Caherconnell Cashel, Co. Clare

Preliminary Archaeological Excavation Report for 2017 season

Licence No: 10E087
by

Michelle Comber

August 2017

Caherconnell Archaeological Field School

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This excavation would not be possible without their hard work, support and expertise.
It is appreciated!

Well done - a pat on the back to all the team!

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Introduction

This report documents the preliminary results of the 2017 season of archaeological excavation at Caherconnell Cashel, Co. Clare (NGR 123622 199486, SMR CL009-03010) (Figs 1 and 2). Test excavation in 2007 demonstrated the archaeological potential of this site to address questions of native settlement in medieval Ireland. An international field school, the Caherconnell Archaeological Field School, was established in 2010 to provide a secure source of funding and quality control for research excavation at Caherconnell.

Fig. 1 Caherconnell (circled), with preserved enclosures and field walls to southwest.

Location

Caherconnell Cashel is located in the townland of Caherconnell, Kilcorney parish, Burren barony, Co. Clare (Fig. 2). The landscape in the immediate vicinity is part of the 'High Burren' and is karst limestone. The land is currently used as pasture. The cashel lies at approximately 130m above Ordnance Datum, on the northern slopes of the shallow, but fertile, Kilcorney valley. The valley is ringed by archaeological monuments of various age. Settlement enclosures of probable Early Medieval date (mostly cashels) are situated on the valley slopes, while prehistoric sites (mostly megalithic tombs) can be found on the highest points in the area (including Poulnabrone to the north, and Poulawack to the south). Caherconnell cashel is one of four drystone enclosures in the townland of that name, and is located to the immediate west of the R480 road that links Leamaneh and Ballyvaghan, a natural routeway through the Burren uplands.

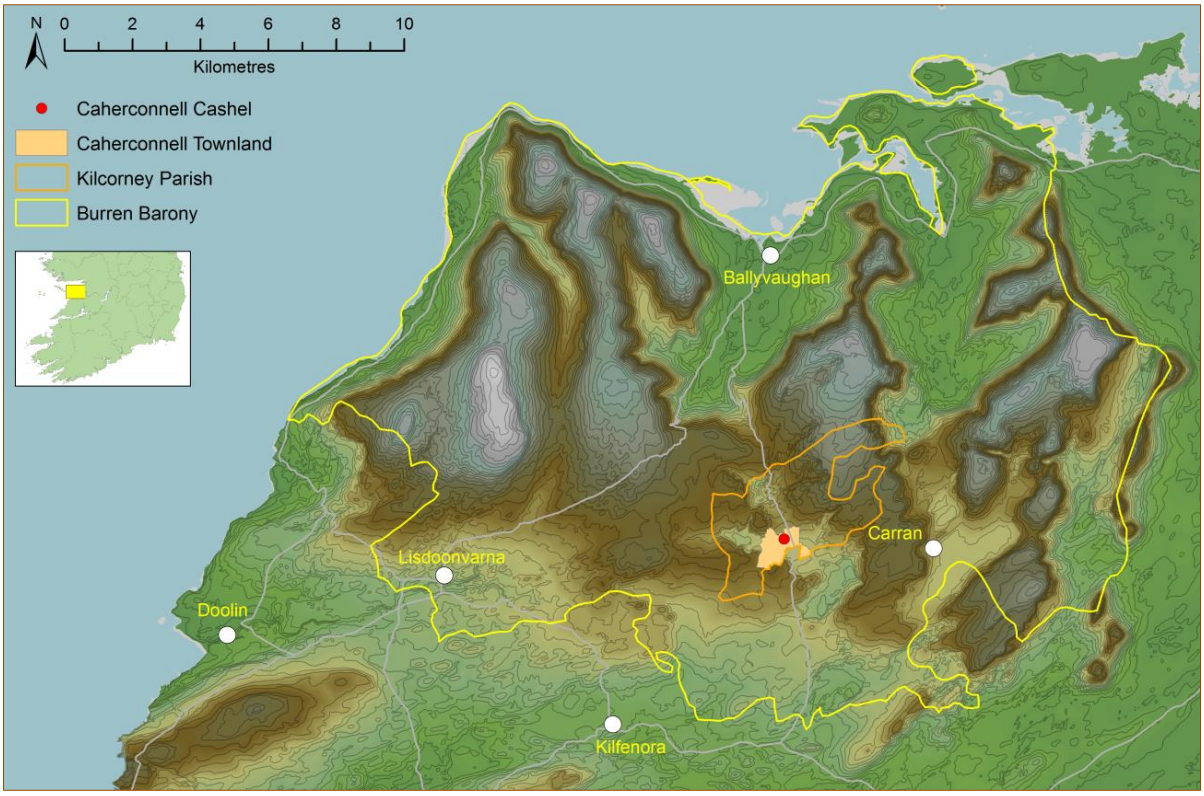

Fig. 2 Location of Caherconnell.

The Cashel (Fig. 3)

The enclosure at Caherconnell is a circular, drystone ringfort or 'cashel'. It measures 42m in external diameter, with walls up to 3m wide at the base and up to 3.6m high.

Fig. 3 Caherconnell cashel, from northwest.

The quantity of stone tumbled from the walls suggests at least another metre in original height. The walls are composed of rough horizontal courses of local limestone blocks and slabs, with smaller stones used to fill the gaps between them. Occasional vertical seams are visible along the external face of the wall. The inner face of the wall has been rebuilt in several places – evident in the vertical and angled setting of the replaced stones. Although Westropp noted the lack of any internal wall terraces or steps, it appears that some of the rebuilding and tumble simply masked such features. A narrow ledge does run along the inner face of the wall to the south (and was also identified in some excavation cuttings). This is

approximately 0.3m – 0.5m wide. In addition, a short flight of steps was discovered just inside the entrance during excavations in 2010. The entrance gap is situated on the east of the site, with Westropp recording vertical jamb-stones defining its external edges at the end of the 19th century. A modern timber access stairs filled this gap prior to the 2010 excavation and few, if any, traces of the original entrance could be discerned.

