VIKING UNST PROJECT

EXCAVATIONS AT HAMAR AND THE UPPER HOUSE, UNDERHOULL: FIELD SEASON 2007

INTERIM REPORT NO. 2
(DATA STRUCTURE REPORT)

SHETLAND AMENITY TRUST
UNIVERSITY OF BRADFORD

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PART ONE: EXCAVATIONS AT HAMAR &
THE UPPER HOUSE, UNDERHOULL
PART TWO: PERSONNEL & RELATED RESEARCH
PART THREE: APPENDICES

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PART ONE

EXCAVATIONS AT HAMAR &

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1. INTRODUCTION

J.M. Bond, Z. Outram & C. Batey

The Viking Unst Project began in August 2005 with an integrated survey of key sites in the island of Unst (Bond *et al*. 2006). Using a Penmap survey as well as simple annotated plans, this initial investigation aimed to thoroughly record the sites in terms of surviving earthworks and the surrounding area. The first excavation season was carried out in July 2006 and focused on the site of Hamar under the direction of Dr. Julie Bond, with work on the site of Belmont being carried out under the direction of Stine Larsen of Roskilde Skibsmuseet.

It has been suggested that Unst may have played an important role in the expansion of the Viking/Norse populations, acting as a staging post between Norway, Britain and the lands further west (Ritchie 1996: 71; Graham-Campbell & Batey 1998: 67). Published excavations include those undertaken at Underhoull (Small 1966), Sandwick (Bigelow 1985), Framgord (RCAHMS 1946), and Norwick (Ballin Smith 2007). Small's excavations at Underhoull took place before the routine employment of sieving and sampling on archaeological excavations and so little can be said about the economy of the site or about its chronology. A major aim of the Viking Unst Project is to excavate new sites in Unst employing up-to-date methodology to address these key issues. This research will advance our understanding not only of Unst's past, but of Shetland as a whole.

The sites investigated during the 2007 excavation season were Hamar (SMR site 3471, Nat Grid Ref. HP 6463 0933), and a longhouse located adjacent to the broch at Underhoull (SMR site HP50SE13, Nat grid Ref. HP5734 0435), located in the Westing and referred to here as the Upper House, Underhoull (figure 1.1).

1.1 THE SITE OF HAMAR

The archaeological investigation carried out at Hamar prior to the 2006 excavations, can be divided into two phases: The first phase consisted of a trial excavation and a geophysical and standard archaeological survey (Stummann Hansen 1994; Bray *et al*. 1997). The second phase included a survey which took advantage of recent developments in GIS (Geographical Information System), and a full open plan excavation directed by Dr Julie Bond.

The First Phase of Investigation

The site of Hamar was first recorded by Stummann Hansen (Stummann Hansen 1995a; *ibid* 1995b; *ibid* 2000). He described it as a single (and possibly single-phase) longhouse almost 24m long, with no associated outhouses or offsets, aligned down slope. In 1994 Stummann Hansen undertook a standard survey of the site (Stummann Hansen 1995b) which identified several features, such as the entrances within the interior of the structure, part of a potential yard wall emerging from the upper end of the structure, and a circular feature interpreted as a hole used to collect the drain from the byre (Stummann Hansen 1995b; Stummann Hansen 2000: 91).

A geophysical survey of the site was also carried out by BUFAU (Birmingham University Field Archaeology Unit) using a Geoscan Research RM15 Resistivity Meter,

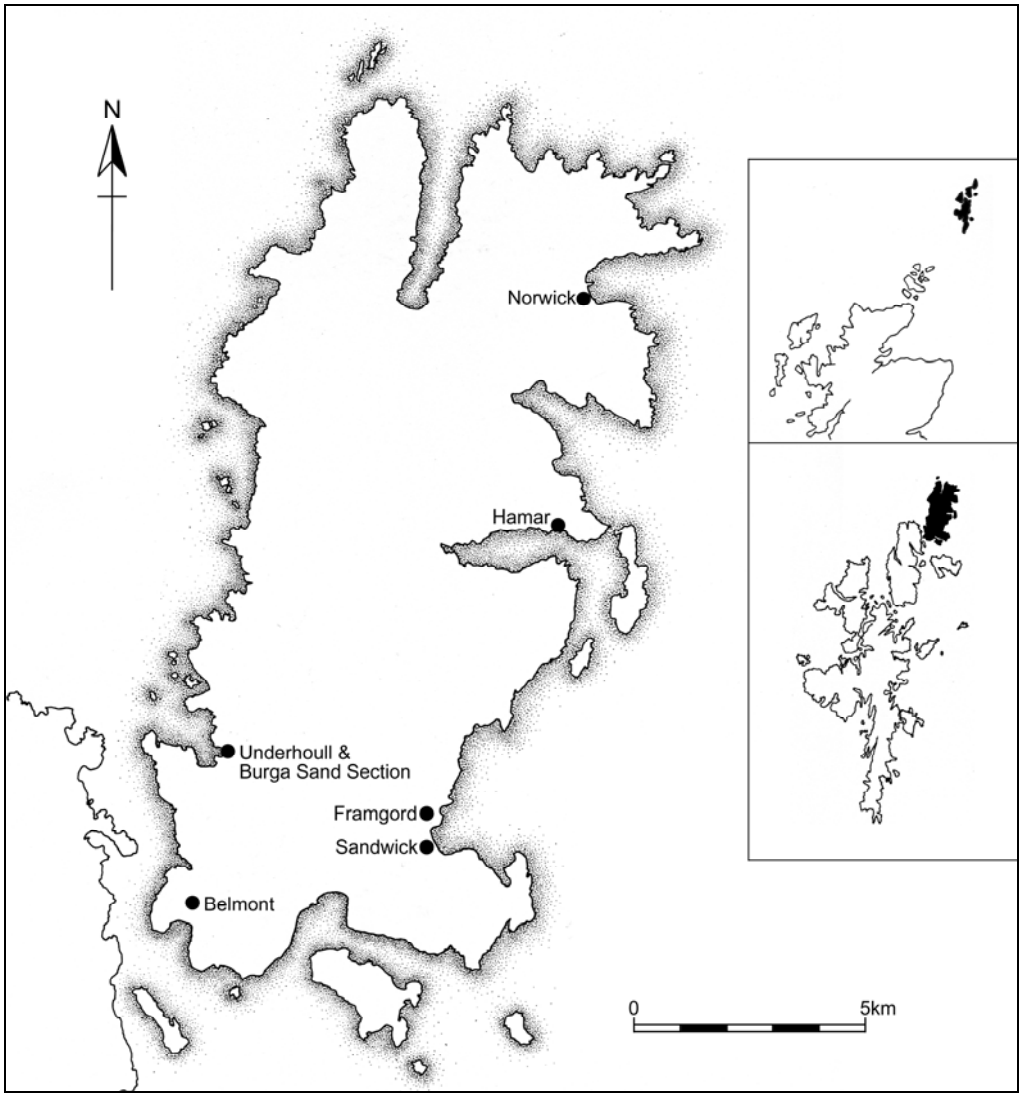


Figure 1.1: Location of the main Viking/Norse sites excavated to date in Unst

operated with a twin-probe array and 0.5m mobile probe spacing, and processed using the Geoplot program, version 2 (Geoscan Research). The survey encompassed the site itself, as well as a substantial area around the structure. The results of this survey clearly showed the position of the structure, as well as the entrances mentioned in the reports produced by Stummann Hansen (1995b). However, the potential yard wall identified in the field by Stummann Hansen (2000: Figure 5) was not recorded by the resistivity survey; it was suggested that excavation was needed to determine the nature of this feature (Bray *et al*. 1997: 7).

A trial excavation carried out by Stummann Hansen focused on a small trench, 60cm wide, which cut across the upper part of the structure. The excavations revealed a feature that could be interpreted as a bench setting running parallel to the outer wall. A floor surface was also identified at a depth of approximately 75cm below the level of the topsoil; the features excavated indicated that the structure had a sunken floor. A fragment of steatite was recovered from the floor surface, which "confirmed the dating of the structure to the Scandinavian period" (Stummann Hansen 2000: 90-91).

The Second Phase of Investigation

A second phase of archaeological investigation began with a survey carried out by Bond *et al.* (2006), which aimed to produce a Penmap survey of the site as well as the surrounding area in order to assess its position within the landscape. This demonstrated the unusual location of House 1 within the landscape, being positioned on a platform halfway up the hill and backed by an increasingly steep slope (Bond *et* al. 2006: Figure 1.1). The structure was aligned downslope with no obvious outbuildings or extensions. The trace of the potential yard wall seemed to follow the line of the platform on which the house sits. The back (upper and northern) wall of the structure appeared to be distinctively curved but only excavation would clarify if this was intentional or an effect of tumble from the original walls.

The survey did not highlight any areas of midden accumulation, nor could it identify the circular drain feature recorded by Stummann Hansen (Bond *et al*. 2006: 3). It was noted that the structure was suffering badly from rabbit damage, both internally and externally. It was suggested that excavation was necessary before any more of the valuable information held by the site was lost.

Using the data collected during this survey, a Geographical Information System (GIS) plot was produced by Maher which enhanced the site's visible features (Maher 2006: 13 and figure 2.4).

In 2003 an additional (possibly later) house was identified by Bond and Turner, higher up the slope. In the 2005 survey the original house was referred to as 'House 1', and the second structure 'House 2' (Bond *et al.* 2006).

The 2006 excavation season

The preliminary excavation of the structure during the summer of 2006 revealed a sub-rectangular building divided internally into an upper and lower room aligned roughly N-S downslope on a small terrace. A remnant of double faced walling excavated on the western wall was interpreted as part of a later addition to the structure. A fragment of a well carved steatite vessel was found within the core of this extension wall. A trench first excavated by Stummann Hansen (2000) that was positioned across the upper room

was partially re-excavated in order to view the stratigraphic sequence of deposits within this area. In addition to this, key sondages were positioned to determine the depth and complexity of archaeology within the lower room, as well as to the northern external area of the upper room. In the latter sondage a possible drainage/soakaway feature was identified.

1.2 THE SITE OF UNDERHOULL

The excavation of the Upper House at Underhoull in 2007 focused on a site adjacent to the road which was partially visible as raised turf covered foundations. Previous work in the area can be divided into two main phases. The first relates to the excavation of a structure located down slope towards the beach at Underhoull, published by Alan Small in the *Proceedings of the Society of Antiquaries of Scotland* (Small 1966), where he reported a Norse building which he assigned to the 10th century in date, overlying an earlier Iron Age settlement with a souterrain. Uphill from Small's site lies a substantial broch structure which may well have influenced both the position of the Norse building(s) in the immediate landscape as well as providing a potential quarry for building stone (Small 1966: 230-235). In more recent decades, revisions in our understanding of the dating of Small's Norse structure have been posited by Batey, Bigelow and Hansen and a Late Norse date would seem to be a better fit for both the structural form and the artefact assemblage (Graham-Campbell & Batey 1998: 181).

The structural remains investigated by Small consisted of longhouse aligned roughly E-W, being approximately 56ft (c.18m) in internal length and with a maximum central breadth of 15ft (c.4.5m). The long walls were slightly curved so that the western end of the building was almost semicircular, giving the house an "almost boat-like shape" (Small 1966: 237). The walls were constructed of drystone that was faced internally, with a turf and stone backing on the exterior face (Small 1966: 237). Several internal features were recorded within the structure, including upright stones that were interpreted as possible bench settings, two post-holes located along the central line that may have acted as supports for the roof, and a small drain (Small 1966: 238). Small also believed that the western end of the structure had been utilised as a byre due to the wide doorway (being approximately 5ft: c.1.5m), and due to the presence of rough paving; other areas of the structure were only paved in order to cover drains, with the remaining area having a beaten earth floor (Small 1966: 258).

The second phase of work at Underhoull took place in May 2007, where a team carried out a thorough survey of the Upper House site to be excavated in the summer of that year. The survey team was led by Robert Friel and produced a detailed contour survey of the feature and the surrounding area, highlighting the wall plan of the structure as well as possible field/yard boundaries.

1.3 THE RESEARCH AGENDA

The excavation of Viking/Late Norse settlements on the most northerly of the British Isles forms the centre of the much larger multi-faceted 'Viking Unst' programme, which includes historical research, place name interpretation, landscape survey, environmental history, heritage interpretation and community involvement and regeneration. Utilising recent developments in archaeological method and theory the maximum amount of

information will be gathered from these excavations in order to address the research issues outlined below.

Little is understood about rural Scandinavian settlement in Britain and much of what we do know is from sites in Orkney, such as Pool (Hunter 1990), Skaill (Buteux 1997), Birsay (Hunter 1986), Buckquoy (Ritchie 1977) and Westness (Kaland 1995). All of these sites are multiperiod settlements situated on good land and often part of a long subsequent settlement history. They are very different to many of the Unst sites, which appear to be short lived single phase settlements, often on poorer land.

One of the major questions addressed by these excavations is the reason for the apparent difference in settlement pattern in Unst, and for the subsequent abandonment of these sites in the Late Norse or medieval period. It is likely that the apparent distribution of sites has been influenced by subsequent settlement; the very best locations are probably occupied by modern farms, burying or obliterating the earlier settlement. However this does not explain the distribution of apparently abandoned farms on land not subsequently used for settlement or arable. Do these sites perhaps signal the next generation's move away from the primary Scandinavian settlements? If so, their short lifespan still needs to be explained. Norse farms in these locations may have been environmentally vulnerable; the solifluction stripes and mountain-tundra soils which can be seen on the Keen of Hamar, just 20m above the longhouse site, testify to its marginal location. It may be that several factors were involved; for example, the poorer climate of the later Norse and Medieval periods and the rise in the importance of fishing in the late Norse economy, as proposed by James Barrett and others (Barrett 2003), which may have led to the abandonment of more marginal agricultural settlements. It may be that some of the sites in upland locations are not abandoned farms, but shielings contemporary with settlements on better land which have subsequently disappeared.

Thus the main aim of the project is to understand this unusual settlement pattern by investigating its chronology, form, economic basis and landscape context, and to understand how this affected later settlement. The project will also seek to understand the date and nature of the initial Viking settlement of Unst, and how this fits into the models of Viking expansion across the North Atlantic.

1.3.1 Site development and chronology

The production of detailed chronologies for the sites investigated is essential to the interpretation of Viking settlement in Unst. The provision of an absolute chronology will facilitate the dating of the structural and depositional sequence of the sites and will provide a chronological framework for the interpretation and understanding of questions surrounding the sites' past inhabitants, economic development and cultural identity.

The dating programme devised for the Viking Unst project is based upon the integration of several techniques, focussing on the generation of research questions in the field as excavation is carried out and requiring specific sampling during the excavation process. Three scientific dating methods have been selected for use; archaeomagnetic dating of *in situ* fired structures such as hearths, accelerator radiocarbon dating of carbonised plant remains (cereal grains) from secure depositional events and surfaces and optically stimulated luminescence (OSL) dating of the last exposure to light of quartz grains within the stratigraphic sequence. It is necessary to utilise a range of dating methods as the radiocarbon calibration curve is insufficiently sensitive at crucial points to be used

as the sole dating technique. The application of these methods to targeted chronological problems has shown great potential in not only the reinforcement of dates produced by a single method but perhaps more importantly by the use of Bayesian statistics on the integrated data (Buck *et al.* 1994). The establishment of an integrated absolute chronology for the Unst sites is essential in order to provide a framework for the other findings from the excavations and interpretations of the sites' economic development and cultural identity.

The analysis of the artefacts recovered will be of enormous importance to the interpretation of the sites excavated over the course of the Viking Unst Project. The expertise of Dr. Colleen Batey will be utilised.

1.3.2 The paleoeconomy of Viking and Norse Unst

Understanding the past economic exploitation of the surrounding landscape, shore and sea (e.g. for arable agriculture, animal husbandry, fishing and other resources such as fuel) is vital to our understanding of the sustainability of these sites. Analysis of the economic data will provide information regarding the subsistence base of the sites and the reasons for their success or failure. It is anticipated that most of the known sites in Unst (with the exception of those with a high windblown sand component) are unlikely to have good bone preservation, though some is possible. If recovered, bone would provide not just information on food resources but also technology (butchery, bone working) and possibly stable isotopic analysis for dietary and environmental reconstruction. Sampling for plant remains will indicate the nature of the arable contribution to the economy and what fuel resources were utilised, as well as providing material for AMS dating.

1.3.3 Formation of the archaeological deposits

An integrated research programme examining magnetic signatures, carbonised and fossilised organic components, phosphate and soil micromorphology will enable an understanding of fuel exploitation, the identification of surfaces within structures, the formation and management of arable soils and provide evidence for deposits associated with ironworking. It is hoped to investigate the nature and extent of any yards or infield surrounding the settlements; this will be important in settling the 'farm or sheiling' question for the sites in the higher areas

1.3.4 Manufacture, trade and contact

Evidence for manufacture, such as copper alloy casting and ironworking, together with imported cultural material, will provide evidence for both production and trade, which in turn provides further insight into the status of the sites and how this might have changed over time.

1.3.5 Status and social hierarchies in Viking/Late Norse period Unst.

Issues relating to the Viking/late Norse society in Unst will be addressed, and to this end investigation of the social status of the settlements will be important.

Geophysical survey will be used, if possible, to investigate the extent of settlements, the presence of midden, yard walls, and earlier structures. The results of the 'Penmap' survey in August 2005 seemed to show that some of the assumed single-structure and single-phase sites, such as Hamar and Lund, may be much more complex, and geophysics would be an obvious means of exploring this (Bond *et al.* 2006). It is hoped

that the nature and extent of the yards or infields surrounding the settlements could be looked at in order to settle the ‘farm or shieling’ question for the sites in the higher areas.

2. THE RESEARCH EXCAVATIONS AT HAMAR AND THE UPPER HOUSE, UNDERHOULL IN 2007

J.M. Bond, Z. Outram, J.E. Cussans, D.J. Bashford & A.R.R. Mustchin

2.1 INTRODUCTION

The excavations carried out in June and July in 2007 centred on the continued excavation of the site at Hamar, with the addition of two new areas associated with House 2 as well as a possible yard boundary. Excavations also began at the site of Underhoull, investigating the structure located adjacent to the broch, and upslope from the structure excavated by Small (1966). This structure is now referred to here as the Upper House, Underhoull.

2.2 EXCAVATIONS AT HAMAR

Excavation of the site of Hamar continued in 2007. Previous work had defined the structural elements of a long house, now referred to as House 1 (Area A). A new trench (Area B) was positioned east of House 1 to investigate features interpreted as a possible yard boundary during the survey carried out by Bond *et al*. (2006). In addition to the excavation of House 1, a second structure, higher up the slope to the north west identified by Bond and Turner in 2003 and known as House 2, was investigated (Bond *et* al. 2006: 3). House 2 seemed to consist of a late, small structure overlying an earlier house with an associated yard boundary, both structures lying roughly E-W across the slope on slightly different alignments. Two trenches were positioned across the two structures, Area C across the earlier elements, and Area D across the later features.

The excavation of these new areas, in addition to the continued excavation of House 1 would allow the different assemblages to be compared, demonstrating how the area was used in terms of the structural, cultural, chronological and environmental evidence recorded.

2.2.1 HOUSE 1, AREA A (FIGURE 2.1)

Previous excavation of House 1 had concentrated on the definition of the structural form, in terms of the size, method of construction of the walls, and any modification to this form over time. The trench excavated by Stummann Hansen (2000) across the upper room was partially re-opened during the 2006 season, and so it was the aim of the 2007 season to fully re-excavate this trench, giving a section through the stratigraphy of the upper room for recording and sampling (Figure 2.2). Two features of note were identified within this trench: the first related to a layer of stone recorded at the base of the trench, context [128], that may represent either paving or the natural bedrock in this area. However, further excavation would reveal the extent of this context and therefore determine more reliably what it relates to.

The second feature of note related to an area of possibly redeposited bedrock recorded to the east of Stummann Hansen's trench, context [120], forming a ledge/bench-like feature. A similar feature was identified during the 2006 season against the western internal wall-face (context [015]), context [092] (Bond & Outram 2007: 19) and may represent two parallel bench features running along the inner wall faces of the upper room. The excavation of material outside of the upper room revealed a similar bedrock horizon that was clearly sealed by the wall elements of the structure, such as context [148], and appeared to be at the same level as the material recorded inside the structure.

