland (Hamilton 1956). At A’ Cheardach Mhor, in South Uist (Young & Richardson 1960), the piers abutted the outer wall but were not bonded in, suggesting perhaps a transitional design.

While there are indications of a chronological change from unbonded to bonded piers, however, this transition need not have been uniform across Atlantic Scotland, and may reflect local expediency. The adoption of bonded piers need not have changed the construction process to any great extent: it is easy to see how the lower parts of the piers could have been built in tandem with the lower parts of the enclosing wall without necessarily leaving the sand-face exposed for any significantly greater length of time. In terms of the finished ‘product’ it would seem that wheelhouses with bonded piers, built according to the methods set out above, should have been more stable than those with unbonded piers.

That being the case, however, the initial use of unbonded piers seems even more peculiar, particularly since they appear to have been a deliberate design choice rather than a necessary by-product of wheelhouse construction. It might have been expected that masons sufficiently expert in dry-stone construction to build something as elaborate as a wheelhouse, would have been well aware of the likely pitfalls involved in leaving such glaring stress points in the structure.

It has been suggested that the original design of wheelhouses reflects a translation into stone of conventional timber roundhouse design and that the piers, therefore represent the timber posts, and were thus kept separate from the enclosing wall (cf Hamilton 1956). Whilst this idea is superficially attractive, the long history of dry-stone construction in the Hebrides prior to the adoption of wheelhouses perhaps makes it seem a little unlikely that such an apparently unstable form would be adopted without modification.

If on the other hand access between the bays had been desired, this function of the aisles seems quickly to have been abandoned as most excavated wheelhouses have produced evidence for the early blocking of the bays. Similarly, evidence for the blocking of bays from the central area of the wheelhouse (which would of course necessitate access through the aisles) has generally been shown to be spurious where closely examined (cf Campbell 1991 for Sollas, contra my own earlier discussion of this phenomenon (1992, 71) which pre-dated publication of Sollas, and re-excavation of Eilean Maleit (Armit 1998).).

On present evidence, then, it appears that the wheelhouse 'aisles' were a deliberate design choice, perhaps reflecting a combination of aesthetic and/or symbolic factors, but which do not seem to have been particularly important for movement around the structure. Instead, the bays seem to have been entered primarily (and perhaps only) via the central area. Generally, as at Cnip, the aisles were blocked or obstructed long before the wheelhouse itself went out of use, and on some (perhaps the latest) wheelhouses they were omitted from the design altogether. The implications for the use of space within wheelhouses caused by the postulated change from unbonded to bonded piers are discussed in Chapter 7.

5.4.2 REVETTED VERSUS FREE-STANDING CONSTRUCTION

Wheelhouses sited on the Hebridean machair appear, as at Cnip, to be uniformly revetted into pre-existing sand-hills. Others, such as Garry Iochdrach (Beveridge 1931) and Eilean Maleit in North Uist (Beveridge 1911; Armit 1998), are revetted into the remains of former structures, including Atlantic roundhouses. Those which are free-standing, Tigh Talamhanta (Young 1952) and Allt Chrisal, T17, in Barra (SEARCH 1998) and Clettraval in North Uist (Scott 1948), occupy inland locations where options for creating a revetted structure were limited.

While revetting into a suitable site was apparently the preferred technique, then, the builders of wheelhouses clearly did not allow themselves to be restricted by such locational factors. Away from the machair and the ruins of former buildings, it seems to have been preferable to build a free-standing structure, rather than to excavate into ill-drained or otherwise unsuitable ground.

There is no particular reason why the same structural principles could not have been used in these free-standing wheelhouses, as were used at Cnip. Instead of using the natural sand dune, or the collapsed masonry of ruined structure, to bear the weight of the corbelling and timber roof, the free-standing enclosing wall would have performed essentially the same function.

This may have placed greater constraints on the potential size of the finished structures: free-standing wheelhouses tend to be rather smaller on average than the revetted examples (cf Armit 1992), and Allt Chrisal, T17, is the smallest of all recorded Hebridean wheelhouses with an internal diameter of only 6.3m (SEARCH 1998). It should be noted, however, that there is considerable overlap between the two groups, and that the free-standing wheelhouses at Tigh Talamhanta and Clettraval are larger than those excavated at Cnip. The free-standing wheelhouses all have unbonded piers.

In conclusion, therefore, it appears that the methods of construction proposed for Cnip have broad applicability to Hebridean wheelhouses as a whole, although the free-standing examples, of which three have been excavated, would have required the addition of a weight-bearing enclosing wall to replace the sand-hill or masonry mass used by the revetted examples.

5.5 MATERIAL RESOURCES

The principal resources required for the construction of the Cnip wheelhouses would have been a large quantity of stone, including a significant number of relatively high-quality lintels, and a supply of timber, thatch and rope for roofing.

The timber requirements of a wheelhouse would have been relatively modest (even discounting the possible use of whale bone to provide roof supports), particularly when compared to the roof and floor requirements of Atlantic roundhouses. The main structural timbers would have comprised a likely maximum of eight principal and eight secondary rafters, each around 2.8m long, and a ring beam formed of eight timbers each around 1.8m long (59.2m of timber total). The remainder of the roof frame would have been more akin to wattle-work in terms of the size of timbers used.

It is difficult to estimate the amount of thatch required, particularly since it is unclear how far over the roofed bays the thatch would have extended, and doubly so since the nature of the thatching material is itself unknown. Reynolds has suggested a usual thatch depth of 0.3m for straw (1982, 189). Given a central timber roof area of approximately 17.6m^2, a layer of 0.3m would equate to a minimum of 5.3m^3 of thatch, if straw or an analogous material was used. Using figures based on Reynolds' reconstruction of the Conderton roundhouses (ibid) this would give a dry roof weight of approximately three tonnes (figures based on extrapolations of roof weights by Dave Lynn pers comm). Again using figures for Iron Age arable production derived from Butser Farm this might equate to the annual yield of around 1.5ha of arable (ibid, 189), or perhaps rather more given the harsher environmental regime of the islands. Analogy with the roof of the reconstructed house at Bostadh, however, suggests that somewhere around one tonne of heather and two tonnes of turf may have been required to roof the Cnip wheelhouse (Jim Crawford pers comm), had these materials been used.

The life-span of the thatch would also play a role in determining how onerous the task of replacement and maintenance was for the household. Blackhouse thatch, for example, was traditionally taken down annually to spread on the potato crop as a valued fertilizer. As with the timber requirement, the design of the wheelhouse seems to have kept the requirement for thatch to a minimum, and the amounts needed would have been significantly less than for Atlantic roundhouses, or even for the much later Hebridean blackhouses.

Overall, the material resources required to construct a wheelhouse do not seem particularly great when compared to Atlantic roundhouses or even the more apparently modest blackhouses of the past two centuries. What wheelhouses did require in abundance, however, was skill in dry-stone construction.

5.6 SKILL AND LABOUR REQUIREMENTS

It is possible to envisage the unskilled parts of wheelhouse construction, such as the gathering and transport of stone, and the initial digging out of sand, as being carried out by a large section of the community. The most highly skilled parts of the job, such as the corbelling of the bays and raising of the piers, however, were a different matter. These were immensely skilful operations with tremendous potential for disaster: both structural collapse and serious injury. It seems almost inconceivable that they could have been carried out by anyone who did not spend a great deal of their time working with dry-stone masonry. Thus the dry-stone masonry element of wheelhouse construction would almost certainly have required a specialist mason, albeit with unskilled or semi-skilled assistance.

It is interesting to note, by way of comparison, that the large timber roundhouses characteristic of the Iron Age in southern England 'can only have been built by few people working for a long time' rather than by large teams of communal labour (Reynolds 1982, 106). Indeed Reynolds has suggested that a team of only two people was required even for very large roundhouses like that at Pimperne (Harding, Blake & Reynolds 1993), with larger groups becoming involved only during daubing and the preparation of straw for thatch (and presumably for assembling materials prior to construction).

It is less clear whether there would have been any need for specialist or semi-specialist thatchers. In many parts of Scotland in recent centuries, the repair and maintenance of thatch at least were carried out by tenant farmers without recourse to specialist assistance (cf Holden 1998, 5) and thatching itself was seen as a communal activity (Walker & MacGregor 1996, 11). Similarly the timber components of the central roof do not seem to have necessitated specialist work. The joinery need not have been complicated and the roof spans were rather limited. As Barber (1992) has suggested for chambered tombs, the principles of wheelhouse construction must have been thoroughly embedded within society, or at least within the knowledge of a group of specialist or semi-specialist dry-stone masons.

5.7 THE MONUMENTAL HOME

The final structure which resulted from the various structural operations described above, while inconspicuous and unobtrusive from outside, would have been extremely impressive when experienced from the interior. Visitors crouching along the entrance passage could hardly have failed to be impressed by the high soaring space which met them as they entered the central area; a near symmetrical forest of graceful stone piers rising towards a roof space which had its apex more than 5m above the central hearth.

Despite being among the smallest wheelhouses, Wheelhouse 1 at Cnip was still far grander in design and calculated in its visual impact than could have conceivably been necessary to provide the necessities of warmth and shelter. It was a monumental building and must therefore have had made a considerable social statement. The social context of this monumental domestic architecture will be discussed further below (Chapter 7).

Chapter 6

Chronology

6.1 INTRODUCTION

6.1.1 SAMPLE SELECTION

A total of 19 radiocarbon dates were obtained from Cnip (Table 6.1). 18 derive from mammal bone samples, submitted soon after the excavation in 1990, and one from the oxidized wooden handle of an iron spade-shoe (wood species unidentifiable), which was submitted during post-excavation in 1998. The samples cover all three phases identified during excavation.

The selection of samples was carried out with extreme care in order to avoid contexts where older, residual material was judged likely to be present. In the absence of suitable charcoal fragments (the charred plant remains were not an option at the time of submission), the most suitable samples were judged to be substantial mammal bones, with no signs of weathering, which appeared to have been fresh at the time of deposition. The great majority of the dated samples, therefore, derive from deposits which had accumulated within occupied buildings, wall-packing associated with building construction, or special 'ritual' deposits. All but one of the samples (the wood from the iron spade-shoe handle, Block 11) were from the 'key sequence' of blocks as defined in the pottery analysis (Chapter 4). Aside from the four samples from deposits from within the abandoned Wheelhouse 2 (which will be discussed separately below, Section 6.3.2), none of the samples were from outdoor or midden contexts which would potentially have been prone to the incorporation of older material through re-working of midden heaps, trampling by domestic animals, or natural processes such as sand deflation.

Had the dating programme been carried out now, rather than in 1990, samples would undoubtedly have been obtained from single entities (ie in this case, single bones) and submitted for AMS dating, to avoid any possibility of conflating non-contemporary material within single samples. However, with the exception of three dates from Phase 1, where this may well have happened (see Section 6.3.2), the remarkable consistency of the remaining dates suggests that this has not been a problem.

It is particularly helpful that the wood-derived date from the spade-shoe proved virtually identical to bone-derived dates from the same phase (Ill 6.1, AA–29767), thus effectively discounting any suspicion of distortion of the bone-derived dates caused by the marine residue effect (in the unlikely event, for example, that the cattle and deer from which the samples were derived had had seaweed as a major component of their diet).

6.1.2 PROBLEMS

Two dates appear to be at variance with the general sequence. GU-2753 (1570 ± 140 BP) relates to a context (C129, Block 6, fragmentary *bos*, see Section 2.3.1.1) which appears to have been contaminated in the mid-first millennium AD. The context was interpreted on site as the upper part of the wall-packing of Wheelhouse 1, but it lay close to the modern

TABLE 6.1
Cnip radiocarbon dates.

Sample	**Context**	**BP**
GU-2754	116	2370 ± 130 BP
GU-2756	276	2600 ± 150 BP
GU-2758	131	2280 ± 140 BP
GU-2755	276	1990 ± 50 BP
GU-2757	131	1960 ± 90 BP
GU-2749	265	1920 ± 60 BP
GU-2746	266	1930 ± 90 BP
AA-29767	72	1910 ± 45 BP
GU-2752	204	1900 ± 50 BP
GU-2748	266	1890 ± 50 BP
GU-2747	223	1890 ± 50 BP
GU-2751	204	1850 ± 50 BP
GU-2742	113	1940 ± 70 BP
GU-2743	109	1930 ± 50 BP
GU-2745	83	1870 ± 70 BP
GU-2741	42	1810 ± 190 BP
GU-2744	83	1770 ± 80 BP
GU-2753	129	1570 ± 140 BP
GU-2750	265	6800 ± 80 BP

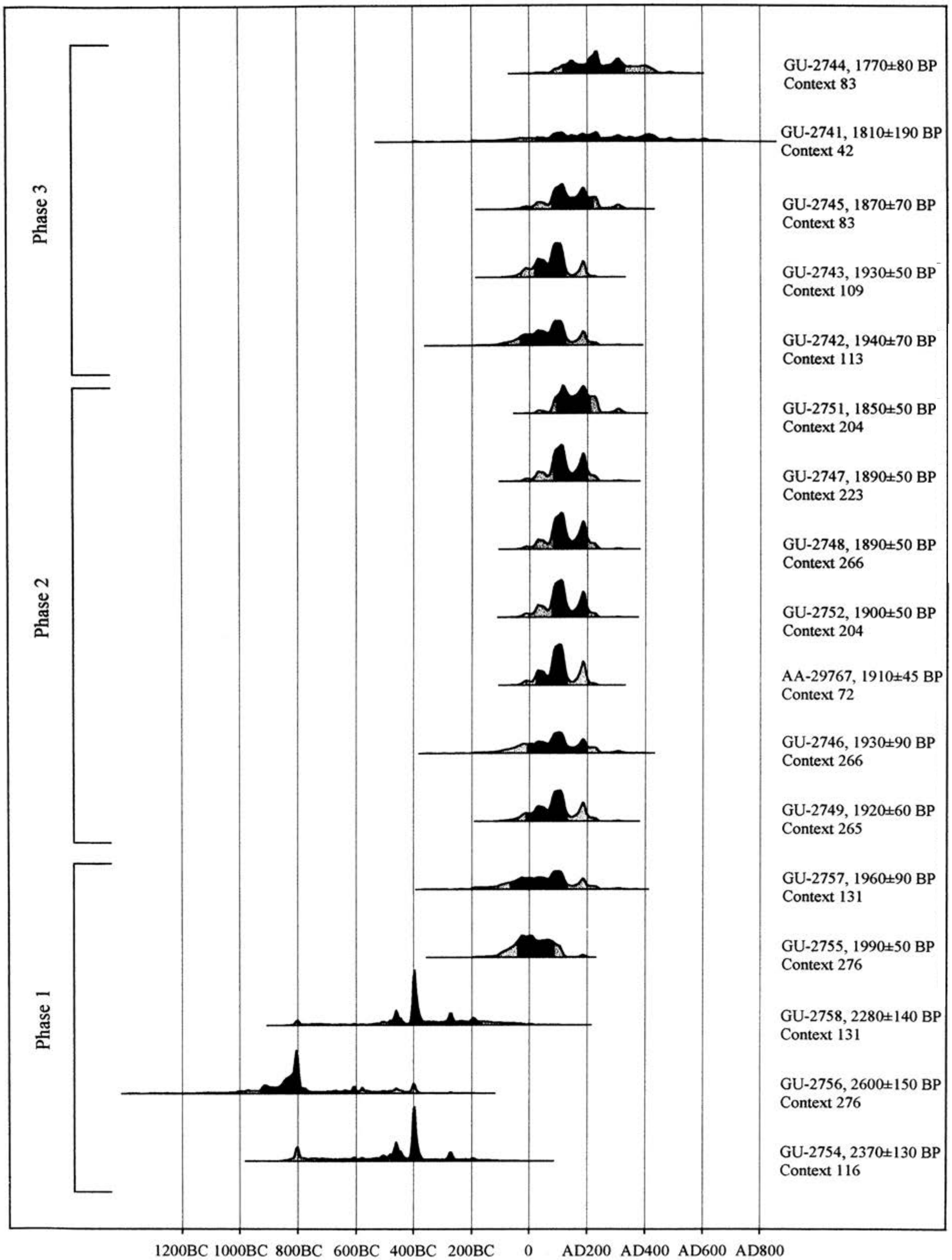


ILLUSTRATION 6.1
Probability distribution of the radiocarbon dates from Phases 1, 2 and 3.

ground surface and was exposed by initial removal of the upper sands by machine. With hindsight, it seems probable that the context relates to some otherwise unrecognized post-abandonment activity, although its wide standard deviation could place it in the latter part of the site's occupation. It cannot, however, relate to the construction of the wheelhouse, as had been hoped, and does not provide a useful chronological indicator. GU-2750 (6800 ± 80 BP), by contrast, cannot be explained in this way, since the bones from which it derives (*bos* and *cervus*) cannot possibly relate to the radiocarbon date as received.

6.2 CALIBRATION AND ANALYSIS OF RADIOCARBON DATES

Magnar Dalland

6.2.1 INTRODUCTION

The dates were calibrated using data from Pearson et al (1986), to produce a calibrated probability distribution (PD) for each date (Ill 6.1). Each PD has a dark middle segment sandwiched between two lighter grey segments. The dark and grey segments represent the short (SCR) and long continuous range (LCR). These are the shortest continuous ranges for which the probability that the date lies within the stated range is greater than or equal to, respectively, 68.26 per cent (SCR) and 95.45 per cent (LCR). These values are equal to the probabilities of the one and two sigma ranges of a normal distribution (Table 6.2).

The two anomalous dates (GU-2750 and GU-2753), discussed above, are listed in Table 6.1 but have not been included in the statistical analysis. The remaining 17 dates derive from 12 different contexts, associated with each of the three phases identified during excavation.

The data which constitute the PD curves are summarized, at 100 years resolution, in Table 6.3. The data for each date are displayed in three columns. The left column shows the probability of the date to lie within a 100-year-interval. The second and third columns present the probability for the date to be younger than, or older than, the lower limit of the 100-year-period defined.

6.2.2 STATISTICAL ANALYSIS

Three types of statistical analyses were undertaken to determine the duration, contemporaneity and formation period of Phases 2 and 3. The statistical evaluations are based on the calibrated probability distributions (PDs) of the radiocarbon dates that have been calculated on the basis of the Belfast calibration curve (Pearson

TABLE 6.2
Cnip calibrated radiocarbon dates.

SAMPLE	BP	SCR RANGE	PROB	LCR RANGE	PROB	Context	Phase
GU-2754	2370 ± 130 BP	BC 615 – BC 255	68.30	BC 840 – BC 170	95.61	116	1
GU-2756	2600 ± 150 BP	BC 925 – BC 600	68.52	BC 1050 – BC 375	95.47	276	1
GU-2758	2280 ± 140 BP	BC 480 – BC 165	68.31	BC 810 – BC 30	95.66	131	1
GU-2755	1990 ± 50 BP	BC 40 – AD 85	68.54	BC 105 – AD 120	95.54	276	1
GU-2757	1960 ± 90 BP	BC 65 – AD 130	68.65	BC 170 – AD 240	95.53	131	1
GU-2749	1920 ± 60 BP	BC 10 – AD 130	68.62	BC 40 – AD 225	95.56	265	2
GU-2746	1930 ± 90 BP	BC 5 – AD 200	69.05	BC 175 – AD 245	95.52	266	2
AA-29767	1910 ± 45 BP	AD 25 – AD 130	68.98	BC 10 – AD 205	95.79	72	2
GU-2752	1900 ± 50 BP	AD 80 – AD 195	68.60	AD 0 – AD 230	95.70	204	2
GU-2748	1890 ± 50 BP	AD 85 – AD 195	68.57	AD 15 – AD 235	95.73	266	2
GU-2747	1890 ± 50 BP	AD 85 – AD 195	68.57	AD 15 – AD 235	95.73	223	2
GU-2751	1850 ± 50 BP	AD 95 – AD 210	70.69	AD 75 – AD 325	95.53	204	2
GU-2742	1940 ± 70 BP	BC 30 – AD 125	69.58	BC 85 – AD 225	95.51	113	3
GU-2743	1930 ± 50 BP	AD 20 – AD 125	68.50	BC 30 – AD 205	95.93	109	3
GU-2745	1870 ± 70 BP	AD 80 – AD 220	68.45	BC 15 – AD 320	95.83	83	3
GU-2741	1810 ± 190 BP	AD 25 – AD 445	68.42	BC 195 – AD 650	95.53	42	3
GU-2744	1770 ± 80 BP	AD 120 – AD 330	69.08	AD 85 – AD 435	95.63	83	3

TABLE 6.3
Probabilities of dates to fall within centuries.