The modern interior of the cashel is clearly raised above that of the external ground surface, an average of 0.7m in the difference. Excavation has proven that this is due to a build-up of occupation material within the enclosure. The interior surface is now somewhat uneven, marked by relatively frequent grassed-over stones and other features. The partially grassed-over wall tumble around the circumference of the interior gives it a somewhat 'dished' appearance. A number of features are visible above the surface.

Internal Features (Fig. 4 below)

Dividing Wall

The interior is divided in two by the remains of a partly grassed-over drystone wall running roughly east–west across the site in a slightly curving fashion. Though the edges of this wall are masked by collapse, it is possible to identify a double-faced wall with a rubble core, approximately 1–1.3m wide where the original width is visible. A maximum of four courses is discernible, though the tumble on both sides would suggest a greater original height. This wall is quite late in date, contemporary with Structure A (the subject of the 2007 and 2015 excavations).

Structure A

One of two visible internal structures, Structure A is situated just inside the north wall of the cashel, and was the subject of the 2007 and 2015 excavations. Rectangular in plan (with its long axis running east–west), it was defined before excavation by a partly grassed-over drystone wall visible to the west and south, but hidden by cashel tumble to the north, and almost completely denuded to the east. Stretches of original, *in situ*, walling were visible amongst the collapse, particularly along the south side wall. Here, the wall had an internal and external facing of contiguous limestone slabs set on edge. The grassed-over nature of the area between the faces prevented the positive identification of a rubble core or horizontal coursing. The original width of the wall reached a maximum of 1.2m, and 0.25m in surviving height. Internally it measured roughly 10m by 5m. Prior to excavation its relationship with the cashel wall was uncertain. The small 2007 excavation showed that Structure A was free-standing rather than keyed into the cashel wall, had opposed doorways near the eastern end of the structure, had a limestone mortar floor and was likely to have been constructed and occupied between the early 15th and early 17th centuries (Comber and Hull 2010).

Structure B

Structure B is built up against the west wall of the cashel and was excavated in 2017. It is sub-triangular in plan, with its interior divided in two by a rather flimsy drystone wall. It measures approximately 8m by 6.5m. Its north wall forms part of the dividing wall running across the site (C.48) and, prior to excavation, was partially covered with vegetation. Up to six

horizontal courses are extant on this side. The remaining eastern wall (C.195 – see below) is not very substantial. The walls were much collapsed and partly overgrown, perhaps explaining the difficulty in positively identifying an entrance or entrances. The most likely position of such was along the eastern length of wall. Before excavation, the entire structure appeared rather late in date.