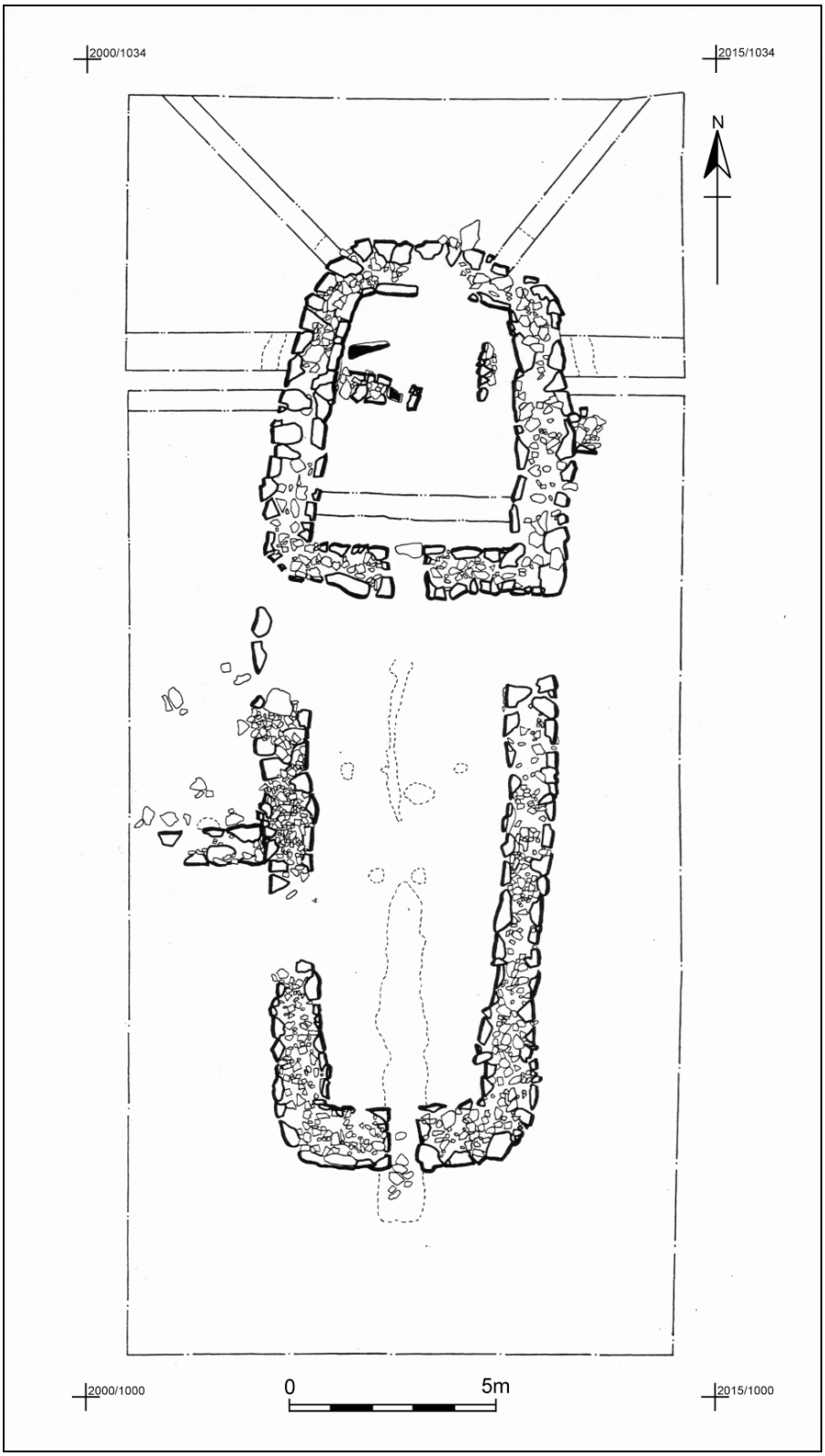


Figure 2.1: Plan of the excavated structure, House 1, at Hamar

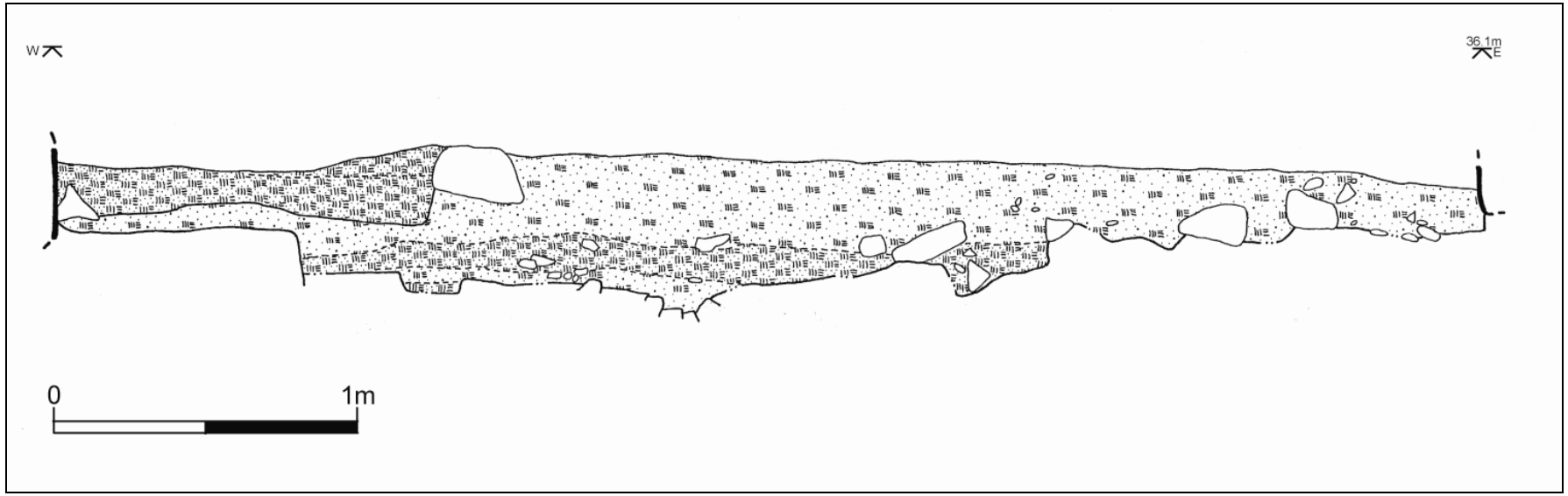


Figure 2.2: Section through the upper room of House 1 at Hamar

Further excavation would be required to determine the function of features [092] and [120] as well as defining the relationship between the redeposited bedrock material recorded on the inside and outside of the upper room.

The east-west baulk running across the centre of the upper room was removed during the 2007 season to fully reveal the outer wall of the structure as well as the deposits located within this room. The large tumbled stones which filled the northern part of upper room were also removed (contexts [007] and [061]), revealing a set of later features including a fragment of double-faced wall running across the upper part of the room from the west wall (context [243]/[244]), a secondary wall lining or base of a platform (context [279]) running N-S parallel to the east wall (context [016]), and a large stone setting in the centre of the room, context [284], perhaps for a single large post. These features seem to form a small inner room and are stratigraphically later than the ashy floor layers seen in Stummann Hansen's trench (contexts [089] and [090]). Extensive rabbit damage was seen in these late contexts and also in the upper part of the fill sealed by them, which overlies the primary deposits. Excavation next season will allow access to and sampling of the primary floor surfaces within the upper room.

Within the northwest corner of the upper room a small area of burning was recorded (context [251]) that was partially sealed by a patch of black ash (context [272]). This feature was interpreted as a possible corner hearth, a feature frequently noted within late Norse structures, although no other structural evidence of such a feature was noted (Graham-Campbell & Batey 1998: 185). The use of this feature resulted in the reddening of the stones adjacent to the hearth in the wall faces [013] and [015] due to their exposure to the heat. Two other patches of ash were recorded within the upper room, located approximately halfway down the length of the room: context [245] was situated adjacent to the inner wall face [016], while context [246] was adjacent to the wall face [015]. Both contexts appear to mirror each other in their locations, possibly relating to the remains of a later floor surface.

Several artefacts were recovered from the deposits within the upper room, most noticeably an iron object (SF276) from the orange-brown deposit context [267], located within the area defined by the linear features. In addition to this, an iron rove from a clench nail was recovered from context [087] (SF902) and a schist bakeplate fragment (SF905) from context [323].

The Cross wall – primary or secondary element?

It was noted during the 2006 excavation season that the wall dividing the upper and lower room may have been rebuilt at some stage. This point was investigated further during the 2007 season. The cross wall was made up of a number of structural elements, defined by contexts [017], [069], [071], [072], [073], [248], [249] and [250]. The nature of this wall was assessed through excavation of the deposits both inside and outside of the doorway in order to determine how they related to the cross wall.

The cross wall itself was investigated through the removal of a small section of [069] to determine if this section of walling represented a rebuilding event. However, it was clear that the stones had in fact slipped from their original position and therefore did not relate to a phase of rebuilding. This was further supported by the stratigraphic relationship of [069] to a red brown deposit (context [126]), which butted the lower

course of the wall; this demonstrated that the material had accumulated against the wall after the stones had become dislodged from their original position.

To the west of context [126], rabbit-disturbed deposits were removed which revealed a cut in the bedrock within which element of the cross wall were set (contexts [017] and [073]). The fact that the structure was partially set into the bedrock was noted during the 2006 season following the re-excavation of the trial trench across the upper room (Bond & Outram 2007: 20), but it was now clear that the walls in this area of the excavation were also set into the bedrock, possibly acting as the foundation course for the structure. However, this does not prove that the cross wall in this area was part of the original structure: excavation of the rubble (context [022]) and the red-brown deposit [126] to the south of the entrance into the upper room suggested that there was a greater depth to the archaeology in this area than previously thought. The continued excavation of this area in the following season will resolve this issue, possibly answering the question of whether the cross wall relates to a primary or secondary phase of occupation.

Lower Room

The excavation of the lower room within House 1 had previously focused on the removal of the turf to reveal a homogenous cultural layer, context [008]. A small sondage excavated towards the southern end of the structure concluded that the material infilling this room was largely sterile but revealed an intriguing feature that may have related to a rock-cut gully or the natural bedrock. Within the northern half of the lower room an orange gravel-based material was recorded (context [030]), which contained a fragment of a steatite vessel.

It was the aim of the 2007 excavation season to fully excavate this area but also to use a number of geoarchaeological and environmental techniques to maximise the information available from the deposits. The combination of this evidence would provide information relating to the function and activities carried out within this room. A total of five sondages (numbered 6 to 10) were positioned throughout the lower room of House 1, though context [008], with the aim of collecting samples from the section edges of the trenches as well as from the remaining baulks between the sondages (figure 2.3): sondages 1-5 relate to the gully around the house, discussed below. Samples were also collected from the northern half of the lower room, following the removal of context [030], which revealed a yellow-brown material, context [165].

Following the collection of the different samples from this material the baulks between the sondages (contexts [237], [238], [239], and [240]) were carefully removed, but it was noted that only four fragments of steatite were recovered from these contexts: SF268, SF271, SF272 and SF275. The removal of these contexts revealed a lighter yellow-brown material, context [276] that sealed the bedrock. Within the northern half of the lower room, context [165] was removed to reveal a lighter yellow-brown deposit, context [324], that was equivalent to [276] within the southern half of the lower room.

A number of important features within the lower room were revealed following the removal of contexts [165] and [237]-[240]. An area of heat reddened bedrock was recorded approximately halfway along the length of the lower room, represented by context [180]. The area of burning was only associated with a very thin layer of burnt material located within the recesses of the bedrock and contained small fragments of charcoal flecking. It was concluded that this feature represented a hearth within the

Figure 2.3: Location of sondages 6 to 10 (left to right) within the lower room of House 1 at Hamar that were sampled for the geoarchaeological and environmental analysis

centre of the room, the deposits of which had been removed after it had gone out of use. The presence of a hearth within the lower room is one of the factors which suggested that it was used as a living space before changing function at some stage, as indicated by the stripping of the room of the deposits and floor surfaces that would have accompanied such a feature.

Three shallow sub-circular negative features were recorded, cut through the bedrock and being infilled with silty material. The features possibly relate to a series of postholes or post settings. The largest of these was located adjacent to the western wall (context [031]), and was 20 by 15 cm, and c.2 cm deep: the cut for this feature, context [290] was sealed by a silty brown infill, context [289]. Two other similar features were recorded parallel to the eastern wall, but were only c.15cm in size.

Within the northern half of the lower room a narrow channel was identified running along the centre towards the upper room, being in line with the doorway defined by orthostats [071] and [072]. The channel cut through the underlying bedrock (context [333]) and was filled with a silty brown material that contained a concentration of charcoal, context [328]. It was not possible to define the origins of this channel, as the northern area was obscured by the rubble (context [022]) and the red-brown deposit (context [126]) in front of the entrance in to the upper room. This will be resolved in the following season of excavation.

The final feature of note related to a large channel running down the centre of the lower room to an area outside of the structure. The channel was wider than the lower doorway and both channel and fill appeared to be sealed by the end walls, contexts [037], [038], [039] and [040], suggesting that the walls had been rebuilt and the house shortened. The channel was filled with large rubble (context [320]) as well as ashy-silt deposits, including contexts [300], [301], [306], [342], and [287]. Two small sondages were excavated through the infill of this feature, sondages 11 and 12, with the aim of collecting a number of samples through the deposits, including whole earth samples, samples for palaeoentomology and soil micromorphology, before the total excavation of the feature. A number of artefacts were recovered from the deposits infilling this feature, including a fragment of pumice (SF918), a schist whetstone (SF919), and a fragment of worked steatite (SF927).

The deposits within the southern doorway were half-sectioned. This demonstrated that the doorway had been filled, or possibly blocked, with very tightly packed rubble (contexts [292/326]) late in the structure's history. Underneath this layer of rubble was a yellow-brown deposit containing some charcoal and ash (context [331]), which in turn sealed stone flags (context [338]) that were interpreted as possible paving. Paving was also identified at this level outside of the southern doorway, context [291], possibly relating to a contemporary feature. Both of the layers of paving sealed an orange-brown clay layer, context [215], which filled a hollow cut into the bedrock (context [339]) that may represent the southern extreme of the channel feature. It has been suggested that the paving was used to overlay the channel feature to allow water to drain away from the interior. The artefacts of note to be recovered from the deposits within the area of the southern doorway included a worked fragment of steatite, recovered from the ash layer [331], SF931 that was broken across a central perforation, and two fragments of steatite from context [215] (SF236 and SF297), see chapter 3.2.2 below.

At the base of the channel feature within the interior of the structure, an ashy deposit was uncovered (context [309]), which sealed several heat-cracked slabs, context [329]. This feature was interpreted as a possible hearth and was associated with a concentration of ash and charcoal, context [347], as well as a small post-hole (contexts [336] and [337]). The fragmented remains of a number of schist and steatite bakeplates and vessels were recovered from the material associated with the hearth, including SF1000 which appeared to have charred residues adhering to the surface. A possible parallel for the channel feature may be found at the site of Skaill in Orkney, from House 3 (Site 2). A long house of similar design to House 1 at Hamar was found which contained a long hearth within the southern end of the lower room. The feature appears to be located in a similar position to the example from Hamar, and was slightly sunken with a stone kerb (Edwards 1997: 74; *ibid*: figure 7.5; *ibid*: plate 7.4). The sites differ in the fact that House 1 at Hamar utilised the natural bedrock as floor surfaces, whereas the feature from House 3 at Skaill was set into the underlying deposits.

A micro-contour survey of the lower room at Hamar was carried out during the 2007 season, as it has been suggested from the excavation of the site of Borg in Lofoten, northern Norway, that the contour of a floor surface could provide information for the function of the room: a sloping floor would be advantageous for a byre, allowing material to drain away from the structure down-slope. This was in contrast to living areas where more horizontal floors would be desired (Arrhenius & Freij 2003: 82). Preliminary observations of the survey of the channel feature within House 1 have indicated that the channel could not be used as a drain as any material would not be able to run out of the southern end of the channel due to a rise in the underlying bedrock in this area. Further analysis of the samples collected from this feature in conjunction with the micro-contour survey may help resolve the issue of its function.

Annexe

At the end of the 2006 excavation season, the remnants of a wall were identified to the west of House 1, context [079] and [009], representing the remains of an annexe that was added to the main structure at a later date. This area was investigated further with the aim of reaching floor deposits that would provide information regarding the function and date of the activity in this area. The assessment of this area began by first removing context [080], a layer of material and rubble butting the walls defined by contexts [032] and [079]. This revealed an area of stones, context [143], which in turned sealed a dark brown silty deposit (context [144]). The darker material appeared to be more confined to the eastern end of the trench against wall [032], fading out along the length of wall [079]. Context [144] sealed a yellow-brown deposit, context [247] that appeared to be confined to the same area as the preceding context, being more concentrated on the eastern end of the trench. A similar context to [247] was recorded within the western end of the trench, context [253], differing as the latter context contained more stones and pebbles.

It was at this level of the excavation within the area of the annexe that a number of large, flat schist stones (context [254]) that may represent the remains of a flagged floor surface were noted. The removal of context [247] revealed a charcoal flecked layer, context [307]. A few burnt stones were uncovered adjacent to wall [079], and it was noted that the face of wall [079] was reddened by exposure to heat. An area of burning was recorded adjacent to this wall, represented by a deposit of black ash, context [346],

which sealed an area of fired clay, context [345]. The fired clay will be sampled for archaeomagnetic dating next season.

Upslope areas external to House 1: Sondages 1 to 5
A series of sondages were excavated around the northern external area of House 1 in order to trace the full extent of the possible drainage gully first identified in the 2006 season. A total of five sondages were investigated within this area, their positions being shown on figure 2.1. It was noted that the gully extended around the northern arc of the structure, though it could not be traced far along the western wall due to extensive rabbit damage, and on the eastern side of the building it appears to fade away approximately half-way down the length of the upper room.

Features of interest within the sondages included small patches of anaerobically preserved wood and midden (context [139]) from Sondage 2, as well as the evidence for a recut event within Sondage 4 (figure 2.4). The complicated sequence of deposits within Sondage 4 was investigated further with the collection of samples for soil micromorphology, focusing on the primary and secondary fills of the gully (contexts [230] and [140] respectively). The final feature of note related to the relationship of the natural bedrock and the outer wall face of the upper room, as recorded in Sondage 5: the lower course of the wall face [012] was found to seal deposits that in turn sealed the fill of the gully within this area. This indicates that the construction of the wall in this area was secondary to the construction of the gully. Further excavation is required to determine if this is the true order of events.

2.2.2 HOUSE 1, AREA B
A feature noted during the survey carried out by Bond *et al*. (2006) was interpreted as a possible boundary to a yard area to the east of House 1 (Bond *et al*. 2006: 3). A trench was positioned over the proposed area to investigate this, located across the internal and external daces of the slope. Following the removal of the turf, context [152], a dark yellow-brown clay-based layer was recorded on the internal (context [153]) and external (context [159]) slopes of the feature. A fragment of worked stone was recovered from context [153], and was the only possible artefact recovered from Area B. On the internal face, context [153] directly sealed the natural bedrock, context [233]/[256]. However, on the external face context [159] sealed a dark yellow deposit containing charcoal flecking, context [205], which in turn sealed the natural bedrock. The presence of context [205] may indicate that the feature represents an anthropogenic feature but the remains of this feature were subtle in character. It was clear once the bedrock was exposed in this area that the bedrock on the internal 'yard' area was more degraded and even that the external area, but it was not clear if this related to an anthropogenic or natural event.

2.2.3 HOUSE 2, AREA C (Figure 2.5)
Although ephemeral on the surface, removal of the turf (context [069]) quickly revealed substantial stone-built walls defining the long axis of a structure measuring some 3.2m across the interior. Defined by contexts [171] to[173], and [175] to [177], the walls measured approximately 1.10m across and comprised faced outer stonework encasing cores of large irregular rubble. Five consecutive stratigraphic layers were recorded internally (contexts [174], [234], [214], [261], and [305]) the upper levels of which contained apparent collapse material from the walls.

Internally, the upper fills of the structure comprised a silty-clay topsoil (context [174]) overlying a gravelly material at the NW end (context [234]). This was interpreted as a spill of the wall core (same as context [172]) into the structure following a suspected collapse or robbing event. The uppermost course of internal wall face [173] was discontinuous at this point. The subsequent layers (contexts [214], [261], and [305]) were progressively more anthropogenic in nature, producing increasing levels of carbon flecking and in the case of context [305], large quantities of peat ash and a substantial amount of charred cereal grains. A sorted bulk sample of context [261] has also produced a sizeable fragment of deciduous wood charcoal.

Notable small finds from [214] included worked pumice (SF294), steatite (SF225, SF242, SF246, SF247, SF253, & SF260), prehistoric pot fragments (SF219, SF220, SF 221, SF230, & SF231), ferrous material (SF283), and a schist whetstone (SF261). Context [261] produced similar finds, including steatite (SF295 & SF298) and a whetstone fragment (SF928), whilst corroded iron (Fe) has been recovered from a processed bulk sample of context [305]. Steatite from all three contexts included square vessel fragments, discussed in more detail in section 3.2.2. Such finds from these lower layers, likely associated with the building's abandonment or post-abandonment phase, are indicative of Late Norse material culture.

Externally, a 'yard' area to the NW of the structure produced six successive deposits, comprising topsoil [170] and successive mixed gravelly material [236] overlying anthropogenic layers displaying varying degrees of carbon flecking (contexts [252], [255], [316], and [317]). At the base of a sondage in this area, context [317] has been initially interpreted as either an amended soil or midden. Soil micromorphological sampling of this layer was carried out to resolve its character. Although contexts [170], [236], and [252] were found to butt outer wall face [171], the physical relationships of the lower levels and the 'longhouse' structure have yet to be determined. Small finds from context [170] included slag (SF208) and post-medieval pot (SF237), whilst context [236] produced slag (SF278), stone (SF279), and ferrous material (SF251, SF277). No small finds were found in the lower layers.