	GU-2756			**GU-2754**			**GU-2758**			**GU-2755**		
	2600 ± 150 BP			**2370 ± 130 BP**			**2280 ± 140 BP**			**1990 ± 50 BP**		
	Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
AD 1000–1100												
AD 900–1000												
AD 800– 900												
AD 700– 800												
AD 600– 700												
AD 500– 600												
AD 400– 500												
AD 300– 400										0.0	0.0	100.0
AD 200– 300							0.0	0.0	100.0	0.1	0.1	99.9
AD 100– 200				0.0	0.0	100.0	0.3	0.3	99.7	7.5	7.6	92.4
AD 0– 100				0.1	0.1	99.9	2.0	2.4	97.6	50.9	58.5	41.5
100– 0 BC				1.3	1.4	98.6	6.1	8.4	91.6	38.6	97.1	2.9
200– 100 BC	0.0	0.0	100.0	4.1	5.5	94.5	11.6	20.0	80.0	2.9	100.0	0.0
300– 200 BC	0.7	0.7	99.3	9.1	14.5	85.5	15.0	35.0	65.0			
400– 300 BC	3.8	4.5	95.5	28.2	42.8	57.2	33.1	68.1	31.9			
500– 400 BC	8.0	12.5	87.5	23.6	66.4	33.6	16.7	84.8	15.2			
600– 500 BC	7.4	20.0	80.0	9.2	75.5	24.5	4.9	89.7	10.3			
700– 600 BC	8.2	28.1	71.9	7.4	83.0	17.0	3.4	93.1	6.9			
800– 700 BC	15.2	43.3	56.7	11.2	94.2	5.8	5.2	98.3	1.7			
900– 800 BC	39.9	83.3	16.7	5.7	99.9	0.1	1.7	100.0	0.0			
1000– 900 BC	11.3	94.5	5.5	0.1	100.0	0.0						
1100–1000 BC	3.1	97.6	2.4									
1200–1100 BC	1.6	99.2	0.8									
1300–1200 BC	0.7	99.9	0.1									
1400–1300 BC	0.1	100.0	0.0									
1500–1400 BC												

	AA-29767			**GU-2752**			**GU-2748**			**GU-2747**		
	1910 ± 45 BP			**1900 ± 50 BP**			**1890 ± 50 BP**			**1890 ± 50 BP**		
	Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
AD 1000–1100												
AD 900–1000												
AD 800– 900												
AD 700– 800												
AD 600– 700												
AD 500– 600												
AD 400– 500				0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0
AD 300– 400	0.0	0.0	100.0	0.3	0.3	99.7	0.5	0.5	99.5	0.5	0.5	99.5
AD 200– 300	3.1	3.1	96.9	5.8	6.1	93.9	8.0	8.5	91.5	8.0	8.5	91.5
AD 100– 200	49.2	52.3	47.7	53.3	59.4	40.6	57.9	66.4	33.6	57.9	66.4	33.6
AD 0– 100	44.3	96.6	3.4	37.4	96.8	3.2	31.6	98.0	2.0	31.6	98.0	2.0
100– 0 BC	3.4	100.0	0.0	3.2	100.0	0.0	2.0	100.0	0.0	2.0	100.0	0.0
200– 100 BC												
300– 200 BC												
400– 300 BC												
500– 400 BC												
600– 500 BC												
700– 600 BC												
800– 700 BC												
900– 800 BC												
1000– 900 BC												
1100–1000 BC												
1200–1100 BC												
1300–1200 BC												
1400–1300 BC												
1500–1400 BC												

TABLE 6.3
Probabilities of dates to fall within centuries

GU-2757			**GU-2742**			**GU-2746**			**GU-2743**			**GU-2749**		
1960 ± 90 BP			**1940 ± 70 BP**			**1930 ± 90 BP**			**1930 ± 50 BP**			**1920 ± 60 BP**		
Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0				0.0	0.0	100.0
0.9	0.9	99.1	0.4	0.4	99.6	2.1	2.1	97.9	0.0	0.0	100.0	0.3	0.3	99.7
4.7	5.7	94.3	3.9	4.3	95.7	8.2	10.4	89.6	1.8	1.9	98.1	4.6	5/0	95.0
24.8	30.4	69.6	31.1	35.5	64.5	32.3	42.6	57.4	35.7	37.6	62.4	40.5	45.5	54.5
36.9	67.4	32.6	44.5	79.9	20.1	35.4	78.1	21.9	52.9	90.4	9.6	44.4	89.9	10.1
24.7	92.0	8.0	18.2	98.2	1.8	17.9	95.9	4.1	9.5	100.0	0.0	9.9	99.8	0.2
6.8	98.8	1.2	1.8	100.0	0.0	3.6	99.6	0.4	0.0	100.0	0.0	0.2	100.0	0.0
0.8	99.6	0.4				0.3	99.9	0.1						

GU-2745			**GU-2751**			**GU-2741**			**GU-2744**			**GU-2753**		
1870 ± 70 BP			**1850 ± 50 BP**			**1810 ± 190 BP**			**1770 ± 80 BP**			**1570 ± 140 BP**		
Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
												0.0	0.0	100.0
						0.0	0.0	100.0				0.6	0.6	99.4
						0.2	0.2	99.8				1.7	2.4	97.6
						3.7	3.9	96.1	0.0	0.0	100.0	22.8	25.1	74.9
0.0	0.0	100.0				5.3	9.2	90.8	0.4	0.4	99.6	21.1	46.3	53.7
0.1	0.1	99.9	0.0	0.0	100.0	12.1	21.2	78.8	8.0	8.4	91.6	27.3	73.5	26.5
4.3	4.4	95.6	3.2	3.2	96.8	13.2	34.4	65.6	25.5	33.9	66.1	13.3	86.8	13.2
17.5	21.9	78.1	21.8	25.0	75.0	16.0	50.4	49.6	35.3	69.1	30.9	8.9	95.7	4.3
50.3	72.2	27.8	62.8	87.8	12.2	20.1	70.5	29.5	26.8	95.9	4.1	3.7	99.3	0.7
24.2	96.4	3.6	12.0	99.8	0.2	13.7	84.3	15.7	3.9	99.8	0.2	0.6	100.0	0.0
3.6	100.0	0.0	0.2	100.0	0.0	8.6	92.8	7.2	0.2	100.0	0.0			
						4.0	96.9	3.1						
						1.4	98.3	1.7						
						1.6	99.9	0.1						
						0.1	100.0	0.0						

et al 1986). To evaluate the contemporaneity of the dates from Phase 2, the dates were tested using the Student's t-test. Using the stratigraphical relationships between samples (Ill 6.2), it was possible to improve the precision of 11 dates from Phases 2 and 3. The duration of Phases 2 and 3 were evaluated using PDs of the age difference between dates. In both cases the stratigraphical relationship between samples was used to limit the range within which the age difference could lie (Dalland 1993).

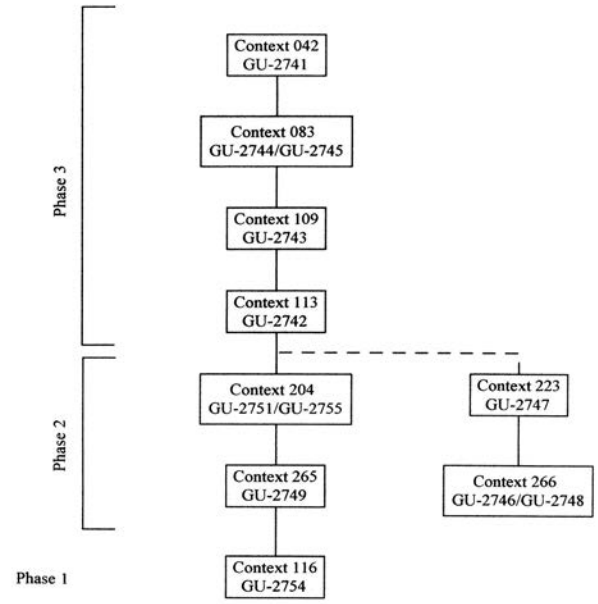


ILLUSTRATION 6.2
C14 samples linked by a direct stratigraphic chain.

6.2.2.1 Contemporaneity of the dates from Phase 2

Seven dates are available from five different contexts ascribed to Phase 2. To evaluate the field interpretation that these contexts were contemporary, the seven dates were tested using the Student's t-test to see if the dates could belong to the same population, as if they were results of multiple dates from the same sample. The seven dates produced a test figure of 1.3, well within the test limits of 12.6. This indicates that the variation in dates between these seven samples could be ascribed to statistical variations, and the test does not contradict the field interpretation.

6.2.2.2 Stratigraphical adjustment

The precision of a radiocarbon date can only be improved by adding data to the system, directly by counting the decays for longer periods, or indirectly by combining the dates of several samples. By using the stratigraphical information new data is added and the precision of the dates can be improved.

The calibrated probability distributions are based on the evaluation of the radiocarbon content of the sample against the calibration data. By using information that is independent of the data on which the distributions are based, the probability distributions could be modified.

If there is stratigraphical evidence that sample A is older than sample B and it is safe to assume that the true relative age of the samples reflects their stratigraphical positions, the condition A > B could be imposed on the probability distributions of the dates of those two samples:

If A) The probability for the age of sample A to lie within AD 100 to AD 105 is 0.05

and B) The cumulative probability of the age of sample B to be younger than AD 105 is 0.6

then The probability that the age of A lies within AD 100–105 while A > B equals 0.05 * 0.6 = 0.03 or 3 per cent.

By recalculating the PD of A using the corresponding values of the cumulative curve of B, a modified PD is produced that takes into account that A > B. Since the normalized values in the unmodified distribution have been multiplied with values less than 1, the modified distribution has to be re-normalized. Returning to the two unmodified distributions, the distribution of B could be modified in the same way using the same condition A > B. The same process could not be repeated using the modified distributions and the same condition, since they are no longer independent of the condition A > B. However, stratigraphical relationships to other samples could be used to further modify the probability distributions.

The effect of this adjustment varies with the relative age of the two dates. If the calibrated distributions of A and B are not overlapping with A being older than B, the adjustment will have no effect as the cumulative values for B and A are 1, for all values of A and B. However, with increased overlapping, the changes become more marked.

When using data that have been modified by stratigraphical information, it is important to be aware of the fundamental assumption that the relative true age of all samples is the same as their relative stratigraphical positions.

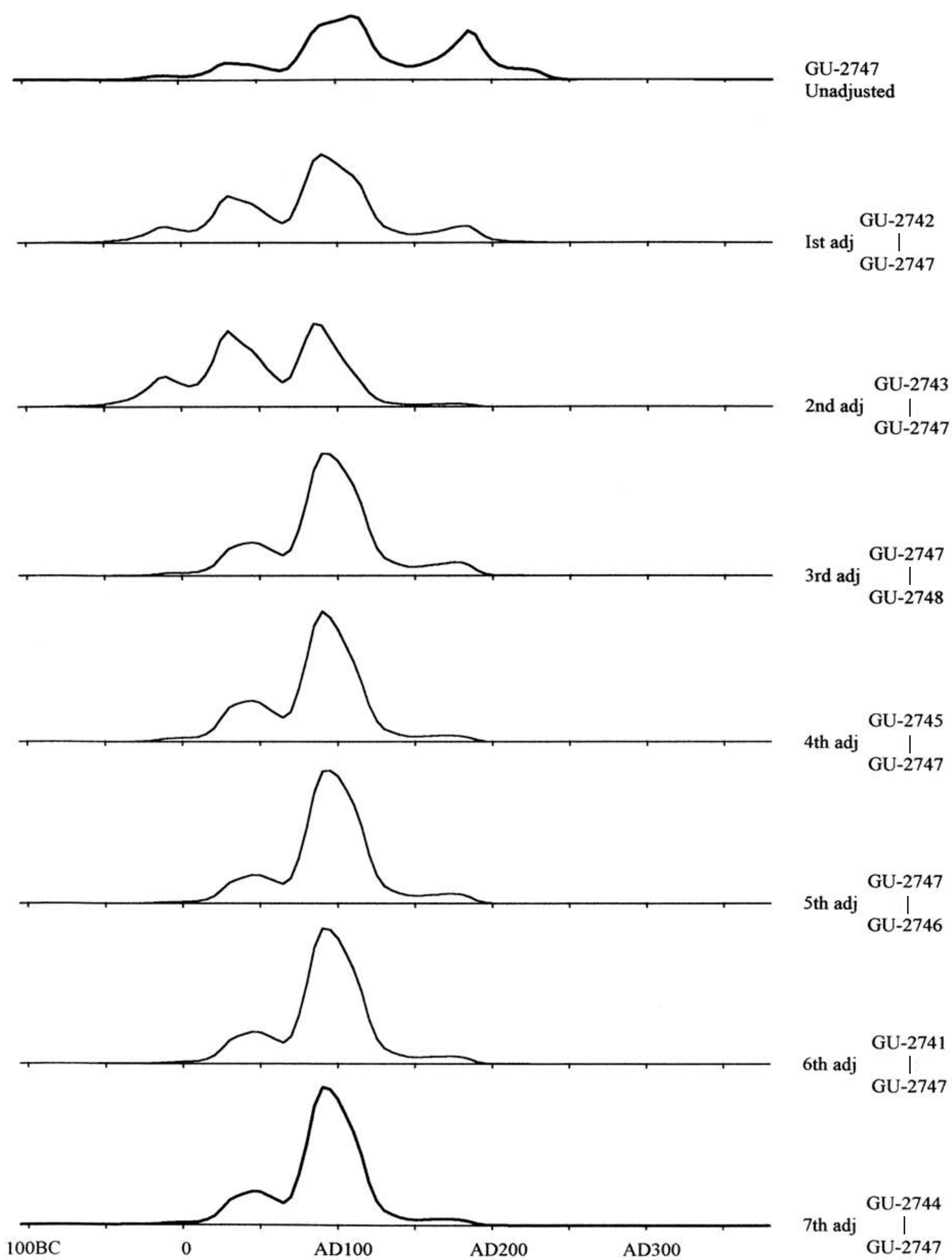


ILLUSTRATION 6.3
Cumulative effect on probability distribution by stratigraphical adjustments.

TABLE 6.4
Cnip calibrated radiocarbon dates adjusted for stratigraphy

DATE	SCR RANGE	PROB	LCR RANGE	PROB	PHASE
ADJ2741	AD 230–AD 490	68.39	AD 210–AD 660	95.68	3
ADJ2744	AD 200–AD 330	68.60	AD 155–AD 425	95.89	3
ADJ2745	AD 170–AD 245	69.33	AD 120–AD 330	95.91	3
ADJ2743	AD 165–AD 210	68.98	AD 105–AD 220	96.24	3
ADJ2742	AD 115–AD 190	73.59	AD 95 –AD 200	96.41	3
ADJ2747	AD 75 –AD 125	70.41	AD 20 –AD 155	95.74	2
ADJ2751	AD 70 –AD 135	68.79	AD 20 –AD 165	95.60	2
ADJ2752	AD 30 –AD 105	71.95	BC 10 –AD 125	95.53	2
ADJ2746	BC 85 –AD 50	69.73	BC 180–AD 100	95.66	2
ADJ2748	AD 15 –AD 100	69.77	BC 30 –AD 115	95.58	2
ADJ2749	BC 40 –AD 55	68.96	BC 80 –AD 105	95.69	2

The cumulative effect of the stratigraphical adjustments is demonstrated in Illus 6.3, where stratigraphical links to seven other dates improves the precision of date GU-2747. The first and second correction are based on under-relationships which pushes the distribution towards the older range, while the third correction based on an over-relationship narrows down the distribution towards the younger range. The last four corrections are less significant due to smaller overlaps.

The modified PDs of the 11 stratigraphically linked dates from Phases 2 and 3 are shown in Illus 6.4. The stratigraphical link to GU-2754 from Phase 1 had very little effect on the other dates due to lack of overlap between the distributions and was not included in the adjustments. The dotted line represents the unmodified distribution, while the dark segments represent the short continuous ranges (SCR). Table 6.4 shows the ranges of the SCR and LCR for the modified PDs. A summary of the adjusted PD curves, at 100 years resolution, is shown in Table 6.5.

The adjusted dates indicate that the Phase 2 dates largely fall within the first century AD. The Phase 3 dates lie mainly within the period from the beginning of the second to the middle of the third century AD.

6.2.2.3 The duration of Phases 2 and 3

Based on the tabulated data of the calibrated distributions, it is possible to calculate the probability distribution of the age difference between two dates. The age difference between two dates is calculated using joint probability.

If I) The probability of date A lying between AD 100 and AD 105 is 0.05

and II) The probability of date B lying between AD 200 and 205 is 0.10,

the probability of date A lying within AD 100-105 with B at the same time 100 years younger than A, is 0.05 * 0.10 = 0.005.

By adding all joint probabilities for A and B to fall within ranges separated by +100 years, the probability of B being 100 years younger than A is calculated. By doing this for all possible differences between A and B, a probability distribution of the age difference between the two dates is achieved. Adding up the probabilities over the entire distribution range creates a cumulative curve. This curve makes it easy to read off the probabilities for various differences.

Since the difference evaluations have to be based on two independent PDs the unadjusted PD of the radiocarbon dates were used in the calculations.

In order to estimate the duration of Phase 2, the difference between two dates from Context 204 and one from 265, as well as the difference between one date dates from Context 223 and two from 266 were calculated. In the evaluation of the duration of the phase, an average of the four difference distributions from these dates was used (Ill 6.5 and Table 6.6). The table shows for example that there is a 62.7 per cent probability that the duration is less than 100 years (37.3 per cent probable that it is more than 100 years).

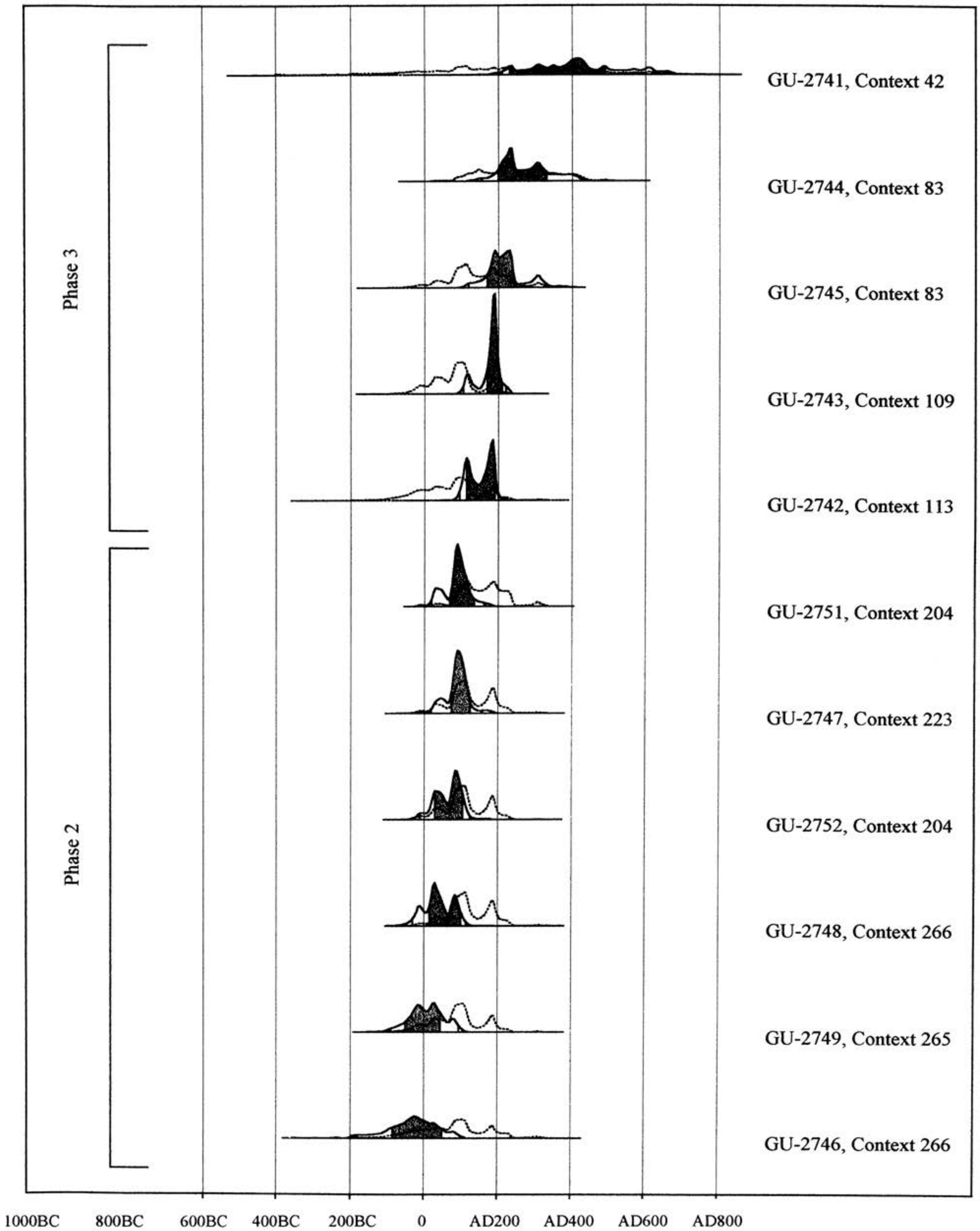


ILLUSTRATION 6.4
Probability distribution of the radiocarbon dates from Phases 2 and 3 adjusted for stratigraphy.

TABLE 6.5
Stratigraphically adjusted probabilities of dates to fall within centuries.

	GU-2746 adjusted			GU-2748 adjusted			GU-2749 adjusted			GU-2747 adjusted			GU-2751 adjusted		
	Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
AD 900–1000															
AD 800– 900															
AD 700– 800															
AD 600– 700															
AD 500– 600															
AD 400– 500															
AD 300– 400															
AD 200– 300	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0
AD 100– 200	1.1	1.1	98.9	6.3	6.3	93.7	1.7	1.7	98.3	40.2	40.2	59.8	37.8	37.8	62.2
AD 0– 100	34.1	35.2	64.8	76.5	82.8	17.2	56.6	58.3	41.7	59.4	99.6	0.4	61.2	99.0	1.0
100– 0 BC	50.5	85.7	14.3	17.2	100.0	0.0	40.5	98.8	1.2	0.4	100.0	0.0	1.0	100.0	0.0
200– 100 BC	12.8	98.5	1.5				1.2	100.0	0.0						
300– 200 BC	1.0	99.5	0.5												
400– 300 BC	0.5	100.0	0.0												

	GU-2752 adjusted			GU-2742 adjusted			GU-2743 adjusted			GU-2745 adjusted			GU-2744 adjusted			GU-2741 adjusted		
	Bin	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**	**Bin**	**Later**	**Before**
AD 900–1000																		
AD 800– 900																0.0	0.0	100.0
AD 700– 800																0.5	0.5	99.5
AD 600– 700													0.0	0.0	100.0	9.7	10.3	89.7
AD 500– 600										0.0	0.0	100.0	0.1	0.1	99.9	14.0	24.2	75.8
AD 400– 500										0.1	0.1	99.9	5.8	5.9	94.1	30.9	55.1	44.9
AD 300– 400				0.0	0.0	100.0	0.0	0.0	100.0	11.2	11.3	88.7	30.9	36.9	63.1	27.5	82.6	17.4
AD 200– 300	0.0	0.0	100.0	2.2	2.2	97.8	14.1	14.2	85.8	52.5	63.8	36.2	53.9	90.7	9.3	16.1	98.7	1.3
AD 100– 200	18.2	18.2	81.8	95.0	97.2	2.8	85.3	99.5	0.5	36.1	99.9	0.1	9.3	100.0	0.0	1.3	100.0	0.0
AD 0– 100	77.5	95.7	4.3	2.8	100.0	0.0	0.5	100.0	0.0	0.1	100.0	0.0						
100– 0 BC	4.3	100.0	0.0															

To estimate the duration of Phase 3, the differences between the date from the lower Context 113 and the two dates from Context 083 were used. The date from ontext 042 above 083 which also belongs to Phase 3 was very imprecise and was not used. However, the central value of the average of the two dates used was very close to the date from Context 042. By not selecting the date from the upper context of Phase 3, the evaluation of the duration of Phase 3 would be an underestimate. As for Phase 2, the average of the difference distributions was used to estimate the duration of Phase 3 (Ill 6.6 and Table 6.7). The table shows, for example, that there is a 67.5 per cent probability that the duration is less than 200 years (32.5 per cent probable that it is more than 200 years).

6.3 INTERPRETING THE CHRONOLOGICAL EVIDENCE

Ian Armit

The calibration and statistical analysis of the radiocarbon dates provides an unusually tight chronological definition for Phases 2 and 3, but does little to resolve the problems of dating Phase 1.