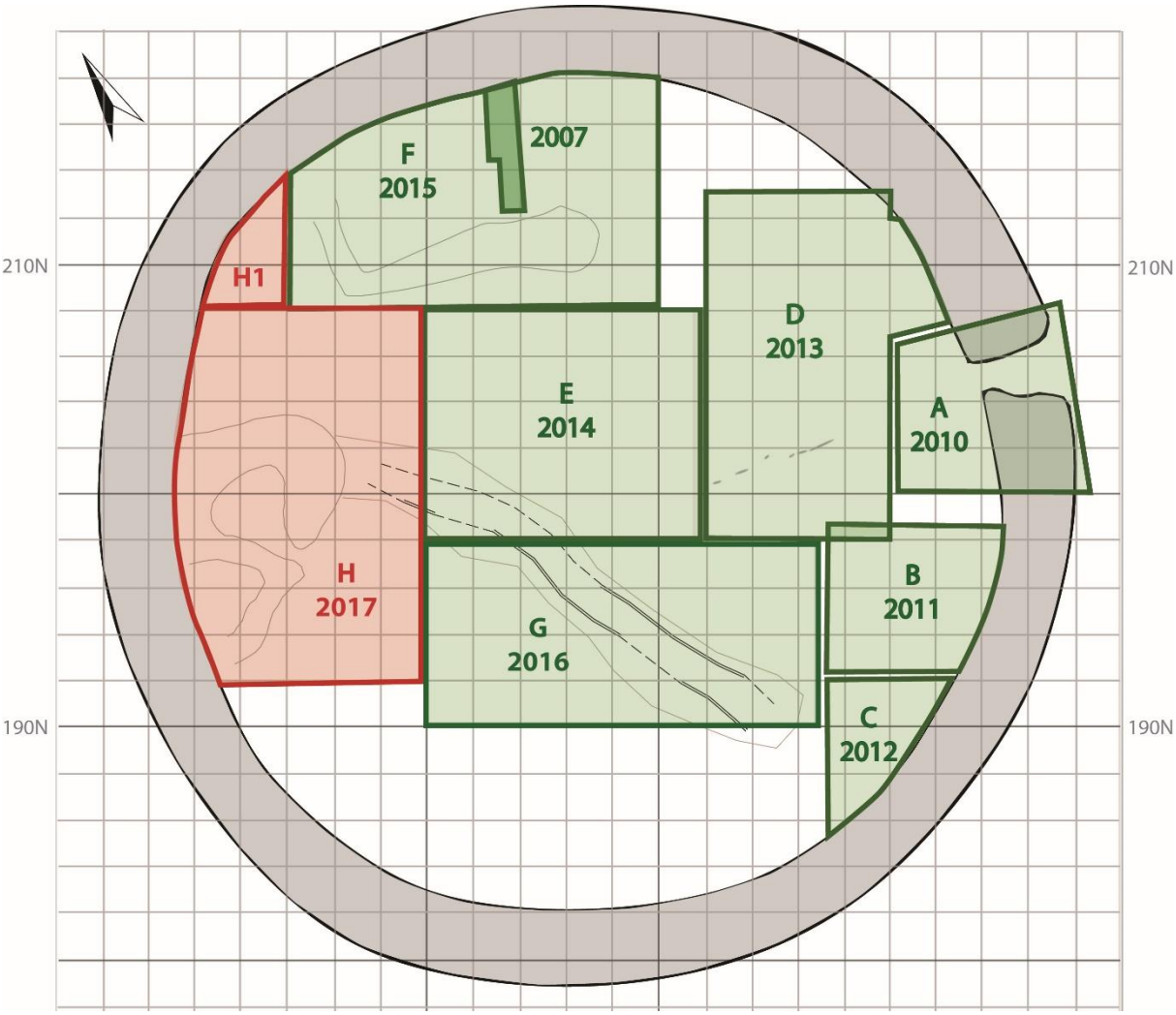

Fig. 4 Survey of Caherconnell, with excavation cuttings marked (2017 Cuttings H and H1 in red).

External Features, Caherconnell townland

A number of non-modern features can be seen in the immediate vicinity of Caherconnell cashel, particularly to its south and southeast. Closest to the cashel (just east of its entrance) is a small, partially grassed-over cairn of large stones. This measures approximately 2.5m in diameter and 1m in height. The possibility of a prehistoric burial mound or covered well cannot be ruled out. To the north of the cashel lies a small, sub-circular barrow, 11m by 14m in diameter, of probable Late Bronze Age or Iron Age date.

The 2008/9 focus of test excavation (08E0535) was a doline (Fig. 5), a natural sink-hole, located approximately 20m southeast of Caherconnell Cashel. Attention was drawn to this geological feature by limited visible remains of a partially collapsed stone chamber. Excavation, however, unearthed a much greater range of evidence.

Fig. 5 Backfilled doline – modern posts mark prehistoric post-holes on left, medieval structure on right.

The earliest activity within the sheltered doline was associated with a rectangular house defined by post-holes, with an internal stone-lined hearth. The house is of Early Bronze Age date. Prehistoric artefacts from the excavation included a fragment of a possible saddle quern, polished stone balls/marbles, a sherd of Neolithic pottery, and thousands of pieces of worked chert (the local substitute for flint) of both Neolithic and Bronze Age type. Also recovered, though possibly reflecting slightly later activity, was a small assemblage of Middle Bronze Age pottery. Anna Brindley has suggested that this may represent the remains of Middle Bronze Age/Late Bronze Age flat cemetery that once existed in the vicinity of the doline, though she does not rule out the possibility of the pottery having served a domestic function (pers. Comm.).

The stone structure partly visible prior to excavation was revealed as a circular chamber built against two walls of the doline. The chamber's walls (at least 1m thick) probably originally rose into a corbelled stone roof, judging by the quantity of collapsed stone found in the interior of the structure. A wide entrance gap led into a 2m-diameter chamber that contained a pit filled with semi-articulated animal bones, and some scattered preserved grain. The discovery of a medieval bedding mortar at the base of the wall, in conjunction with a small assemblage of medieval artefacts and some radiocarbon dates, suggest a medieval date for the, as yet unique, structure. It may have been built by the adjacent cashel dwellers, perhaps as a store (explaining the wide entrance, bone and grain remains, and lack of occupation evidence or hearth within the chamber).

The final event revealed by excavation within the doline was the placing of human remains within the partly silted up entrance of the medieval structure (Fig. 6). The remains comprised

disarticulated bones of at least three individuals, largely those of an adolescent though missing most of the long bones.

Fig. 6 Human remains from doline.

The bones were radiocarbon dated to the 15th/16th century AD, a time when a branch of the ruling Gaelic O'Loughlin family was living in the adjacent Caherconnell cashel. It seems likely that the remains were accidentally disturbed elsewhere, sometime after the 15th/16th century, and redeposited in the doline. Perhaps part of an ancestral cemetery of the O'Loughlins was uncovered by farm or building works at a time when it was no longer marked or known as a burial place. The now missing long-bones could have been wrongly identified and discarded as animal bones. However, once a human skull was encountered, the remaining disturbed bones could have been gathered together and simply placed in what was then a convenient hole in the ground.

Caherconnell cashel is one of four drystone enclosures in the townland. Lisnandrom is the westernmost of the four, measuring 28m in diameter. It sits on top of a low inland cliff, with conjoined structural foundations located at the foot of that cliff. Situated between Lisnandrom and Caherconnell are two possible boulder burials and miscellaneous other features. Due south of the main cashel are more extensive remains, comprising a circular cashel, a sub-square drystone enclosure, ancient field walls, routeways, and smaller house-like enclosures scattered about the area (Fig. 7). An old route-way also skirts Caherconnell and runs off to the south-southwest.

Fig. 7 Circular and square enclosures south of Caherconnell cashel.

The sub-square enclosure was the focus of a Royal Irish Academy-funded research excavation, directed by the author (10E119). Excavation occurred during the summers of 2010, 2011, and 2012, the final report since submitted. Three definite structures, lengths of yard wall, and the original entrance were all investigated. Finds included quantities of animal bone, hazelnut and sea shells, metalworking slag, chert and flint lithics, stone axes, iron tools, bronze dress-pins, glass beads, bone artefacts, stone tools, quernstone fragments etc. Initial radiocarbon dates have provided a 7th to 9th-century AD date for much of the activity, with 10th-century dumping around its entrance. Questions remain over the site's shape, size, entrance orientation and prehistoric artefact assemblage, with answers suggesting a specific social role for this site.

Research framework

The excavation at Caherconnell was designed to reveal information on the site itself, to integrate the monument into a wider study of the archaeological landscape currently being undertaken by the author and colleagues in the Department of Archaeology, NUI, Galway, and to provide students with hands-on training in archaeological excavation.