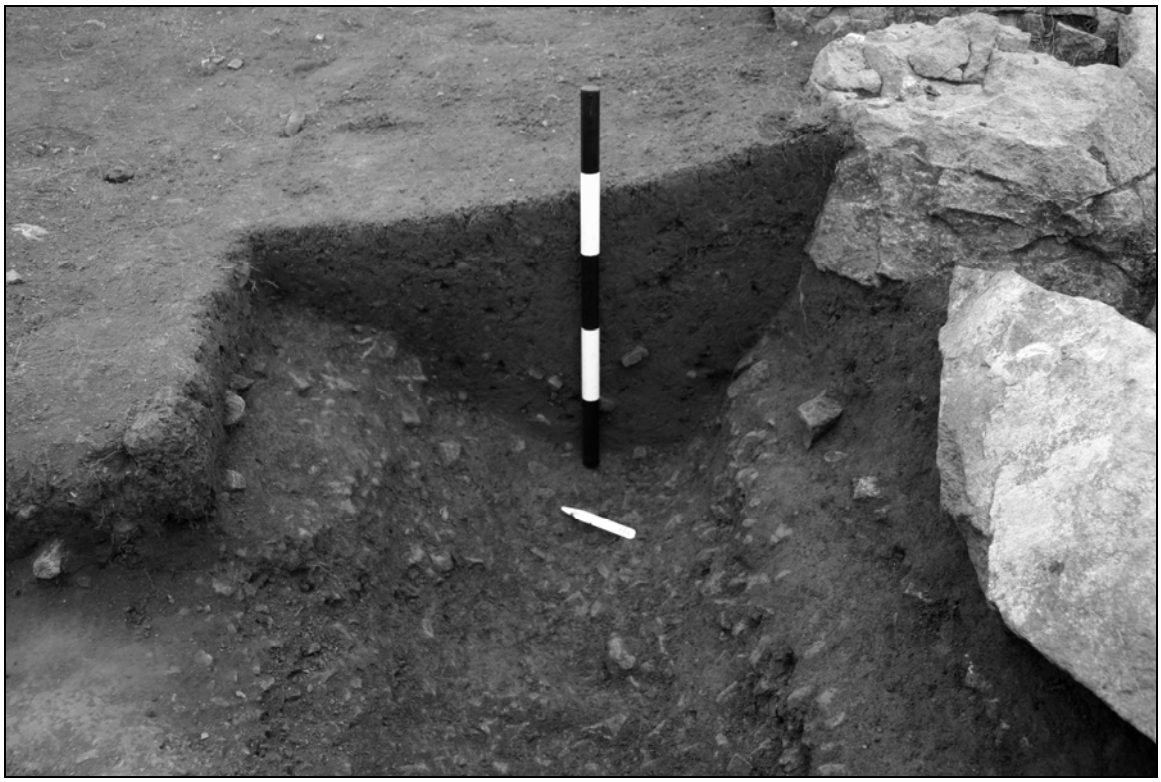
To the SE of the structure excavation revealed a potential wall face [262] abutting outer wall face [177]. Running at approximately 90° to the main structure the stonework of [262] was smaller than that of the main wall and was butted on each side by large irregular 'rubble' (contexts [263] and [264]). Due to the small trench size it is unclear at this stage, which if either of these rubble layers constitutes wall-core material.

2.2.4 HOUSE 2, AREA D (Figure 2.6)

It was noted following the removal of the turf in this area, that the walling uncovered in Area D followed a separate alignment to that of Area C and was constructed differently. The core material was of a similar size to the facing stones and the approximate width of the walls was only 80cm in places.

Time constraints limited excavation of this area and few deposits were defined outside the structure. On the NW side, the turf (context [224]) overlaid two topsoil-like deposits (contexts [218] & [259]) within the 'infield' or 'yard' area mentioned above (see Area C). The silty-clay layer [259] produced a single corroded ferrous small find (SF429). To the SE of external wall face [223], 'collapse' rubble (context [198]) was found directly beneath the turf and yielded no finds of note.

(a)



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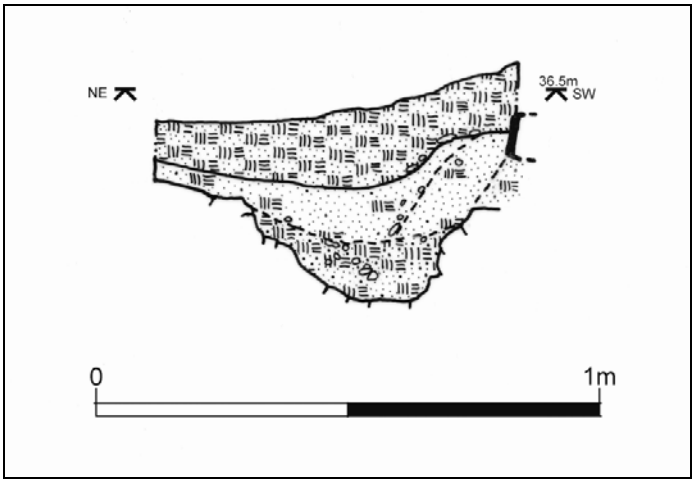

Figure 2.4: (a) Photo and (b) section of Sondage 4 at Hamar showing the relationship of the soakaway/gully feature to the outer wall of House 1 and the later recut of the gully.

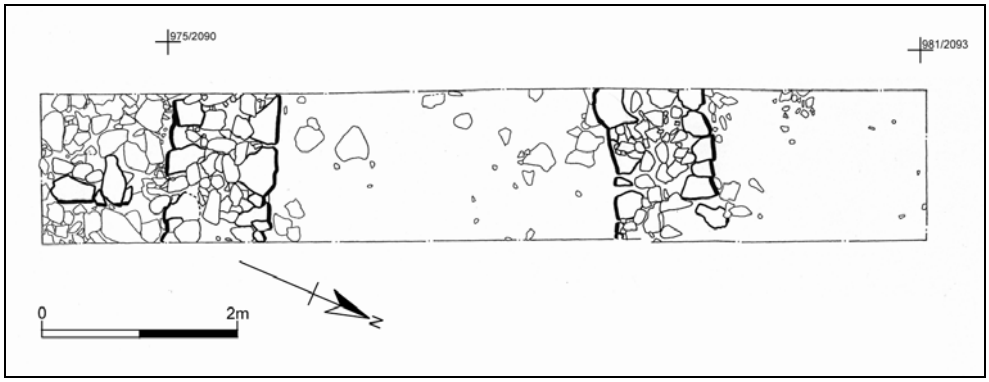

Figure 2.5: Plan of the excavated structure within Area C at Hamar

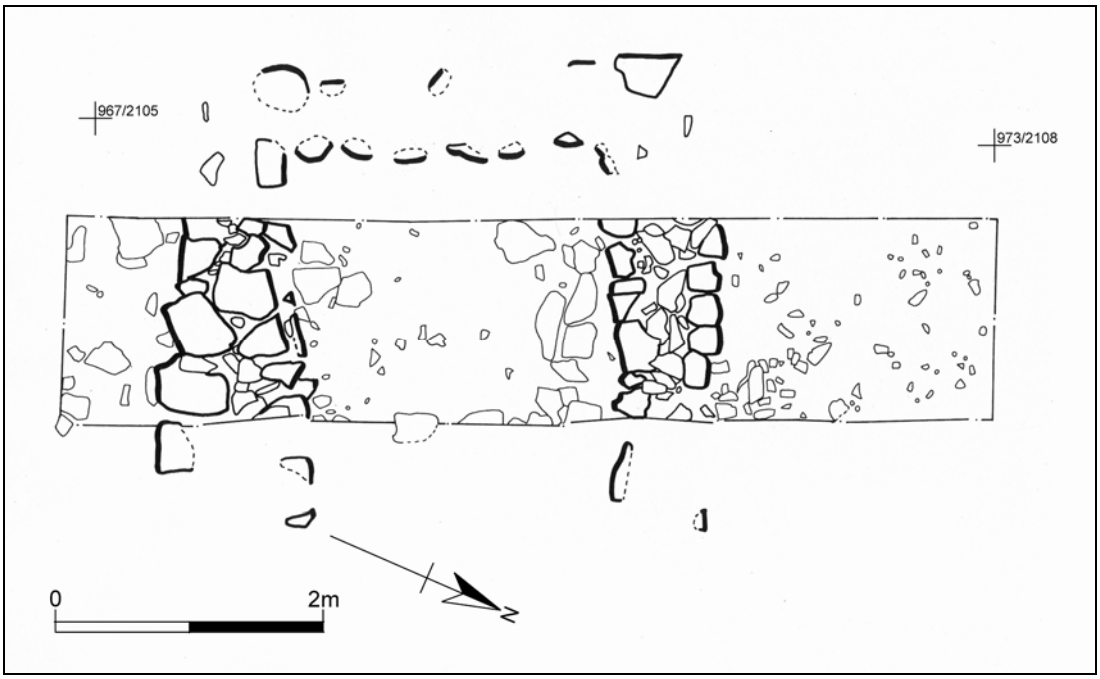

Figure 2.6: Plan of the excavated deposits within Area D at Hamar

Inside the structure, three consecutive layers (contexts [184], [260], & [297]) were associated with the building's post-abandonment phase. Collapsed wall stone was identified close to the North and South wall faces (contexts [227] & [228] respectively), initially recorded as lying within contexts [184] and [260]. Although excavation of the earliest deposit ([297]) produced no small finds, the uppermost internal contexts both yielded post-medieval pottery (SF234, SF243, SF254, SF293, SF299 & SF427), whilst context [184] also produced worked stone (SF244) and modern glass (SF428). A stone pot-lid was found within the core material of the NW wall (context [220]). No small finds from Area D suggested an abandonment date earlier than the post-medieval period.

2.2.5 CONCLUSIONS AND FUTURE WORK AT HAMAR

The site of Hamar has been described in the past as one of the best preserved Viking long houses in the region. The excavations carried out as part of the Viking Unst Project in the 2006 and 2007 seasons have revealed that although substantial portions of the structure survive, the extensive rabbit damage in the area has severely disturbed many of the deposits associated with the structure, as well as the structure itself. This disturbance will have resulted in damage to the archaeological evidence recorded. However, several aspects of the structure were identified from the excavation: the soakaway located on the upslope of the structure is an important feature that was investigated further during the 2007 season with the aim of collecting environmental samples.

The evidence recorded from the upper room of the structure has further demonstrated the use and reuse of this area, which have included the identification of a second possible bench-like feature and late structural elements within the centre of the room.

Within the lower area of the structure it was noted that the deposits were largely sterile, and so were extensively sampled for geoarchaeological assessment. The channel feature located within the lower room poses several questions as to its function and changing function of the room. A preliminary assessment of the environmental samples has indicated the presence of charred barley grains from the infill of this feature, which should enable radiocarbon dating. The excavations so far demonstrate that there were two, late Norse houses at Hamar, and that House 1 had a much longer life than previously suspected.

2.3 EXCAVATIONS AT THE UPPER HOUSE, UNDERHOULL (Figure 2.7)

As part of the Viking Unst Project, excavation began this year at the supposed Norse house site close to the Broch of Underhoull and north east of the site excavated by Small (1966) (NMRS HP50SE 32). The structure excavated during the 2007 season is from here referred to as the Upper House, Underhoull to differentiate it from Small's 1966 excavations (Small, 1966). A topographic survey was undertaken by Robert Friel in May 2007 to more clearly define the house and other features in the vicinity. Two trenches, Areas A and B, were opened to assess the surviving archaeology, in preparation for the full excavation planned for 2008. One trench was positioned across the top of the structure at its western end (Trench A: 12m x 6m) and a second across the middle of the structure (Trench B: 16m x 6m) encompassing what appeared to be an annexe or extension to the house.

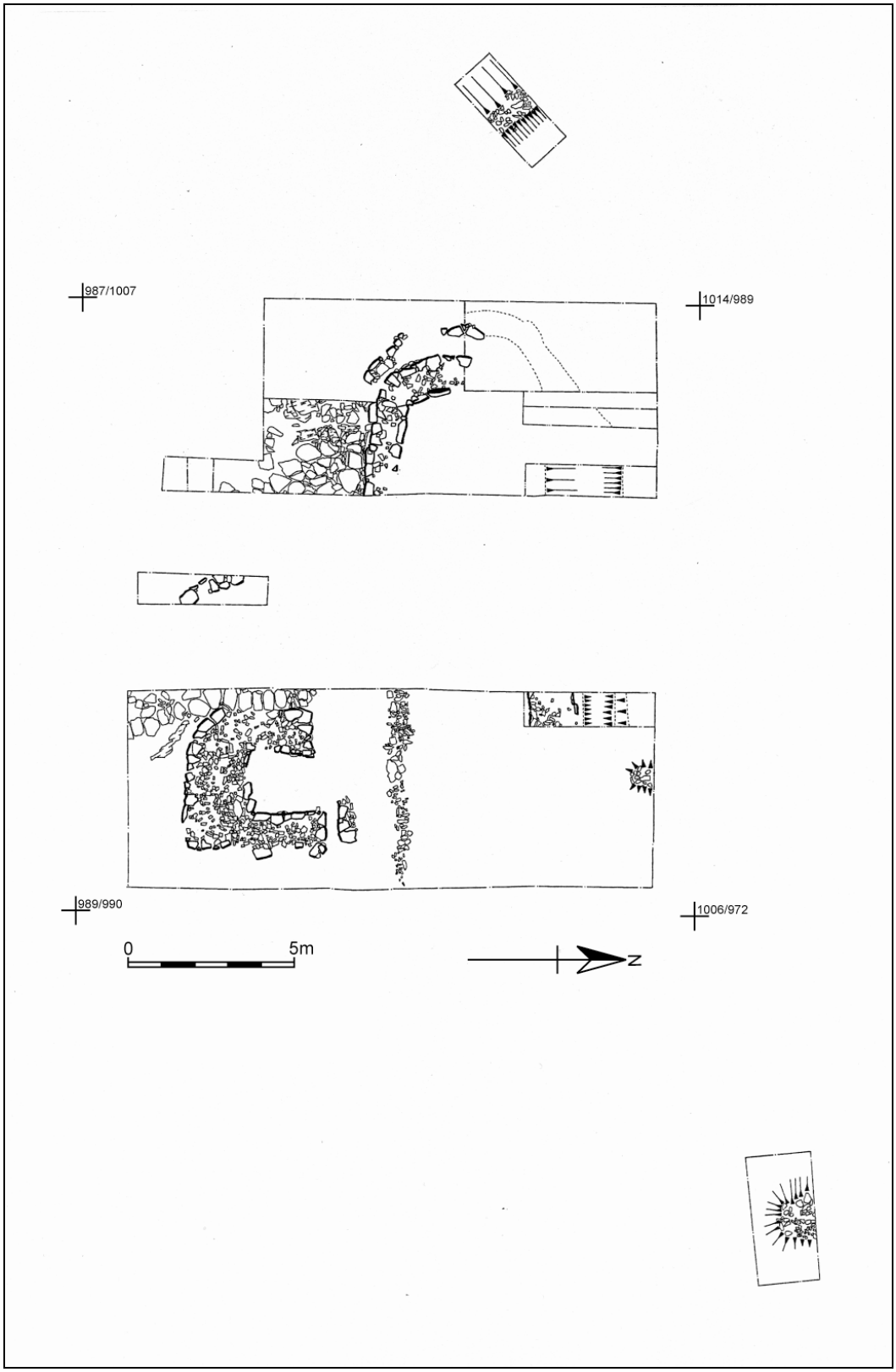

Figure 2.7: Plan of the excavated structure of the Upper House, Underhoull

2.3.1 AREA A

On removal of the turf and topsoil within Area A, a clearance cairn [009] was uncovered overlaying the southern arc of the top of the house. The outer wall face [020] was formed of coursed stone standing to a height of 25-50cm. The inner face [044] was also formed of coursed stone with the addition of several orthostats at the structures western end. A thin black peaty context [015] butting the outer face [020] and a similar context [019] between the wall faces were possibly the remains of a turf component to the main wall. The remnants of a second wall [100] shadowed the curve of the structure's southern arc of walling adjacent to its outer face.

A spread of gravel [007] overlay the mound forming the possible northern wall line. Only a small segment of this area was excavated revealing little in the way of coursed stone. It is possible that part of the wall may have been robbed out leaving only a dark brown peaty soil [073] and a firm black context [092] that may be the remains of a turf component to the wall similar to the deposits [015] and [019] found in the southern arc of walling. Following the curve of the structure on its northern side ran a shallow gully [064] filled with small rubble [061] and [062]. [061] sealed the lower fill [063] a greasy black deposit. A continuation of this gully [065] appeared adjacent to the wall line in Area B.

Very little of the structure's internal fill was excavated this season. Beneath the topsoil several thin peaty layers [018] [021] [045] were removed, revealing the top of the occupation deposit [070]. This layer produced a large quantity of steatite vessel fragments and a single steatite line sinker (SF544). Work on the interior was stopped at this point in order to allow for a full excavation of the floor deposits during the 2008 season.

To the south of the main structure a sondage was cut through thick peat deposits [025] and [026] that were found to seal an area of large flagged stone [029] (figure 2.8). On extension of the sondage the flags were found to butt wall [020] and partially overlay the natural bedrock. To the south of and sealed by flagging [029] was a further peat layer [041] which contained a substantial piece of waterlogged wood (SF469). A further smaller sondage was excavated here revealing a possibly naturally formed gully [060] cut into the bedrock. The gully ran from north to south and contained a series of dark silty fills [082], [081] and [055] sealed by peat [041]. The peat and gully fill sequence was extensively sampled for soil micromorphology, pollen, tephra, palaeoentomology and plant macrofossils.

At the northern edge of Area A, a wide spread layer of fuel ash slag [003] was revealed sealed under approximately 15cm of peat deposits [001] [004] and [002]. The extent of this deposit is not yet known as it extended under the trench edges. This overlay a large area of burning [093] still containing a considerable amount of slag; archaeomagnetic dating samples were taken from this deposit.

2.3.2 AREA B

At the southern end of the trench removal of the topsoil revealed a large spread of small rubble [016]. This contained a number of steatite vessel fragments, a large fragment of a loom weight (SF130) with a cross mark carved on one surface and the remains of a cross hatched pattern on the opposing surface. In addition to this, an unusual fragment

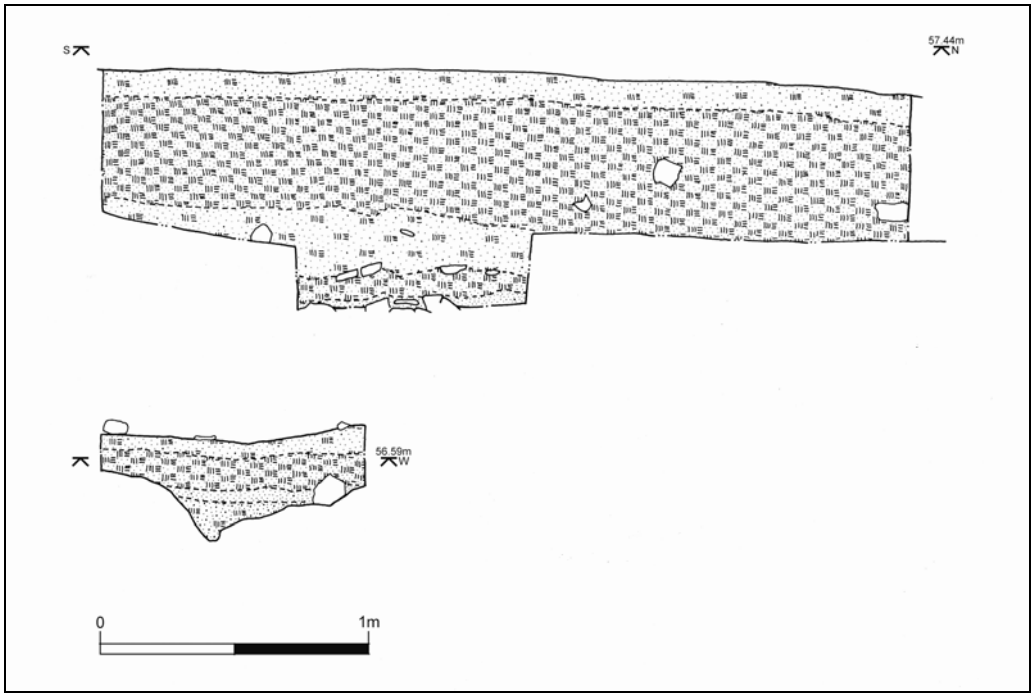

Figure 2.8: Section through the peat deposits overlying paving within Area A, the Upper House, Underhoull

of steatite was recovered that has been described as a possible depiction of a human. This rubble sealed a small thick walled annexe to the main structure. The outer [039] and inner [049] wall faces were formed of coursed stone of no more than three courses at the highest point. The rubble core of the wall [059] was similar in nature to [016]. Together these features formed a small U-shaped structure with walls over a metre wide with a small central cell (1.9 x 1.9m). The fill of this cell [053] was left for excavation in the 2008 season. A small single faced wall [078] was found running parallel to the north of the annexe's eastern wall. Its relationship to the main structure is not yet clear but it does appear to form a small drain or slot running out of the annexe. To the south beneath rubble [016] and a shallow peaty soil [050] was an area of flagging [038] butting the annexes southern and western walls. In common with flagging [029] in Area A, [038] partially sealed the natural bedrock. Where flagging [038] butts the annexe's western wall it appears to form a path leading towards the main structure; further excavation is needed to clarify this. Two imported schist whetstones (SF129, SF415) were discovered at either end of the possible path with a third example (SF169) found within the annexe itself.