6.3.1 DATING PHASES 2 AND 3

The seven dates from Phase 2 derive from three different parts of the settlement. GU-2746–8 all relate to samples taken from the secondary occupation of Structure 4 (Contexts 223 and 266, Block 8), in the middle part of Phase 2. GU-2751–2 both derive from an extensive occupation deposit in the later part of the Wheelhouse 1 sequence (Context 204, Block 5b, see Section 2.4.1.1), while GU-2749 derives from an earlier deposit within the same structure (Context 265, Block 5a). The remaining date, AA–29767 derives from the wooden handle of a spade-shoe dumped in the uppermost infill layers of the entrance to Wheelhouse 2, which collectively span Phase 1 and Phase 2.

All five of the Phase 3 samples came from floor deposits of Structure 8 (Block 1). GU-2741 is stratigraphically latest, deriving from the final re-use of the structure, probably following de-roofing. The remainder range stratigraphically from the primary occupation of Structure 8 (GU-2742, Context 113), through a substantial build-up of floor deposits to GU-2744–5 (Context 083) (see Section 2.5.1.2).

The consistency of the dates from Phases 2 and 3 strongly supports the initial hypothesis that the mammal bone samples were deposited in fresh condition as cooking or butchery waste as the various occupation deposits formed. The integrity of these samples, both in terms of potential marine reservoir distortion, and potential for contamination through the mixture of fresh and 'old' bone, is confirmed by the date obtained from the wooden handle of the spade-shoe (AA–29767), which slots perfectly into the Phase 2 sequence. The same cannot be said, as we shall see below (Section 6.3.2), for the samples derived from non-floor deposits in Phase 1.

As Magnar Dalland has indicated, the adjusted radiocarbon dates indicate that Phase 2 falls principally within the first century AD, and has a 62.7 per cent probability of having lasted for 100 years or less. The succeeding Phase 3 lies mainly between the early second century AD and the mid-third century, and has a 60.2 per cent probability of having lasted for 150 years or less. From the preceding stratigraphic description and analysis it is clear that there was no break between Phases 2 and 3 and that their durations are thus directly sequential. The stratigraphic evidence

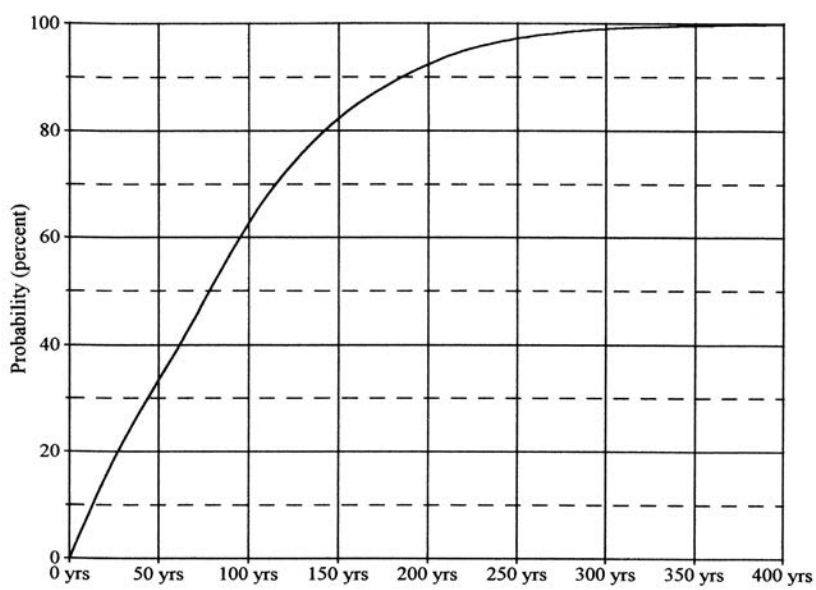


ILLUSTRATION 6.5
Cumulative probability distribution for the duration of Phase 2.

TABLE 6.6
Duration of Phase 2.

Duration (years)	**Probability (%) less than**	**more than**
450	100.0	0.0
300	99.0	1.0
250	97.2	2.8
225	95.4	4.6
200	92.4	7.6
175	88.1	11.9
150	82.3	17.7
125	74.0	26.0
100	62.7	37.3
75	48.1	51.9
50	33.5	66.5
25	18.7	81.3
0	0.0	100.0

would, in general, favour a shorter, rather than longer, interpretation of the potential period of occupation, and adds weight to the statistically based suggestion of time-spans of no more than around 100 and 150 years respectively. If we were to suggest, therefore, that Phase 2 ran from around AD 1–AD 100, and the main occupation of Structure 8 in Phase 3 from around AD 100–AD 250, it seems unlikely that we would be too far wrong.

It is statistically possible, however, that sporadic re-use of Structure 8 in Phase 3 persisted as late as around AD 400 (GU-2741) but even this latest dated sample could easily lie within the AD 100–250 period suggested for Phase 3. It is worth noting that the context from which this date derives (042, Block 1) represents the final, apparently small-scale, re-use of Structure 8, possibly soon after it lost its roof and effectively provides a *terminus ante quem* for the disuse of the settlement as a domestic focus (see Section 2.5.1.2). It is also worth noting that the three copper alloy objects (from Phase 1 and late Phase 2) show no sign of influence from Roman metal, while one pin mould (also from late Phase 2) does have signs of such influence (see Sections 3.9 and 3.12). This would be consistent with a date for the later Phase 2 deposits in the second half of the first century AD, and so is fully supportive of the radiocarbon dates.

6.3.2 DATING PHASE 1

The stratigraphically earliest date from Phase 1 comes from cattle vertebrae sealed behind the wall of Wheelhouse 2 (Context 116, Block 16) which has been interpreted as a deliberate foundation deposit. This deposit also included a great auk head and a complete cordoned jar. Its context, therefore, was arguably the most secure of all the dates from the site and was thought to represent the most secure sample for wheelhouse construction to have been processed from any excavated site. Problems, however, lay ahead.

The sample dates to the period from 615–255 cal BC at 1 sigma, and from 840–170 BC at 2 sigma (Table 6.2). At the time of submission it was believed that this sample should date the construction of Wheelhouse 2 fairly precisely, as it was assumed that such a foundation deposit would have been fresh at the time of deposition, perhaps from an animal specially sacrificed, or from a foundation feast. However, there is a generally greater awareness now of the potential for the curation of special deposits, and it is entirely possible that these cattle vertebrae were not fresh at the time when they were placed in the wall. Nonetheless, the condition of the accompanying great auk head, with its beak still attached, from the same context, suggests that this at least was deposited as an intact head, and was thus presumably either fresh or in some way preserved.

Taken at face value, therefore, the date from this sample would suggest that the wheelhouse was built almost certainly before 170 BC, and probably before

TABLE 6.7
Duration of Phase 3.

Duration (years)	**Probability (%) less than**	**more than**
600	100.0	0.0
500	99.7	0.3
400	97.3	2.7
350	94.0	6.0
300	88.3	11.7
275	84.4	15.6
250	79.8	20.2
225	74.2	25.8
200	67.5	32.5
175	60.2	39.8
150	52.4	47.6
125	43.2	56.8
100	33.5	66.5
75	24.4	75.6
50	15.8	84.2
25	7.6	92.4
0	0.0	100.0

255 BC. This possibility should not be discounted out of hand. However, it is also possible, as we shall see below (this section), that this bone derived from an earlier source and may not be representative of the true construction date of the wheelhouse.

The remaining four Phase 1 samples derive from the infill of Wheelhouse 2 (Contexts 131 and 276, Block 15, see Section 2.3.2.2). These contexts were sealed by the construction of Structure 3 and are thus stratigraphically part of Phase 1. One sample from each of these two contexts (GU-2755 and GU-2757) appear to date to the first century BC or early first century AD (Table 6.2), given the restrictions on their SCR and LCR ranges occasioned by the dating of the later Phase 2 deposits to the first century AD. The other two samples (GU-2756 and GU-2758), however, produced much earlier dates, with much wider ranges, dating respectively at LCR to 1050–375 BC and 810–30 BC. Although not conflicting with the dates for Phase 2, in that all could lie comfortably before the first century AD, this range of dates for Phase 1 suggest an improbably early origin for the wheelhouse.

One hypothesis might explain the early dates. If we accept that curated bone from an off-site source was deliberately introduced to the settlement, perhaps to provide foundation deposits, and/or as components of wall-packing material, this material could have found its way into the infill of Wheelhouse 2 at the time when the upper walls of the building were demolished, early in Phase 1. Some additional circumstantial evidence for the importation of off-site material comes from the unusual artefactual composition of the wall-packing material in Wheelhouse 1, which included concentrations of metal-working debris otherwise unrepresented on the site. Thus the later Phase 1 dates could derive from contemporary, non-contaminated sources, while the earlier dates could have been contaminated by inclusion of one or more bones which were old at the time of deposition.

The Phase 1 dating problem clearly highlights the danger both of dating samples from midden-type deposits, where material can derive from multiple sources, and of 'multiple-entity' dating, where mixtures of old and fresh material can produce misleading 'average' dates (Ashmore 1999).

So what, if anything, can we say about the dating of Phase 1? We might suggest that the later Phase 1 dates represent discard from Wheelhouse 1 which accumulated during the first century BC, with construction of the wheelhouses being represented by the foundation deposit date (GU-2754), some time in the third century BC or even earlier (see Section 2.3.2.1). The third century BC is clearly a surprisingly early date for wheelhouse construction, and we will probably have to await the results of future excavations before we can judge how reliable this Cnip construction date really is. All that can be said with confidence is that Phase 1 occupation of the wheelhouse dated in part to the first century BC, and may have begun significantly earlier.

6.3.3 CONCLUSION

In conclusion we can propose the following as a broad dating framework for the site.

Phase 1	? BC–AD 1
Phase 2	AD 1–AD 100
Phase 3	AD 100–AD 250

6.4 CNIP AND THE CHRONOLOGY OF WHEELHOUSES

Ian Armit

Until quite recently Hebridean wheelhouses tended to be dated to the middle of the first millennium AD.

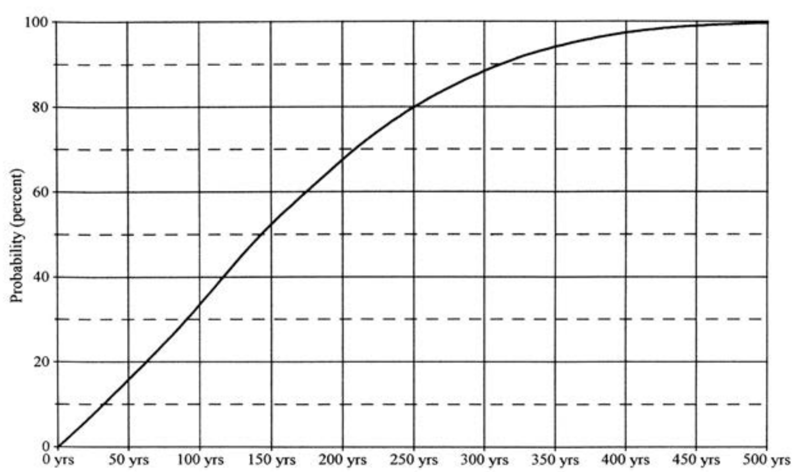


ILLUSTRATION 6.6
Cumulative probability distribution for the duration of Phase 3.

Especially influential was Stevenson's study of the metalwork, particularly pins, from several of these sites, to which he ascribed a broadly mid-first millennium AD date (Stevenson 1955). Many wheelhouse sites, however, were occupied long after the wheelhouses themselves had ceased to be used in their primary form. Much of the artefactual material available to Stevenson, therefore, derived from potentially late occupation within what were often multi-phase and poorly understood sites. This material has little direct bearing on the dating of wheelhouses as a structural type (cf Armit 1992, 69).

Prior to the excavations at Cnip, radiocarbon dates from wheelhouses and related structures were restricted to those from Sollas (Campbell 1991) and the Udal (Crawford nd), both in North Uist, and the radially partitioned structure at Hornish Point, South Uist (Barber 2003). The radiocarbon dates from Structure 5 at Hornish Point suggest that it was built in the fourth or third centuries BC (Barber et al 1989), although the dates are from marine shell and thus pose some problems of interpretation. Two dates from immediately post-wheelhouse occupation at the Udal (Crawford nd, 9) apparently suggest a first century AD date for 'squatter' activity subsequent to the occupation of the wheelhouse.

More problematic, however, are the series of radiocarbon dates from the wheelhouse at Sollas, which range primarily from the late first to early third centuries AD, overlapping with the latter part of Phase 2 and Phase 3 at Cnip. Although it has been suggested that these radiocarbon dates relate to the construction of the Sollas wheelhouse (Campbell 1991), re-examination of the contexts from which the dates derive, particularly in the light of the evidence from Cnip, suggests that they may instead relate to secondary occupation.

The radiocarbon samples from Sollas were obtained from a series of pits cut into the floor of the wheelhouse. In his publication of R J C Atkinson's 1950s excavations, Campbell identified a stratigraphic relationship between two groups of pits; an earlier group comprising a series of large pits from the cells and periphery of the structure, and a later group of more disordered, smaller pits spread across a larger area (Campbell 1991). The radiocarbon dates were obtained exclusively from the later series of pits, which commonly cut through the upper fills of the early series, suggesting some time-depth to the deposits. In the publication of the excavations it was suggested that all of these pits related to one major episode of pit-digging prior to the occupation of the wheelhouse; thus it seemed permissible to relate the radiocarbon dates from the later series of pits to the primary occupation of the building. Yet, assuming that the floor deposits at Sollas, as at Cnip, may have been periodically cleaned down to the primary sand floor, either or both series of pits could have been excavated, and deposits placed within them, at any time during the primary occupation of the wheelhouse. Such cleaning and scouring of deposits is clearly demonstrated at Cnip (especially in Structure 4) and may be expected to be even more marked in the context of a structure like Sollas, which is the largest and most architecturally imposing of all known Hebridean wheelhouses.

None of the radiocarbon dates from Sollas, therefore, need relate either to the construction of the wheelhouse, or to its earliest phase of occupation. Although the wheelhouse at Sollas does indeed appear to have been occupied from the late first to early third centuries AD, overlapping with Phases 2 and 3 at Cnip, it may have been built rather earlier.

Aside from the slim body of radiocarbon evidence, some information on wheelhouse chronology can be gleaned from the evidence of artefactual material, particularly querns, found on various wheelhouse excavations. Although rotary querns are commonly associated with wheelhouses in the Western Isles, the earlier saddle quern form has also been found at three sites. At Foshigarry, North Uist, a saddle quern was recovered from Wheelhouse C, which was probably the earliest wheelhouse on the site (Armit 1992), perhaps suggesting a date for the occupation of this structure prior to *c* 200 BC (Armit 1991). At the nearby site of Bac Mhic Connain a saddle quern was recovered the upper fill of a wheelhouse, but its context is not particularly helpful: it could simply have formed part of the upper walling of the structure which had collapsed at a late stage in the building's structural history (Beveridge 1931). At A' Cheardach Mhor, South Uist (Young & Richardson 1960), a similar situation was recorded, with a broken saddle quern built into one of the wheelhouse piers. The wheelhouse at Kilpheder, South Uist, however, had broken rotary quernstones incorporated in its walling (Armit 1992). This evidence, combined with the saddle quern from Foshigarry C, would seem to suggest that wheelhouses were constructed both before and after *c* 200 BC, the likely period of transition from saddle to rotary querns.

Overall then, the evidence so far available suggests that wheelhouses were being constructed and occupied in the later centuries BC, possibly prior to 200 BC (based primarily on the rather tenuous quern evidence from Foshigarry) and with clear antecedents (represented by Structure 5 at Hornish Point) perhaps as early as *c* 400–500 BC. It is clear, however, that we still lack evidence for the inception of the Hebridean wheelhouse building tradition. The demise of Hebridean wheelhouses, by contrast, is much better dated. Wheelhouse 1 at Cnip was clearly losing its monumental stature during the first century AD. The wheelhouse at Sollas most probably went out of use during the second century AD. Secondary structures also appear to have been built over a wheelhouse at the Udal in the first century AD (Crawford nd, 9), while Kilpheder, South Uist, on the basis of the Romano-British brooch from the final period of occupation, may well have been abandoned around the end of the second century AD (Lethbridge 1952). There appears to be no evidence as yet for the construction of any Hebridean wheelhouse after the first century AD.

Chapter 7

Living in Iron Age Lewis

7.1 INTRODUCTION

The main purpose of this final chapter is to step back from the detailed analyses of individual bodies of material which have dominated earlier sections of this report and to examine what can be learnt overall about the Iron Age people of Cnip. I will also discuss some of the ways in which the evidence from the Cnip excavations can broaden our understanding of Iron Age society more generally. Several of the main themes of the project have been discussed in detail already, notably the importance of Cnip for our understanding of both wheelhouse architecture (Chapter 5) and chronology (Chapter 6). These discussions will not be repeated, but a number of other themes, important to recent debates in Iron Age archaeology, such as domestic ritual and cosmology, will be addressed.

I will begin with a review of the sequence of activity at Cnip, and a reflection on the parallels between the life-cycle of the Cnip settlement complex and those of other Hebridean wheelhouses. This will be followed by a summary of the ways in which the Iron Age people of Cnip made their living from the resources available to them: how they obtained food, fuel and the raw materials for tools; the ways in which their lives may have been structured year by year; and the degree to which their activities were bound or otherwise by the constraints of the Hebridean environment. Next comes a consideration of the ways in which the archaeological deposits can provide insights into the daily lives and world views of the inhabitants. The nature of Iron Age cosmologies and the ritualization of domestic life have been major preoccupations of archaeologists in recent years and the evidence from Cnip can provide some insights into these and other issues. Finally, I will examine the ways in which the settlement at Cnip may reflect, at a local scale, wider processes of social and economic change around the end of the first millennium BC.

7.2 WHAT HAPPENED AT CNIP: A SPECULATIVE SUMMARY

Discussion of the site sequence so far has been detailed and peppered with qualifications and the evaluation of alternative possibilities. In the midst of the detail it is easy to lose sight of the bigger picture. What follows is a brief narrative, shorn of most of the earlier circumspection, which seeks to describe the history of the Cnip wheelhouse complex insofar as it can be reconstructed from the detailed arguments which have gone before.

Some time in the last few centuries BC someone decided to build a new house on the machair at Cnip, a little way back from the sea, behind the coastal dunes. This patch of land lay within a landscape farmed for many centuries, if not millennia. The people who intended to occupy the wheelhouse were probably local, most likely an off-shoot from another settlement nearby. The land on which their sights were set was not simply up for grabs. Only a few hundred metres away was the Loch na Beirgh broch tower, still an imposing building and most likely still the home of prosperous and influential people. The building of the Cnip wheelhouse can only have been planned and conducted within the context of the land-holding patterns long established in the Bhaltos peninsula. It is probably not too fanciful to suggest that the project may have been overseen by the incumbents at Beirgh. The intended occupants of the new house may even have grown up in the broch tower, but perhaps were not in line to inherit it; perhaps they were the family of a second or third son, allocated a block of land within the wider holding. Maybe, given that the plan was for two houses, they were the families of two siblings.

The plan then was to build two conjoined wheelhouses. Wheelhouses were the standard 'new-build' house form of the day, and one requiring a significant amount of labour and skill. What made this particular venture unusual was the intention to build the two houses together, as most wheelhouses were single dwellings. Over time, presumably during slack periods of the farming year, resources were gathered for the project; large quantities of stone and smaller quantities of timber and thatch. The intended occupants perhaps carried out or oversaw most of this preliminary work themselves, along with neighbouring families, but skilled labour was required for the actual process of building and this may have meant arranging for outside help. The process of building was accompanied by ritual offerings, and the residue of these activities, in the form of animal remains and other objects, were placed behind the rising walls of the structures. Midden material was brought from elsewhere to pack behind the walls of the building. This contained much metal-working debris and may have been retrieved from an abandoned settlement or an activity area nearby, perhaps the former home of the intended occupants.

At some point, during an advanced stage of construction, plans changed and the second wheelhouse was left unfinished. Perhaps it was intended that it should be completed later, but for whatever reason, perhaps the death or change in circumstance of one of the principal occupants, it never was. Instead the single wheelhouse was completed and its occupants moved in. The house was small but skilfully made, and would have been an impressive sight once inside, although from outside there would have been little more to see than a thatched roof poking above a sand-hill surrounded by midden grazed by a few pigs. For a time the house was carefully maintained and its occupants most likely remained a single family. It may have passed from father to son or mother to daughter, and there would have been a steady inflow and outflow of people as births, deaths and marriages altered the make-up of the household. But the house and the activities of the inhabitants changed little: food was prepared, cooked and served in fine decorated pottery vessels made within the community; people wove and spun, worked antler and whale bone around the fire; talked, laughed, sung, made music, played board-games, entertained guests, and everything else we might expect from a small, but fairly prosperous farming community. Nonetheless, we should not think of these people as simple, practical farming folk, familiar from our recent rural past. These were people with deep-rooted beliefs and attitudes to the world around them entirely alien to those of our own society or those of our recent ancestors; as witnessed, for example, by the presence of human skulls retained, and perhaps displayed, within the house.

Over the course of the first century AD changes began to affect the fabric of the house. The roof was becoming unstable and had to be propped up in places, while the walls and piers needed periodic buttressing and other forms of support. The form and symmetry of the wheelhouse became obscured by these changes and by the re-modelling now being carried out. The old unfinished wheelhouse was filled in and replaced by a small cell, perhaps for storage. Before it was built, the occupants (or perhaps someone more appropriate to such a solemn purpose) scooped a hollow in the sand and placed in it part of a human skull accompanied by two fragments of a pottery and a piece of animal skull. Such ceremonies were not uncommon (although the incorporation of human remains was unusual) and punctuated the lives of the household.

As generations passed the form of the house changed. A second cell was built with carefully graded stone slabs forming its lower wall. Probably no specialist help was needed for this or any other re-building works. Nothing requiring the craft and precision of the original wheelhouse was built subsequently and the skills of the inhabitants and their neighbours most probably sufficed. This second cell had its own hearth and co-existed with the main wheelhouse interior. Perhaps the household had split into two family groups, possibly once again the families of two siblings, or it may be that social norms were changing and certain groups were being segregated on the basis of age or gender. But within a generation or two this second cell had been dismantled and filled in with midden.