The study of archaeological landscapes is becoming increasingly popular in Ireland and elsewhere. Recent work by Billy O'Brien, Liam Hickey and Nick Hogan on the Beara peninsula, Co. Cork, has revealed the potential of such work in an Irish context (O'Brien 2009). The Beara studies (at the Barrees Valley, Cloontreem and Ardgroom) mapped extensive archaeological landscapes that survived in the valleys and along the lower slopes of an upland region. These surveys, and some excavation at Barrees, revealed much about past human activity in these areas, and suggested what the landscape may have looked like in other areas where such remains have not been preserved. The Burren, with its extensive preserved remains, should, at the very least, provide similar information for the west of Ireland.

Some landscape survey has been undertaken in the Burren. The first attempt at landscape mapping was completed by Blair Gibson as part of his doctoral thesis studying the chiefdom of *Tulach Commain* and the archaeological remains in the area of Cahercommaun, to the southeast of Caherconnell. Gibson's survey, however, was not an electronic one and did not record the same density or detail of surviving remains (Gibson 1990). A more recent digital survey in the area was carried out by Carleton Jones of NUI Galway, at Roughan Hill to the southeast. This work had a prehistoric focus, but did incorporate archaeological remains of all periods in its survey (pers. comm.). Initial excavations by Jones are now being continued by Ros O Maolduin. Christine Grant, with the aid of the Burren Beo Volunteer Trust, is currently mapping remains in the townland of Kilcorney, to the southwest of Caherconnell.

Elizabeth Fitzpatrick of NUI, Galway has recently commenced a study of the later medieval estates, residences and schools of the Gaelic professional classes, including those of the Burren. One of the main foci of her work is the Cahermacnaghten estate of the O'Davorens, a minor gentry family who were keepers of legal manuscripts and teachers of law in the lordship of Burren. In addition to mapping the archaeological remains in the area, the project has undertaken three seasons of excavation in the vicinity of Cahermacnaghten in a search for

chronological and functional evidence (funded by the Royal Irish Academy). Excavation targeted a well-preserved stone building called *Cabhail Tighe Breac* (that may have served as a medieval school building), a possible outhouse structure, and a small possible dwelling house (pers. comm.).

Also relevant to this excavation at Caherconnell, is the survey work of the author; a study of the cashels and associated remains in a study area extending south from Caherconnell as far as Kilfenora, east to Carran and Cahercommaun, and southeast to Leamaneh. This project, *Ringforts and the Settlement Landscape of the Burren in the First Millennium AD*, commenced in 2005 and was funded by the Heritage Council of Ireland. It marked the start of a study of the settlement landscape of the first millennium AD in a chosen study area within the Burren, Co. Clare. The area in question incorporated the shifting political boundaries of *Corcomruad* territory. The first year saw the analysis of data from all relevant monuments within the study area, numbering approximately three hundred extant sites (mostly cashels, raths, enclosures and ecclesiastical remains). This analysis revealed that many of these settlements were deliberately sited to best exploit the most fertile farmland in the area, a not uncommon tendency in this period (Comber 2005). It also suggested, however, that some settlement may have been strategically positioned with regard to communication strategies and territorial politics. Caherconnell is one such site, positioned as it is at one end of a major north-south pass through the Burren mountains (still used today by the two modern roads, the N67 and R480).

More recent work has seen the detailed digital survey and mapping of a preserved archaeological landscape located between the large cashel of Ballykinvarga to the south of Caherconnell, and Leamaneh castle to the southeast (Comber 2006). Extensive field systems and enclosures were recorded in this area, with the area of study expanded through the examination of vertical aerial photographs. Elements from various periods of the past were identified, reflecting the continued use of this zone throughout prehistory, the Early Medieval period, and the medieval periods. These included at least ten different forms of field wall, individual fields, small enclosures, larger settlement enclosures, tracks and roads, cairns, tombs and castle remains. Most of the extant material, however, *appears* to date from the Early Medieval period.

The next, logical step in this study was the acquisition of scientific dating evidence from as many parts of this landscape as possible, from cashels, small enclosures, ancient field walls etc. When the opportunity to excavate at Caherconnell arose, a third phase of survey was undertaken in advance of excavation (Comber 2008). This mapped, in 2d (Fig. 8) and 3d, multi-period archaeological remains in the townland of Caherconnell, including three circular cashels, a sub-square enclosure, field walls, a barrow, boulder burials, house sites etc. These features are now the focus of the Caherconnell Archaeological Project, a project that involved test excavation undertaken by volunteer archaeologists (07E0820 and 08E0535, see summary above), full-scale research excavation funded by the Royal Irish Academy (10E119, see summary above) and the Caherconnell Archaeological Field School (10E087, subject of this report and previous reports on 2010-16 excavations).