A line of small rubble [076] [091] runs east to west in line with the southern wall's inner face [044] in Area A, but no more substantial evidence of the wall was visible at this point. A large slab [077] placed centrally within this line of stones and opposite the interior of the annexe may have been the remains of a threshold stone. Within the interior of the main structure upper fill [013] was removed onto a possible floor surface [074]. Again excavation was stopped at this point to be continued during the 2008 season. In the top of this layer and on the building's central axis a possible post shadow was identified. Adjacent to this post shadow a loom weight (SF480) was discovered with a cross mark carved on one surface.

The northern end of the trench revealed the possible beginnings of a second annexe or yard wall [098] made of turf and stone. The continuation of the stone filled gully from Area A appears here as cut [065]. The rubble fill from Area A [061] and [062] continues in Area B as [017] sealing a dark silty fill [072] which in turn seals cut [065]. In the northwest corner of Area B a sondage was excavated to establish the relationship of this gully with the northern wall of the structure and to establish the extent of survival of this wall. This revealed [065] to be a secondary recut of the gully cut through several peaty soils [084] and [095]. These sealed a black peaty context [094] the primary fill of the original gully [096] cut into the natural bedrock (figure 2.9). The sondage also revealed the lower course of the north wall of the structure consisting of its inner [079] and outer [083] faces and rubble core [011].

2.3.3 AREAS C, D AND E

Three further smaller trenches were excavated this season. The first was placed over the terminal of a field boundary wall that ran to the northeast of the structure (Area C 2m x 4m). Removal of the topsoil revealed a boundary terminal constructed from turf [069] and stone [032]. This showed a clear difference between the light brown soil [067] to the west of the boundary and the gravel layer [030] to the east. A second trench was placed across another field boundary that dog-legged around the top of the structure to the west (Area D 1.5m x 3m). As in Area C this boundary was formed of stone [036] and turf [068]. The third trench (Area E 1m x 4m) was placed between the two main trenches at the southern edge of the site to ascertain whether the flagging [029] in Area

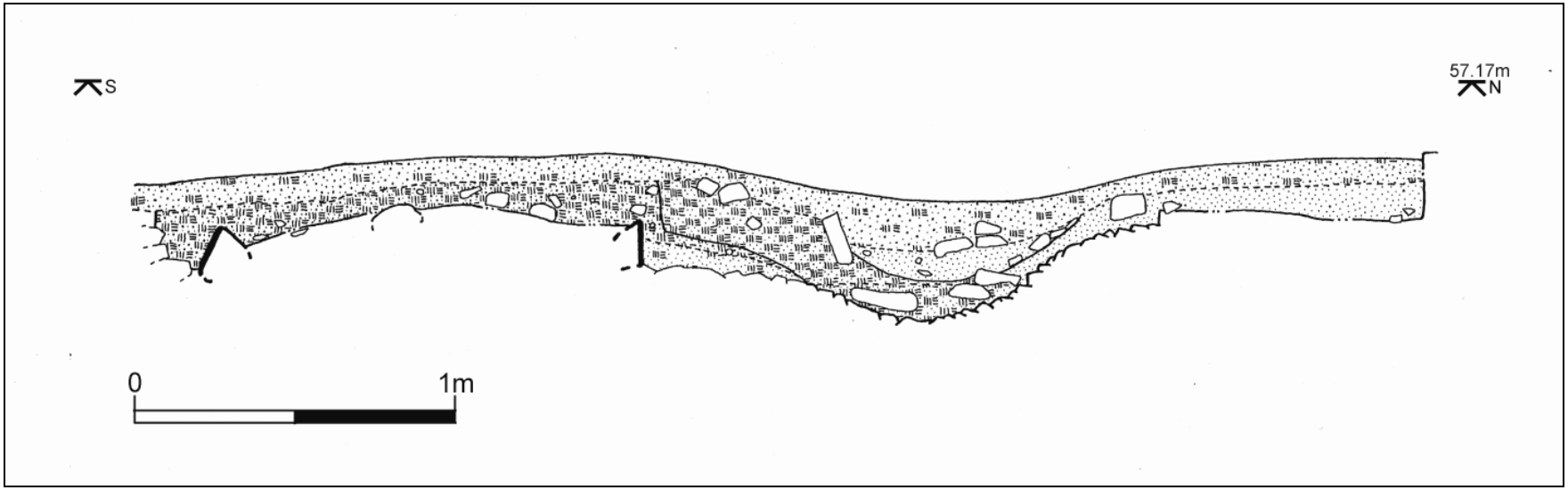

Figure 2.9: Section through the gully and north wall of the structure, the Upper House, Underhoull

A and [038] in Area B were in fact part of the same feature. No flagging was found within this Area E but [085] formed the remnants of a possible wall line.

2.3.4 Other possible structural remains, east of the Upper House, Underhoull

Approximately 50 metres to the east of the main structure the ephemeral remains of a second house was identified. Unlike the Upper House at Underhoull that runs from east to west this structure is oriented north to south running down slope. Although in a denuded state the structure appears as several low banks with a later clearance cairn situated at the top of the structure, as in Area A. A noticeable rectangular depression on its eastern side forms a possible annexe to the main structure. There are two square platforms running adjacent to the western wall with a smaller example set to the east of the possible annexe.

3. SUMMARY OF FINDS FROM THE 2007 SEASON

J.M. Bond, C. Batey, D.J. Bashford, L.D. Brown, J.G. McDonnell, N.D. Melton, Z. Outram, & W.S. Marshall

3.1 INTRODUCTION & OVERVIEW

J.M. Bond & Z. Outram

In total, 295 small finds were recorded from the site of Hamar, and 325 small finds from the Upper House, Underhoull. Here, the term 'small find' refers to the single unique identifier attributed to an individual artefact, or in some cases groups of an artefact type found together, for example a group of pottery sherds. The exact location of each 'small find' is tagged and then three-dimensionally recorded using a total station linked to the 'Penmap' survey package. This provides the potential for the analysis of the spatial distribution of the assemblage. A programme of dry sieving deposits was also implemented at the site of Hamar in order to maximise the information available from the site. The reports presented here represent the preliminary assessment of the material recovered from the two sites.

The artefacts recovered from the site of Hamar demonstrated a much wider range of items than were recorded during the 2006 season, with examples of both prehistoric and post-medieval pottery, steatite vessels, schist bake plates, hones, a number of objects of iron and copper alloy, as well as a possible bone bead.

The assemblage of artefacts recovered from the Upper House at Underhoull was dominated by the presence of a cinder fuel ash slag, recovered from the north-eastern area of the excavations. In addition to the large quantity of slag, a substantial assemblage of worked steatite and worked stone was recovered, as well as a number of fragments of prehistoric pottery. This large assemblage will allow the material collected from both Hamar and the Upper House at Underhoull to be compared, as well as allowing the material to be compared to the assemblage recovered during the excavations carried out by Small on the lower site (1966).

One of the most curious artefacts recovered this year was a crudely-carved piece of soft fine-grained steatite from Underhoull (SF098, [016] see figure 3.5). There was some discussion as to whether the piece was meant to represent a human figure or whether the resemblance was purely fortuitous, but after cleaning the anthropomorphic features became clearer, and it does indeed seem to be a human form, possibly an unfinished roughout.

The figure is 88mm long, with a shape reminiscent of a line sinker, though somewhat smaller. The apex is slightly pointed, the basal end flatter, the whole curved and pointing slightly to the left, with a distinct curve to the back of the piece. The head is delimited by a series of heavy horizontal cuts. The face has been carved by using two vertical cuts to produce a nose, giving the appearance of deeply grooved cheeks. The eyes and mouth are shallow inverted cones, which appear to have been produced by inserting the point of a knife into the soft stone and twisting it around. Two similar conical hollows on either side of the 'head' seem to represent the ears. There is no indication of a beard. The top of the 'head' is broken, but it is possible that the horizontal line visible on the back of the figure is the start of some kind of headgear. Below the 'head', there is an extended y-shape carved in relief, giving the vague

impression of a figure with (disproportionately short) arms held in front. What the leg of the y-shape might represent is unclear; the carving here is very rough and a protuberance in the lower part seems to have broken in antiquity, possibly during carving. Although fairly rough knife marks are visible over virtually the whole of the remaining surface, the object appears unfinished; the lower back of the object still seems to retain the original surface of either the fragment of steatite or the broken object from which it was made.

This artefact is unique; no parallels have been found for such a figure. Its position in the infill of the Upper House would suggest a Late Norse date and the only other representation of a human face known from Shetland at this date is the so-called Janus-headed pin from the Late Norse Sandwick South excavations, also in Unst (Bigelow 1985: Plate 21) and see also Shetland Museum & Archives photo index: http://photos.shetland-museum.org.uk/). The Janus pin, which is carved from bone, depicts two supposedly male heads, also beardless, but there is no other similarity between the two artefacts (see figure 3.1).

3.2 WORKED STONE

3.2.1 COARSE STONE

D.J. Bashford & W.S. Marshall

The artefacts from the Hamar and Underhoull stone assemblages are predominantly formed from steatite and schist with only a few examples made from coarser stone. Although the majority of stone used in the manufacture of these artefacts is of local extraction several of the artefacts, including the schist and purple phyllite, are more likely to be Scandinavian in origin.

THE ASSEMBLAGE FROM HAMAR

The worked coarse stone from Hamar is a relatively small assemblage of only 19 artefacts. The schist bakeplates have been discussed within the steatite report due to their close links with this material.

Whetstones/Hones

There are four examples of whetstone/hones within the assemblage. SF261 (88 x 17 x 8.5mm) is a large fragment of schist whetstone with damage to both ends. The wear produced by use of the implement has caused it to taper heavily down its length. The whetstone is rectangular in section with the majority of wear having occurred on two surfaces. SF173 would have been a similar example to SF261 but the stone has corroded leaving it heavily fragmented. Both SF261 and SF173 appear to be examples of Norwegian imports similar to the three examples from Underhoull. Similar examples of this type of whetstone have been found within the Viking/Norse contexts from Old Scatness (an example from Old Scatness includes SF13349) and Jarlshof (Hamilton 1956: 114).

A much larger example is SF928 (109.5 x 48.5 x 25mm), the remaining half of a schist whetstone (figure 3.2). Resembling the smaller examples the wear inflicted along two of

(a)

(b)

Figure 3.1: (a) The Janus-headed pin from the Late Norse Sandwick South excavations, and (b) SF098 from the excavations of the Upper House, Underhoull

the implement's edges cause it to taper heavily inward. Unlike the imported whetstones, the schist used to make SF928 is probably of local origin.

SF421 (50 x 19.5 x 6mm) is a small fragment from the surface of a whetstone. Although only one working surface of the whetstone remains, it displays a large amount of wear and polish. Unlike the other three examples it has been fashioned out of purple phyllite rather than a schist. Both schist and purple phyllite are types of stone readily utilised in the production of whetstones. Similar examples have been found from sites at Hedeby, York and Thetford (Moore 1983: 277-300). Although local sources of phyllite can be found on the island of Unst these outcrops appear to be of graphitic rather than purple phyllite. Due to the geological similarities between the purple phyllite and the imported schist examples it has been suggested that a similar Scandinavian origin is the most likely source for the phyllite whetstones. Although no sites have been found, a Scottish source for the material is possible but the Shetlandic phyllites appear to be too coarse to be considered (Crosby & Mitchell 1987: 483-506).

Pebbles

There are eight small pebbles and cobbles that show little signs of working but display areas of heavy scratching. Two of the larger examples, SF239 (89 x 70 x 43.5mm) and fragment SF265 (71.5 x 39 x 29mm) have flattened and worn areas that may represent their use as a type of burnisher or polishing stone. Only one example SF211 (44 x 38 x 11.5mm) shows any sign of purposeful working. Like the other examples this is a small flat rounded pebble with areas of scratching on its surfaces but it has also had one edge worked to a crude bevelled edge.

As in last year's assemblage, there were a large number of blue/green polished pebbles of varying sizes found in virtually every context. These do not appear to be part of the local geology but none of the pebbles appear to show any sign of wear or working and no reason for their presence in such numbers is forthcoming.

Bedrock

The natural bedrock is serpentine that is easily worn and weathered, making identification of working difficult. One possible artefact made from the bedrock is SF124 (148.5 x 99 x 32), a crude medium-sized paddle. The artefact tapers slightly down its length with two notches worked into opposing edges at its narrower end. A large fragment is missing from the blade end of the paddle. There is little evidence of wear or scratching on the surfaces of the implement or around the two notches. A second fragment of bedrock SF126 (50 x 30 x 22.5mm) has a possible perforation or notch along one edge but again due to the character of the rock it is difficult to ascertain if this is just natural weathering.

Individual Artefacts

There is one example of a small worked disc or pot lid (SF223) approximately 90mm in diameter. The disc is quite thick (21mm) and has been crudely chipped from a quartz rich schist with a small fragment missing from along one edge.

Although there are no complete weights within the assemblage there is one example of an unfinished blank. SF177 is a large block of schistose phylite (256.5 x 116 x 61mm) with two crude areas of pecking placed centrally on opposing surfaces. Unlike the

example from Underhoull (SF136) this artefact has not split or broken before completion so it is unclear why this perforation was left unfinished.

A single possible gaming piece is included within the assemblage, a small domed pebble SF917 (40 x 36 x 18mm).

Pumice

There were only two small pieces of pumice within the assemblage. SF294 is a small rounded pebble that shows no sign of having been worked. However SF918 (82 x 55.5 x 34mm), a sub rounded pebble has a centrally worn groove running along its length. The pumice could have been used for a number of tasks but the smoothing and polishing of a material such as bone is the most likely.

THE ASSEMBLAGE FROM THE UPPER HOUSE, UNDERHOULL

The following section discuss the preliminary assessment of the twenty four worked, coarse stone artefacts recovered during the UND07 excavations. The assemblage comprised of a number of artefact types including hammerstones, burnishing stones, whetstones and weights as well as some unidentified tools.

Discs and Counters

Within the assemblage were four complete worked stone discs and two fragmented examples which, with the exception of SF009, were all were made from types of schist. Of the four complete examples SF094 was a crudely worked flat disc, 64mm in diameter and SF463 was of flat sub-circular form measuring approximately 114mm diameter. Another stone disc (SF009) differed from the above examples, in that it had apparently been made through the splitting of a rounded beach pebble, in much the same way as a Skaill knife. However, rather than being retouched to a cutting edge this example had been bifacially worked to a disc shape 57mm in diameter. The two fragmented examples SF007 and SF068 were both semi-circular with one worked, curved edge and one broken straight edge.

Whetstones/Hones and Burnishers

There were four whetstones in the assemblage. SF415, SF169 and SF129 were made of a stone which was unlike the local geology but compared well to the fine grained schist used in Norwegian examples, leading to the conclusion that the above whetstones were imported. All display evidence of use on all four sides. SF415 tapered inwards towards the middle, SF169 tapered slightly along its length and example SF129 showed heavy use wear, tapering significantly along its length. SF129 also featured a worn groove across one broken end, strongly suggesting that it had fractured along the point of a perforation. Whetstone SF107 had fractured along a bedding plane into two pieces and did not show evidence of heavy use. SF418 was a short, sandstone bar, triangular in profile with both ends squarely broken off. One of the three unbroken surfaces had been worn flat, indicating its use as a burnishing stone.

Weights

There were five possible weights in the assemblage, made of various materials including sandstone, schist and steatite. SF544 is a flat, teardrop shaped sandstone cobble with a centrally worked 10mm perforation. One face has sheared away leaving a fragmented surface and the other side has a deep groove worn into the surface, running

from the perforation to the top outside edge. This groove suggests that the weight had been attached to a line, probably under considerable load and is thus interpreted as a weight such as a loom or fishing weight. Further evidence for this interpretation was observed in the fragmentation of the bottom of the weight, possibly from the action of contact with the sea bed. Weight SF087 is larger (142 X 106 X 34mm), teardrop shaped sandstone cobble with an 8mm diameter biconical perforation.

Other worked schist

The following three schist artefacts all showed signs of working but are of unknown application. SF457 (178 X 103 X 40mm), an elliptical, flat piece of schist appears to have been pecked towards one end, resulting in a narrowing of its width. This narrowing may well have been for the purpose of a handle or attaching a handle and does to some extent give it the appearance of a paddle or spade. SF073 is sub-rectangular and flat with one possibly worked face and one worked, rounded, long edge. SF004 is a flat, rectangular piece of schist; it has one long, broken edge and one long, worked edge, rounded towards one end.

Hammer stones

Four hammer stones were identified within the assemblage, all of which were sandstone cobbles. Example SF062 is a large (178 X 100 X 44mm) lozenge shaped cobble, heavily faceted on both ends. SF135 tapered along its length and was heavily faceted at its narrower end and SF528, a possible hammer stone, is a rounded cobble, slightly fragmented on one end. Example SF088 also shows impact fragmentation, but differs from the other hammer stones in that it was of a denser type of sandstone.

3.2.2 STEATITE AND RELATED SCHIST ARTEFACTS

C. Batey

THE ASSEMBLAGE FROM THE SITE OF HAMAR

The excavation season of 2007 produced 60 individual finds units of steatite, comprising raw or minimally worked stone (24 Finds Units) , vessel (27 Finds Units) and baking plate (5 Finds Units) fragments and three possible weights and a whorl. Within the areas excavated, Area A (House 1) yielded 43 finds and one unstratified, and Area C (House 2) 17 finds (see Table 3.1).

AREA A					
Context	**Raw/minimal working**	**Vessel**	**Baking plate**	**Weight**	**Whorl**
Unstratified	1				
002					1
027		1			
043	1				
044	1				
063	1				
089		1			
097		1			
107	1				
162		1			

164	1				
165	1	2			
179	1				
185	1				
199			1		
213	2				
215	1	1			
243			1		
268	1				
276	1				
287				1	
299	1	1			
306	1				
309	1	3	2		
314	2				
318	1		1		
323			1		
331				1	
347	3	2			
AREA C					
176		1			
178	1				
214		10	1	1	
261		2			
TOTAL	24	26	7	3	1
N=61					

Table 3.1: Summary of the items of steatite recovered from Hamar

There are three contexts which have slightly greater concentrations of material than others: from Area A, [309] and [347] make up 11 finds in total (18%) and in Area C, [214] has 12 finds making up 20%. Both context [347] and [309] are infilling deposits from a major channel within the lower part of House 1 and between them they account for 11 Finds Units of steatite material (raw material, vessel pieces and baking plate fragments) In Area C, context [214] is the upper charcoal rich fill of the building and includes 12 Finds Units including some 10 vessel sherds of which three seem to be from one vessel (SF246, SF247 and SF249) and two others are from another one (SF253 and SF260), in addition to a single find (SF233) which could be a modified handle.

Raw and Minimally Worked Material

Of the 24 finds in this category, most contexts have single finds, with the exception of [347] (3 Finds Units), [314] and [213] which both have two. Area C has just one find in this category from Context [178]. There are several sources of steatite available in Shetland, most particularly at Clibberswick in Unst although there are major deposits elsewhere in the islands at Fethaland, Fetlar and Cunningsburgh in the south. Current research into the chemical properties of steatite will enable individual quarry signatures to be identified. However, in view of the indifferent quality of the steatite at Hamar, it would be perverse to anticipate that the Unst examples had been sourced out of the island prior to confirmation of the trace analyses (Jones *et al.* 2007).

Vessels
There are 27 Finds Units of steatite vessel sherds which represent few vessels, as for example from Context 214 which is the richest single context for vessel fragments, three are from a single vessel and a further two are from another one. Of the sherds which are from vessels of identifiable form, there are square vessels, such as SF198, SF934 and SF247 and also ovoid/ sub-square tray-like or shallow dish-form vessels indicated, as with SF940 and SF1000. Several sherds are too fragmented to enable further detail of vessel form to be identified, although SF903 from context [299] in Area A may be part of a hemispherical bowl, it seems to be an isolated sherd of the usually common vessel form. SF255 from context [178] was found not to be steatite. The possible handle sherd, SF233 from Area C might indicate an origin from a hemispherical vessel if the working at the broad end of the handle is a correct identification.