By around AD 100 the wheelhouse was becoming dangerously unstable. Indeed, it was no longer really possible to discern the original conception of the building from inside, such was the extent of its decay. Perhaps such buildings were no longer relevant or fashionable, or perhaps the inhabitants were by now in no position to command the resources and skilled labour that was available a few generations earlier. Whatever the reason, the new building that they chose to construct within the ruined and collapsing interior of the wheelhouse was of a rather different and simpler form: a rectangular building with a pitched roof and timber gable. It retained echoes of the wheelhouse: two of the old cells were preserved and looking up from the floor beneath them the skill of the old stonemasons could clearly be seen. The entrance passage still followed the old wheelhouse entrance line. These things were not accidental. This house had been in continuous occupation and its current occupants were most likely the descendants, perhaps between four and eight generations removed, of the first inhabitants. They would have known their predecessors names, recalled stories of their exploits, and been able to recount the events that had occurred in and around the wheelhouse. They still lived in the shadow of Loch na Beirgh which remained a focus for power in the locality no matter how battered and decayed the old broch tower might have become.

For perhaps another three or four generations this new building remained in occupation until some time during the third century AD it was finally abandoned. Perhaps the last inhabitants simply died without heirs, or perhaps other factors, such as coastal movement and increasing soil erosion, forced a change of location. There may have been a few episodes of casual re-use when people out working on the machair sheltered within the walls and made small fires from seaweed and driftwood picked up from the beach, but soon the building filled with windblown sand, disappearing from view and, eventually, from memory.

7.3 CNIP AND THE HEBRIDEAN WHEELHOUSE TRADITION

The initial design of two conjoined wheelhouses at Cnip has already been remarked upon as being highly unusual. Of the other Hebridean wheelhouses excavated in the post-war period only that at A' Cheardach Bheag, in South Uist, has evidence for two conjoined wheelhouses and there the relationship between the two is rather different (Fairhurst 1971). At A' Cheardach Bheag, the main wheelhouse is clearly the dominant structure (Ill 7.1d), while the conjoined wheelhouse is much smaller and less well built. Although the smaller wheelhouse at A' Cheardach Bheag is stratigraphically secondary to the main wheelhouse, and is thus interpreted by Fairhurst as a secondary addition, it is quite possible that it is 'secondary' only in a constructional (rather than chronological) sense, as is more clearly the case for the unfinished wheelhouse at Cnip. Nonetheless, the relationship between the buildings suggests a rather different intention on the part of the builders. A similar situation applies to Cell A at Sollas, in North Uist (Campbell 1991, 133), which is secondary in constructional terms to the wheelhouse and of poorer masonry. Cell A at Sollas, however, lacks the internal piers which define the wheelhouse form (Ill 7.1c).

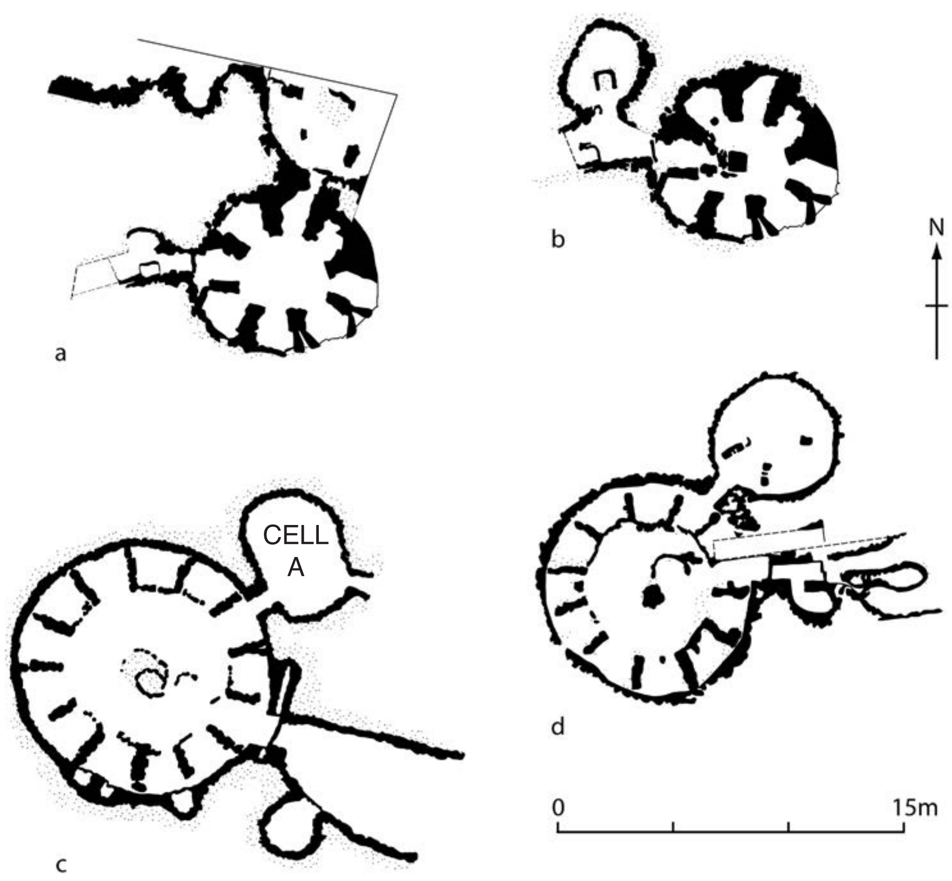


ILLUSTRATION 7.1
Simplified plans showing: (a) Cnip Phase 1; (b) Cnip Phase 2; (c) Sollas, North Uist; (d) A' Cheardach Bheag, South Uist.

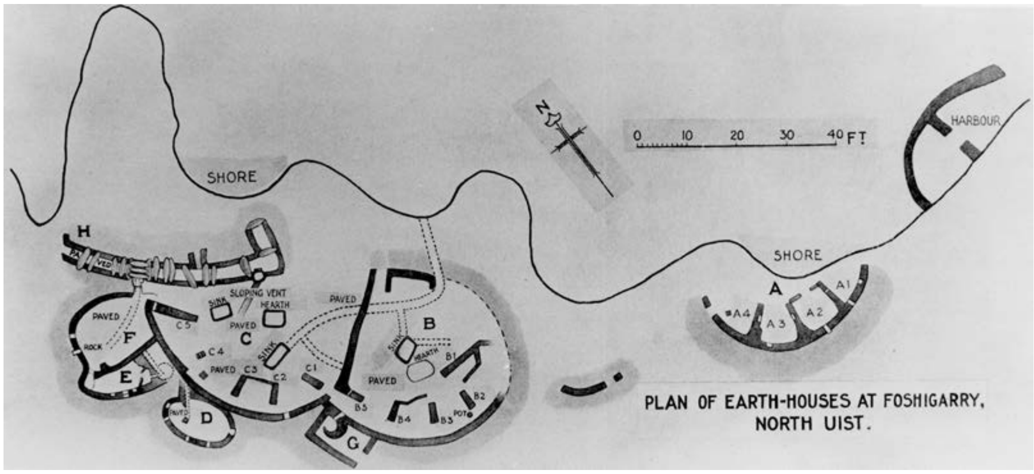


ILLUSTRATION 7.2
Foshigarry, North Uist (from Beveridge 1930, plate 2): the various excavated wheelhouses have been shown to be successive rather than contemporary.

Elsewhere there is little clear evidence for the co-existence of two or more wheelhouses on the same site, and most multiple wheelhouse sites (eg Foshigarry, in North Uist, Ill 7.2) can be shown to have developed through the periodic replacement of one wheelhouse by another, although the possibility of some chronological overlap can be hard to discount (Armit 1992, 54). The same may apply to the multiple wheelhouses at the Udal, North Uist (Crawford nd), although the relationship between the wheelhouses on that site cannot be properly evaluated in the absence of published detail.

The length and complexity of the entrance passages to both wheelhouses at Cnip is also mirrored by the passage at A' Cheardach Bheag in South Uist (Ill 7.1c). Here again Fairhurst (1971) argues that the entrance passage was a composite structure added to over time although the equally composite passage to Wheelhouse 2 at Cnip was seemingly built over a fairly short period before the wheelhouse itself was fully completed (which in this case, of course, it never was). The entrance passage to the Sollas wheelhouse was also apparently secondary and went through a number of rebuilds (Campbell 1991). The small cell in the

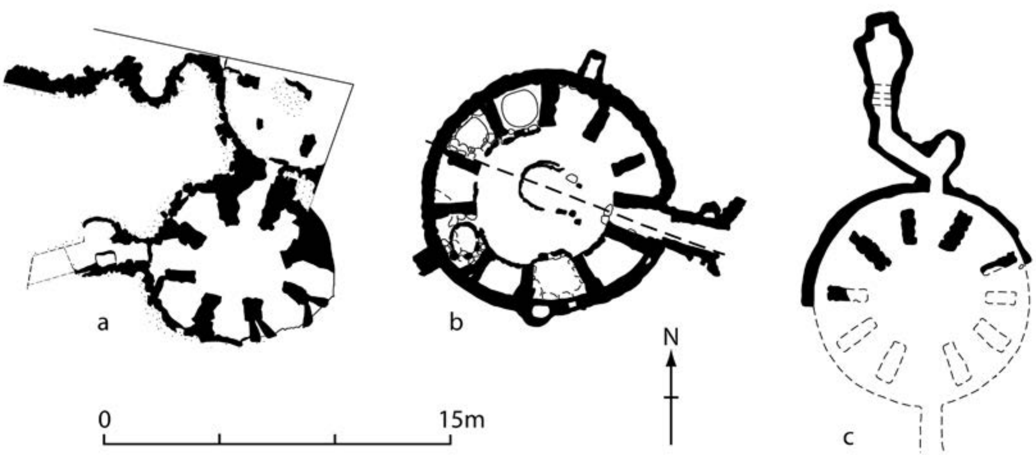


ILLUSTRATION 7.3
Simplified plans showing: (a) Cnip Phase 1; (b) Kilpheder, South Uist; (c) Usinish, South Uist.

wheelhouse passage at Sollas (ibid 1991, 135) seems closely similar to Structure 7 at Cnip, although the Sollas example has no clear stratigraphic relationship to the wheelhouse.

The life cycle of the Cnip wheelhouse complex finds some reflection in the corpus of excavated Hebridean wheelhouses, but there is considerable variability from site to site. In some cases Hebridean wheelhouses seem to have survived in more or less their original form until abandonment. The wheelhouse at Kilpheder in South Uist, for example, seems to have been largely unmodified when it was abandoned (Lethbridge 1952), suggesting either that it was exceptionally well-constructed or that its occupation was relatively short-lived (Ill 7.3b). The same appears to be the case for Sollas (Campbell 1991) although the possible removal of later structures by the antiquarian excavations of Erskine Beveridge raises some uncertainty.

One of the most striking characteristics of the settlement history at Cnip is the perseverance of the inhabitants with the wheelhouse structure long after it had become dangerously unstable, and when building afresh on another site would have seemed a far less risky alternative. Other Hebridean wheelhouses show a similar concern to maintain the integrity of these buildings. At Clettraval, in North Uist (Ill 7.4a), at least two of the wheelhouse piers had been strengthened prior to the re-modelling of the central hearth and re-roofing of the building (Scott 1948), suggesting that stresses had built up similar to those experienced by the inhabitants at Cnip. At Clettraval these problems seem to have led finally to the collapse of the building and later occupation was seemingly restricted to a small and poorly dated construction built in the former entrance to the wheelhouse (ibid). At Allasdale in Barra, two of the wheelhouse bays seem to have collapsed completely and a revetted retaining wall had to be put in place

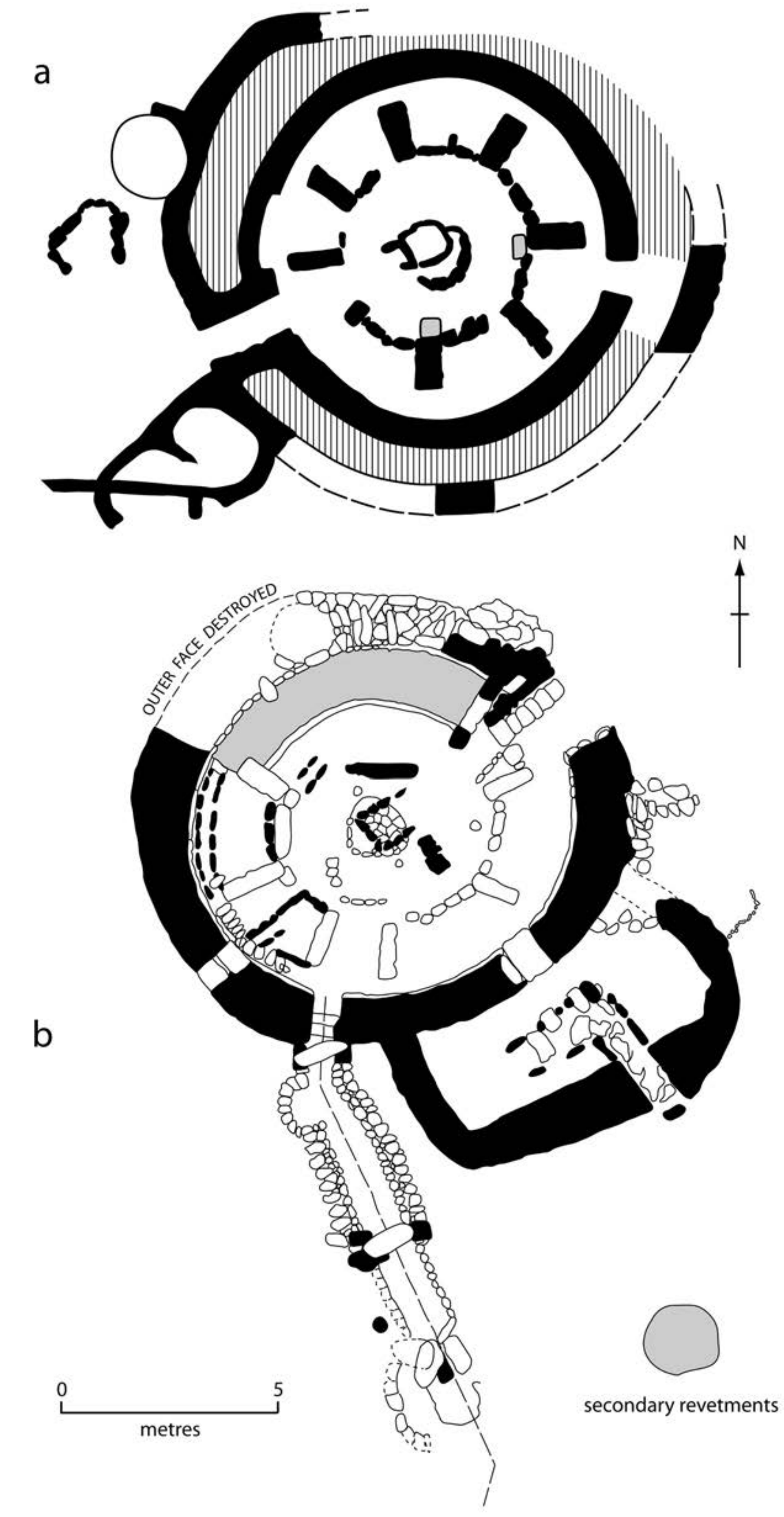


ILLUSTRATION 7.4
Wheelhouses with evidence for structural failure and repair highlighted: (a) Clettraval, North Uist (after Scott 1948); (b) Allasdale, Barra (after Young 1952).

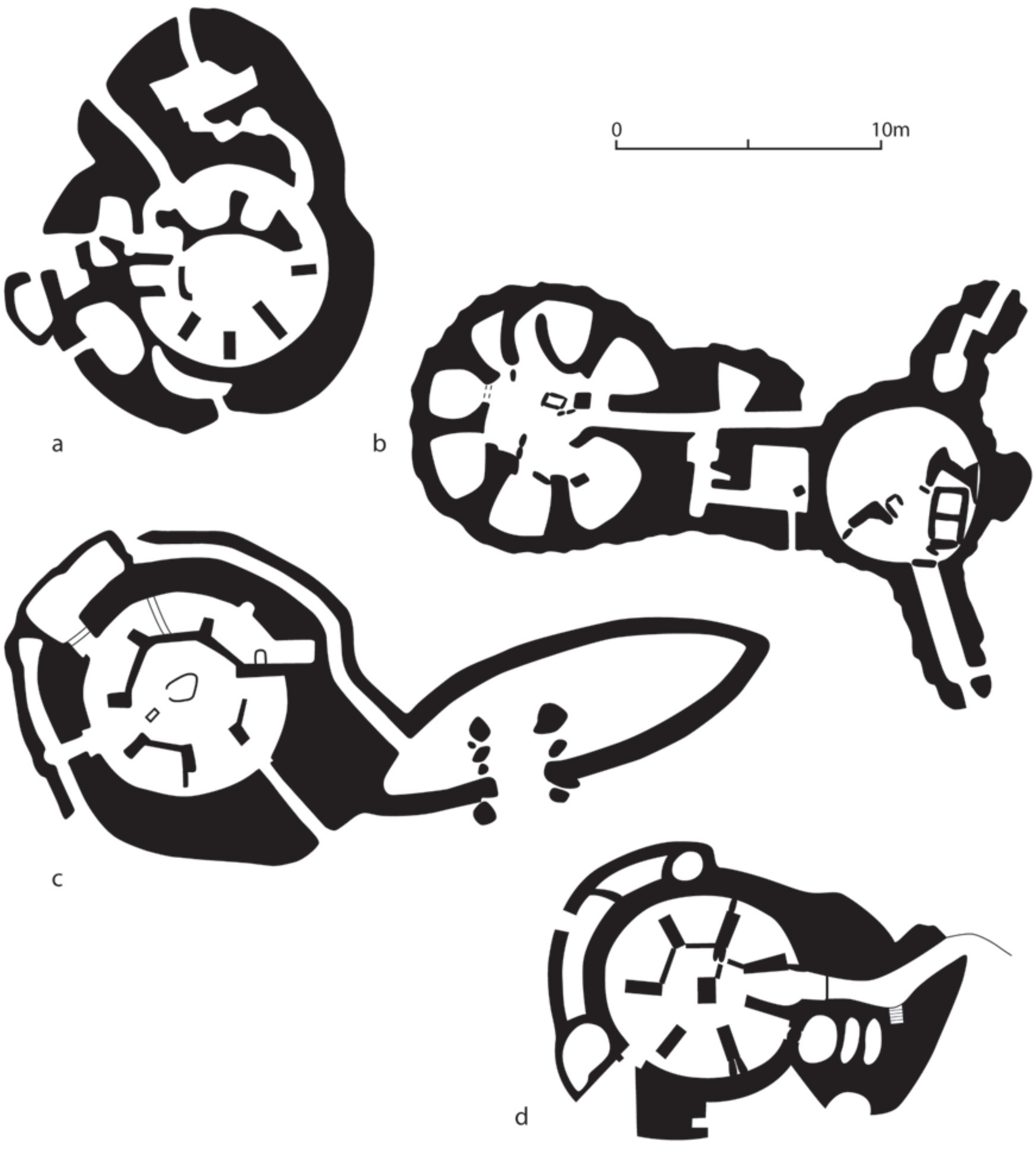


ILLUSTRATION 7.5
A selection of Erskine Beveridge's wheelhouse plans: (a) Eilean Maleit (from Beveridge 1911, 200a); (b) Bac Mhic Connain (from Beveridge 1931, Fig. 1); (c) Garry Iochdrach (from Beveridge 1931, Fig. 2); (d) Cnoc a Comhdhalach (Beveridge 1911, 208a), all in North Uist. Each apparently conflates the evidence of multiple periods of construction which went unrecognized at the time of excavation.

to stabilize the rubble, yet occupation apparently continued inside (Ill 7.4b). At several wheelhouses, notably Sollas (Campbell 1991, 128) and A' Cheardach Bheag (Fairhurst 1971, 77) most of the aisles between the piers and the outer wall had been blocked with poor quality masonry, again mirroring the situation at Cnip.

It is difficult in the available literature to find any obvious parallels for Structure 4 at Cnip, which seems to have operated as a secondary focus of quite careful design, with its own independent access leading off the wheelhouse entrance passage. Where post-wheelhouse structures occur on other wheelhouse sites, they tend to be fragmentary and perhaps ephemeral, as with the succession of structures which overlay the robbed-out wheelhouse of A' Cheardach Mhor, in South Uist (Young & Richardson 1960), which may have been associated with metal-working (perhaps suggesting that they were set apart from the settlement of the time for social or practical reasons). It should be remembered, however, that many excavations of wheelhouses were carried out early in the twentieth century and that later, less substantial buildings may well have been removed without full understanding of their character, to reveal the more immediately obvious wheelhouse plan beneath. This may well be the situation with a number of Erskine Beveridge's excavations in North Uist (Ill 7.2 and 7.5), for example Foshigarry (Beveridge 1930) and Bac Mhic Connain (Beveridge 1931), and is almost certainly the case at Eilean Maleit (Beveridge 1911; Armit 1998). Examination of the available plans does not suggest any close parallels for Structure 4 at Cnip. Although there are numerous possible parallels for the small pit-like structures represented by Structures 5 and 6 at Cnip, for example adjacent to Wheelhouse C at Foshigarry (Beveridge 1930 and see especially structure 'D' on Ill 7.2), these small structures have not been given any real attention in the older literature.

The reorganization of the settlement in Phase 2, which included the construction of Structure 4, has been interpreted as resulting from a desire to segregate either two groups within the household, or certain activities carried out within the settlement. It may be that a similar division is reflected by the secondary constructions of the smaller wheelhouse at A' Cheardach Bheag (Fairhurst 1971) and Cell A at Sollas (Campbell 1991), although in these cases the secondary cell is accessed through the wheelhouse rather than directly from the entrance passage. Although all three structures are quite different in design, they may represent local responses to a wider shift in social practice.

Anna Ritchie (2003) has recently included Structure 4 at Cnip in a small group of structures from the Northern and Western Isles which she identifies as possible 'oracle shrines'. These structures share the peculiarity of having hearths which nearly or actually block access to the interior, as was clearly the case in the primary (although not the secondary) occupation of Structure 4 at Cnip. Ritchie suggests that the use of such structures, which include House 5 at Buckquoy in Orkney, and buildings at Clickhimin and Old Scatness in Shetland, may have involved a gathering together of select individuals, prior to the lighting of the fire which would prohibit subsequent movement in or out of the building until the completion of the ritual (ibid, 6–7). Other Hebridean examples cited by Ritchie comprise secondary structures from Dun Bharabhat and Loch na Beirgh broch tower in the Bhaltos peninsula (ibid, 6) although these are perhaps less compelling than the northern examples. The ritual interpretation for at least some of these buildings is attractive, and would go some way to explaining the differences in depositional patterning between Structure 4 and the contemporary wheelhouse deposits at Cnip. Given the small numbers and fairly broad date range of these buildings, however, it would be unwise at present to place too much interpretive weight on the putative oracular function of the building.