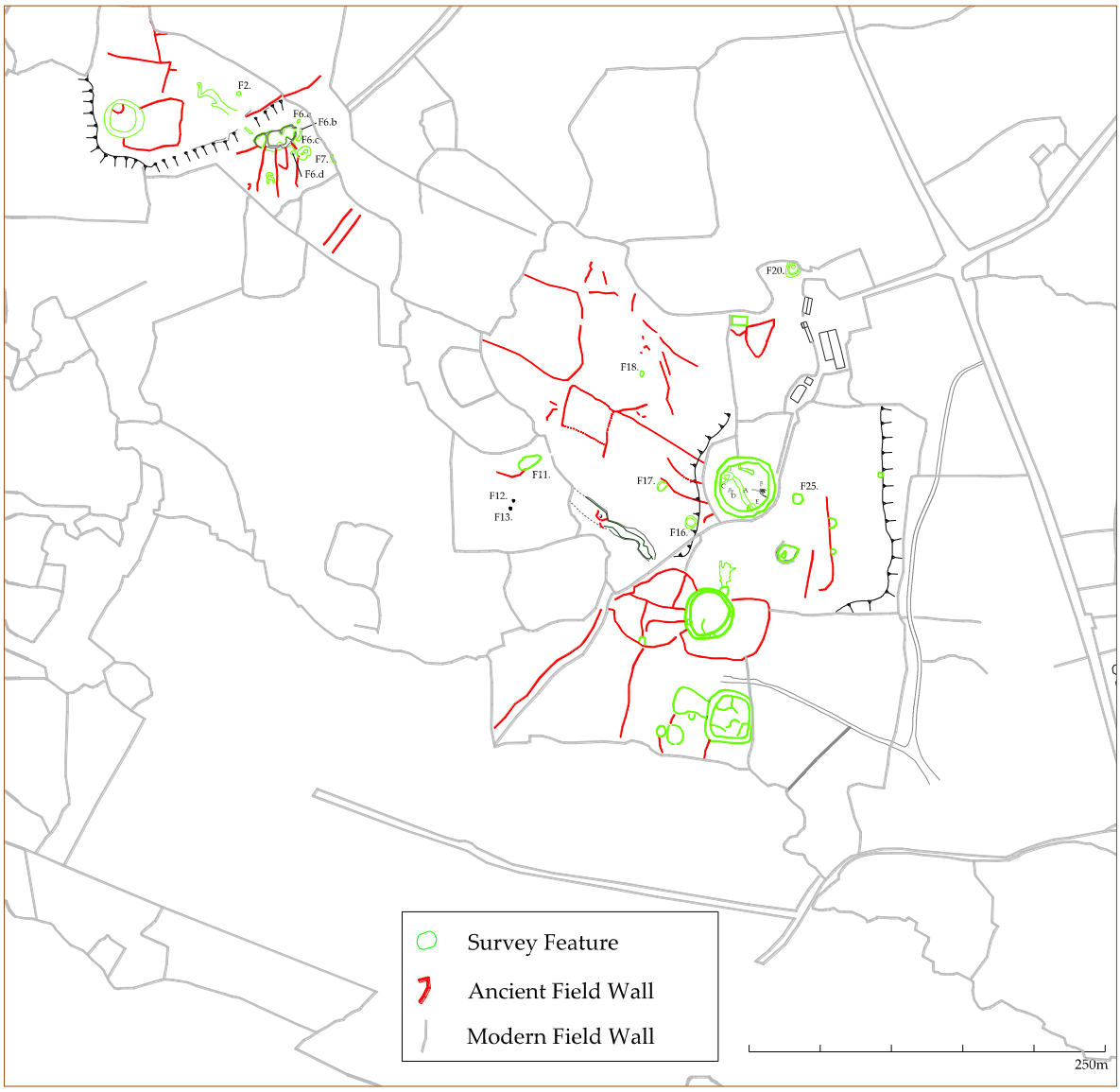

Fig. 8 Survey of Caherconnell townland.

Excavation Aims and Methodology

The 2010 to 2017 excavation seasons are part of a programme of excavation that is intended to examine as much of the cashel interior as possible. This programme is being funded by the Caherconnell Archaeological Field School, led by a team of highly-qualified professional archaeologists (directed by the author), and accredited by NUI, Galway. The field school was established in response to the potential demonstrated by the initial test excavation in 2007. This demonstrated the wealth of preserved archaeological material and its importance for the study of continuous native Gaelic settlement throughout the Early Medieval and Medieval periods. The only way to ensure ongoing funding and consistent high quality for such a significant undertaking was the establishment of an international field school. It is hoped that these excavations will help identify the archaeology of the native Irish in the medieval period, a period largely dominated by Anglo-Norman archaeology. They should, in addition, reveal much of the native way of life in a changing world.

Following submission of a method statement and licence application, a licence to excavate was granted to Graham Hull by the National Monuments Service of the Department of the Environment, Heritage and Local Government, in consultation with the National Museum of Ireland in 2010. The licence was transferred to Michelle Comber in 2012 and extended for 2013, 2014, 2015, 2016 and 2017. The licence number is 10E0087.

The 2010 (Cutting A) and 2011 (Cutting B) excavations were focused on the cashel entrance and the internal area to the immediate southwest (Fig. 4). The entrance was targeted first, to facilitate the removal of wooden steps that provided recent visitor access to the cashel interior (the site having its own visitor centre). This improved access for the excavation team and less mobile visitors to the site. The 2012 excavation (Cutting C) was situated immediately south, and adjacent to, cutting B from 2011. It measured 7m by 5m (maximum), being defined by the cashel wall on two 'sides'. Grassed-over possible structural remains were visible in this area prior to excavation. The eastern end of the wall dividing the cashel interior did not run cleanly up to the cashel wall. Rather, roughly 5m from the cashel wall there was a gap followed by the apparent splitting of the wall into two raised 'banks' with a sunken area between (see Figs. 4 and 9). It was uncertain which, if either, of these might represent a continuation of the dividing wall. The hollow between them measured roughly 4m by 1.5m, and up to 0.5m deep. It contained partially grassed-over large stones and slabs, some of which were in a horizontal position with voids visible beneath them – all caused by a relatively modern animal burial. Writing at the end of the nineteenth century, Westropp (1899, 375) described this area:

> *The garth is divided by a long wall running north-west and south-east; at its northern end are two house sites, one 30 feet long, and at its southern an enclosed hollow, possibly a hut or souterrain.*

It was impossible to determine, prior to the excavation of Cutting C, whether or not this part of the site represented a souterrain or some other feature.

Fig. 9 Cutting C before excavation.