The tray-form vessels, termed also Sub-Rectangular vessels by Forster in her consideration of the examples from Old Scatness Broch where they number only about 25% of the quantity of vessel sherds examined (IRO 8 vessels) (Forster *forthcoming*). They can be defined as having an ovoid form and a flattening base and are distinguishable from the hemispherical forms more often seen and commonly imported from Norway. The tapering rim of SF1000 which has burnt debris overlapping the shallow raised lip is of most significance in this small group. A purely visual inspection of the steatite and working methods of these pieces suggests that these are local products rather than imported items. Forster has noted that single shallow dish fragment from Old Scatness may be a Norwegian import on the basis of object morphology alone (Forster *forth*). The debris and burnt deposits support a use in a domestic rather than industrial process.

The vessels which are represented by squared base/wall junctions (such as SF189) and by virtually flat wall sherds (such as SF938) indicate either square or sub-rectangular vessels, characterised by flat sides. These types are common finds in Shetland assemblages, such as Jarlshof (Hamilton 1956: 166) and the Biggins (Smith 1999: 131-132), as well as Kebister (Sharman 1999: 172). These would be assigned a date range between the 11th and 13th centuries, probably broadly contemporary with the tray-form types and performing a different function in the cooking process.

Baking Plates
Grooved schist plates have been identified within Norway and Shetland as griddle stones for the baking of thin, unleavened type breads or perhaps oatcakes. They are a common feature in Late Norse contexts throughout parts of the Northern Isles (e.g. Quoygrew on Westray, Orkney (Batey *forthcoming*); Da Biggins, Papa Stour, Shetland (Weber 1999). There are seven finds units within this category. Two are from context [309], channel infill in Area A (and may in fact be from the same object) and one from each of contexts [199], [243/244], [318], [323] in Area A and [214] in Area C. In each case the bake stones are coarsely chiselled, with the finds from [309], although very friable do in fact preserve narrow chisel markings and regular broader chiselling working inwards from the intact edge. In terms of shape these seem to be more squared in finished form, whereas the Norwegian examples which have been studied are circular and made of stronger schist which is carefully tooled on both faces (e.g. Weber *op cit*). Weber has identified a Shetlandic origin for types of bake stones (Weber *op cit*: 134).

The examples which have been noted as Scandinavian imports (e.g. Weber *op cit*) are thinner than the Shetlandic ones, presumably this is a function of the nature of the raw material, which in Shetland is commonly steatite unlike the fine-grained schist of Norway. Weber notes that the finds from Shetlandic materials can be up to 25mm in thickness and of rectangular or sub-rectangular shape (*op cit*: 134) The Norwegian imports are between 5 and 25mm in thickness, have a high schistosity, grooved on both faces and of round form between 300 and 600mm across. The examples from Hamar are between 8 and 11 mm in thickness and in the few cases where overall shape can be suggested, they are apparently rectangular. It is most likely that the close proximity of steatite outcrops in Unst, for example at Clibberswick, would have facilitated access to a more convenient local resource.

Weights and Whorl

Three possible weights have been identified. From Area A, SF931 is a steatite fragment with a substantial perforation and one original squared edge and SF927 is a fragment of steatite which appears to have the remains of a lateral perforation in a broken smoothed pebble. SF052 from Area C is similar to SF931. In both cases it is possible that these broken pieces could be from vessels and that the perforations are the suspension points commonly found just below the rim, as in SF940 from context [309] in Area A. The expedient use of local resources to make simple weights is commonly identified in areas of Norse contact and is not a feature confined to this period. It cannot be judged if these are fishing or loom weights but both simple types are discussed by Forster in relation to the larger Old Scatness Broch assemblage (*forthcoming*).

A single spindle whorl, SF121 from context [002] was recovered in this season (figure 3.3). The whorl is conical in form and has a very substantial perforation. The lower side is broken away, but the full height remains for virtually half of the basal circumference. The steatite is dense and there are clear traces of knife paring on the outer face. The type is a common form and lead examples are known from other sites, such as the Brough of Birsay (Curle 1982: 79, 117) as well as steatite ones from sites such as Quoygrew on Westray in Orkney (Batey *forthcoming*) and Jarlshof in South Shetland (Hamilton 1956: 126).

THE ASSEMBLAGE FROM THE UPPER HOUSE, UNDERHOULL

The site of Underhoull has witnessed two phases of excavation to date, focusing on the Upper House as well as the structure excavated by Small (1966) located down slope towards the beach. The site of Underhoull differs from that of Hamar in the fact that the Norse phases seal Iron Age activity, represented by the remains of an earlier structure and souterrain as well as a broch tower. The different circumstances of the site may be reflected in the artefact assemblage, with the possibility that there may be elements of blending in the material culture (Small 1966: 230-235). However in the steatite (and mica schist) assemblage the types which can be assigned a cultural connotation are Norse, and no earlier pieces have been distinguished at this stage.

Small noted that haunched hones were a common find in his Norse building (*op cit*: 241), and indeed this type is to be seen in the small collection from the 2007 season (e.g. SF129, Area B context [016]). In addition Small recorded fragments of a vessel which was interpreted as being used for rendering down fish livers (*op cit*: 242). Small notes that a large quantity of sherds of steatite vessels were recovered and that:

"particularly common were large round vessels varying in diameter from 4" (c.10cms) to over 40" (100cms). Most of these had curving sides and a relatively small flattish bottom. Square pots with rounded corners, steep sides and flat bottoms were also plentiful. The thickness of the pots varies from ½ to 2 in. (c.15mm-50mm) and seems in part to be related to the quality of the soapstone. Decoration is limited to a small grooving below the rims of some of the smaller vessels ...The quality of the workmanship...shows a distinct division. A quantity of sherds reveal rough workmanship with the tool marks clearly visible. Broad chisels have been used, many with a curving blade. These roughly made and often asymmetrical pots contrast markedly with the many smooth finely finished vessels which are more like the work of professional craftsmen. Skjolsvold ...draws attention to a similar dichotomy in Norwegian finds" (Small 1966: 243).

He goes on to note that large quantities of varying qualities of steatite exist on Unst, the nearest only a few hundred metres from the site itself (*op cit*: 243).

Whilst there have been major developments in the study of steatite since Small's work at Underhoull, most notably by Forster (e.g. 2004) and Jones *et al.* (2007) it is nevertheless appropriate to include his observations, preliminary as they may well have been in relation to the material from the 2007 excavations.

The overall assemblage is numerically dominated by a substantial quantity of unworked fragments of steatite and schist which reflects the proximity of the raw material. There are 54 Finds Units of vessel sherds which include sherds of thin walled, finely made vessels as well as much coarser and thick walled vessels. A number of rims are represented as well as wall/basal junctions, but the predominance is wall sherds. Some hemispherical vessels have been identified, including a slightly flattened base, as well as several which are most likely to be squared forms. However in most cases the vessel form is not certain. Unlike the assemblage from Hamar, there are no baking plates at all identified in this assemblage, although Small did distinguish the flat vessel possibly related to fish oil processing, such flat vessels are lacking from the Upper House at Underhoull 2007. The category which is noted as Non-Vessel includes pieces which have distinct tooling, but the function remains unclear. Five simple pebble weights are noted from 5 contexts across Areas A and B and a single gaming piece or counter completes the assemblage. (NOTE: SF397, SF407 and SF461 noted as steatite in the catalogue have not been located the time of writing and therefore not included).

Unworked: Raw and Minimally Worked

Area A has 32 Finds Units, Area B, 34 Finds Units and Area C has two, 68 in total from an overall assemblage total of 138 Finds Units (49%). Amongst the richest contexts are [021] from Area A with 23 Finds Units and [016] from Area B with 12 Finds Units. This includes pieces which have received no working at all and a small number which may have been slightly modified to enable them to be brought to the site. In the material examined there is no debris which indicates that vessels or smaller items have not been manufactured on the parts of the site so far investigated, although it is a reasonable assumption that remodelling of broken sherds may have taken place and such evidence may be available in samples from both midden and floor deposits. Detailed scientific investigation is required to be able to source this material, but it is clear even on a preliminary visual examination that there are different grades of steatite represented

across the assemblage as a whole, and as Small noted in 1966 (cited above *in extenso*) this will have impacted greatly on the degree of finish for vessels (and other items alike). It is anticipated that local resources of steatite will have been utilised as well as potentially more distant sources.

Vessels

There are 54 Finds Units of vessel sherds which include both coarse fragments and thin and highly worked sherds of hemispherical bowls, in some cases it is possible to see flattened bases. In addition there are a number of squared vessels represented but these are not very common. There are 33 Finds Units of vessels from Area A, with nearly half of these from the single context [021]. Hemispherical forms have been distinguished from contexts [007] (SF453), [048] (SF488) and [070] (SF539) as well as a number from context [021] (e.g. SF171). Within this overall form there are both very coarse sherds (such as SF143) as well as more finely tooled ones (such as SF546 which is unstratified). Sherds which indicate the junction between wall and base of a hemispherical vessel are also noted in Area A (SF005). Other pieces are clearly squared vessels and again basal/wall junctions as well as straight wall/rim fragments are notable in this group (such as SF145 which is a thin wall and SF435 which is thicker). These broadly correspond to types noted by Forster and Bond, oval bowl (although it is possible that these examples are more circular) and large sub-rectangular or square, with dates suggested as 11th century and continuing in the squared form into the Late Norse period (c14th century) (Forster & Bond 2004: fig 3, 225).

Area B has fewer vessel sherds , 15 in all, with a dominance from context [016] which has 11 Finds Units. The range of square vessels (e.g. SF095), hemispherical (e.g. SF104 and SF106) and thin walled (e.g. SF149) are all noted. Area C has only 6 Finds Units, including square vessel sherds (e.g. SF043 and SF085).

This assemblage includes all the main elements which Small noted at the lower site (see above) which is of considerable interest. However, pending detailed re-examination of that assemblage, it is not clear how close the parallels are likely to be in vessel sizes and forms. In terms of vessel size, there are very few examples where it has been possible to even estimate the diameter of the complete vessels, but SF453 from context [007] in Area A appears to be approximately 28-30cm in diameter, which is the most commonly found size within Norway and SF143 from context [026] from the same area is somewhat smaller, being approximately 16-18cms and made of very coarse stone. No vessels the size that Small noted at the top end of his range, some 100cm have been identified, although a similarly substantial vessel was recovered from Gord on Fetlar during a Time Team excavation a few years ago. In terms of surface treatment, there is no decoration or even simple incised line below the rims and in several cases there are very clear knife paring marks, which may equate the broad chisel marks noted by Small, although they lack the distinctive chattering associated with the use of a chisel. Distinctive crude gouging of the external faces is commonly found amongst the coarse stone and in one case there is a clear distinction between the basal treatment and that of the outer wall which is smooth (SF106 from context [016] Area B). Several sherds have burnt deposits externally from sooting and there are also good examples of internal burnt deposits which would repay further work (e.g. SF027 from context [016] Area B and SF375 from context [054], Area B). One final observation is that this assemblage differs from that at Hamar in that it includes several hemispherical vessels and apparently lacks the low-sided trays. This may be indicative of different functions at

each of the sites rather than different dates of the assemblages. The same interpretation may be valid to explain the lack of baking plates, identified both at Hamar (see Batey DSR) and indeed in structure excavated by Small at Underhoull (Small 1966: fig 16, 244)

Weights

There are five stone weights which have been distinguished in this assemblage, four are steatite pebbles which have been perforated at the apical end (one of which was discarded during manufacture as the hole is incomplete (SF437)). The simple form of all four of this type is commonly found on sites in the Northern Isles (e.g. Pool, Sanday: Clarke 2007: 382). However, SF130 and SF480 from Area B have incised lines on one or both of the flat faces. In the case of SF130, there are two single crossing lines (vertical and horizontal) on one face (as on SF480) but SF130 has the addition of a more complex set of lines on its second face (figure 3.4). These markings may be simple indicators for good fortune in the fishing or indicators of position in a set of loomweights. The simple nature of the second set of markings may even indicate ownership.

The last of the weights, SF136 from Area B context [017] is of a different kind. It is much larger than the others, more tabular in form and broken across the area where a substantial perforation was being positioned. This may have served a different function, perhaps even as a fish hammer or a mallet. Either kind of weight may have served as a generic weight, possibly even a simmen weight for securing thatch, as noted in more recent Shetlandic contexts and as Hamilton noted at Jarlshof (Hamilton 1956: 142).

Worked Steatite-Non Vessel

There are 11 finds in this miscellaneous category: one unstratified, four from Area A, six from Area B and one from Area C. Amongst these, six are trimmed or flat pieces which have no discernible function, such as SF127 (unstratified) or SF467. The trimming is commonly knife paring, as seen in SF481 or SF484, but crude chiselling is also represented, as in SF152. A single steatite disc has been noted as is likely to be a pot lid, a ubiquitous find in the Northern Isles and not period diagnostic, it is 82mm in diameter and clearly not of the same function as the small counter or gaming piece SF392 discussed below.

Two finds are grooved or smoothed which could indicate use as smoothing surfaces (SF424, SF041) or sharpening (SF481). SF168 is interesting, although incomplete it may represent a stone (schist) spade or other tool approximately 220 X 110 X 20mm in size. One end is trimmed to an arc and the other is trimmed to a squared edge. A possible related example from Clickhimin is described as a handled disc (Hamilton 1968: fig 33 no. 7) and is from an Iron Age context, and another is from the broch (*op cit* fig 47, no. 7). Closer parallels are from Old Scatness Broch, SF36125 and SF33715 from Iron Age contexts where they are described as stone bars which would have functioned as ards or mattocks. The type is also published from the Howe broch in Orkney (Ballin Smith 1994: 203 illus 118, no. 4107). This would seem to be an item which is related to the activities in the adjacent broch than those in the Norse structure.

The most enigmatic item from this category is SF098 from Area B Context 016, which has been described as a depiction of a human (figure 3.5). The lenticular piece has undoubtedly been trimmed and pared, probably with a knife and has raised areas and

grooves which have been deliberately formed. However, the end which might indicate a face is very distorted, and the major groove which delimits it is as likely to have been an attempt to cut the fragment is two. The lower two thirds has a raised T-shaped form with additional broken projections. However on balance this piece does not do more than superficially represent a human and the cautious interpretation would be to assume casual whittling.

Counter or Gaming Piece

The single example in this category is SF392 from Area B context [017], relating to a complete disc approximately 25mm in diameter. It is paralleled in Small's excavation assemblage (Small 1966: 244) and suggested as a gaming piece, although his "simple gaming boards" may also include baking plates.

3.3 POTTERY & FIRED CLAY

L.D. Brown, Z. Outram & N.D. Melton

A substantial assemblage of pottery was recovered from both the sites of Hamar and the Upper House at Underhoull. The material from Hamar was dominated by fragments of post-medieval vessels, including pipkins, bowls and jugs. In contrast to this, the material from the Upper House at Underhoull was dominated by sherds of prehistoric pottery, possibly reflecting the Iron Age settlements present at Underhoull.

3.3.1 PREHISTORIC POTTERY & FIRED CLAY

L.D.Brown

THE ASSEMBLAGE FROM THE UPPER HOUSE, UNDERHOULL

A small assemblage of early pottery, totalling 22 sherds, was recovered from the excavations at Underhoull in 2007. The majority of the sherds are small, fairly abraded fragments and as such have not been fully recorded. One body sherd of note is SF120 from within the rubble overlying the annexe in Area B, context [016]. The sherd has abundant organic inclusions, and measures 26mm x 20mm, with a wall thickness of 7mm (although this does not account for the partial loss of the exterior surface). Some soot is present on the dull orange exterior of the sherd. Other artefacts from this deposit include steatite vessel fragments and the carved steatite figurine. Two examples of sherds with steatite inclusions within the clay were noted from two separate contexts, SF409 from the possible remnants of the southern wall in Area B, context [056], and SF482 from context [068] within Area D.

By far, the most concentrated amount of pottery (50% of the assemblage) was found within the deposits relating to the interior of the structure in Area A. Eleven sherds were recovered from within one of the later deposits, [021], with a further, similar sherd from with the deposit directly below [021], context [070]. The sherds, a mixture of small fragments and body sherds, are all of a similar type. The dark grey fabric contains mica and an angular quartz inclusion. The wall thickness of the sherds generally falls within 6-7mm, and for the most part, the sherds (both fragments and body sherds) are broken on one or two opposing sections, along the coil join. The sherds seem to have been fairly crudely manufactured, not only seen in the seemingly weak coil joints, but also in the finishing of the vessel. Three of the sherds, S371, SF374, and SF419 conjoin at the

coil breaks, and it is likely that the sherds found within this deposit are from the same vessel.

THE ASSEMBLAGE FROM HAMAR

The pottery from Hamar consists of eight small fragments from three contexts. In general the pottery is fairly abraded, and is of a grey fabric. Only one sherd was recovered from a cleaning layer, [097], within the main house, House 1, whilst the remaining sherds were all from House 2 – the upper post-abandonment deposits [214], and from the deposit directly below this, [261].

3.3.2 THE POST-MEDIEVAL POTTERY

Z. Outram & N.D. Melton

A substantial assemblage of Post-Medieval pottery was recovered from the excavations at both the Upper House at Underhoull and Hamar, summarised in tables 3.2 and 3.3 respectively. The largest assemblage was recovered from Hamar, with a total of 42 sherds, while only four sherd were recovered from the Upper House at Underhoull. The small assemblage from Underhoull will limit the comparison of the Post-Medieval pottery between the two sites.

SF No.	Context	Area	Description	Possible date
032	016	B	North European red earthern ware, internal red glaze	c.17th century
049	016	B	North European red earthern ware, internal red glaze	c.17th century
058	009	A	Cream ware with an external black glaze	19th century?
078	027	C	3 fragments of tin glazed stone ware, white glaze	Late 19th/early 20th century

Table 3.2: Summary of the Post-Medieval pottery fragments recovered from the excavations of the Upper House, Underhoull

SF No.	Context	Area	Description	Possible date
127	097	A	North European red earthern ware with a red glaze	c.17th century
129	097	A	North European red earthern ware, cream & brown striped, slip decorated plate or bowl	c.17th century
130	097	A	Red earthern ware with green glaze	c.17th century
131	097	A	North European red earthern ware	c.17th century
132	097	A	North European red earthern ware, cream & brown striped, slip decorated plate or bowl	c.17th century
133	097	A	North European red earthern ware, external rilling present - a possible fragment of a pipkin	c.17th century
135	097	A	North European red earthern ware, pipkin handle with a single applied cordon	c.17th century
139	097	A	Buff coloured fragment with no signs of glazing	?
140	065	A	Black glazed red earthern ware	Late 18th/19th century
143	008	A	Cream ware	Late 18th/early

				19th century
144	008	A	Very small fragment of tin glazed earthern ware	c.18th century?
153	002	A	Clay pipe stem, burnished	c.17th century
159	002	A	North European red earthern ware, internal red glaze, external sooting, a possible fragment of a pipkin	c.17th century
161	002	A	North European red earthern ware, internal green glaze	c.17th century
161	002	A	North European red earthern ware, possibly slip decorated, burnt fragment	c.17th century
168	044	A	White stone ware jar fragment	Late 19th/early 20th century
170	140	A	North European red earthern ware, red glazed internally, fragment of a pipkin	c.17th century
183	129	A	Dutch tin glazed earthern ware with a white glaze	c.18th century
210	203	A	North European red earthern ware, internal red glaze, externally sooted, external rilling – a possible fragment of a pipkin	c.17th century
212	160	A	North European red earthern ware, internal red glazed leg & base of a pipkin, evidence of over-firing	c.17th century
213	211	A	North European red earthern ware, red glaze	c.17th century
222	211	A	North European red earthern ware, internal red glaze, external rilling, possible fragment of a pipkin	c.17th century
224	211	A	North European red earthern ware, internal red glaze, fragment of the handle-body junction of a pipkin	c.17th century
234	184	D	Late salt glazed stone ware mineral water bottle with label "*Lerwick aerated water*"	c.19th century
236	172	C	North European red earthern ware, red glaze	c.17th century
237	170	C	North European red earthern ware, internal red glaze	c.17th century
241	211	A	Clay pipe stem fragment	c.17th century
243	184	D	White stone ware vessel - a possible jar	Late 19th/early 20th century
250	211	A	North European red earthern ware, fragment of a handle-body junction from a pipkin	c.17th century
254	184	D	Red earthern ware fragment, green glazed	?
262	051	A	North European red earthern ware, green glazed internally	c.17th century
264	164	A	Tin glazed earthern ware	c.18th century
287	051	A	North European red earthern ware, flat based bowl	c.17th century
288	051	A	North European red earthern ware, internal & external red glaze, very fine walled vessel. Pipkin?	c.17th century?
289	051	A	North European red earthern ware, pipkin body fragment from the shoulder of the vessel, thin walled, greenish internal glaze and externally sooted	c.17th century
293	260	D	North European red earthern ware, internal red glazed with a decoration of yellow & green trail slip, flat ware, possibly a bowl or a plate	c.17th century
296	051	A	North European red earthern ware, internal green glaze, external rilling & sooting, a fragment of a	c. 17th century

			possible pipkin	
299	260	D	North European red earthern ware, internal red glaze, everted rim, possible fragment of a pipkin	c.17th century
424	160	A	North European red earthern ware, traces of external rilling – a possible fragment of a pipkin	c.17th century
427	184	D	White glazed stone ware	Late 19th/early 20th century
432	211	A	North European red earthern ware, internally glazed, a possible fragment of a pipkin	c.17th century
909	002	A	The base of a salt glazed stone ware jar or bottle with a potters stamp of an eagle	Late 19th/early 20th century

Table 3.3: Summary of the Post-Medieval pottery fragments recovered from the excavations at Hamar

An assessment of the assemblage from Hamar demonstrated that it was dominated by North European red earthern ware, dating to c.17th century. Several of these sherds were thought to be from pipkin vessels, with a handle (SF135), a base (SF212) , and two fragments representing the junction between the body and handles (SF224 & SF250) being recovered. In addition to these fragments, a number of sherds had evidence of external rilling (SF133, SF210, SF222, SF296, and SF424). This feature has been noted on a number of pipkin vessels and therefore may indicate that these sherds also relate to the remains of pipkin vessels (Lindsay 1983: 567).