The low-roofed, souterrain-like structure running out from one of the bays at Allasdale (Young 1952) is perhaps the closest parallel for Structure 3 at Cnip both in terms of its relationship to the main body of the wheelhouse and its difficulties of access, but its elongated form is quite different (Ill 7.6). The Allasdale 'souterrain' is closely similar in form to one recorded by Captain Thomas at Usinish, in South Uist (Thomas 1870), and similar structures are implied by the narrow passages leading off from Bay 5 at Kilpheder (Lethbridge 1952) and Bay 5 at Sollas (Campbell 1991, 129). The form and construction of Structure 3 at Cnip, however, are presently unique.

It is equally difficult to find a close parallel for the rectilinear Structure 8 at Cnip. Within the Western Isles, the two rectilinear buildings close to the wheelhouse at Allasdale seem superficially the most similar in form (Ill 7.6). One of these is a lean-to 'kiln-house' leading off from a northern bay of the wheelhouse (Young 1952) but its chronological relationship to that structure is far from clear and it may indeed be a relatively recent building. The same problem applies to the rectilinear 'barn' on the same site which may very well be medieval or later. Excavations at Tungadale, in Skye, revealed a substantial rectilinear building, partially terraced into a hillside, with an entrance in its short, east end (Miket 2002, 98–9). This appears to have been a domestic building with a formal central hearth and an attached souterrain (Ill 7.7). The parallels with Structure 8 at Cnip, however, extend little beyond its shared rectilinear form and the position of its entrance in one of the short walls; and the radiocarbon dating evidence for Tungadale seems to suggest an earlier date, perhaps around the third century BC (ibid).

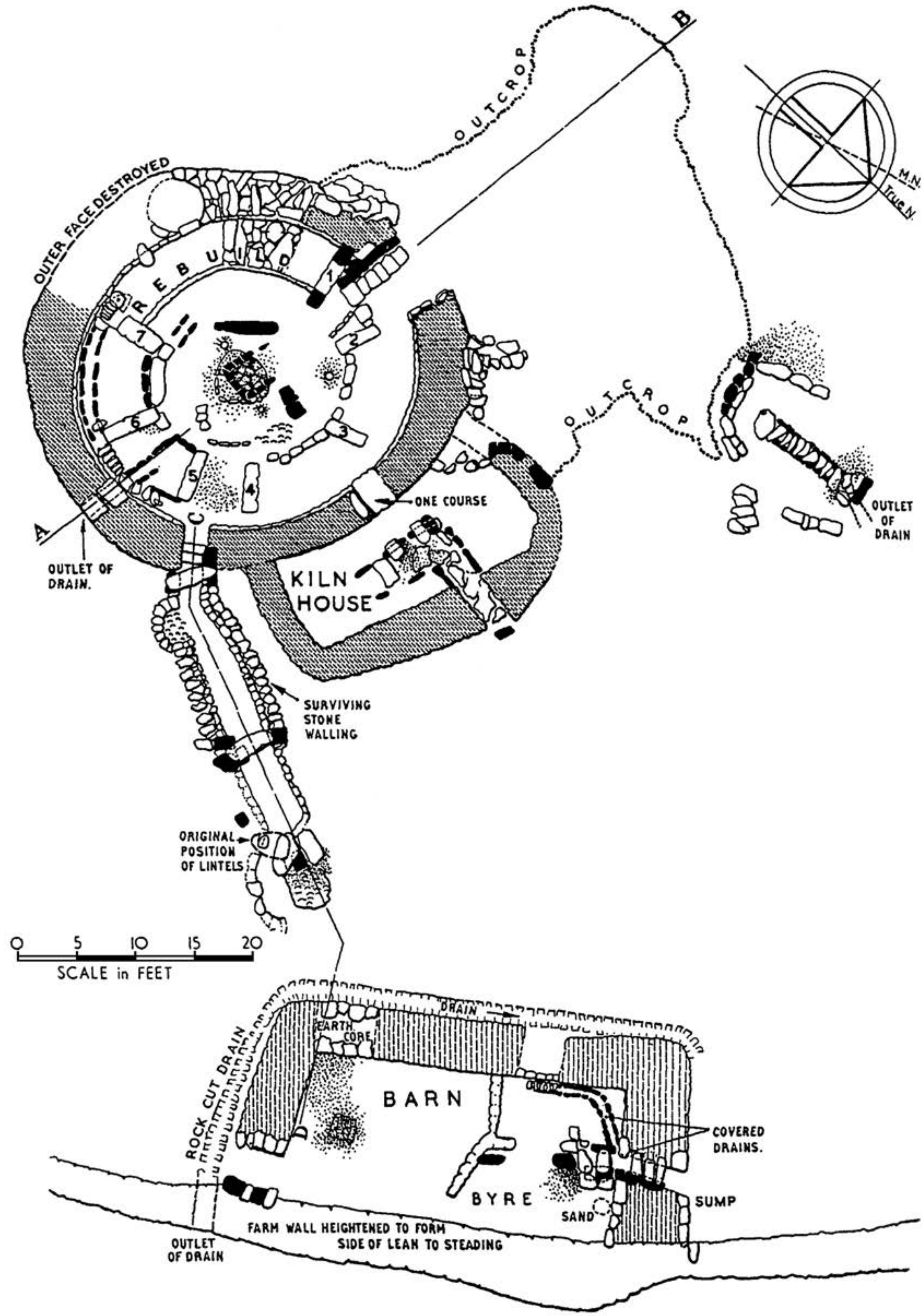


ILLUSTRATION 7.6

Allasdale, Barra (from Young 1952, Fig 3): the wheelhouse lies within an enclosure and in association with other buildings. It is unclear whether this complex is contemporary with the wheelhouse or, more likely, a series of later, perhaps post-medieval accretions.

Further afield, the rectilinear form of Structure 8 suggests possible parallels with the distinctive oblong, stalled wags of Caithness (Ill 7.7), such as those at Langwell and Forse (Curle 1912, 1941, 1946, 1948). Sally Foster has suggested that these may have a *floruit* in the sixth and seventh centuries AD (1989, 39–40). Although wags have traditionally been thought to be exclusive to Caithness, particularly the parishes of Latheron and Dunbeath, Foster has suggested links to similar rectilinear structures recently recognized in Orkney at Pool, Howe and Structure 15 at the Brough of Birsay (Hunter 1986, 56). It is possible, therefore, that a move towards rectangularity across Atlantic Scotland may have resulted in a series of architectural variants of which Structure 8 at Cnip was a localized Hebridean example, although if so it was clearly rather early in the sequence.

7.4 MAKING A LIVING: HOUSEHOLD, SOCIETY AND ENVIRONMENT

The archaeological and palaeoenvironmental remains recovered from Cnip illuminate a range of aspects of resource exploitation in Iron Age Lewis. Many of these have already been detailed in Chapters 3 and 4, where specific categories of material have been considered. This section presents a brief thematic review concentrating on the evidence for food production, the use of wild resources, the gathering of fuel, and the evidence for movement across the landscape. The settlement at Cnip did not exist in isolation, and it is important also to consider the wider evidence for Middle Iron Age settlement in the area.

7.4.1 THE NEIGHBOURS

The Iron Age archaeology of the Bhaltos peninsula is dominated by the long-lived settlement complex at Loch na Beirgh (Ill 7.8). The broch tower which forms the earliest identified element of the settlement sequence, is the largest in the Western Isles and incorporates an extremely well built scarcement ledge and indications of dressed granite facing stones around its entrance (Harding & Gilmour, 2000). It was clearly a monumental and prestigious building when first constructed, and must reflect the high status of its original inhabitants. It may have been of more than local significance. Indeed there is continuing evidence throughout the Beirgh sequence to suggest that the settlement retained its high status throughout its occupation, despite the changing forms of the main building. By the second century AD, this exceptionally fine structure had been significantly reduced in height and the settlement seems to have focused on a secondary roundhouse (Harding & Gilmour 2000, 64). Yet it was presumably at around this time that Samian pottery, imported ultimately from the Roman Empire, was obtained by the inhabitants, even though the sole sherd recovered was re-deposited in a much later context. Roman imports are exceptionally rare in Atlantic Scotland generally, and in the Western Isles in particular, yet as well as the sherd from Loch na Beirgh itself, two further sherds were found from the eroded middens on the beach a few hundred metres away. The evidence is limited, but this access to imported pottery suggests that the occupants of the secondary roundhouse at Beirgh had inherited something of the status and contacts of their predecessors in the broch tower; a supposition supported by the total absence of Roman imports in the substantial finds assemblage from Cnip.

In later years, the cellular settlement at Beirgh continued to provide evidence of high status inhabitants judging by the presence of copper alloy metal-working debris relating to the production of objects such as spear-butts (Heald 2001). Bronze brooches attest to

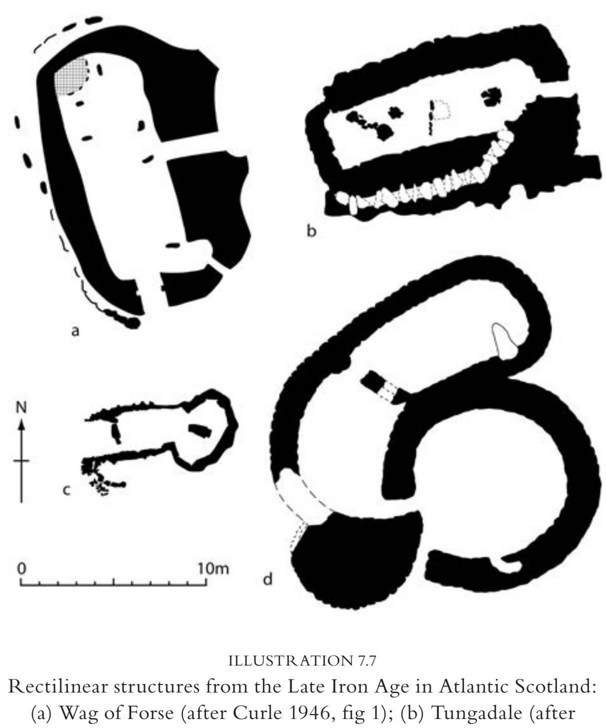


ILLUSTRATION 7.7
Rectilinear structures from the Late Iron Age in Atlantic Scotland: (a) Wag of Forse (after Curle 1946, fig 1); (b) Tungadale (after Miket 2002); (c) Cnip Structure 8; (d) Latheron, Caithness (after RCAHMS 1911, fig 13).

ILLUSTRATION 7.8
The broch tower of Loch na Beirgh seen from the shore.

the presence of individuals with access to high-quality goods in the centuries leading up to Norse colonization (Harding & Gilmour 2000). It would appear then, that the Loch na Beirgh settlement remained a high status settlement throughout its known period of occupation from the last few centuries BC until the early ninth century AD. There seems little doubt that it would have formed the dominant presence in the social and settlement landscape of the Bhaltos peninsula.

When the settlement at Cnip was first established, the Loch na Beirgh broch tower would still have stood in something close to its original form. During the occupation of Cnip, the tower would have been partially dismantled and the succession of secondary roundhouses constructed. By the time the settlement at Cnip fell into decline, the Loch na Beirgh settlement continued to prosper and was entering its phase of cellular building. It seems a reasonable assumption that, throughout this period, there would have been a close, most likely familial, relationship between the occupants of the two sites, with Loch na Beirgh being the dominant partner in terms of social status and economic influence.

The status of other contemporary settlements within the Bhaltos peninsula is less well established but some possibilities are apparent. The complex roundhouse of Dun Bharabhat lies on an islet in a small loch in the hills which form the core of the Bhaltos peninsula (Ill 7.9). The dating of this site is less secure than that of Loch na Beirgh, but it does appear that secondary occupation, after the collapse of the primary structure, focused towards the end of the first millennium BC, while slighter occupation of uncertain character extended, perhaps sporadically, into the first millennium AD (Harding & Dixon 2000, 26–7). Full analysis of the pottery assemblage should help to determine the chronological relationship with Cnip more closely than is currently possible. At present it seems more likely than not that Dun Bharabhat was still occupied when the Cnip wheelhouse complex was built, though no longer in its primary form. The dating of the other Atlantic roundhouse on the peninsula, Dun Camus na Clibhe, is entirely unknown at present.

There is a second wheelhouse, set on a sand-covered knoll at the rear of the Traigh na Beirgh, nestling at the foot of the low hills which form the interior of the peninsula. This site was dug into by a local resident, Calum MacLeod, during the 1950s and enough was done to establish that it was a wheelhouse of the conventional Hebridean type. Surface inspection reveals it to have an internal diameter of around 7–8m, closely similar to that at Cnip, and several pier ends remain visible (Armit 1994, 80). From what we know of wheelhouse chronology in the west it seems highly probable that this settlement was a direct contemporary of the Cnip wheelhouse, less than 1km away. Calum MacLeod's wheelhouse lies only 200m from the Loch na Beirgh broch tower to which it must have had close

ILLUSTRATION 7.9
The complex roundhouse of Dun Bharabhat, prior to excavation (photograph by D W Harding).

socio-economic ties. Further wheelhouses may of course remain undiscovered in the machair systems of the peninsula or may have been destroyed by coastal erosion. A series of middens recorded along the Traigh na Beirgh beach-face in the early twentieth century, for example contained at least one apparently stone corbelled structure (RCAHMS 1928, no. 98). These middens have now entirely disappeared. Hints of other broadly Iron Age settlements are provided by the discoveries of two souterrains (Armit 1994, sites 10 and 11), though virtually nothing is known of their form, chronology or associations. This was, nonetheless, a well-populated landscape: in all aspects of their lives, familial, social, political, economic, and religious, the inhabitants at Cnip would have interacted with their close neighbours.

7.4.2 ARABLE AGRICULTURE

Despite the general lack of direct evidence from earlier wheelhouse excavations, the common occurrence of querns, both rotary and the earlier saddle varieties, suggests that arable agriculture was routinely practised. The analysis of the carbonized plant macrofossils from Cnip indicates a reliance on six-row hulled barley as the dominant crop. Indeed, barley is the only crop which can be proven to have been deliberately grown as the single caryopsis of emmer is insufficient to suggest the deliberate cultivation of wheat. Barley seems to have been harvested by uprooting, judging from the presence of culm nodes and bases, presumably to conserve as much of the straw as possible (Chapter 4).

The siting of so many wheelhouses on the machair probably relates, at least in part, to the amenability of these soils to arable agriculture, despite the problems they pose in terms of both drought and vulnerability to erosion. Unfortunately, as at Cnip, the light and highly mobile machair soils seldom preserve any dateable traces of Iron Age agriculture, in the forms of field systems or boundaries, and the settlements themselves characteristically survive as islands of preservation in landscapes otherwise deflated and episodically re-worked by wind and sea (Armit 1994). Indeed, the best chance for the recovery of contemporary fields and land divisions probably lies in the detailed exploration of the environs of upland wheelhouse settlements like those at Clettraval (Scott 1948) and Allasdale (Young 1952), although these are unlikely to be representative of the more common machair wheelhouse settlements.

The pollen analysis of the adjacent Loch na Beirgh catchment (Lomax 1997) suggests that the arable fields associated with Cnip would have focused on the light machair soils in the immediate environments of the settlement. If these light sandy soils were indeed farmed, then there must have been ongoing concern for the stabilization of the machair which, as in more recent times, would have been extremely vulnerable to erosion and redeposition which could be potentially devastating to the barley harvest. This would have been the case particularly if uprooting was the favoured harvesting technique, since this would inevitably break the soil surface. Mike Church (infra) has suggested that the prevalence of wild turnip may have been a response to this problem, intended to stabilize the sandy machair soil, either as a fallow crop, or growing with the barley. This weed species has been identified in the Loch na Beirgh pollen profiles (Lomax 1997) and from the plant macrofossils at both Cnip and Loch na Beirgh.

As well as cultivation of the machair it is likely that further arable fields were located away from the coast. Weed species including slender St Johns Wort, as well as sedges, suggest either the presence of damp arable fields or ridged fields with damp ditches, both indicative of cultivation off the machair.

7.4.3 ANIMAL HUSBANDRY

The most important domestic animals at Cnip were cattle and sheep, with cattle playing a more important role than might have been predicted from a purely environmental viewpoint. Even by the standards of Iron Age Scotland, the Cnip cattle were extremely small, perhaps as a result of isolated breeding or, as McCormick suggests (see Section 4.2.2.), because of the poor quality of the available grazings in the area; essentially the peat-covered uplands which rise sharply from the machair.

A major area of recent debate has been the extent to which dairying was practised in the Atlantic Scottish Iron Age. For McCormick (see Section 4.2.2) the slaughter patterns of the cattle from Cnip seem to rule out a dairy-based economy and suggest that cattle were kept primarily for meat, with milk and secondary products like cheese being of much lesser importance. This view is supported by early documentary sources which suggest that primitive cattle would only yield milk if stimulated by the presence of their calves. Martin Martin, travelling in the Hebrides at the end of the seventeenth century, reports exactly this problem

(Martin Martin 1716). Following this argument, the culling of young calves, as seen at Cnip and other Hebridean Iron Age sites, would seem to be incompatible with dairying. Instead, these slaughter patterns may simply reflect the difficulties faced by the community in securing sufficient fodder to over-winter young cattle. Faced with this problem it may have been preferable simply to slaughter the young cattle as a ready source of meat at a time when other resources were scarce.

For others, the high proportion of calf bones in middens associated with Atlantic Scottish sites suggests exactly the opposite, ie that calves were slaughtered as part of a dairying strategy, freeing up milk for human consumption. This view finds some support in both documentary and ethnographic records. As McCormick has noted (see Section 4.2.2) in this volume, there are accounts from the Hebrides suggesting that cows could be encouraged to yield milk by the use of a calf-skin draped across a frame. Records from Ireland, dating to the seventeenth century, record practices such as 'cow-blowing', which involved blowing into the 'bearing place' of the cow to stimulate milk-flow. It is possible, therefore, that the community at Cnip, as elsewhere in the Hebrides, could have developed strategies to maintain milk production while slaughtering the great majority of their young calves for meat.

This is an important debate as the two divergent views reflect different perceptions of the sophistication and stability of Hebridean Iron Age economies. The dairying hypothesis reflects a well-established and stable pattern of husbandry producing storable secondary products, such as cheese, which could have formed an important part of the diet at times when other resources were scarce. By contrast, McCormick's view of calf slaughter as a mechanism to provide ready meat and relieve pressure on scarce fodder resources, is more suggestive of a marginal economy under chronic stress.

The reliance on cattle in preference to sheep may appear surprising given the environmental setting of Cnip. Indeed the unsuitability of the area for cattle husbandry is reflected in the poor condition of the Cnip cattle themselves and it seems probable that cultural rather than environmental factors favoured the raising of cattle. It is not uncommon ethnographically for cattle to be used as an indicator of wealth and status and some such mechanism in the Atlantic Scottish Iron Age may have encouraged communities to persevere with the raising of poor quality cattle when sheep may have been a more economically productive option. While sheep were roughly equal in numbers to cattle at Cnip they were far less significant as a food resource, although their wool would have been a significant asset. Unlike the scrawny local cattle, the Cnip sheep appear to have been broadly similar in stature to other Iron Age populations in Scotland.

Cook (nda) notes that the cattle from Loch na Beirgh are significantly larger than those at Cnip suggesting that they were better provided with winter fodder, although the slaughter pattern is still indicative of a cull of calves prior to the onset of winter. This might simply relate to the slightly later date of the elements of the Beirgh assemblage so far studied (third century AD onwards), but it might also relate to the status difference between the two sites, with the Beirgh inhabitants having access to a greater supply of winter fodder for their livestock.

Pigs were also kept at Cnip, as is shown by the presence of a neo-natal specimen, although probably in small numbers. It seems improbable that pigs would have been allowed to graze at will on the vulnerable machair soils, where they could have initiated serious soil erosion. The most likely scenario is that a small number of pigs was kept on or close to the settlement, scavenging scraps and waste and providing a ready meat source as and when required. Such a practice may explain the relative lack of bone debris in the midden deposits which formed on the ground surface around the settlement during Phase 3. Domesticated dogs were also present although there is no evidence that they were eaten. The presence of gnawed bones within the buildings suggests that dogs were allowed into the houses.

7.4.4 WILD RESOURCES

Red deer were another major source of food for the people of Cnip, although whether they can be truly classed as a wild resource in this context is debatable. It may be more appropriate to see the exploitation of red deer as another facet of animal husbandry practices. Although a marked contrast to the situation in the Uists, where they hardly feature in most faunal assemblages, the high proportion of red deer at Cnip does accord with both the mid–late first millennium AD assemblage from the nearby Loch na Bergh broch tower (Cook nda), and late first millennium BC material from Dun Bharabhat (Cook ndb). The implication is, therefore, that the management and exploitation of red deer was an important feature of the economy of communities in the Bhaltos peninsula over a period of at least 1,000 years.

The proximity of the Bhaltos peninsula to extensive areas of upland in the west of Lewis may have made the locality more environmentally suited to the maintenance of red deer herds than the relatively crowded and intensively exploited Uists. However, the high proportion of red deer from Dun Mor Vaul on Tiree, despite the manifest unsuitability of that island for the co-existence of humans and wild deer herds, suggests that red deer exploitation in the Hebridean Iron Age was probably not dictated by environmental expediency. McCormick has suggested that the combined evidence from Cnip and Dun Mor Vaul indicates that certain communities in the Hebrides were treating red deer more or less as a domesticated animal, conserving and managing their herds through highly selective culling regimes.

Aside from red deer, the evidence for the exploitation of other wild land mammals is minimal. Indeed, only in Phase 3 is there some limited evidence for the exploitation of otter, perhaps hunted opportunistically for food and/or fur.

Despite the prevalence of whale bone from the various floor deposits at Cnip, it is unlikely that whales were actively hunted. More likely the inhabitants of Cnip exploited occasional strandings (cf Angus 1993 for modern data on strandings in the area). Meat would presumably have been stripped from the carcass in situ, so the bones retrieved from the settlement probably represent materials specifically retrieved for tool-making, structural use and fuel. Similar activities, albeit on a more convenient scale, probably apply to the exploitation of seals for meat, skins and oil. Other marine resources may have been more regularly available but did not necessarily occupy a major role in the diet of the site's inhabitants. Fishing seems to have been small-scale and shore-bound and perhaps undertaken preferentially at slack times within the yearly round. The hunting of sea-birds, particularly shag and great auk, may similarly have been conducted as seasonal ventures.

There is some evidence in the carbonized plant macrofossil assemblage that might suggest the limited consumption of wild plant species, such as brassicas and Bear berry. There is little scope in the Hebridean environment for wild plants to play any significant dietary role, although certain species may of course have been sought out for specific culinary or medicinal purposes.