Excavation in 2013 comprised a cutting (Cutting D) measuring 14m by 8m (with a 5m by 3m extension on the northeast and a 1m-wide extension along the north, Cuttings D1 and D2, respectively) located immediately west of Cutting A from 2010 (the entrance cutting). It was designed to target the continuation of the slab pathway (context 10) first identified in 2010, the path running between the entrance and centre of the enclosure, and a flat open area to the north with no features visible above the modern ground surface. Several pathways, post-holes and other features were uncovered.

Cutting E was excavated in 2014, located closer to the centre of the cashel, immediately west of Cutting D from 2013. It measured 10m x 12m. It uncovered the continuation of the slab pathway leading to/from the entrance, the continuation of path Context 66, a length of the wall dividing the cashel interior in two, and two structures – an early circular one, and a later rectangular example.

2015's Cutting F targeted the house first investigated in 2007, situated just inside the north wall of the cashel. It confirmed and extended the 2007 findings, and located the footprint of the return wall of the rectangular house identified in 2014. The 15th/16th-century house was sub-rectangular in plan with opposed doorways in the long side walls. It had an internal sub-division at its east end, a central hearth, a lime-mortar floor, and a stone-built oven. Its eastern end was clearly rebuilt at some point during the use of the house, being of different, more stable, construction, and overlying part of the original floor that, elsewhere, abutted the house wall. The compressed pre-15th century layers beneath the house contained the remains of a metalworking furnace or hearth, represented by crushed pieces of fired clay, slag fragments, small crucible and mould sherds.

Cutting G in 2016 was located next to cuttings E and B from 2014 and 2011, just south of the centre of the cashel. Features uncovered included part of the original circular house of the cashel (continued from Cutting E to the north), a contemporary metal workshop area complete with furnace base and rock-cur hearth, a slightly later ancillary structure with internal hearth and pit, and a continuation of the late wall (15th/16th century) that divides the cashel interior.

2017 saw the excavation of Cutting H (16m x 10m maximum), a cutting located immediately west of cuttings E and G, and its extension Cutting H1 (5.5m x 6.5m maximum) that completed the excavation of the space between Cutting H, Cutting F, and the cashel wall (Fig. 4). These targeted a stone-walled structure built up against the cashel wall in this area (Structure B above), and explored its relationship with earlier, contemporary and later features. The chance of recovering evidence from the earlier occupation layers of the cashel was strong here, due to an apparent depth of stratigraphy trapped beneath stone tumbled from the cashel wall. This part of the interior, due to its sheltered nature, might also have seen early activity. The western wall of the rectangular house uncovered in Cuttings E and F also fell within this cutting.

Tumble, topsoil and archaeological features and deposits within the cuttings were hand-excavated sequentially. The excavation concluded at the surface of the underlying bedrock. A

full written, drawn and photographic record was made in accordance with the Caherconnell Archaeological Field School Excavation Guidelines (2017) and the NMI Advice Notes for Excavators (2010).

Fig. 10 Field School students.

The fieldwork took place over three months in June, July and August 2017. The excavations were directed by Michelle Comber, and supervised by Noel McCarthy (licence eligible), with the assistance of Pat Cronin. The excavation teams were composed of students from the field school (Fig. 10 etc.) – Susan Frank, Sara Best, Jenny Sacher, Joseph Normandy, Kayla Kennedy, Cheryll McCormick, Dennis McCormick, Anna Stafford, Justin Dawson, Molly Johnson, Ashley Fuller, Christopher Moore, Emily Gilhooly, Christopher O'Connor Coates, Eleanor Howell, Ashley Shults, Erin Sack, Owen Brady, Kathryn Maag, Kathleen Bishop, Jaimie Schwartz, Annette Burns, Mason Boy, Patricia Kincaid, Cailey Girard, Michelle Philburn, and Vanessa Zimmerman; and Burren Beo Conservation Volunteers – Cynthia Cox, Deirdre Gloster, and Garry Lanigan.

Archaeologically significant contexts (feature fills, occupation layers etc.) were wet-sieved on site to recover small artefacts and ecofacts (principally small bone fragments, Fig. 11). A number of bulk samples were also taken for more controlled processing during post-excavation work. Due to the training nature of the field school, a metal detector was also employed to check the spoil. This exercise revealed very little, demonstrating the effectiveness of on-site supervision and sieving.

Fig. 11 Wet-sieving in the field next to the cashel.

Artefact strategy

All artefacts from the current season were retained. These have been numbered and recorded in accordance with current National Museum of Ireland guidelines. All artefacts (including those from this season) have now been fully catalogued (in publishable form, and using the NMI artefact database). All finds will be treated, stored and conserved in accordance with *Advice Notes for Excavators* (NMI 2010). Post-fieldwork conservation services are provided by a recognised IPCRA conservator (Susannah Kelly, UCD). The artefacts will be temporarily stored in NUI, Galway and the Caherconnell Archaeological Field School, and will be deposited with the National Museum of Ireland in due course. In addition, an artefact project was launched in 2015 to train local BurrenBeo Conservation Volunteers in the methods of artefact recording (Fig. 12). It is hoped that these volunteers will assist with future artefact processing.

Fig. 12 BurrenBeo volunteer learning to draw artefacts.

Excavation results

Fifty-two new context numbers were allocated in 2017, bringing the total number of contexts recorded thus far to 246. These include numbers for the cashel (01), cashel tumble (02, 05, 06, 22, 24), the sod and topsoil (03, 04), and the bedrock (00).

A total of eight archaeological phases have been identified to date, six of which were clearly evident in 2017. These are described below in stratigraphic/chronological order. It can be stated with a high degree of confidence that these phases date to the early-medieval, medieval and post-medieval periods. It is hoped that further relative dating (artefact typology) and absolute dating (radiocarbon) will facilitate refinement of this stratigraphic sequence.