The majority of the remaining sherds recovered from Hamar related to red earthern wares, glazed with a red glaze. However, six examples of green glazed vessel fragments were recovered, and one example of a sherd with a black glaze (SF140). A buff coloured sherd with no signs of glazing was recovered, SF139, and is unusual to the general assemblage from Hamar. Three examples of decorated fragments were recovered: SF293 represented a yellow and green trail slip decoration on the internal face of the vessel. SF129 and SF132 represented cream and brown stripped vessel fragments. All of these sherds represented examples that are dated to c.17th century, with the exception of the black glazed sherd, SF140 that dates to the late 18th/early 20th century.

Although the assemblage from Hamar was dominated by North European red earthern wares, examples of other wares were also present: cream ware (SF143), tin glazed earthern wares (SF144, SF183, and SF264), and stone ware (SF168, SF234, SF243, and SF427). These sherds represent vessels from the 18th to early 20th century. In addition to the vessel fragments, two examples of clay pipe stems were recovered. Unfortunately there were no diagnostic features on the pipe stems, such as a makers stamp, and so they could only be dated to c.17th century.

A number of the sherds recovered from Hamar related to either rim or base fragments and so it was possible to determine the forms of these vessels. Examples of plates or bowls were present, such as SF129, SF132 and SF287. In addition to this, examples of jugs or jars were also recovered, represented by SF234, SF243 and SF909. All of these examples related to examples of late 19th/early 20th century wares, and included an example of a 'Lerwick aerated water' bottle and a jar with a potter's stamp of an eagle on the base. The impressed eagle mark was used by the Eagle Pottery, Glasgow

between 1882 and 1923, which predominantly made domestic and commercial storage jars and flagons (Kelly 1999: 89)

The assemblage of Post-medieval pottery from the Upper House at Underhoull, although very small, produced a similar range of sherds to those recorded at Hamar, including North European red earthern ware, a black glazed vessel fragment, and stone glazed ware. It could be concluded that there was no significant difference between the two assemblages.

3.4 METAL FROM HAMAR & UNDERHOULL: THE 2006 AND 2007 ASSEMBLAGE
J.G. McDonnell, Z. Outram & W. Marshall

A preliminary assessment of the ferrous and non-ferrous metal assemblage was carried out following the 2007 excavation season in order to identify the main types of evidence recovered from both Hamar and Underhoull, as well as assessing the analytical techniques that could be applied. The assemblage has been summarised in tables 3.4 and 3.5.

Site code	Area	SF number	Context	Metal	Description
UND07	B	012	002	Fe	Head of a nail
UND07	B	018	013	Fe	Fragment of iron
UND07	B	023	002	Fe	2 nails corroded together
UND07	B	035	016	Fe	Nail shaft and head
UND07	A	039	003	Fe	Nail with the head present
UND07	B	056	016	Fe	Iron pan
UND07	B	070	016	Fe	Nail
UND07	A	082	003	Fe	Nail shaft
UND07	B	124	016	Fe	Nail
UND07	B	131	016	Fe	Nail
UND07	C	304	034	Natural corrosion product	Fired clay? with iron pan?
UND07	B	475	080	Fe	Nail
UND07	B	483	013	Natural corrosion product	Iron pan surrounding worm cast

Table 3.4: Summary of the preliminary assessment of the ferrous (Fe) and natural corrosion products recovered from the Upper House at Underhoull

Site code	Area	SF number	Context	Metal	Description
HMR06	A	002	003	Fe	Iron pan
HMR06	A	005	003	Fe	Nail or rod fragments
HMR06	A	006	002	Fe	Corrosion shell of an object
HMR06	A	007	002	Fe	Nail or rod
HMR06	A	008	002	Fe	Nail or rod
HMR06	A	009	002	Fe	Nail or rod
HMR06	A	010	002	Fe	Modern wire?

HMR06	A	022	002	Fe	Nail or rod
HMR06	A	027	063	Fe	Nail or rod
HMR06	A	028	063	Fe	Head of a nail
HMR06	A	031	002	Fe	Fragment of iron, possibly a nail or a rod
HMR06	A	044	085	Fe	Fragment of iron, possibly a nail or a rod
HMR06	A	094	076	Fe	Corroded iron object
HMR07	A	128	097	Cu-alloy	Copper alloy sheet
HMR07	A	136	097	Fe	Nail
HMR07	A	154	008	Fe	Nail shaft or rod
HMR07	A	157	100	Fe	Nail or rod
HMR07	A	175	130	Fe	Rivet
HMR07	A	176	058	Fe	Part of a bar or a nail and corrosion
HMR07	A	179	058	Fe	Nail shaft
HMR07	A	181	063	Fe	Fragment of iron
HMR07	A	182	129	Fe	Nail shaft
HMR07	A	184	063	Fe	Fragment of iron
HMR07	A	185	063	Fe	Fragment of iron
HMR07	A	190	165	Fe	Nail shaft
HMR07	A	192	063	Fe	Fragment of iron
HMR07	A	193	063	Fe?	Natural iron pan? Sheet?
HMR07	A	194	063	Fe	Sheet
HMR07	A	195	166	Fe	Nail shaft
HMR07	A	196	126	Natural corrosion product?	Slag? Natural material?
HMR07	A	206	174	Fe?	Corrosion around an object
HMR07	A	229	162	Fe	Sheet
HMR07	A	232	026	Fe	Nail or rod
HMR07	C	251	236	Fe	Nail?
HMR07	A	258	242	Cu-alloy	Copper alloy sheet
HMR07	D	266	259	Fe	Large nail
HMR07	C	267	259	Fe	Nail shaft
HMR07	A	270	270	Fe	Thin bar or nail end
HMR07	A	276	267	Fe	Head of a nail
HMR07	C	277	236	Fe	Nail
HMR07	C	282	236	Fe	Rod or a nail
HMR07	C	283	214	Fe	Heavily corroded nail
HMR07	A	290	051	Fe	Large nail
HMR07	D	429	259	Fe	Fragments of sheet
HMR07	C	430	261	Fe	Sheet
HMR07	A	902	087	Fe	Rove?
HMR07	A	925	027	Fe	Iron object
HMR07	A	926	027	Fe	Iron object
HMR07	A	929	008	Fe	Head of a nail
HMR07	A	1003	347	Cu-alloy	Copper alloy associated with organic material
HMR07	C	1031	305	Fe	Awl?
HMR07	C	1032	305	Fe	Tip of an object?

Table 3.5: Summary of the preliminary assessment of the ferrous (Fe) and non-ferrous (Cu-alloy) material recovered from Hamar

The preliminary assessment of the ferrous and non-ferrous objects recovered from Hamar and Underhoull highlighted that the assemblage was dominated by nails/rods. Some of these items could be more confidently identified as nails, bolts and rivets but others will require characterisation by X-radiography. Of the assemblage, the two large nails recovered from Hamar (SF266 and SF290) were important in the assessment of the technology and crafts carried out in this period: the size of these objects, being c.70 by 20mm and c.50 by 20mm respectively, indicates that large timbers were being worked. An assessment of the microstructure of these items may provide information on whether they were driven straight through the wood or if hole was drilled through the wood prior to their use.

Two main conclusions can be drawn from the assemblage of ferrous and non-ferrous. Firstly, the assemblages are almost identical in the variety and type of objects recorded, with nothing to distinguish between the items from Hamar and Underhoull. It could be argued that Hamar recorded a slightly greater variety of items, with a possible awl, rivet and a rove being recovered, but this may simply be due to the fact that two seasons of excavation have been carried out at Hamar. Secondly, no evidence has been recorded to suggest that metal was being worked at either of the sites, with no black-smithing debris being recovered to date. This suggests that metal was brought to the sites from a larger centre that contained a smithy and a smelting site. This is in contrast to similar sites recorded in Greenland and Iceland, with a number of smithies being found at the settlements (Vésteinsson 2000: 169), reflecting the status of both Hamar and Underhoull. The lack of a smithy on the site is not in accordance with the classic view of Viking farmsteads, suggesting that Hamar and Underhoull may not represent permanent farmsteads.

In addition to objects of metal, a significant quantity of 'slag-like' material was recovered from both sites. The majority of the slag-like material was recovered from Hamar following the flotation of whole earth samples. The majority of the material has been identified as Fuel Ash Slag, a silica-rich non-diagnostic slag (McDonnell 2000); the largest quantities being recovered from samples SF841 and SF849 from Area C. It was noted that concentrations of peat and large fragments of charcoal were also recorded from these samples.

At Underhoull a concentration of slag-like material was recovered from the north-west corner of Area A in contexts [003] and [093], located outside of the structure. A preliminary assessment demonstrated that the material was a light, silica-rich cinder fuel ash slag, similar to material found on sites such as Wasperton, Warwickshire (McDonnell *pers.comm*) as well as the slag recovered from Pool (McDonnell & Berg 2007: 455). The similarity in the material from the site, and the context in which it was recovered suggests that it was formed through a single one-off event prior to deposition. However, the precise materials that were burnt to form this material, or the processes that were carried out to produce this quantity of the material are unclear. Further research on this material is essential.

It has been suggested that the reason that the material is found at all relates to the context of deposition: the slag is relatively friable and would break easily if trampled. The significant quantity recovered from Underhoull indicates that it was either deposited towards the periphery of the site, away from the general movement around

the settlement, it was deposited prior to the abandonment of the site, or that it was deposited as a single event. Identifying the full extent of the context of deposition would therefore benefit the assessment of this material and therefore what it relates to. This will be one of the priorities for the following excavation season.

The Hamar and Underhoull metal and slag-like material assemblage provides an excellent opportunity to investigate aspects of Viking pyrotechnology. Archaeometallurgical analysis of the iron artefacts would provide comparative data for the analysis of the Pool artefacts (McDonnell & Berg 2007) and Viking iron from Iceland and Scandinavia. Analysis of the slag-like material from Underhoull is essential to determine possible causes of the formation of this material.

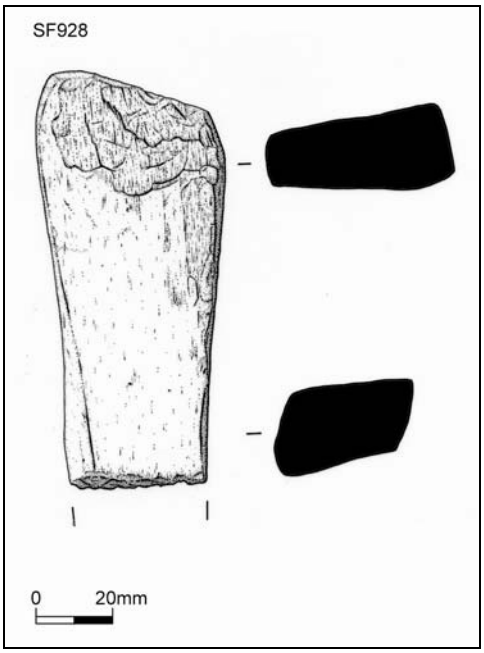

Figure 3.2: A schist whetstone, SF928, from context [261], House 2 at Hamar

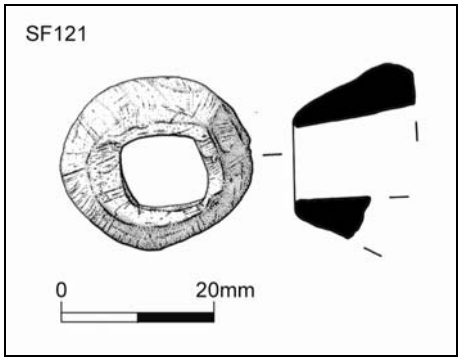

Figure 3.3: A steatite spindle whorl, SF121, from context [002] at Hamar

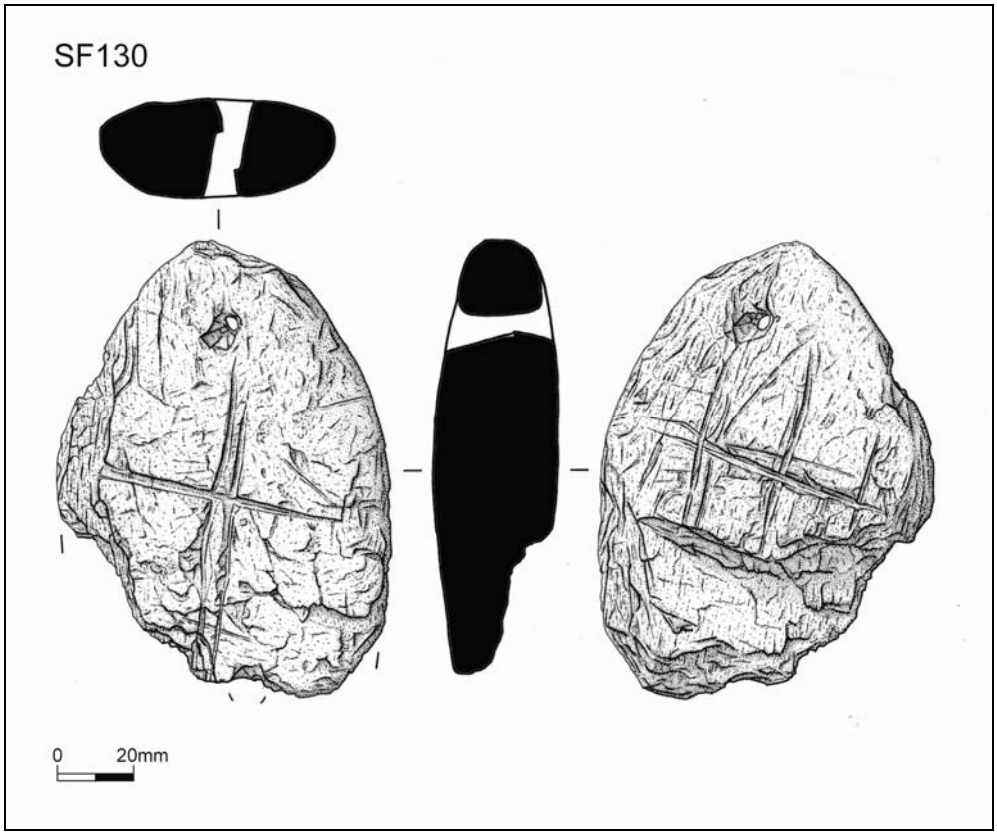

Figure 3.4: A steatite weight, SF130 from context [016], the Upper House, Underhoull

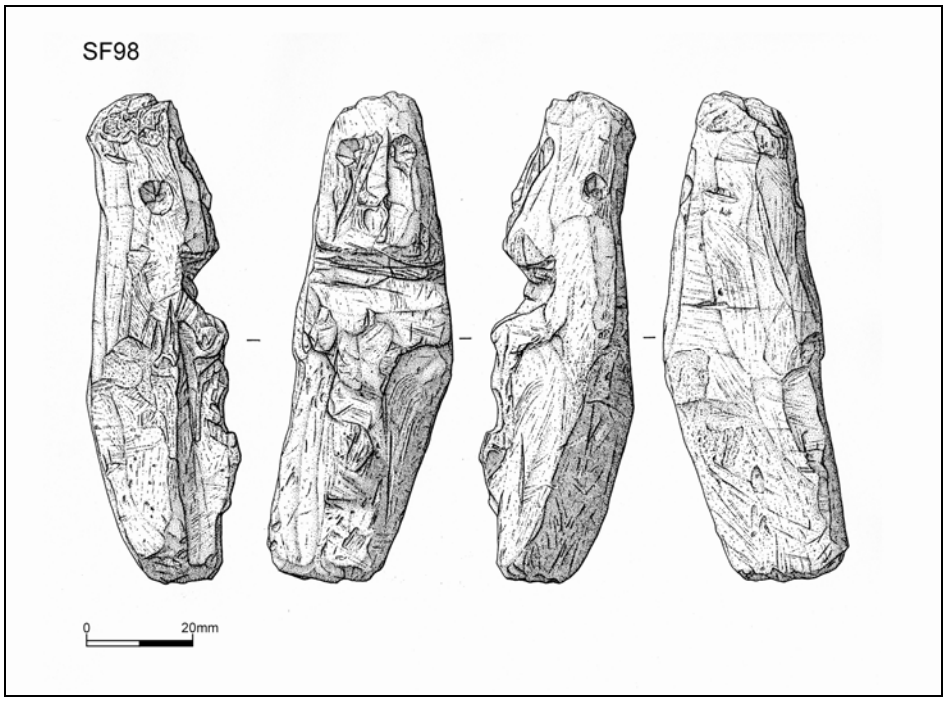

Figure 3.5: Carved steatite object from context [016], the Upper House, Underhoull

4. ENVIRONMENTAL EVIDENCE

J.M. Bond, Z. Outram, R.A. Nicholson, M. Church, J.E. Cussans, J. McKenzie, R. Legg & V. Turner

4.1 BIOARCHAEOLOGICAL SAMPLING

J.M. Bond, Z. Outram & V. Turner

The environmental sampling programmes used at the two sites assessed during the 2007 excavation season were vital in addressing the research aims proposed at the start of the project. In order to maximise the information available from some of the more delicate deposits reached during the 2007 season, micromorphological samples were collected from key sections at both Hamar and the Upper House, Underhoull. This work was carried out by Dr. J. Mackenzie from the University of Stirling.

Deposits from within the upper and lower rooms of House 1 at Hamar were extensively sampled for a range of standard environmental techniques. In addition to this, the deposits located within internal and external areas of Houses 1 and 2 were assessed. It was noted during the 2006 season that the archaeology in many areas of the site at Hamar was quite shallow, and so a strict sampling strategy was implemented to ensure that the maximum amount of information was collected.

The excavations of the Upper House, Underhoull specifically targeted key areas in order to assess the surviving archaeology in preparation for the full excavation within the 2008 season. With this in mind, it was important to focus the environmental programme on providing information relating to the conditions of the archaeological deposits and the evidence that has survived, so as to inform the excavation strategy for the following year. It became clear as soon as the excavations began at Underhoull that the site was sealed under a significant layer of peat, indicating the likely presence of anaerobically preserved plant macro- and microfossils, including pollen. The sampling strategy therefore included the use of monolith tins to collect block samples, as well as samples to determine the preservation of insect and plant remains.

Bulk samples were taken from all significant contexts at both Hamar and from the Upper House, Underhoull, such as from middens and floor surfaces. The samples were processed in a flotation tank in Shetland and Bradford: the light fraction was collected in a 500μm mesh and the residue in a 1mm mesh. Bulk sample sizes ranged from 1-90 litres, the majority being between 20-40 litres. In total, 106 bulk samples were taken from Hamar, sampling material from 89 different contexts. The excavations of the Upper House, Underhoull produced 24 bulk samples from 20 different contexts.

In addition to bulk samples, GBA (general biological analysis) samples were collected from both sites to assess the presence of insects and waterlogged plant remains. A total of 20 GBA samples from 14 contexts were collected from Hamar, while 10 GBA samples from six contexts were collected from the Upper House at Underhoull. The samples will be analysed in the laboratories in Bradford. Spot samples were also collected from discrete, significant deposits from both sites, 25 from Hamar and 35 from Underhoull.

An extensive sampling programme for pH, phosphate, and magnetic susceptibility analysis was implemented from key deposits at Hamar, resulting in approximately 300

individual samples being collected. A number of these were collected as part of an MSc dissertation by Robert Legg (see section 6.1.2). A subset of the remaining samples was processed as part of a Nuffield Foundation project carried out by Nicola Cowie as part of her placement year, with a report in archive.

The samples collected from the 2007 excavation season are in the process of being investigated, providing evidence of mammal and fish bones, charred plant remains and marine shells. The samples have been processed in part by placement students from the University of Bradford, and by trained volunteers, and their analysis is ongoing.