7.4.5 CRAFT-WORKING

A range of crafts was practised at Cnip, although the quality of evidence is variable. There is clear evidence for both antler and mammal bone-working although, as we shall see below (Section 7.5.2), these seem to have been carried out in different areas. Other objects suggest activities such as leather and textile-working, with both spinning and weaving being carried out within the houses. Again the evidence for the zoning of activities will be discussed in more detail below. There is no conclusive evidence for either pottery manufacture or metal-working on the site itself, although both were clearly carried out somewhere within the vicinity of the settlement. The site of Cnip 2/3, only around 150m north-west along the beach from the settlement, seems to have been a specialist metal-working area where both iron- and bronze-working were practised at various times (Armit & Dunwell 1992). Unfortunately, the site cannot be precisely dated, although a broadly Iron Age date is probable and a period of overlap with Cnip cannot be ruled out. Pot-making was most likely carried out in the open air, close to the settlement, though there is no evidence for it beyond a few tools of bone and pumice that may have been employed in the finishing and decorating of vessels (but may equally have had other uses unrelated to pot-making). Although the archaeological evidence is lacking, it is likely that other crafts such as wood-working and basketry would also have been practised.

7.4.6 FUEL

A variety of fuel sources were available to the inhabitants of Cnip, as is indicated both from the soil analyses and the carbonized plant macrofossils. While peat was apparently the predominant fuel, turves, dung, crop processing waste, and seaweed (represented indirectly by parasites rather than directly by carbonized remains) also seem to have been used. It seems likely that wood was not commonly used as fuel, presumably being too valuable as a resource for building and tool manufacture. Driftwood would certainly have been available and small managed stands of woodland may have survived within the Loch Bharabhat catchment in the nearby higher ground.

The burning of seaweed is restricted to certain groups of deposits: in particular the very latest deposits within Structure 8 (Phase 3). In this case, the burning of seaweed may simply reflect a shortage of more efficient fuel sources as the settlement fell out of use, or the opportunistic utilization of seaweed available from the beach, perhaps in the absence of a curated fuel source such as a peat or turf stack. A similar apparently expedient use of seaweed as a fuel is recorded at the burnt mound complex of Ceann nan Clachan in North Uist (Armit & Braby 2002).

7.4.7 ECONOMY, ENVIRONMENT AND IDEOLOGY

The evidence for local site economies in the Hebridean Iron Age does not appear to represent a strictly environmentally determined model. The environs of Cnip were peculiarly unsuited to the raising of cattle, yet cattle were present in far higher proportion than in the Uists. At Dun Mor Vaul, too, the apparent reliance on red deer flies in the face of local environmental conditions. While the husbandry of deer at Cnip, and probably also somewhat later at Loch na Beirgh, is more explicable, it is still puzzling why deer rather than sheep should have been accorded so much attention. Deer, apparently uniquely, occur occasionally as a motif on Hebridean decorated pottery (Ill 7.10) for example at the Kilpheder wheelhouse, in South Uist, and at Dun Borbaidh, on Coll (Lethbridge 1952, 189), and on a fine wooden handle from Dun Bharabhat close to Cnip itself (Harding & Dixon, fig 34); and in medieval times their hunting and consumption was to acquire connotations of high status. This may be a local reflection of a much more widespread phenomenon since deer are also the only animals represented on late La Tène painted pottery on the Continent (Ralston pers. comm.), and may have been hunted for sport in certain parts of Gaul during the final last centuries BC (eg Ménez 1996). It is possible, therefore, that the hunting and/or husbandry and consumption of red deer at monumental settlements like Cnip and Dun Mor Vaul may have been associated with a desire to demonstrate the status of the site's occupants. Similarly, cattle, even if rather tawdry specimens, may have had a status value not accorded to sheep, as was the case in the Early Christian period in Ireland.

7.4.8 SEASONAL PATTERNING AND MOVEMENT THROUGH THE LANDSCAPE

Cook (ndb) has suggested that the Pictish period inhabitants of Loch na Beirgh may have practised a system of transhumance, whereby cattle and sheep were removed to higher grazings inland from Bhaltos during the summer, and returned to the lower ground after the harvest to graze on the lower pastures and arable stubble where their manure would enrich the

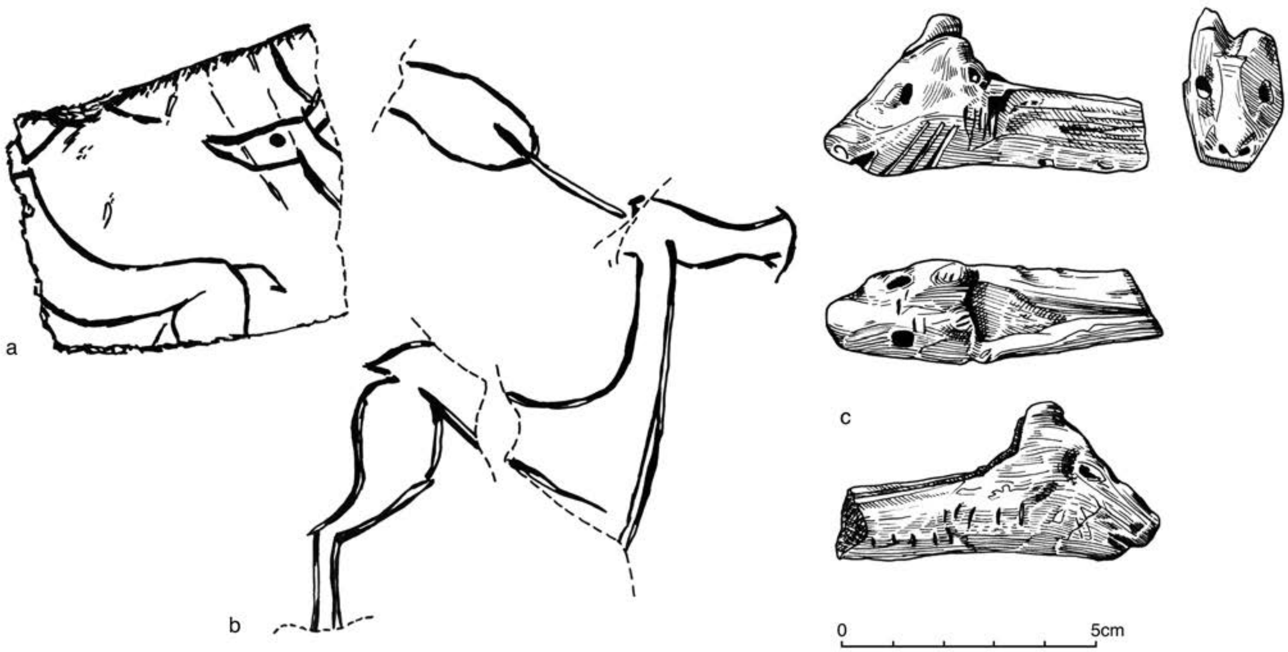


ILLUSTRATION 7.10
Comparative drawings of deer on pottery at: (a) Kilpheder, South Uist and (b) Dun Borbaidh, Coll (after Lethbridge 1952, 189), and on a wooden handle from Dun Bharabhat, Lewis (after Harding & Dixon 2000, fig 34).

soil for the next crop. A system of this kind would keep livestock away from the growing crops and make most efficient use of the limited grazings available, and it seems probable that the inhabitants of Cnip would have operated in a similar way. The time spent in the higher pastures would also have enabled the exploitation of red deer which, as Cook notes (ndb), may have articulated well with a mixed stocking regime. For example, red deer may, in some instances, preferentially graze areas previously grazed by cattle (Gordon 1988). Other summer tasks in the uplands may have included the cutting of peats and the gathering of wild plants such as Bear berry, which grows on cliff or upland bogs. Clearly the exploitation of the landscape extended well beyond the confines of the Bhaltos peninsula and would have involved the negotiation and maintenance of rights to resources such as peatlands, red deer herds and upland pastures. On the basis of more recent transhumant regimes in upland Scotland it seems unlikely that such a system would have been operated independently by a single household such as that occupying the Cnip wheelhouse. It is more likely that it would have operated at a wider community-based level, perhaps focused on the Bhaltos peninsula as a whole, or perhaps a still wider area. In terms of their economic and social lives, then, we should not see the Cnip household as self-contained or self-sufficient.

The seasonal splitting of the community into groups engaged in distinct tasks, such as tending stock in the uplands, or tending crops on and around the machair would have involved the division of the household for periods of time, perhaps along age or gender lines, and the mixing of elements of the household with their peers in the wider community. This temporary disaggregation of the household and close contact with neighbours may help us interpret two of the major themes in the study of wheelhouse architecture and inhabitation: the importance of the house in defining and structuring household identity, and the concern with the visual impact of household interiors on visitors in an increasingly socially integrated community.

7.5 LIFE AT CNIP

The various buildings at Cnip formed elements within a permanently occupied settlement which was the focus of domestic life over many generations. Although we have discussed the possibility that groups within the household may have spent time away from the settlement, for example in the uplands during the summer months, it seems highly probable, in view of its scale and permanence, that the wheelhouse complex was the centre of social life for the household, occupied through the summer by at least part of the community, and through the winter by the whole group.

The large concentrations of pottery sherds, mostly highly fragmented and often heavily sooted, suggest that cooking and eating were among the principal activities carried out within all of the domestic structures at Cnip. We can probably assume that sleeping and food storage were also functions of these buildings, although there is little direct evidence. It seems intuitively likely that people slept in some or all of the bays, the structure of which would inevitably have acted to define and segregate individuals, couples and groups within the household. For example, there may have been bays set aside for children or household dependants of low status, while others may have been reserved for the household heads or elders. We will examine the limited evidence for such segregation below (see Section 7.5.2). First, it is important to consider how the major archaeological deposits on the site might have formed, and how these issues of taphonomy might affect our interpretation.

7.5.1 FLOOR FORMATION AND THE ARCHAEOLOGY OF THE NON-ROUTINE

It is inevitably difficult to identify specific activity areas within the buildings at Cnip, and indeed within any prehistoric building, principally because of the uncertainties over the ways in which the various floor deposits may have formed. Indeed, the very existence of floor deposits in prehistoric buildings has increasingly come to be recognized as a problem. Until quite recently, layers of sediment confined to the interiors of Iron Age roundhouses, and variously peppered with pot sherds, lumps of bone and other fragmentary objects, were accepted fairly unproblematically as 'occupation' or 'floor' deposits. In other words, the build-up of debris which had accumulated during the occupation of the building, directly reflecting the nature and the distribution of activities carried out inside.

In recent years questions have begun to be asked as to how floor deposits actually form within an inhabited building. Different cultures obviously have radically different attitudes to the disposal of rubbish. Yet it still seems intuitively improbable that societies like those of Iron Age Britain, that put so much effort into the construction of elaborate and monumental homes, should have spent their domestic lives wading around in their own waste (cf Matthews 1993). In monumental buildings like wheelhouses, where the interior was clearly intended to create an impression of symmetry, height and space, these accumulations of floor deposits seem even less in keeping. Yet how else are we to explain the artefact-rich sediments that repeatedly turn up in the roundhouses of Atlantic Scotland?

If we accept that Iron Age roundhouses would generally have been kept reasonably clean and free from any substantial build-up of domestic waste, at least during their initial period of use, those 'floor' deposits which do survive might best be interpreted as 'terminal' deposits, ie debris which accumulated or was deposited on the floor of the house shortly before, during, or even after, the abandonment of the building. We might expect that this sort of material will, generally speaking, fall into one or more of the following categories:

1. material deposited when the house is in terminal decline, and thus when the activities carried out inside it, or the status of the occupants, may be unrepresentative of the period of its construction and primary use.
2. a succession of deposits built up through ad hoc temporary re-use of the building following abandonment.
3. the remnants of midden debris dumped in the building following abandonment.
4. material deliberately deposited to mark the abandonment or 'death' of the building.

Only in exceptional circumstances should we expect that genuine 'floor' deposits, directly representative of the activities carried out in the house, will be preserved in situ. This might happen, for example, when a building is abandoned or destroyed unexpectedly; perhaps by fire, through violence, or the sudden death of the inhabitants.

Structure 4 at Cnip provides a clear picture of what we might expect to have been the 'normal' treatment of floor deposits on a settlement of this kind, ie truncation. The earliest coherent floor plan recovered from Structure 4 is shown on Ill 2.28b. It comprises a central hearth and areas of ash deposit which survive only within slight depressions in the natural sand floor. These deposits seem to have been 'skimmed off' horizontally at that level, but even underneath these truncated deposits there were earlier, even more truncated deposits (Ill 2.28a). These comprise just a few fragments of an even earlier hearth, and a small number of ash deposits again surviving in hollows. It is impossible to say if these features were associated with each other, as parts of a primary floor, or if they represent a palimpsest of fortuitously surviving deposits from any number of floors which have otherwise been entirely removed. Indeed, such truncation of surfaces is typical of the sequence at Cnip and it seems clear that, as might be expected, the removal of domestic waste from the floors of buildings was routine. Rubbish was not simply allowed to accumulate for the benefit of future excavators.

This, however, is not the whole picture. Following the disuse of the second hearth in Structure 4, a new floor was apparently deliberately laid, some 0.15m thick, sealing all of the earlier deposits (Ill 2.28c) and containing an entirely new hearth built towards the rear of the building. Ill 2.31 shows the earlier hearth (not the very earliest one), the laid floor above it, and the later hearth. So why was it decided to insert this secondary floor, particularly in a low-walled building where vertical space was already at a premium, and where the routine practice seems to have been to clear out and truncate earlier floors to re-expose the natural sand below?

Indeed throughout the occupation of the Cnip wheelhouse complex, two contrasting practices can be defined:

1. the routine cleaning-out and consequent truncation of floors which can, by definition, be inferred only from those instances where it was imperfectly achieved

and

2. the periodic burial and sealing of floors which accounts for the vast majority of the surviving deposits.

This same phenomenon can be discerned at other wheelhouse sites such as Sollas, in North Uist, where the clean sand lenses, originally interpreted as windblown sand, appear instead to be deliberately laid floors, sealing earlier activity (Armit 1996, 145–8). The same pattern may be inferred at A' Cheardach Bheag, in South Uist, where Fairhurst describes lenses of clean sand at various levels within the bays of the wheelhouse (Fairhurst 1971, 74). The laying of new floors, and the consequent burial of old floor deposits, therefore, marks a break from the routine maintenance of the buildings. So what factors might have given rise to these non-routine events? As is so often the case, we can consider both functional and ritual/symbolic explanations.

A functionalist explanation might suggest that the laying of a new floor, eg of clean sand, might be a reasonably effective way to cover up and neutralize the noxious filth that would otherwise have to be carted out of the house in buckets. However, it is not at all clear that carrying sand into the building would be any less labour intensive than carrying waste out, particularly when that very waste would have been a valuable source of soil enrichment in the unstable machair fields.

Another possible explanation is that the periodic burial of old floors was a symbolic or ritual act. The settlement sequence at Cnip is, as will be discussed below, punctuated by unambiguously ritual deposits, principally relating to the foundation and abandonment of buildings, and often involving human and animal remains. In each case, the deposits can be interpreted as marking events in the life of the household by the careful placing of significant deposits. It could be argued that the laying of new floors (and, perhaps more importantly, the burial of old floors) played a similar role in marking the passage of time within the settlement. Burying, rather than removing, earlier floor deposits, particularly when these form a potentially valuable economic resource, suggests both a degree of reverence, and a mark of closure. It suggests a desire to mark the passing of time by the incorporation of material relating to the past (albeit presumably the very recent past) within the domestic environment.

This interpretation is given some support by the treatment afforded to the small cell, Structure 3, leading off from Wheelhouse 1. During Phase 2 the perfectly sound paved floor within Structure 3 was overlaid with a near-identical secondary paving, within a structure where the internal space was already extremely cramped. It is hard to imagine any functional reason for this like-for-like replacement, and it seems more in keeping in the context of a symbolic or ritual interpretation, particularly in view of the more clearly ritualistic foundation deposits associated with this structure (see Section 7.5.3).

The most obvious interpretation might be that these events mark the deaths of individuals within the household. Seen in this light, they might perhaps represent a rare visible trace of otherwise fugitive Iron Age funerary rites. The recurrence of re-flooring episodes at Cnip, set against the radiocarbon chronology for the site, would allow their interpretation as generational events. Other non-routine events which may have proved significant or traumatic in the life of the community may have included failed harvests, diseased livestock, prolonged bad weather, episodes of warfare, or perhaps specific 'bad' or unpropitious deaths. Any such event might have precipitated ritual acts of closure.

7.5.2 ZONING OF ACTIVITIES

Despite the non-routine nature of these acts of closure, there is nothing to suggest that the floor deposits thus sealed were anything other than the accumulation of debris discarded or lost during the normal domestic occupation of the houses. Much of the make-up of the surviving floor deposits appears to reflect the discard, spread and trampling of hearth debris, and the decay in situ of organic floor coverings. There is clearly a danger, therefore, that some of the artefactual material within these deposits will have been re-deposited, even if only marginally: for example, sherds from a pot broken on the hearth may have been swept out along with the ash to form part of the central area floor deposit. Nonetheless it has been possible to identify broad scale patterns of difference between the various spatial zones, both between buildings and within them.

Food was apparently consumed in most, if not all, excavated parts of the settlement, given the widespread occurrence of animal bone debris and pot-sherds, although it is unclear whether the grinding of grain for domestic consumption was carried out within the house, as all five rotary quern fragments were found in secondary contexts (see Section 7.5.4). It is also difficult to separate the evidence for food preparation from that of consumption, particularly since the same pottery vessels may have been used for storage, cooking and serving.

There is clear evidence for the 'vertical' zoning of pottery in that the amount of pottery being deposited within the floor deposits declines sharply through time. Phase 3, with an estimated span of around 150 years has a minimum representation of 144 vessels, while the estimated 100 year span of Phase 2 saw the deposition of some 1494 vessels. Despite the uncertainties of taphonomy and the rather greater volume of deposits associated with Phase 2, this is a startling contrast and must reflect real differences in the consumption of ceramics through the generations.

When considered alongside the narrowing of the decorative and morphological range of pottery in Phase 3 it suggests that the use of pottery for the preparation and serving of food, and the time and skill devoted to its production, were in decline.

The volume of ceramics consumed within Phase 2 merits some comment in its own right. A crude calculation of the number of vessels represented against the estimated duration of the occupation suggests that fragments of around 15 vessels were deposited each year (rather more than one per month). This, however, takes no account of the general regime of floor clearance outlined above which must presumably have removed all traces of the great majority of pottery vessels broken within the house. The overall quantity of pottery recovered from Cnip is very large given that it was generated by a single household, albeit over some 250 years. The 84 kg of recovered pottery can be compared, for example, with the 34 kg of Early Iron Age pottery from the much larger, multi-household, enclosed settlement at Winnall Down, Hampshire (figures from Hill 1995, 129).

Ethnoarchaeological studies drawn from a wide range of societies provide an indication of the amounts of pottery and the use-life of individual pots present in households of various types (Mills 1989). In societies where large quantities of pottery are used on a daily basis, such as among the Fulani of West Africa, mean numbers of vessels in use in any one household at any one time range up to around 21 (ibid, 138). For other ceramic-using societies, the figures can of course be much lower (as low as five in Mill's study). The same studies show that the use-life of individual vessels varies a good deal (eg cooking pots last less time than storage pots), but mean use-lives can nonetheless be calculated. These calculations show that, in the societies studied, vessels tend to last for around four years on average, but mean use-lives range from as little as nine months to as much as nine years.

Drawing on these figures J D Hill has shown that a hypothetical society with the largest number of vessels in use, who used those pots for the shortest time, would break and discard around 22 vessels per year (Hill 1995, 128–9). At Cnip, for Phase 2, as we have seen, we seem to have physical evidence for the breakage and discard of around 15 vessels per year, with clear indications that these represent only a fraction of the vessels originally in use. The potential volume of 'missing' pottery is impossible to estimate but it does appear nonetheless that the inhabitants of Cnip during Phase 2 were using a substantial number of pots at any given time, and were breaking and discarding them at a substantially greater rate than most societies documented in Mills' ethnographic study (closer perhaps to the Mayan households also documented by Mills but left aside by Hill as potentially misleading for a consideration of British Iron Age societies). The purpose of these wide-ranging comparisons is not to suggest any specific linkages but simply to highlight the scale of ceramic consumption and deposition at Cnip.

The large scale of pottery breakage at Cnip seems unlikely to be simply the result of congenital domestic clumsiness. If nothing else, it signals that large numbers of pottery vessels were present within the wheelhouse throughout its use. Pottery production must have been a regular and important activity. It is also possible that at least some pottery vessels were deliberately broken in certain social contexts, or were made for (and broken at the conclusion of) specific occasions. This is probably not unique to Cnip: settlements in Atlantic Scotland generally, but the Western Isles in particular, tend to produce very substantial assemblages of pottery. It is seldom possible, however, to be so specific regarding the duration of the occupation and thus to establish the rate of breakage and discard. The question of ceramic consumption patterns and their change through time clearly merits more discussion than is possible here and would benefit from a thorough review of previously excavated assemblages.

There are indications that certain activities were restricted to certain parts of the settlement. Metal-working, for example, seems to have been carried out at some distance from the houses (understandably given the unpleasant and potentially dangerous conditions involved). Metal-working debris occurs mainly in structural contexts, the largest concentrations being found in the wall-packing material of Wheelhouse 1 (Phase 1), the packing of Structure 4 (Phase 2) and of Structure 8 (Phase 3). It may of course have been deliberately sourced from elsewhere for this purpose, but it is perhaps more likely that it derives from metal-working somewhere in the vicinity of the settlement, perhaps at the nearby metal-working site of Cnip 2/3 (Armit & Dunwell 1992).

More surprisingly, virtually the only evidence for mammal bone-working (other than whale bone) comes from two small waste pieces contained within deposits dumped in Structure 5 at the beginning of Phase 3. This material is presumably re-deposited but seemingly from somewhere other than the excavated houses, since it contains a quite distinct material assemblage. It would appear, therefore, that mammal bone-working was carried out within the settlement but not within the houses. By contrast there is plentiful evidence for antler-working and the working of whale bone within Wheelhouse 1, suggesting that a distinction was made between the areas appropriate for working these various materials. Conceivably this distinction could relate to the 'wild' whale and deer, as against the 'cultural' domesticates, although even deer bone does not seem to have been worked within the houses.

Despite their presence within Wheelhouse 1 during Phase 2, even antler-working and whale bone-working debris are absent from the contemporary deposits in Structure 4 (Table 2.4). Indeed the general paucity of cultural material other than pottery within Structure 4 is striking. This distinction cannot be explained by differential degrees of clearing out of the structures, as the pottery assemblages of the two are comparable. It would appear, therefore, that while certain craft activities were carried out within the wheelhouse during Phase 2, the neighbouring Structure 4 was not used in this way.