Within Cutting H, the limestone bedrock (00) was karstified and was characterised by frequent shallow grykes or fissures orientated approximately north-south and averaging 0.05m in width (though one or two widened to 0.3m in places). The grykes averaged 0.07m in depth, reaching 0.27m in a few places. A few widened grykes may have acted as post-settings (see below), and occasional calcite veins occurred *in situ.* The surface of the bedrock was relatively level, though uneven, across most of the cutting (Fig. 13). It stepped down just inside the cashel wall in the southwest quadrant of the cutting, providing slightly deeper stratigraphy in this area (a drop averaging 0.1m). In the southeast quadrant of the cutting, the bedrock surface was more weathered, having been cleared and exposed for some time in the 19th/20th century. In the northern part of Cutting H (north of wall C48), the grykes were narrower and shallower, with less evidence of exposure. The better surviving deposits in Cutting H1 (due to extensive overlying tumble from the cashel wall) suggest that the bedrock was at least partially exposed during the primary occupation of the cashel, but was quickly covered by occupation material.

Fig. 13 Bedrock in Cutting H. Scales 2m.

Phase 1: Early Medieval Pre-cashel Activity

Evidence of this phase was uncovered in Cutting D1 in 2013. It comprised a low burial mound covering two cists containing the remains of two infants and an elderly woman, all dating from the late 6th / early 7th century AD (Fig. 14). No features of this date were identified in Cuttings H or H1.

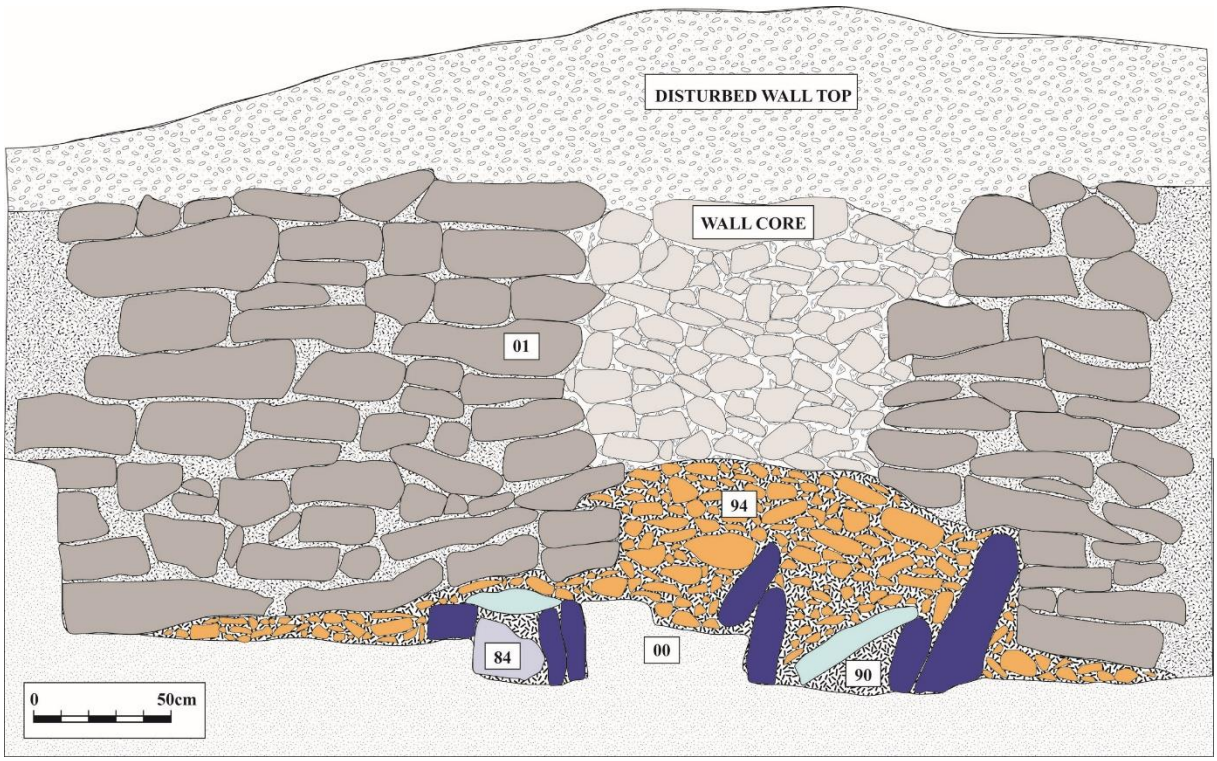

Fig. 14 Section of burial mound and cashel-wall elevation.

Phase 2: Early Medieval pre-cashel Activity

So far, this phase is represented by a rock-cut fire-pit excavated in 2011 (Cutting B). Bone from the pit was radiocarbon-dated to the second half of the 7th century AD. No features of this date were identified in Cuttings H or H1.

Phase 3: Levelling and Construction

Cuttings A – C, F, and H/H1 showed that the cashel wall (01) was built directly on the limestone bedrock (00) in most places. The only deviation from this occurred along the top of a small number of shallow grykes that appear to have had small stones used to fill them (56/37) – before the cashel wall was built over their tops. In Cutting D1 the cashel was built partly on bedrock and partly up over the top of the Phase 1 burial mound.

Immediately over the bedrock in parts of Cuttings H and H1, and running beneath the cashel wall, was a very compact deposit (37) of small stones (0.05–0.12m maximum dimension) in a white to grey sandy silt matrix. This deposit was used as a levelling material in the eastern part of the cutting where the bedrock dropped in places, to create a flat, level surface upon which the cashel wall was partially built (Fig. 15). It averaged 0.1m thick.

Fig. 15 (37) levelling beneath cashel wall. Scale 0.3m.