4.2 PALAEOBOTANICAL REMAINS FROM HAMAR AND THE UPPER HOUSE, UNDERHOULL

J.M. Bond, M. Church & Z. Outram

In the 2006 season very few plant remains were recovered from the contexts sampled at Hamar house 1; this had been anticipated, given that the contexts excavated were in the main shallow and possibly disturbed. This year the sampling and flotation programme intensified, as the channel in the lower room and other undisturbed contexts were investigated. Sorting and recording of these samples is in progress, and what follows is a summary of the initial findings.

Palaeobotanical remains from Hamar

The most significant contexts for plant remains excavated from House 1 (Area A) at Hamar proved to be the channel in the lower room. The deposits above this channel ([008] and its equivalents) are remarkably poor in charred plant remains, as they are in other finds, but the channel appeared to have deposits consisting mostly of ash intermixed with stones and artefacts (see section 2.2, above).

Context [306], from the channel infill, had 25 cereal grains, the majority being hulled six-row barley (*Hordeum vulgare*), though oats (*Avena* sp.) were also present. On the basis of the surviving grains it is not yet possible to say whether the oats were cultivated or a weed of the barley crop, since no floret bases were preserved, but measurement and further analysis of the oat grains might clarify this. Some dimpling observed on the barley grains may be due to one of several factors; immaturity of the crop when harvested, the beginnings of germination of the grains (either deliberately, as malt, or accidentally during storage) or fungal disease; again further work will be needed to clarify this.

The non-crop seeds from the samples again require more intensive work, but preliminary assessment suggests a range of weed seeds including *Rumex* spp. (Dockens) and *Stellaria media* (Chickweed), both of which may be from the cereal crop, as well as seeds from *Empetrum nigrum*, the Crowberry, which may have originated either as fuel in the hearth or from the use of berries as food; much more taphonomic work will be needed to help elucidate this. There is a small quantity of charcoal present in the samples, the majority from context [324], in the north of the lower room, though there are also a small number of fragments from the channel. More detailed work will be needed to identify these fragments further. As would be expected from recovery from excavation and the sieving of deposits, no bone or shell was recovered from House 1 samples, but there is slag in some samples; this will also be analysed further.

Three contexts from House 2 (Area C) were sampled; as explained above, Area C was only a small exploratory trench which was only excavated into the upper fills inside the house in an attempt to assess the date and nature of the structure. These samples proved to be very rich in charred cereal grains, with [261] being the richest of the samples. As with House 1 samples, both barley (six-row hulled) and oats are present. The barley grains are in general very well preserved, with the charred hulls still present. As with House 1 some of the grains are dimpled, but in general they seem larger and plumper than those from House 1; further work will include measurement of the grains to confirm this. There is a wide range of crop weeds present, and also much *Calluna* (heather) -type charcoal, presumably from its use as a fuel. The sample from context [261] contained much slag, which will require further investigation. Significantly, preservation in these deposits seemed to be different to those from House 1, with both fish bone and shell being recovered from these samples.

These plant remains from Houses 1 and 2 at Hamar are extremely important; they represent the first systematically sampled material from Viking and late Norse Unst, and our first chance to research in detail the agrarian economy of the island at that time. The samples from House 2 are from the fill of the building after it had gone out of use, and judging by the artefacts recovered from those contexts (see section 2.2.3, above) are in all probability Late Norse in date. The weed seeds in the samples suggest that these cereals are not imported from elsewhere but have been grown in the vicinity; the first archaeological indication that cereals were being grown there at the time, and judging by the large, well-filled grains, they were grown successfully. Some of the cereal grains from these contexts will be used to provide radiocarbon dates for the two houses, which will also allow us to understand their relation to each other as well as providing direct chronologies for the two buildings.

4.3 MAMMAL BONES
J.E. Cussans

Two large mammal bones were found at the site of Hamar this season; one from area A and one from Area C. Due to the scarcity of bone found at the site both of these were small found.

SF 434 came from context [305] in Area C. This piece was considerably degraded and was lifted in a block of deposit. At present identification is uncertain but the bone appears to be a long bone epiphysis belonging to a large terrestrial mammal. When first uncovered during excavation proximal cattle humerus was suggested, however cleaning and consolidation in the laboratory is needed to make a secure identification.

SF 911 was recovered from context [044] in Area A. This piece was much better preserved and considering no other bone fragments have been recovered from this area other than modern rabbit and sheep sized bones (Cussans 2007) this fragment was remarkably robust. The bone was a fragment of a right cattle pubis consisting of the articulation and approximately one third of the shaft which had been sawn through, this may be indicative of bone working rather than just butchery but this dependant on the date of the bone, which is hitherto unknown. Some of the surface had been lost in places but some evidence of trampling or gnawing was present.

4.4 SOIL MICROMORPHOLOGY

J.T. McKenzie (School of Biological and Environmental Sciences, University of Stirling)

Thin section micromorphology is an established technique in archaeology and one which is increasingly seen as an important extension to both field description and the interpretation of site stratigraphy (e.g. Davidson and Simpson 2001; Goldberg and Macphail 2006). Analysis of micromorphological soil features can not only identify elements relating to human activity which may not be identifiable during excavation, but also allow these to be set in context with both the natural pedogenetic and disturbance-related processes to which an archaeological site is subject, both during and after its occupation. When coupled with more traditional spatial and stratigraphic archaeological analyses, soil micromorphology can therefore address key archaeological questions on, especially, the mechanics of site formation and the nature of the soils and sediments - and therefore the wider environment - of the site in question. A key part of the 2007 Viking Unst excavation season was the selection for micromorphological analysis of a range of contexts at both the Hamar Houses 1 and 2, and the Upper House, Underhoull sites. A summary of the samples collected for analysis is provided in tables 4.1 and 4.2.

Sample number	Context	Description
205	082	A grey-green organic clay at the base of a possible gully
206	082/081	Samples boundary between an organic clay deposit and a black, gritty organic silt deposit within a possible gully
207	081	A black, gritty organic silt deposit within a possible gully feature
208	055	A dark peaty material sealing a possible gully feature
209	041/055	Samples the boundary between a dark peaty layer and a brown peaty layer to the south of a paved surface
210	041	A brown peaty material to the south of a paved surface
211	041/026	Samples the boundary between a brown peaty deposit and a purple-black material
240	026	A purple-black material

Table 4.1: Summary of the samples collected from Area A, from the excavation of the Upper House, Underhoull for assessment using soil micromorphology

The collection of samples from the Upper House at Underhoull focused upon the south-west of Area A in a north-south oriented extension, excavated so as to locate the southernmost extent of paving [042]. A small sondage was excavated across the width of this extension to investigate the depositional sequence pre-dating the paving. This cut a section through a shallow, presumably natural, north-south running gully through the mica schist bedrock which was filled by a series of clearly defined deposits. Excavations at this location therefore resulted in a physically linked sequence of north, west and east facing sections within which a potentially richly informative series of deposits were identified, providing a complete sequence running from the peat deposit forming the present-day land surface down to natural bedrock. These sections were the

subject of an intensive and integrated sampling programme, with dating, bulk soil and pollen core samples taken alongside eight 50 x 80mm Kubiena samples for micromorphology.

The three deposits identified within the gully may represent deliberate deposition events as well as the 'natural' silting up of the feature, and micromorphological analysis of these may therefore provide important information on early activity at the site. Primary gully deposit [082], with a greenish colour probably derived from the natural bedrock, appears to be an anthropogenically sterile silting episode, while the rich black and brown of contexts [081] and [055] above this suggests a more direct human influence. Examination of the microstructure of these contexts may provide information on the mode of their deposition and therefore the use-history of the gully. Likewise, with signs of iron mobilisation throughout these deposits suggesting waterlogging, and thus the potential for good survival of anthropogenic features, it is likely that microscopic traces of indicator materials such as fuel residues may survive to further characterise these deposits (Samples 205, 206, 207, and 208).

Further up the profile, the presence of just-visible microlaminations of material raises the intriguing possibility that [041], upon which paving [042] sits, may be a water-lain deposit. Micromorphological analysis will investigate this further (Samples 209 and 210). The physical sealing of this uppermost archaeological deposit ([041]) by surface peat context [026] is potentially the most interesting section of the profile. The presence of a slightly compacted clay-rich lens immediately below the relatively clear, sharp boundary between the two contexts suggests some complexity here – can we identify truncation of the archaeological layers prior to peat development? Is there evidence for a relict land surface at this level? Analysis of soil microstructure and pedofeatures will investigate both this crucial interface, which possibly represents the immediate post-abandonment phase of the site (Sample 211), as well as the structural character of the peat both above it (Sample 212) and further to the north where the peat lies directly upon paving [042] (Sample 240).

Sample number	**Context**	**Area**	**Description**
515	156	A	Orange brown upper fill of a gully feature within sondage 4
526	230	A	Red-brown primary fill of a gully feature within sondage 4
531	090	A	Grey brown ashy layer with much charcoal flecking at the base of the re-excavation of Stummann Hansen's trench
532	089	A	Purple-red-brown layer with large charcoal flecking, possible floor surface at the base of the re-excavation of Stummann Hansen's trench
533	090	A	Assessment of the boundary between the basal deposit of the re-excavated trench opened by Stummann Hansen
852	008	A	Yellow-brown clay based deposit within the lower room of House 1
853	008	A	Yellow-brown clay based deposit within the lower room of House 1

854	004/008	A	Assessment of the boundaries between the material within the lower room and the topsoil horizon sealing the site
855	306	A	Dark brown clay silt forming the lower fill of the channel feature running through the lower half of the lower room. Samples collected from sondage 11
856	287	A	Orange-brown upper fill of the channel feature within the lower room. Samples collected from sondage 11
861	317	C	Dark brown organic silt clay representing a possible midden/amended soil in sondage through the northern exterior of Area C
862	169	C	Topsoil horizon within the external area of Area C

Table 4.2: Summary of the samples collected from Hamar for assessment using soil micromorphology

At Hamar House 1 (Area A), micromorphological samples were taken from a range of locations, targeted to address the specific research questions raised by this complex structure. In the upper room, where a substantial depth of archaeology remained, micromorphological sampling focused on Stummann Hansen's 2000 trial trench. Running east-west across the lower part of the room and thus providing a section through much of the unexcavated material; re-excavation of this trench in 2006 identified *in situ* ashy deposits, interpreted as a floor surface (Bond *et al*. 2007), located at the base of the trench ([089] and [090]). Microstructural analysis of these contexts, particularly the identification of microlamination features caused by packing and trampling of material, may confirm this. In addition, assessment of surviving microscopic anthropogenic features in these contexts aims to provide information on the makeup of these deposits, and thus the nature of activity upon these surfaces, prior to full excavation (Samples 531, 532, and 533).

The lower room presented a different scenario. Here, a fairly shallow and generally homogenous deposit ([008]) appeared to represent the only archaeological context remaining within the structure. This had a fibrous, 'turfy' texture possibly indicating the presence of byre material. The usefulness of micromorphology for identifying turf and peat materials in such contexts is well documented (e.g. Guttmann *et al*. 2006) and so a vertical Kubiena sample sequence was obtained from a point near the eastern north-south wall (Samples 852 and 853), with the aim of maximising identification of any residual anthropogenic information which might inform on the use-history of this lower room.

Upon the removal of [008], a wide, irregular gully was revealed running north-south through the centre of the lower room. Excavation of a small sondage (sondage 11) across this feature identified two separate infills ([287] and [306]). Micromorphological samples were obtained from both contexts (Samples 856 and 855 respectively) in order to investigate the nature of these infills and any information they may provide on the purpose and use of the gully and, as with samples 852 and 853, the overall use-history of the more severely truncated lower room.

The final target for micromorphological sampling in Area A was outside the upper room, in the small drainage ditch cut into the bedrock along the outer curve of the back wall (sondage 4). This was interpreted as a means of preventing hillwash material entering the structure and as such may potentially contain significant environmental information (Bond *et al*. 2007). There is also the possibility that contexts identified within this feature may relate to the period of abandonment of the structure. A vertical sequence of micromorphological samples were therefore taken through contexts [230] and [156] (Samples 526 and 515) in order to investigate both the microscopic inclusions and microstructural features of these deposits.

An additional micromorphological sample was taken from House 2 at, where a sondage in the north-west corner of the trench was investigated (Context [317], Sample 861). Microscopic analysis, especially the identification of fuel residue materials, should aid the interpretation and help to further characterise this deposit in advance of further excavation.

4.5 A GEOARCHAEOLOGICAL ASSESSMENT OF DEPOSITS AT HAMAR

Z. Outram, R.M. Legg, C.P. Heron & B. Stern

It was noted during the excavations at Hamar during the 2006 season that the deposits within the lower room of House 1 (Area A) were largely homogeneous in nature with few artefacts being recovered. It was therefore difficult to determine the function of this large room. It has been concluded at similar sites that these large rooms functioned as byres due to the presence of key structural and topographical features. These features include:

- Sites being oriented downslope, which would aid the drainage of material out of the byre, e.g. Borg in Lofoten, Northern Norway (Arrhenius & Freij 2003: 82)
- The presence of a drainage gully, e.g. Toftanes, Faroe Islands (Stummann Hansen 1990: 47)
- Areas of paving, such as the paving associated with Houses 2 and 6 at Jarlshof (Hamilton 1956: Figure 62 & 74)
- The area is split into three zones: two side aisles and a paved area/drain running down the centre e.g. Niðri á Toft and Kvívík in the Faroe Islands (Stummann Hansen 2003: Figure 3.5; Dahl 1965: Figure 3).

It has been argued that the side aisles relate to areas of stalling. Some examples of stalls survive within the archaeological record at other sites, such as at Vorbasse, Jutland (Hvass 1980: 145-146), or Sandnes in Greenland (Roussell 1936: 88).

In addition to the structural and topographic information, the activities associated with the use of a structure as a byre may result in magnetic and chemical signatures that can be identified through the collection of small samples, c.100g of a deposit. A number of techniques have been used to analyse the deposits from the lower room with the aim of identifying evidence that relates to its use, including: magnetic susceptibility and viscosity, organic and inorganic phosphates, pH, and soil lipid analysis. A multidisciplinary approach is advantageous as it allows the information produced by the different techniques to be compared, contrasted and correlated, providing a more

detailed assessment of the processes that resulted in the formation of the sampled deposits.

Samples were collected at regular intervals where possible, spaced 20cm apart from the lower room of House 1 (contexts [186]-[197)), and context [261] from the interior of the structure sampled within Area C. The exceptions to this relate to the samples collected by Robert Legg for soil lipid analysis, with a total of six samples being collected from the lower room of House 1, and the *in situ* magnetic susceptibility survey, which was carried out using a 5cm grid.

4.5.1 MAGNETIC SUSCEPTIBILITY & VISCOSITY

The background magnetism of a site is a measure of the concentration and composition of the magnetic minerals present, as well as the size and shape of the magnetic grains within these minerals. This largely reflects the underlying geology of the area, but the effects of human and natural activities can enhance/alter these different parameters, such as through heating/burning, fermentation and dehydration (Tite & Mullins 1971: 209; Thompson & Oldfield 1986: 75; Dearing 1999: 60). With this in mind, samples were collected for assessment using both magnetic susceptibility and magnetic viscosity in order to identify any possible evidence of enhancement to the deposits at Hamar.

Magnetic susceptibility provides a measure of the ability of a material to become temporarily magnetised when placed within a magnetic field, being dependent on the mineralogy, size and concentration of the magnetic minerals present. Enhancement of the magnetic susceptibility of a deposit is largely related to processes of heating/burning, converting non-ferrimagnetic minerals to ferrimagentic minerals, such as magnetite (Thompson & Oldfield 1986: 75; Marwick 2005: 1359). In addition to heating, fermentation/decay processes of organic material within a deposit have been linked to the enhancement of magnetic susceptibility through the action of microbial, organic matter and iron within the soils (Gaffney & Gater 2003: 38; Tite & Mullins 1971: 209-210; Linford 2004: 178). Both of these processes would occur in a domestic setting as well as within a byre. The patterns of enhancement across the structure will therefore be useful in the interpretation of the site.

In terms of the magnetic viscosity, this provides a measure of the ease of which magnetic grains become aligned with an external magnetic field. Materials with higher magnetic viscosity values are dominated by larger magnetic grains, as these take longer/more energy to align with the magnetic field (Gaffney & Gater 2003: 46). It has been noted that the repeated heating and cooling of magnetic materials tends to reduce the size of the magnetic grains, corresponding to a decrease in the magnetic viscosity (Gaffney & Gater 2003: 46). An assessment of this parameter will therefore provide some indication as to the intensity of activity within the area, as well as the occurrence of industrial activities such as metal working.

In addition to the individual measurements of magnetic susceptibility and viscosity, the benefits of combining the assessments have been demonstrated. By simply determining the relationship between these two parameters, Gaffney and Gater have shown that a distinction can be made between samples enhanced through industrial and domestic activities, providing further information regarding the intensity of the activities carried out at Hamar (Gaffney & Gater 2003: Figure 157).

The measurements of magnetic susceptibility and viscosity were carried out on 50g of dried and sieved samples. The assessment of magnetic susceptibility was carried out using a low field A.C. susceptibility bridge (Evans & Heller 2003: 63), while the magnetic viscosity was assessed using a pulsed induction meter (P.I.M). In addition to the laboratory measurements of magnetic susceptibility, *in situ* assessments were carried out in the field using an Exploranium KT-9 Kappameter across a 5cm grid of the lower room of House 1.

4.5.2 PHOSPHATE ANALYSIS

The use of phosphate for geochemical prospection is a well documented technique (Bethell & Máté 1989). Phosphorus is abundant within soil systems, being present in both inorganic and organic forms, as well as in both soluble and insoluble forms. The use of this element in prospection is based on the fact that different activities enhance the levels of phosphate within a deposit, such as disposal of refuse, the presence of manure, plant remains and ash, and the preparation of food (Terry *et al.* 2004; Guttmann *et al*. 2005; Bethell and Máté 1989: 303; Middleton 2004: 53-54). The abundance and stability of this element within the archaeological record therefore supports its use as an indicator of human activity. However, the fact that so many processes result in an enhancement of phosphate complicates the significance of the results, making it difficult to determine what an enhanced phosphate signal specifically relates to for the site in question (Middleton 2004: 55).

In terms of the assessment of the material at Hamar, the relative concentrations of both organic and inorganic phosphates have been compared, providing some indication of the source that dominates the phosphorus signal of the samples. The samples were processed using the standard molybdenum blue colorimetry method using 0.1g of dried and sieved material (Murphy and Riley 1962, in Holliday and Ganter 2007: 309). A preliminary assessment of the potential of phosphate analysis has been carried out by Robert Legg and has produced some promising results (2007). However, the assessment and interpretation of these samples is ongoing.

4.5.3 SOIL LIPIDS

The preservation of lipids within archaeological contexts has been frequently demonstrated within the literature (Copley *et al*. 2005; Heron *et al*. 1991; Bull *et al*. 1999; Simpson *et al*. 1999; Heron 2001). It has been demonstrated that key lipid biomarkers can be used to identify the activities that were occurring. Of importance to the assessment of the deposits at Hamar is the identification of lipids associated with manure. The main lipids of interest are 5β-stigmastanol and coprostanol, lipids frequently associated with herbivorous faecal remains. In addition, bile acids have also been shown to persist in archaeological soils, such as deoxycholic and lithocholic acid, which are indicative of both human and cattle faecal remains (Simpson *et al*. 1999: 223; Simpson *et al*. 1998: 742; Heron 2001: 569). The presence of these key lipid biomarkers within the samples collected from Hamar would indicate the presence of faecal matter within the lower room of House 1. This in turn could be used to suggest whether the lower room was used as a byre during its final use.

A total of six samples were collected for analysis from the lower room and prepared for assessment using gas chromatography-mass spectrometry (GC-MS). This technique is one of the most effective methods of separating, detecting and identifying complex mixtures of lipids (Evershed 1993: 359). This work is in its preliminary phases at present, but will be crucial for the understanding of the function of House 1 within its later period of use.

4.5.4 pH MEASUREMENTS

The measurement of pH indicates the relative acidity or alkalinity for a given sample. Human activity on a site can influence the pH level of the local area through the addition of certain materials, such as ash, mortar, vegetation etc. In addition to this, the pH of a deposit will affect the preservation of certain types of materials, as well as the stability of certain elements, such as phosphorus within a deposit. pH measurements will therefore add vital background information to the study of these deposits. Samples were processed using a Jenway Model 3150 pH meter using 10-15ml of material.

4.6 ADDITIONAL PALAEOENVIRONMENTAL SAMPLING

M. Church

The following is an account of additional samples taken in the 2007 season, the research questions they were designed to answer, and the means by which these answers may be approached. Details of contexts and samples can be found in the appendices to this data structure report.

4.6.1 SAMPLES COLLECTED FROM HAMAR

A series of column spot samples were taken from a number of sections in addition to the comprehensive sampling strategy routinely undertaken on the site. These samples were taken to answer specific research questions, usually relating to site formation processes. The additional sampling included:

House 1

Sample SF516 (Drawing 51)

Research questions:

- What are the formation processes of the fills of the gully?
- Do the fills represent *in situ* material relating to the occupation or post-abandonment?
- Do they contain information that could provide insights into the function of the gully?
- Do they contain information that could provide insights into the immediate environment around the structure during occupation?