The differences between Structure 4 and Wheelhouse 1 are particularly striking given the detailed similarities in patterns of movement within these two buildings, and parallels in the construction and modifications of their hearths (see Sections 2.3.1 and 2.4.3). These distinctions might reflect a division of the household, based perhaps on age, rank or gender, with Wheelhouse 1 perhaps housing the lower status members of the household. Thus Structure 4 might have been an area where food was consumed by certain elements of the household, with food preparation and other tasks restricted to Wheelhouse 1. Alternatively I have already discussed Anna Ritchie's suggestion that Structure 4 may have served as a form of 'oracle-shrine' (Ritchie 2003, 6–7).

7.5.3 STRUCTURED DEPOSITION AND THE TREATMENT OF HUMAN REMAINS

While the evidence for zoning may be taken to be a relatively unconscious reflection of the spatial distribution of domestic activities, there are a number of deposits which have clearly been deliberately assembled and buried in carefully chosen locations. These occur under floors, behind walls, within abandoned structures, and in several cases appear to mark liminal spaces (eg entrances) or times (eg the construction or abandonment of a building).

Liminality of both space and time is reflected in particular by two deposits associated with the construction of Structure 3, the small, low cell which led off from Bay 2 of Wheelhouse 1. Prior to construction, a hollow had been scooped in the underlying sand, within the infill of the unfinished Wheelhouse 2. Into this hollow was placed the upper part of a human skull (Ill 2.26) and two fragments of pottery. At the threshold between Structure 3 and Wheelhouse 1 a second pit was dug into which were placed the skulls of two sheep along with the butchered bones of one of them. A bone beater tip (SF172, see Section 3.5.3.3, Ill 3.21b), probably a weaving implement, seems also to have been a deliberately selected item in this deposit. The first deposit suggests a desire to mark the closure of the abandoned Wheelhouse 2 and/or the foundation of the new Structure 3. It marks a particular time or event in the life of the settlement. The threshold deposit need not have been dug at the same time, although this cannot be ruled out. Certainly, the puzzling re-flooring episode in the same structure, (see Section 7.5.1) demonstrates that continuing attention was devoted to this small structure throughout the course of its use. A deposit of antler-working debris (SF66, SF69a-d, SF69f. SF52, and SF291, see Section 3.5.2.1) and a stone disc or pot-lid (SF087, see Section 3.6.4, Ill 3.25g) in the make-up of the primary floor of the rectilinear Structure 8 show the continuation of such depositional practices into the later stages of the site's use.

The human skull fragment within the pit below Structure 3 raises wider issues concerning the treatment and curation of human remains. The absence of conventional or routine human burial across most of Iron Age Britain has tended to suggest that the prevalent rite for disposal of the dead was excarnation (eg Carr and Knüsel 1997), and the arguments apply in Atlantic Scotland as much as in southern England, where most work on this issue has been done. Against this background, however, we see the periodic occurrence of human remains on settlement sites, suggesting either that bodies or body parts were periodically retrieved from excarnation areas for the performance of secondary rites, or that certain individuals were selectively denied 'normal' funerary treatment (Armit & Ginn forthcoming).

The human bone assemblage from Cnip, although small, is far from random in its composition. Three of the four recovered pieces are cranial fragments, and the only non-skull fragment (HB04, see Section 3.4) part of a tibia, was also the only piece to derive from the external midden rather than the houses themselves. The three cranial fragments were all from adults, and the only one for which the sex could be identified was male. Two had been deliberately modified prior to deposition, one drilled apparently to enable suspension.

The preponderance of skull fragments at Cnip recalls the composition of the Early Iron Age human bone assemblage at All Cannings Cross in Wiltshire (Cunnington 1923, 40), where the assemblage was restricted to 32 skull fragments from at least 9–12 individuals (Keith 1923, 41–2). At least four of the fragments had been modified, one to create a perforated roundel, perhaps worn as a pendant or charm (Cunnington 1923, plate 26). Whimster cites similar 'cranial amulets' from Iron Age sites at Glastonbury in Somerset, and Handley in Dorset, as well as eight northern French examples from the Marne region (1981, 185). The drilled fragment from Cnip could have belonged to a similar, though larger roundel, although it could equally have come from a complete suspended head or skull. Supporting the latter interpretation is the occurrence of a cranial vault from Hillhead broch in Caithness which has been perforated with three holes, presumably to enable suspension, and a similar triple-perforated skull from Hunsbury in Northamptonshire (Parry 1930, 96, plates IIIb and IVa); a further skull with a single perforation was found, along with numerous other human bones, under one of the ramparts of the promontory fort at Burghead in Moray (MacDonald 1862, 358). In each example the skull modifications were apparently made post mortem.

Although the cut-marks visible on these fragments do not seem to represent trepanation in the commonly understood sense, of a medico-religious operation performed on a living individual, they nonetheless fall within the general category of trepanation defined in a recent overview (Roberts & McKinley 2003). This recent study lists only six Iron Age sites in Britain with evidence for trepanation: Cnip, Hillhead and Burghead form a distinct northern Scottish group while the remainder, including the Hunsbury examples, are concentrated in central southern England (Ill 7.11). Aside from the quoted examples, the remainder seem to display larger trepanations more likely to represent medical interventions. Nonetheless, the example at Watchfield, in Oxfordshire, was deposited as a de-fleshed skull in a pit accompanied by a pig skull in a rite resonant of the depositional practices in Iron Age Atlantic Scotland. Fragments of skull, although apparently unmodified, also dominate the human bone assemblage from the Atlantic roundhouse of Dun Vulan in South Uist and have been radiocarbon dated to the same span of occupation as is represented at Cnip (Mulville et al 2003, 23–4).

While far from conclusive, the small sample of human bone from Cnip (and indeed from Hillhead, Burghead and Hunsbury) is at least consistent with the retention of adult male heads for curation and/or display; a familiar 'Celtic' motif, recorded in contemporary Iron Age communities in Gaul, most famously in the works of Posidonius and his successors, notably Diodorus Siculus and Strabo (Tierney 1960). Cunnington, for example, had no hesitation in invoking classical literary sources to provide a context for the All Cannings Cross material (1923, 40–1), although the evidence for the treatment of skulls there is less immediately suggestive of display than at sites like Hillhead and Hunsbury.

The communities of Atlantic Scotland were, nonetheless, very different to their semi-urbanized contemporaries in southern Gaul where this 'cult of the head' is most clearly manifested in sanctuary sites such as Entremont and Roquepertuse (eg Arcelin et al 1992; André & Charrière 1998; Rapin 2003). Indeed, there is nothing especially 'Celtic' about an interest in heads, as even the briefest review of the ethnographic literature shows (eg Hoskins 1996; Armit 2006). Even within Iron Age Europe, the taking and display of heads as a by-product of warfare is known well beyond the supposed extent of Celtic territory: most famously in the depiction of human heads displayed on stakes at a Dacian town depicted on Trajan's column in Rome. Rather than relying upon attractive but potentially misleading 'Celtic' models from the Continent, we need to consider the interest in heads among Atlantic Scottish communities within their own archaeological context (Armit & Ginn forthcoming).

An alternative to the possibility of hostile head-taking is the reverential retention of human bodies or body parts from within the community. Parker Pearson has recently recovered what he interprets as evidence for preserved human bodies (in effect mummies, preserved perhaps by drying), curated over many generations prior to eventual deposition, at the Later Bronze Age settlement of Cladh Hallan in South Uist (Parker Pearson et al 2002). While it does not appear that these Cladh Hallan bodies showed the degree of modification seen in the worked skull fragments from Cnip, there are nonetheless resonances with the foundation skull deposit under Structure 3. This

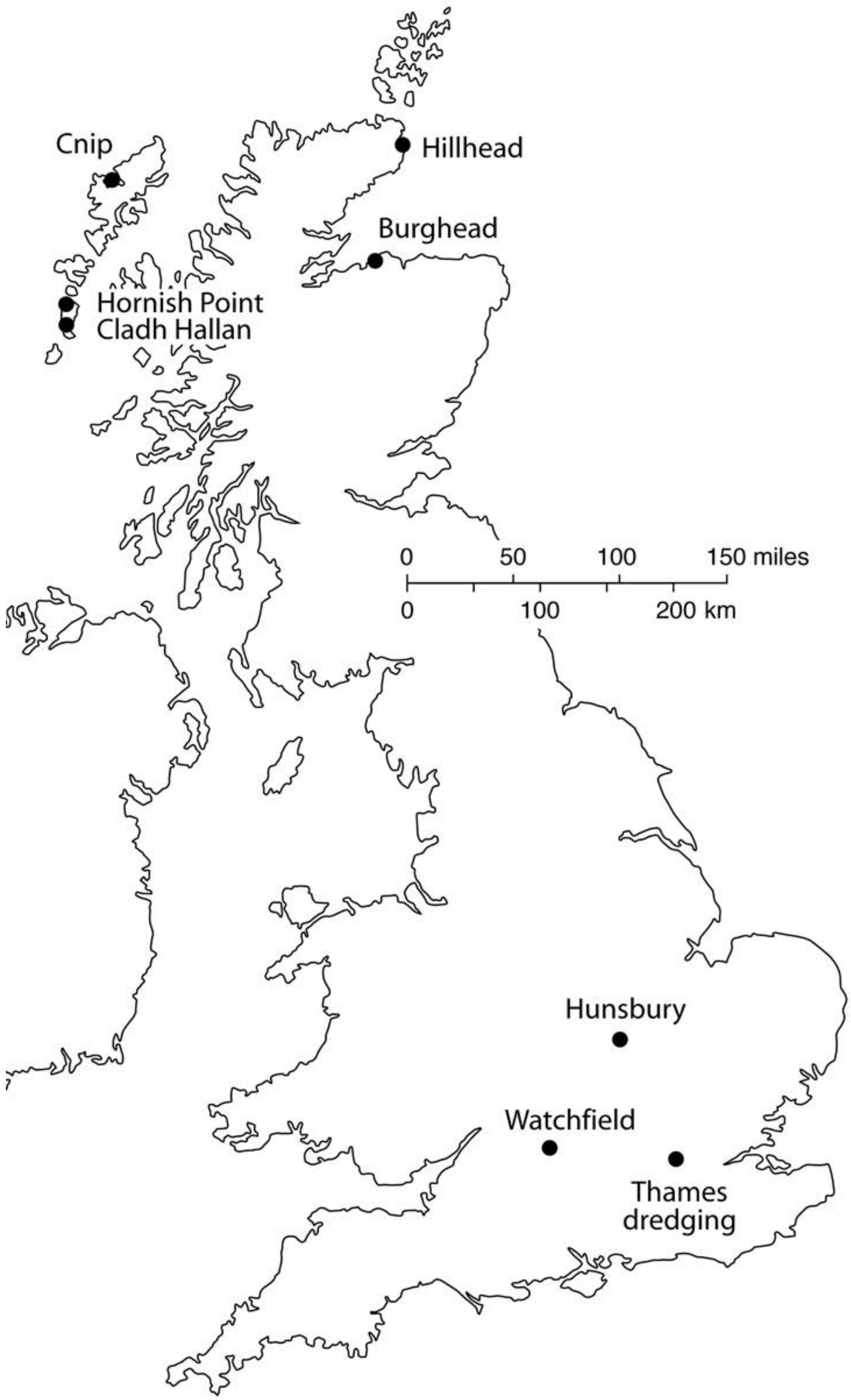


ILLUSTRATION 7.11
Distribution of Iron Age sites in Britain with evidence for trepanation, also indicating the location of Hebridean sites with evidence for obviously curated remains (data from Roberts and McKinley 2003, with additions).

deposit does not appear to represent someone killed for the occasion or even freshly dead. The skull, belonging to a middle-aged male, was partial and found with a small fragment of animal bone (or just possibly human but from another skull) either chosen because of its resemblance to the human skull, or else mistaken for a genuine part of it. The rite appears consistent with the disposal of a body part which had been curated for some time prior to deposition. Interestingly, this skull showed no sign of modification or suspension and may indicate the co-existence of at least two separate rites involving human skulls or heads.

Human remains are not a particularly common occurrence on previously excavated wheelhouse sites, but a striking example does come from Hornish Point in South Uist; a radially partitioned structure clearly related to the wheelhouse tradition (Barber et al 1989). The floor of this building contained a series of four pits, each holding parts of a boy aged around 12 years (ibid). The boy had been dismembered after death when decomposition had already begun to take effect. The human remains were accompanied by the butchered bones of young cattle and sheep, suggesting that an episode of feasting had occurred in association with this unusual burial (although the human bones were not subjected to butchering). It seems most likely from the context of the pits that these rites were intended as an act of propitiation for the building. As at Cnip, the human remains used for this ritual were not fresh. The excavator has suggested that the boy may have died at sea and subsequently washed up on the beach: perhaps as a stranger or having suffered an inauspicious death he was thus disposed of in this unusual way. Perhaps more likely, given the incorporation of the body within the house, he was a member of the local community whose death had occurred, whether by accident or design, some time prior to the completion of the building.

Although lacking human remains, the wheelhouse at Sollas in North Uist contained around 150 pits dug into its soft sand floor (Ill 7.12), of which around 60 contained animal deposits, including cattle, sheep and pig, both burnt and unburnt (Campbell 1991). Three, for example, contained entire sheep, recalling the Structure 3 threshold pit at Cnip, described above. Other pits lacked animal remains but contained other sorts of deposit, for example a crucible covered with mica plates. Over another was laid the perforated upper stone of a rotary quern, which Campbell has argued may have allowed the pouring of libations into the pit below, or at least some form of communication with the ritual world (ibid, 147). Other, apparently empty pits, may conceivably have contained more perishable materials, such as dairy or plant foods. Although interpreted in the published report as foundation deposits, set in place before the occupation of the structure, it is perhaps more likely that many of these inter-cutting pits were dug at various times during the primary occupation of the building (Armit 1996, 154–7). Other wheelhouses contained similarly structured deposits, placed during the period of primary occupation, including a kerb of red deer jawbones and a cache of 32 ox teeth at A' Cheardach Bheag in South Uist (Fairhurst 1971).

It is unfortunate that there was no opportunity to examine the primary floor of Wheelhouse 1 at Cnip to establish the presence or otherwise of pit deposits. There were, however, a series of clearly structured deposits in other locations, aside from those already discussed. Most important was a series of deposits placed within the walls of the Wheelhouse 2 during construction. Only a short stretch of walling to the south of the entrance was dismantled during the final days of the excavation, yet a series of discrete deposits was found including a complete pottery vessel, the head of a great auk, and an articulated portion of cattle vertebrae. This strongly suggests a series of acts relating to propitiation of the building during its construction, paralleling the burial of the boy and accompanying animals at Hornish Point and the earliest pits at Sollas. It is an intriguing possibility that similar wall deposits may exist unnoticed at previously excavated wheelhouse sites, since it is not clear from the published literature that any have previously been dismantled in this way.

The identification of these sorts of deposit as ritual or religious in intent is no longer particularly controversial, although one could question the central significance they are sometimes accorded in interpretations of the British Iron Age. For example, a recent book on Hebridean blackhouses noted that 'pieces of iron, old horse shoes, and other metal objects are added to the core material [of blackhouse walls] for luck' (Walker & MacGregor 1996, 4). While this might be an interesting observation of the behaviour of rural house-builders in the nineteenth-century Highlands, it cannot be claimed as a particularly useful starting point for understanding their social or religious life on any wider level. The present-day deposition of coins into more or less any pond, well or pool is a similar example of what we might term the 'holy well' syndrome of structured deposition. We

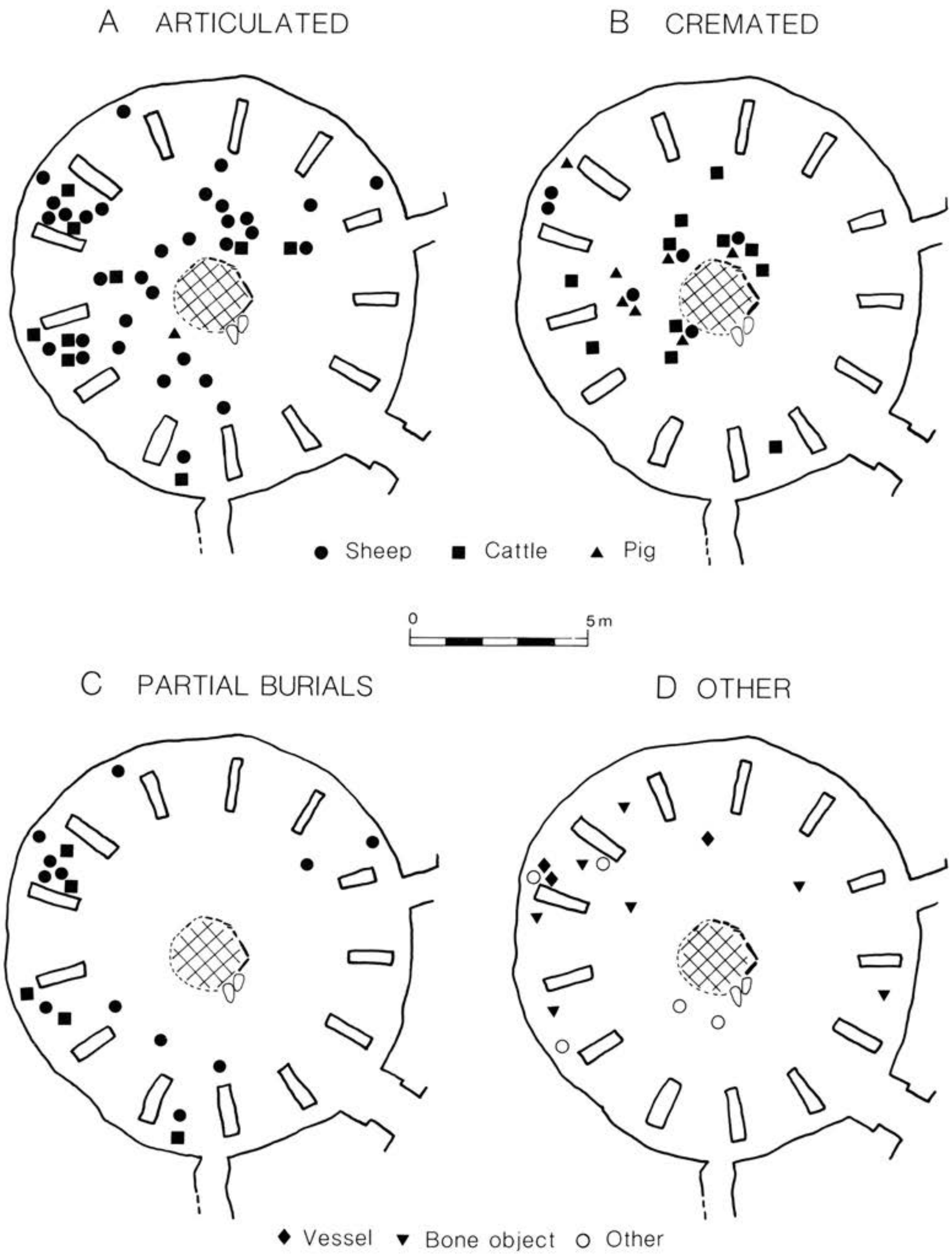


ILLUSTRATION 7.12
The pit deposits at Sollas, North Uist (from Campbell 1991).

need to be wary, then, of any assumption that such acts had greater significance in the Iron Age than in more recent times. What most forcibly distinguishes Iron Age depositional practice of course is the periodic incorporation of human remains into such deposits, suggesting that these acts may indeed have been of central importance within the lives of those present.

7.5.4 UNSTRUCTURED DEPOSITION? QUESTIONING THE QUERNS

A final aspect of structured deposition of relevance here is the treatment of querns. All five rotary quern fragments recovered from Cnip were found in secondary contexts, either built into walls, paving, or in one case the lining of a pit. It has become commonplace to view such occurrences as deliberate, ritually charged deposits, connected presumably with agricultural symbolism, and in some cases this interpretation seems highly probable (cf Hingley 1992, 32; Armit 1999, 584). Unfortunately, however, broken rotary querns lying around a settlement, even if they had no ritual significance whatever, would most likely have been used opportunistically in the patching and repair of drystone structures, for paving, and for the construction of internal stone furniture. Thus to have any confidence in the attribution of a symbolic dimension to their deposition we have to be able to demonstrate either that the patterning of querns on the site differs from that which would be expected by the sceptical functionalist, or else that usable (and thus presumably valuable) querns had been deliberately taken out of commission.

There is nothing in the locations of the three querns built into the walls at Cnip that immediately marks them out as special or unduly liminal locations (since almost any part of a wheelhouse with the possible exception of the piers and central area could be considered as liminal to some extent). Each relates to a different phase of occupation: one was built into the middle of the north wall of Structure 8 in Phase 3; another was built into Structure 7, the small cell that replaced Structure 4 in the latter part of Phase 2; and the other formed part of the small entrance passage cell of Wheelhouse 2 in Phase 1. There may of course be numerous other quern fragments unrecognized within the wheelhouse walls which were not dismantled during excavation. Both the wheelhouse paving and the pit lining were put in place during the Phase 2 occupation, and neither need relate to major building works on the site (indeed the same could be said of Structure 7 which seems to represent a small-scale building episode confined to the entrance passage). One could argue, therefore, that these were construction episodes where there was a greater than usual chance of the opportunistic re-use of stone which happened to be lying around the settlement. In large-scale building episodes, by contrast, there is more likely to have been a concerted effort to import quantities of suitable building stone from elsewhere. Of the five quernstones recovered from the site, three had clearly been broken before being incorporated into the walls, while another had been badly damaged. The fifth was a lower stone and may of course have originally belonged with an upper stone which had itself been broken. There is certainly nothing to suggest that pristine or even serviceable querns were deliberately 'sacrificed' during the various building episodes.

If one wanted to pursue the symbolic line on this issue, one could suggest that the pit was of ritual significance in itself, that the paving represented a liminal zone between inside and outside, and that the two entrance locations (the wheelhouse 2 entrance cell and Structure 7), were similarly liminal areas between the 'domestic' interior and 'wild' outer world. One might be struggling somewhat with the fragment in the Structure 8 wall, but could perhaps dismiss it as a later chance occurrence. While we should remain open to the possibility that these querns are of ritual significance, there is nothing in either the contexts or condition of the Cnip quern fragments that would not equally have been predicted by the sceptical functionalist viewpoint.