This sample consisted of 19 spot sub-samples (0.05 litres) taken at 2 cm intervals through the deepest section in the external gully feature to the north of the main structure (cut [231]). The samples were taken for routine soil tests (LOI, pH, magnetic susceptibility, phosphate) to complement the two Kubiena tins (Samples SF515 and SF526) taken from the basal fills (contexts [156] and [230]) for soil micromorphology. Additionally, *in situ* Exploranium readings were taken down the section. It was

hypothesised that increased magnetic enhancement would be seen in the lower fills relating to the presence of any occupation debris. Only slight enhancement was indicated by the Exploranium readings. The spot sub-samples from the basal fill may also contain contemporary pollen that would give an extra-local indication of the vegetation surrounding the structure.

Task list:
1) Loss-on-ignition x 19 for each sub-sample.
2) Low and high frequency magnetic susceptibility measurements x 19 for each sub-sample using Bartington MS2 system to test field readings from Exploranium.
3) pH from a representative sub-sample from each of the three gulley fills (contexts [140], [156], [230]).
4) Phosphate x 19 for each sub-sample.
5) 2 pollen assessment samples from the basal fill (context [230]) to assess pollen preservation.
6) Further pollen analysis if pollen preservation is good.
7) Integrated reporting based upon section drawing with analytical parameters plotted against depth and soil micromorphological report.

<u>Sample SF854 (Drawing 53)</u>

Research questions:
- What are the formation processes of the upper interior fills in House 1?
- Do the fills represent *in situ* material relating to the occupation or post-abandonment?
- Do they contain information that could provide insights into the function of the structure during this phase?

This sample consisted of 15 spot sub-samples (0.05 litres) taken at 2 cm intervals through the deepest section in the upper interior fills of the lower room in House 1 (contexts [005] and [008]). The samples were taken for routine soil tests (LOI, pH, magnetic susceptibility, phosphate) to complement the two Kubiena tins (samples SF852 and SF853) taken from the fill (context [008]) for soil micromorphology. Additionally, *in situ* Exploranium readings were taken down the section. It was hypothesised that increased magnetic enhancement would be seen in context [008], relating to the presence of any occupation debris. A clear enhancement was indicated by the Exploranium readings, perhaps indicating the presence of ash within the mixed matrix.

Task list:
1) Loss-on-ignition x 15 for each sub-sample.
2) Low and high frequency magnetic susceptibility measurements x 15 for each sub-sample using Bartington MS2 system to test field readings from Exploranium.
3) pH from a representative sub-sample from each of the two fills.
4) Phosphate x 15 for each sub-sample.
5) Integrated reporting based upon section drawing with analytical parameters plotted against depth and soil micromorphological report.

<u>Sample SF857 (Drawing 68)</u>

Research questions:

- What are the formation processes of the fills of the interior channel feature in Area A?
- Do the fills represent *in situ* material relating to the occupation or post-abandonment?
- Do they contain information that could provide insights into the function of the structure during this phase?

This sample consisted of 22 spot sub-samples (0.05 litres) taken at 1 cm intervals through the fills of the interior channel feature in House 1 (contexts [287] and [306]). The samples were taken for routine soil tests (LOI, pH, magnetic susceptibility, phosphate) to compliment the two Kubiena tins (samples SF855 and SF856) taken from the fills for soil micromorphology. Additionally, *in situ* Exploranium readings were taken down the section. It was hypothesised that increased magnetic enhancement would be seen in both fills relating to the presence of any occupation debris. A slight enhancement was indicated down the profiles by the exploranium readings, perhaps indicating the presence of ash within the mixed matrix.

Task list:

1) Loss-on-ignition x 22 for each sub-sample.
2) Low and high frequency magnetic susceptibility measurements x 22 for each sub-sample using Bartington MS2 system to test the field readings from the Exploranium.
3) pH from a representative sub-sample from each of the two fills.
4) Phosphate x 22 for each sub-sample.
5) 2 pollen assessment samples from the basal fill (context [306]) to assess pollen preservation.
6) Further pollen analysis if pollen preservation is good.
7) Integrated reporting based upon section drawing with analytical parameters plotted against depth and soil micromorphological report.

<u>Sample SF862 (Drawing 77)</u>

Research questions:

- What are the formation processes of the exterior deposits associated with the earlier structure (House 2) in Area C?
- Do the lower deposits represent *in situ* material relating to the occupation (contexts [316] and [317]) such as old ground surfaces or amended soils?
- Are the upper deposits (contexts [255], [236] and [170]) *in situ* material relating to the occupation or post-abandonment?
- Do they contain information that could provide insights into the function of the structure during this phase?
- Do they contain information that could provide insights into the immediate environment around the structure during occupation?

This sample consisted of 29 spot sub-samples (0.05 litres) taken at 2 cm intervals through the exterior deposits upslope of the earlier structure (House 2) in Area C. The deposits consisted of material abutting the exterior wall line (context [171]) that included contexts [255], [236] and [170]. Context [236] was a gravel rich layer with a clear bedding angle related to the slope. It was hypothesised that these contexts related

to post-abandonment. Conversely, the lower contexts [316] and [317] were at the same level or only slightly abutted the wall-line and so it was hypothesised that these deposits related to the occupation of the structure. The sub-samples were taken for routine soil tests (LOI, pH, magnetic susceptibility, phosphate) to complement the Kubiena tin (Sample SF861) taken from the lowest context [317] for soil micromorphology.

Task list:
1) Loss-on-ignition x 29 for each sub-sample.
2) Low and high frequency magnetic susceptibility measurements x 29 for each sub-sample using Bartington MS2 system to test the field readings from the Exploranium.
3) pH from a representative sub-sample from each of the six deposits.
4) Phosphate x 29 for each sub-sample.
5) Pollen assessment samples from the six deposits to assess pollen preservation.
6) Further pollen analysis if pollen preservation is good, especially of lower contexts [316] and [317].
7) Integrated reporting based upon section drawing with analytical parameters plotted against depth and soil micromorphological report.

4.6.2 SAMPLES COLLECTED FROM THE UPPER HOUSE, UNDERHOULL

A series of column samples, column spot samples and GBA samples were taken from a number of sections in addition to the comprehensive sampling strategy routinely undertaken on the site. These were taken to answer specific research questions, relating to site formation processes, local environmental reconstruction and chronology. The site presents an exciting and rare opportunity to assess a wide range of detailed palaeoenvironment research questions due to the waterlogged nature of parts of the site stratigraphy and the peat accumulation to the south of the main structure. The additional sampling included:

<u>Samples SF213 and SF214 (Drawing 20)</u>

Research questions:
- When was the occupation and abandonment of the site?
- How did the peaty deposits form?
- What was the nature of the immediate environment around the site before, during and after occupation?

These two column samples were taken through the exterior peaty deposits revealed in the southern extension of the main west trench. The deposits related to possible pre-occupation and occupation material (Contexts [055] and [041]) and the post-abandonment phase of extensive and rapid peat accumulation (Context [026]) to the present day. This presented an opportunity for establishing a detailed chronology for the occupation of the site and creating a trajectory of environmental change in the immediate area. Three Kubiena tins were also taken for soil micromorphology from Context [026] (Sample SF212), the interface between Contexts [026] and [041] (Sample SF211) and Context [041] (Sample SF210).

Task list:
1) X-ray column samples at NERC facility in Aberystwyth

2) Full laboratory description of each column sample (Troels-Smith description, texture, Munsell colour) followed by magnetic susceptibility using Bartington MS2f meter.
3) Sub-sample (1cm^3 by volume) at 1 cm intervals for LOI (~110 sub-samples).
4) pH from a representative sub-sample from specific contexts
5) Phosphate x 55 for every second sub-sample.
6) Pollen assessment to assess pollen preservation x 6
7) Further pollen analysis if pollen preservation is good.
8) Radiocarbon submission based on stratigraphy, soil parameters and pollen profile.
9) Integrated reporting based upon section drawing with analytical parameters plotted against depth and soil micromorphological report.

Samples SF238 and SF239

These two column samples were taken through the peaty deposits that had built up against and over the paving (Context [029]) and the degraded turf spill (Context [040]) from the southern wall line of the main structure.

Gully samples

Two further areas were sampled in detail for palaeoenvironmental reconstruction including a) the gully fill to the north of the main structure (basal fill = Context [084]) sampled by Sample SF620 (12 sub-samples at 1cm intervals) and b) the possible gully feature running down-slope from the south of the main structure (Context [060]). This latter feature was sampled for soil micromorphology (Samples SF205, SF206, SF207, SF208 and SF209), pollen (Sample SF216 = 32 sub-samples at 1 cm intervals: Sample SF217 32 spot samples at 1cm intervals) and additional GBA samples for beetle and uncarbonised plant macrofossil assessment and possible analysis. Both gullies were sampled to a) assess the function of the features and b) provide a detailed extra-local environmental reconstruction of the immediate area around the settlement during and after occupation.

5. DATING AT HAMAR & THE UPPER HOUSE, UNDERHOULL

Z. Outram, C.M. Batt, G.T. Swindles, & M. Church

5.1 OBJECTIVES OF THE DATING PROGRAMME

The main aim of the dating programme of the Viking Unst Project is to provide a precise absolute chronology for the development of the sites under assessment. This is seen as an essential part of the research agenda, and is particularly important given that there are relatively few scientific dates produced for the North Atlantic during the Viking and Norse periods (Jansen 1972: 30; Fridriksson & Vésteinsson 2003). Dating these structures is crucial for answering the research questions proposed as part of the Viking Unst Project. Without accurate dates we cannot begin to build a model for Scandinavian settlement and society on Unst.

In addition to the archaeological dating methods of stratigraphy and typology, three scientific dating techniques have been employed at the sites of Hamar and Underhoull during the 2007 season: AMS radiocarbon dating, archaeomagnetic dating and tephrochronology.

5.2 AMS RADIOCARBON DATING

The use of AMS radiocarbon dating forms the major component of dating strategies. Contexts for dating have been selected by J. Bond, Z. Outram, C. Batt and M. Church; decisions will be based on the availability of material, the integrity of the deposit and the importance of its position within the stratigraphic sequence. It was noted that the deposits excavated during the 2006 season at Hamar were heavily bioturbated, possibly compromising the security of the contexts in terms of movement of residual/intrusive material through the sequence of deposits. It was concluded that the selection of material for radiocarbon dating should be weighted towards the deposits sampled during the 2007 season, with the exception of the deposits at the base of the trench first excavated by Stummann Hansen.

The AMS technique has been selected as it allows small samples to be dated, reducing interpretive difficulties due to delayed use and residual material. The main material which will be used is charred barley grains due to the short-lived and seasonal nature of the grains. The grains have been obtained by flotation of carefully excavated samples (see Section 4.1). The results of the radiocarbon dating will be calibrated using the Oxford Radiocarbon Accelerator unit programme OxCal v.3.10 (Bronk Ramsey 2005) that utilises the most recent Reimer *et al.* (2004) calibration curve (INTCAL04) and, where appropriate, Bayesian models will be used to interpret the results. The final results will be presented in appropriate academic publications.

5.3 ARCHAEOMAGNETIC DATING

The method of archaeomagnetic dating assesses *in situ* burnt features in terms of the last heating event recorded by the magnetic minerals within the clay. Standard sample collection methods were carried out by attaching a plastic reference marker to the feature with fast-setting glue (Clark *et al.* 1988, 655-7). The samples were orientated in the present geomagnetic field using a magnetic compass. Magnetic direction is determined in the laboratory using a spinner fluxgate magnetometer and the stability of the sample is assessed using alternating-field demagnetisation. The main stable

magnetic direction is calibrated using the UK calibration curve to give a calendar date at 95% confidence (Clark *et al*. 1988; Batt 1997) as well as the most recent calibration curve, Rendate (Zananiri *et al.* 2007).

One feature was sampled during the 2007 season, context [093], relating to a possible area of burning in the north-west corner of Area A at Underhoull. The context was described as an orange deposit containing quantities of ash and fuel ash slag and was located outside the area of the structure. A total of 18 samples were collected from the feature, although two of these were found to lie on slag and therefore could not be used for dating purposes. The removal of the samples showed that the deposit was relatively thick, being over 5cm in places. It was not clear at this stage if the material related to an *in situ* burning event or a dump of fuel ash, but this will be clear from the archaeomagnetic results.

Following the removal of the archaeomagnetic samples it became clear that the sampled layer sealed a bright red and orange deposit (context [093]), although as this context lay close to the limits of the excavation in this area it was not clear what this deposit related to. Further excavation is needed to clarify this and to reveal the full extent of the context and therefore if it relates to an *in situ* burning event. This layer will be sampled during the 2008 season.

The excavation at Hamar revealed four deposits interpreted as hearths during the 2007 season, all of which were recorded in House 1 (Area A):

Context	**Location**	**Description**
180	Lower room	Area of heat-affected bedrock
251 & 272	North-west corner of the upper room	Corner hearth with a patch of orange and black ash
329 & 309	Within channel-feature adjacent to the southern doorway	Heat-affected slabs forming the base of the hearth, associated with a concentration of ash and fragments of bakeplates
345 & 346	Within annexe adjacent to wall [079]	Larger area of red fired clay and black ash

Table 5.1: Summary of the hearths recorded during the 2007 season at Hamar

Only the hearth recorded within the annexe contained material that could be sampled for archaeomagnetic dating, and will therefore be sampled in the 2008 excavation season. The remaining features will be, or have been sampled for environmental analysis in the hope of collecting charred barley grains that can be used for radiocarbon dating.

5.4 TEPHROCHRONOLOGY

The principles behind using volcanic ash, or tephra as a dating technique are based on the distinctive geochemical properties of the material being specific to a volcanic system. During an eruption, material is ejected into the atmosphere; the majority of this material will settle relatively close to the source of the volcano, but fine particles of volcanic ash can be rapidly dispersed across an extensive area through the atmosphere

and forms characteristic horizons (isochrons) wherever this material is deposited. These horizons allow the correlation of different areas, linking spatially distinct areas to a common event in time (Dugmore 1989: 168; Dugmore & Newton 1999: 70). Dates for the various tephra layers can be obtained through historical records, or where these are not available for prehistoric tephras/tephras of unknown origin, through complementary dating techniques such as radiocarbon or ice-core chronology (Dugmore *et al*. 1995: 379; Wastegård *et al*. 2003: 278). The precision of the associated radiocarbon dates have been greatly improved in recent years through the application of wiggle-matching to the sequences of dates (Swindles *et al.* 2007: 667). It has been noted that Holocene tephras can be dated with an accuracy of approximately 10 years, which clearly exceeds the available precision associated with radiocarbon dating (Hall & Pilcher 2002: 229; Wastegård *et al*. 2003: 278).

Dugmore (1989) was the first to identify the occurrence of tephra within Scotland, but despite the potential of this technique to both the chronology and palaeoenvironmental studies, only limited work has been carried out within Shetland. An assessment of a lake core from Catta Ness, Lunnasting was carried out by Bennet *et al* (1992), while an investigation of the deposits at Kebister was carried out by Dugmore and Newton (1999: 70).

A number of tephra layers may have been deposited on Shetland during the periods that pre- and post-date the settlements at Hamar and Underhoull (Hall & Pilcher 2002: Table 2). The identification of these tephras would constrain the chronological assessment of these sites, as well as allowing the evidence recorded at Hamar and Underhoull to be unambiguously linked to sites across the North Atlantic. With this in mind, a preliminary assessment of samples collected from the layers of peat sealing the site of Underhoull will be assessed during the post-excavation season. The samples that will be assessed have been summarised in table 5.2:

Sample number	**Context number**	**Section**	**Description**
213	026	E-facing section, upper half	A purple-black well humified peat with some silt and clay
214	026, 041, 055	E-facing section, lower half	Three successive layers of well humified peat representing the pre- and post-abandonment horizon of the site. The lower deposits are associated with a layer of paving (context [029]) and may include some evidence for soil amendment.
238	026	W-facing section, upper half	A purple-black well humified peat with some silt and clay
239	026	W-facing section, lower half	A purple-black well humified peat with some silt and clay, that directly seals the paving layer, context [029]

Table 5.2: Summary of the monolith samples that will be used to investigate the presence of tephra within the deposits at Underhoull, Area A.

The individual shards of tephra are generally 10-100μm in size, being contained within the matrix of the deposit so that they are not commonly visible with the naked eye, and are referred to as crypto-tephra (Hall & Pilcher 2002: 224; Dugmore 1989: 169). The presence of tephra within a deposit will therefore require the samples to be assessed using light microscopy. If tephra is located, the samples can then be geochemically assessed using electron microprobe analysis with the hope of identifying the source, and therefore the date of the material present (Pilcher & Hall 1996: 101).

PART TWO

PERSONNEL & RELATED RESEARCH

6. PROJECT OUTCOMES

6.1 RESEARCH PROJECTS

6.1.1 PHD RESEARCH

Department of Archaeological Sciences, University of Bradford

The Westward Viking Expansion: a Study in Population Reconstruction.
A.R.R. Mustchin (Division of AGES): 2010

6.1.2 MSC DISSERTATIONS

Integrated chemical and magnetic analysis of Norse deposits from Hamar, Unst, Shetland
R. Legg (Division of AGES, University of Bradford): 2007

Several morphological and topographical features are associated with byres of the Norse period in the North Atlantic region. Most of these have not been demonstrated on an archaeological site. This dissertation attempted to highlight whether an integrated chemical and magnetic soil analysis could aid in the interpretation of possible byre areas.

Soils samples within and around a possible byre area of a longhouse structure at Hamar, Unst were analysed for organic and inorganic phosphorus content, magnetic susceptibility, soil lipid chromatograms and loss on ignition. Samples were taken from the possible byre area, down-slope of the structure and also uphill of the site.

High values of organic phosphorus and loss on ignition from the fillings of gully at the bottom end of the byre were interpreted as possible accumulation of byre waste for drainage of water. Similarly enhanced values of organic phosphorus down-slope of the site appeared to highlight possible drainage and clearance of the byre downhill.

Gas chromatography data suggested a slight difference between the site deposits and surrounding soils. More detailed interpretation will require identification of specific faecal biomarkers using gas chromatography-mass spectrometry. High magnetic susceptibility values in all samples masked any variation due to anthropogenic activity. The high values are believed to be due to presence of a magnetic remanence carrying mineral such as magnetite in the soil.

6.1.3 OTHER RESEARCH PROJECTS

Soil analysis using magnetic susceptibility, magnetic viscosity, pH, and phosphate measurements: a geoarchaeological assessment of Hamar, Unst.
N.J. Cowie (Division of AGES, University of Bradford). Funded by the Nuffield Foundation, Science Bursaries for Undergraduate Research.

6.1.4 OTHER PROJECT OUTCOMES

Viking/Norse Sites database
C.M. Freeth

Work is in progress collating information regarding known and suspected Viking/Norse sites on Unst into an MS Access database. Data has been collected from various sources including the SMR, NMR, Canmore/Archsearch, Royal Commission, '*Discovery and Excavation in Scotland*', and published accounts of previous research. To date, 104 sites securely or tentatively identified as Viking/Norse have been recorded. The fields within the database relate to a site's preservation, geology, topography, associated finds, the nature, layout and dimension of the remains, excavation history and site bibliography. The database also provides links to relevant documentation and websites.

The information will contribute to our understanding of the wider context of Hamar and Underhoull as well as providing a research resource for investigating specific questions regarding the siting, distribution and relationship of Viking/Norse settlement on the island. It is also envisaged that should the database be made available to the public (for example as a website) it could potentially provide a resource that will enhance the enjoyment and understanding of the island's Viking heritage for visitors and residents, and also provide a means to encourage their participation.

Bibliographic database
Work is also underway building a bibliographic database relating to Viking/Norse settlement in the North Atlantic. The references are provided with a series of keywords to aid searches and cataloguing. Areas focused on include primary sources, site reports, artefacts and structures, landscape studies, environment and climate, subsistence and economy, expansion and settlement. On completion this resource could also be made available to the public through websites or publication.

6.2 PRESENTATIONS

Barton, R. 2007. Viking Unst – The Story So Far. Shetland Museums and Archives, Archaeology Week. 10/09/2007.

Bond, J.M. 2007. The Viking Unst Project: Excavations at Hamar. Unst Heritage Centre. 26/06/2007.

Bond, J.M. 2007. The Viking Unst Project: excavations at Hamar and Underhoull. International Polar Year Project "Long term Human Ecodynamics in the North Atlantic". Edinburgh 2007 Symposium. University of Edinburgh. 3/12/07

6.3 PROJECT RELATED PUBLICATIONS

Bond, J.M., Larsen, A-C, and Turner, V.E. 2007. Viking Unst: Hamar and Belmont. In Turner, R. (ed.) *Discovery and Excavation in Scotland*. Edinburgh: the Council for Scottish Archaeology.

(Text and photographs were also produced by Bond, Freeth and Outram (2007) to be included in the Viking Unst Project Newsletter; this material was also circulated as a newsletter to the students and volunteers from the University of Bradford).

7. PERSONNEL

7.1 MANAGEMENT TEAM

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