7.5.5 IRON AGE COSMOLOGIES

One focus of recent work on the British Iron Age has been the interpretation of the cosmological principles by which past societies understood and structured their lives (Haselgrove et al 2001, 8). Although the Iron Age in Britain lacks evidence for specialized religious buildings, structured deposition of the type described above occurs widely on settlement sites (eg Hill 1995). Several studies have considered the ways in which cosmological principles may be reflected in domestic architecture, in patterns of daily living, and through periodic acts of structured deposition in and around the home (eg Parker Pearson 1996a, 1996b; Fitzpatrick 1997; Oswald 1997). Although this work focused initially on central southern England, the unusually high quality of site preservation in Atlantic Scotland, and particularly the survival of human and animal bone deposits in the machair environment, has increasingly brought this region centre stage. The recent report on the excavations of Dun Vulan in South Uist, for example, contains a section headed 'the broch as cosmological encoder' (Parker Pearson & Sharples 1999, 353), although it is on wheelhouses that the most detailed cosmological arguments have been based.

Following Parker Pearson and Sharples' discussion (1999, 16–21) the following principles have been suggested as most relevant to the structuring of life within Hebridean wheelhouses:

1. The importance of the movement of the sun in determining the orientation of roundhouses; leading to a predominance of 'east-facers' which respect the equinoctial sunrise.

2. The importance of the sun's daily path in structuring domestic activities; ie 'day-time' activities such as food preparation, cooking and craft-working in the south, and 'night-time' activities such as sleeping in the north.
3. The importance of the hearth as both the real and symbolic centre of the house, around which other activities are ordered in a series of concentric zones.
4. The importance of structured deposition in reflecting cosmological principles, through the specific composition and location of deposits.

The contribution of the Cnip excavations to this debate is limited since it was not possible to excavate the primary floor of the main wheelhouse, nor was it possible to excavate all of the bays. There are some points, however, where the work at Cnip has provided additional insights. Both wheelhouses at Cnip, for example, face west rather than east. Parker Pearson and Sharples recognize this and list Cnip along with Allasdale, Barra and Clettraval, North Uist, as exceptions to their general rule (1999, 17). They attempt to account for these exceptions by suggesting that the inhabitants of Cnip may have been different because of 'their status as specialist metalworkers' (ibid). This interpretation perhaps places undue weight on the undated (though putatively Iron Age) metal-working area along the beach at Cnip 2/3 (Armit & Dunwell 1992): there is nothing from the excavations at the wheelhouse complex itself to suggest that the inhabitants were specialist metalworkers. The problem becomes greater when we add further exceptions; the west-facing wheelhouses on Grimsay and Eilean Maleit, North Uist (Armit 1998), and the north-facing Bruach Ban in South Uist (Scott pers. comm.) bringing the total to seven (counting both Cnip examples separately). Overall, the predominance is still for an east to southeast direction (11 examples) but there is a greater degree of variation than a strict adherence to the cosmological model might suggest (Ill 7.13). The variation is not random and suggests that certain principles did underlie the decision to orientate wheelhouses, even if we might struggle to establish what these principles might have been. It is worth re-stating the case that Oswald (1997) makes regarding the inadequacy of earlier functional arguments for house orientation. These usually focus on the issues of prevailing wind direction and the admittance of light to the building. The latter is patently irrelevant in the context of wheelhouse architecture where the semi-subterranean setting and lengthy entrance passages on most structures would prevent light reaching the interior whichever way it faced. The reconstructed Late Iron Age house at Bostadh is instructive in this respect as, even without an expanded entrance passage, the interior remains in near-complete darkness on even the brightest days. The issue of wind direction is harder to deal with in a Hebridean context where micro-topographical factors may have a greater than usual role, but it has been shown to be insufficient as an explanation for the general distribution of house orientations across Britain as a whole (ibid).

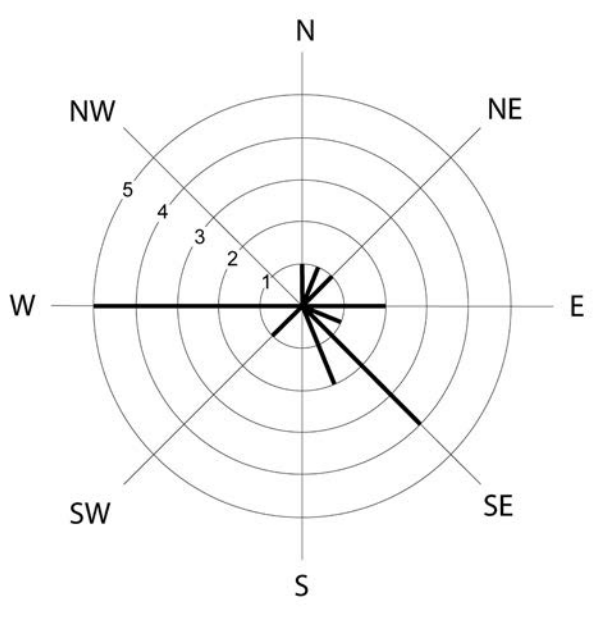


ILLUSTRATION 7.13
This diagram shows the entrance orientations of all Hebridean wheelhouses for which data is available.

Assessing the second proposition, regarding the split between a 'day-time' south and a 'night-time' north within the wheelhouse, is even more problematic. Following the cosmological model this divide should be reflected in the bias of deposition of such materials as pottery, animal waste and querns towards the south side of the structure. At Cnip the relevant data is largely unavailable, since the primary levels remained unexcavated. A second, equally vexing, problem concerns the way in which we interpret west-facing wheelhouses within this cosmological scheme. Parker Pearson and Sharples (1999, 17) suggest that these buildings represent conscious reversals of the 'normal' pattern and that their interiors may thus be arranged as a mirror image of the expected pattern. Following this line they argue that movement within the wheelhouse at Cnip (see Ill 2.15), shown by the arrangement of stone furniture in Phase 2a, was channelled anti-sunwise (or anti-clockwise), reversing the pattern seen at 'east-facers' like Sollas an A'Cheardach Bheag (ibid). This seems a reasonable interpretation of the situation at these three sites, although it is worth mentioning that the relationship of the hearth to the entrance at A'Cheardach Mhor, another east-facing wheelhouse, but one not discussed by Parker Pearson and Sharples in this context, seems to dictate an anti-sunwise progression around the interior (Young 1959, fig. 2). Nonetheless, the floor layout from Phase 2a at Cnip certainly suggests an anti-sunwise pattern of access within the wheelhouse, as does the evidence from the contemporary floor of Structure 4. All of this would tend to suggest that the north side of the Cnip wheelhouse 'ought' to have been used for 'day-time' activities, while the south side, 'ought' to have been reserved primarily for sleeping.

The data relating to this is, as we have seen, limited, but we can at least compare the nature of the finds assemblages from the north Bays 1 and 2, and the south Bay 7 (though we have to double the numbers for the latter since only half was excavated). The results are mixed (Ill 2.22a and b) since the south bay falls somewhere between the two north bays in terms of the proportions of pottery present, although it does have a significantly higher degree of pottery fragmentation than the other excavated parts of the interior. All of the excavated bays exhibited a marked 'bowling' of deposits which has been interpreted as caused by compression, perhaps through repeated use for sleeping.

The third point in the cosmological model, that relating to the centrality of the hearth, applies to Cnip as to any other excavated wheelhouse. At least in Phase 2a, when Wheelhouse 1 was still maintained in more or less its original form, the hearth was both central and dominant, and was carefully built and kerbed. It is perhaps significant that it was not geometrically central, as we might expect if a cosmological plan was being rigidly adhered to, but was instead rather closer to the entrance than to the rear of the house. Nor did the excavated hearths display the 'horseshoe' form, with the open end aligned with the entrance, which has been suggested as both characteristic of wheelhouses and 'a microcosm of the house's structure' (Parker Pearson & Sharples 1999, 17). Indeed, it also lacked the waterworn pebble construction which Parker Pearson and Sharples identify as ubiquitous in wheelhouse hearths in the Hebrides (ibid, 17–18) although the second hearth in Phase 2a did include some waterworn pebbles as well as angular edge-set slabs. It seems intuitively probable, nonetheless, that the design of the wheelhouse and position of the hearth would have promoted a broadly concentric ordering of space.

Finally with regard to the cosmological model, we might expect that the pattern of structured deposition within the wheelhouse should reflect the cosmological principles around which the house was constructed and inhabited. Again the problem lies in the partial nature of the recovery; not enough walls were dismantled and not enough primary floor excavated to talk sensibly of patterning in this material. The contribution of the work at Cnip here lies in the realisation that the walls, as well as the floors, were considered as appropriate vessels for ritualized offerings; and that these offerings could be similar in composition to those found in under-floor pits at sites like Sollas.

7.6 WHY WERE WHEELHOUSES BUILT?

We looked in Chapter 5 at 'how' wheelhouses were built. Now it is important to consider 'why'. Wheelhouses have been found so far only in the Western Isles and Shetland. Their apparent absence from Orkney is all more remarkable given the long history of archaeological and antiquarian effort in those islands. During the last century or so BC and first couple of centuries AD, at the time when wheelhouses were being built in the Western Isles, settlement patterns in Orkney seem to have been increasingly dominated by nucleated broch villages like those at Gurness and Howe (Hedges 1987b; Smith 1994; Armit 2003, Chapter 5). Both regions thus demonstrate significant changes in settlement patterns over the same broad period, though each results in the emergence of quite different archaeological monuments. It can be argued that both developments reflect similar social processes characterized by a trend away from egalitarianism. Before examining this idea further we need to look at the nature of the settlement landscapes of the Hebrides towards the end of the first millennium BC.

7.6.1 BREAKING WITH THE PAST

Although the specific architectural form of the wheelhouse was restricted to a fairly brief span of a few centuries in the Hebrides (though probably much longer in Shetland), it belonged to a tradition of radially partitioned domestic buildings with a much longer history. Similar spatial divisions can be seen, for example, in the Later Bronze Age structures at Jarlshof in Shetland (Hamilton 1956), and in Orcadian broch towers such as Gurness (Hedges 1987b) and Howe (Ballin Smith 1994). Oddly, however, there is little evidence for such spatial arrangements in the Hebridean Bronze or Early Iron Ages. Indeed, it is possible that the wheelhouse was adopted in the west as an 'exotic' architectural style having developed from the pre-existing vernacular traditions of the Northern Isles.

Whatever their origins, wheelhouses fulfilled essentially the same functions as Atlantic roundhouses in the west, serving as single-household settlements. Wheelhouses, however, differ from Atlantic roundhouses in a number of significant respects. These can be interpreted, to some extent, in terms of the degree to which the buildings are adapted to the natural environment of the Hebrides. The following structural contrasts can be drawn:

Atlantic Roundhouses	**Wheelhouses**
Long roofing spans	Short roofing spans
Heavy use of timber	Minimal use of timber
Poorly insulated	Well-insulated
Exposed	Sheltered

The reasons for the emergence and eventual disappearance of the Atlantic roundhouse tradition have been discussed exhaustively elsewhere (eg Armit 2003) and need not be rehearsed here. What is important for present purposes is that wheelhouse design and construction were better-adapted to the problems posed by high winds, low temperatures and the shortage of timber. From this rather limited, functional perspective, wheelhouses marked a return to a more energy and resource efficient form of construction, more akin to Neolithic and Bronze Age house forms, after the interlude of extravagant and ill-adapted architectural bombast represented by the Atlantic roundhouse tradition.

To explain the emergence of wheelhouse architecture in these functional terms, however, is inadequate. The adaptive qualities of wheelhouse architecture probably were important as one of a range of inter-linked factors which led to the adoption of this new architectural form. Yet wheelhouses were by no means simple, utilitarian buildings: they were monumental structures. But the monumentality of wheelhouses was directed entirely inwardly. As we have seen, the apex of the roof of Wheelhouse 1 at Cnip would have risen some 6m above the hearth, while the stone piers rose gracefully from their narrow foundations to create an extraordinary display of drystone virtuosity. Yet these impressive and imposing internal spaces could be appreciated only by the inhabitants and their guests. The imprint of most wheelhouses on the external landscape was virtually nil. In this sense, they presented no challenge to the territorial statements made by neighbouring Atlantic roundhouses. A second set of distinctions can, therefore, be proposed, which moves beyond the purely functional:

Atlantic Roundhouses	**Wheelhouses**
Prominent in landscape	Hidden in landscape
Outwardly monumental	Inwardly monumental
Limited defensive potential	No defensive potential

As has been suggested elsewhere (Armit 2005) these distinctions suggest that Atlantic roundhouses and wheelhouses embody rather different relationships between the household and the landscape and between neighbouring households. So how did these distinctions emerge? Despite uncertainties over chronology, it is tolerably certain that the pattern of settlement represented by wheelhouses is later than that represented by Atlantic roundhouses (Armit 1997). Clearly, however, occupation of certain Atlantic roundhouses, and particularly some of the most elaborate broch towers, continued through this subsequent period. The Loch na Beirgh broch tower is an obvious and immediate example. Indeed, I have suggested elsewhere, that the most important centres during the period of wheelhouse construction, may have been broch towers occupied by the most successful and influential households in the region (Armit 2005). The nature of these successive settlement patterns has been discussed in detail elsewhere (eg Armit 1992, 1997, 2002, 2005) but the following summary outlines some of their main characteristics.

The Atlantic roundhouse landscapes of the Western Isles date broadly to the Middle Iron Age, from around 400–100 BC. Throughout the islands, dense distributions of these monumental roundhouses dominate discrete parcels of land upon which they seem to imprint the territorial claims of their builders (Armit 2002). Studies in North Uist and Barra suggest that Atlantic roundhouses were the standard settlement type for land-holding households, who probably formed the majority of the islands' population, although there may of course have been a landless element of the population whose existence has left little trace. There were certainly far too many Atlantic roundhouses to justify the assertion that they were (in any meaningful sense) elite residences.

The distribution of Hebridean wheelhouses is more difficult to reconstruct as it is dependent on the vagaries of discovery through excavation (wheelhouses being only rarely identifiable through surface survey). Nonetheless, the density of Erskine Beveridge's excavations and later work in the Vallay Strand area of North Uist allow us to make some generalisations. Essentially it appears that that the general pattern of dispersed single-household farmsteads carried on into this period, although the locations of individual settlements often changed, with an increased focus on the machair fringe. The density of wheelhouses around the Vallay Strand is similar to that of Atlantic roundhouses and there is nothing to suggest any substantial increase or decrease in population. There must presumably have been a period of transition, of unknown duration, during which certain people lived in Atlantic roundhouses while certain others lived in wheelhouses, with the balance shifting over time to a point where only a minority of households inhabited Atlantic roundhouses.

7.6.2 LAND, INHERITANCE AND POWER

Atlantic roundhouses, where excavated, appear to have formed the focus of settlement within their local areas over many generations. This carries some implications for the nature of land-holding and inheritance patterns in the region, which have been the subject of a recent study (Armit 2005). Commonly cited forms of inheritance tend to centre around variants of either unigeniture or partible inheritance. The various forms of unigeniture (eg primogeniture, where the eldest inherits the entire holding) will tend to lead to the gradual emergence of larger holdings, as certain individuals inherit lands from their own parents and from close kin who die without heir. It also produces an ever-expanding landless class of surplus offspring. By contrast, most forms of partible inheritance, where the holding is divided between multiple heirs, result in the fragmentation of land-holdings over time.

Modelling both these modes of inheritance produces considerably more dynamic patterns of expansion, contraction and movement of settlement locations than is seen archaeologically in the Atlantic Scottish Iron Age (Armit 2005). Neither seems adequate to account for the apparent stability seen within Atlantic roundhouse settlement patterns. Instead there may have existed a system similar to that seen in Early Christian Ireland where land was redistributed within a kin-group (Charles-Edwards 1972). In such a system, which I have dubbed 'redistributive partible inheritance' (Armit 2005), substantial areas of land are held in common by a kin group within which individual households occupy individual land-holdings. When a holding falls vacant, normally through the death of the incumbent, it is allocated to younger kin who may or may not be a direct descendant of the previous incumbent. The new incumbent takes over the existing house and land in its entirety, ensuring the integrity and thus continued viability of the holding. Such a system avoids the fragmentation of land-holdings associated with other forms of partible inheritance, while also preventing the emergence of the social inequalities which are an inevitable by-product of primogeniture.

In Ireland during the seventh century AD, for example, a redistributive form of partible inheritance was initially practised within a kin group (the *derbfine*) based on descent over four generations, which later gave way to one based on descent over three generations (the *gelfine*) (Edwards 1990, 53). Such a system can only operate within a relatively egalitarian social structure and creates little sense of permanent land 'ownership', at least for the individual. Assuming more or less constant population numbers, the observed settlement pattern under such a system would remain essentially unchanged from generation to generation.

While there was clearly variation in the degree of elaboration evidenced among Atlantic roundhouses, for example between the imposing and expertly built Loch na Beirgh broch tower and the tiny and rather shoddily constructed Dun Bharabhat, these were differences in scale rather than kind. It is in this context that the adoption of wheelhouse architecture signals a marked change. For the first time we begin to see landscapes within the Hebrides where two entirely (and presumably consciously) distinct, forms of architecture co-existed. Certain households, like that at Loch na Beirgh, continued to inhabit long-lived, outwardly monumental traditional centres, while others built new, inwardly monumental wheelhouses like those at Cnip. Lesser Atlantic roundhouse sites, like that at Dun Bharabhat, ceased to be occupied altogether. Thus the broadly egalitarian settlement pattern of the Atlantic roundhouses began to pass to one in which marked social distinctions became increasingly evident.

So what was the relationship between the inhabitants of Atlantic roundhouses and wheelhouses? Traditionally they have been seen as distinct classes; broch lords and wheelhouse peasants (eg Barber 1985). As we have seen, however, that there is little to suggest that the land-holdings associated with wheelhouses were in any way inferior. Indeed some wheelhouses are built into the disused Atlantic roundhouses, suggesting a broad continuity of tenure. Yet, although the pattern of holdings itself may have retained its overall shape, a disparity seems to have emerged between those who inherited and maintained Atlantic roundhouses, and those who established the new wheelhouse settlements.

One possibility is that there had been a move towards unigeniture. There must always have been some mechanism for decision-making in the allocation of land-holdings within the kin-group. It is possible then that those with the decision-making power, perhaps the eldest or most senior member of the kin group, may have begun to retain some lingering authority over the reallocated holdings. This might have taken many forms, for example, the payment of tribute by junior kin, obligations of labour, or the recognition of subservient status. One outcome of such a changing relationship may have been that Atlantic roundhouses, as symbols of autonomy and territoriality, would have become appropriate residences only for those with control of the land. The emergence of wheelhouses may thus reflect the beginnings of more explicit social ranking within previously egalitarian kin-groups.

This rather abstract model of land inheritance has been developed on the basis of the general patterns in the settlement landscapes of the Hebridean Iron Age. Yet it also provides a potential explanatory model for the settlement changes seen locally in the Bhaltos peninsula in the last centuries BC. Applying the general model to this specific environment we might interpret the Loch na Beirgh broch tower as the dominant presence throughout, and one which was continually inhabited by the senior household and their immediate heirs. The establishment of the settlement at Cnip, and other wheelhouses in the peninsula, would then represent the allocation of land to junior branches of the kin-group, whilst overall authority remained vested in the traditional centre. These junior families would continue to perceive themselves as being of high status (at least in the sense of being land-holders and members of the kin-group to whom the broch tower and land belonged) while forming part of an increasingly inegalitarian system of land control and economic power. The wheelhouses at Cnip reflect this perceived status, displaying the relative wealth and resources of the builders without challenging the territorial authority of senior kin.

7.6.3 WIDER CHANGES

The increasing socio-economic inequalities reflected by changing settlement patterns in the Western Isles may also underlie the contemporary developments seen in Orkney. The emergence of broch villages, like that at Gurness, where a central broch tower was surrounded by a nucleated village of subordinate dwellings, again suggest changes in the local land-holding regime. At Gurness the effects of this process are displayed more starkly than in the Western Isles. Where their immediate ancestors had occupied scattered, autonomous farmsteads, the inhabitants of the Gurness village were physically and symbolically drawn within the shadow of the broch tower; which was presumably occupied by the senior household within the kin-group (Armit 2003).

7.6.4 CONCLUSION

A host of reasons, many inter-connected, may be suggested to explain the adoption of wheelhouse architecture in the Western Isles. Most immediately apparent are the practical difficulties that must have been experienced in maintaining the extravagant broch towers and other Atlantic roundhouses of the preceding period. Environmental constraints, most importantly the limitations of the timber supply, must have played a part in setting the limits of what was achievable architecturally. It is little surprise then that traditional vernacular principles which maximized heat retention and minimized wind exposure were re-employed.

Social factors were at least as important in determining the specific adoption of the wheelhouse form. As we have seen, this highly distinctive architectural style may have evolved in Shetland and may have been adopted quite consciously as an 'exotic' style. Its monumentality and symmetry lent themselves to the interpretation of the house within wider cosmological schemes. Wheelhouses retained the aura of status and permanence previously associated with Atlantic roundhouses. They were not the dwellings of an oppressed peasantry yet they may, nonetheless, represent the first real archaeological indications of a growing trend towards social inequality within Atlantic Scotland. As the first millennium AD progressed, the ideological basis of Atlantic Scottish societies seems to have progressively shifted from an emphasis on the household and community towards an emphasis on the status of individual (Armit 1990b, 206). Houses became less elaborate, less monumental and less pivotal within communal ritual practice. Pottery, also central to domestic sphere, declined in elaboration and importance (as we have seen in snapshot form at Cnip itself). If, as in many societies, pottery manufacture was carried out primarily by women, it may be possible to interpret this transformation as reflecting a down-grading of women's roles during the first millennium AD. Individual burial becomes increasingly important, as does the production of jewellery to adorn the individual body in life. Overall it seems that we can trace a long-term trend towards a more socially divided society, both in terms of the relationships between households, and in the status of individuals within these households. This cannot be unrelated to the political transformations seen over the first millennium AD; societies organized only at the local level of the kin-group seem to have been enmeshed within ever-larger polities during the early centuries AD; a process leading ultimately to the development of the Pictish kingdom. It is tempting to see the changing settlement patterns of both the Western Isles and Orkney as foreshadowing the medieval clan system; an ideology based around common descent, but characterized in reality by deep-rooted social inequalities.

For the inhabitants at Cnip these wider social processes would have been quite irrelevant. For all its undoubted hardships, theirs was a stable, settled and integrated community. The character of certain objects from the excavations (the lyre peg, the gaming piece, the pottery), together with the beauty and symmetry of the wheelhouse itself suggest a lifestyle far removed from that of the lower echelons of the rigidly hierarchical societies which were to emerge in the Hebrides, as elsewhere, in later times.

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