In cuttings B, C and D1 the inner face of the cashel wall showed two distinct styles of construction. The bottom metre comprised relatively thin slabs of limestone laid in fairly regular horizontal courses, a well-built wall with few gaps between the slabs. This bottom metre was mostly below the modern ground surface and, therefore, somewhat protected. Above this the stones are generally shorter and thicker, with only the occasional large slab used. There are also more gaps between the stones. The different nature of the upper stones may relate to the difficulties encountered in raising large slabs as the height of the wall increased, and the gaps between stones are perhaps due to exposure to early modern human and animal activity. There remains, of course, the possibility that the cashel wall was built and/or altered at different stages – though it may not be possible to determine whether or not a chronological gap of any significance occurred between stages.

In Cutting F, a 0.2m – 0.35m-wide ledge originally ran along the inner face of the cashel wall, approximately 1.5m above ground level. Part of its length was masked by early-modern rebuilding of the wall in Cutting F, where the rebuilt upper section of the wall sat flush with the inner face of the lower portion of the wall – effectively 'filling' the ledge for a length of approximately 5m. At roughly 2m below the current top of the wall, this ledge did not provide a view out over the wall. No trace of an upper ledge was identified. The function of the existing ledge may have been related to the construction of the wall. This ledge did not survive within Cutting H or its extension, H1.

The cashel wall defined the western and northern edges of Cuttings H and H1. Uneven along its top, this stretch of wall bears several patches of early-modern rebuilding. Where the inner

face was protected by accumulated material and collapse from above, its stones were closely set and tight fitting. Areas of modern rebuild are clearly visible above the level of the protective tumbled stone. The presence of a modern animal pen (see below) built up against the cashel wall in this area explains the damage and subsequent rebuilding. The wall (Fig. 16) survived to a maximum height of 3.04m within Cutting H.

Fig. 16 Cashel wall in Cutting H. Scales 2m and 1m.

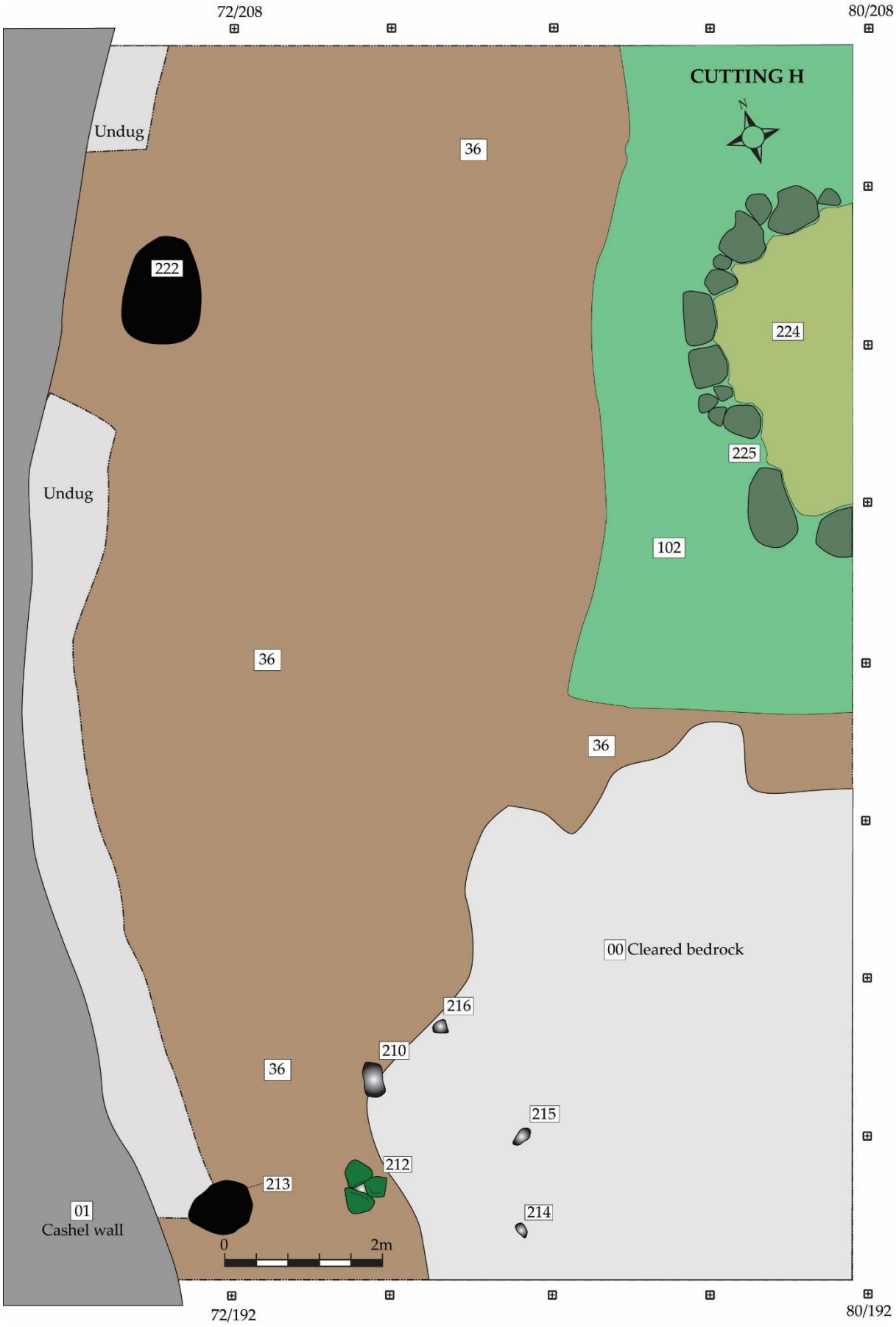

Fig. 17 Select contexts from Phase 4: Early occupation in Cutting H.

Phase 4: Early occupation (Fig. 17)

Overlying the levelling layer (37) or bedrock (00) was a definite occupation layer (36). This deposit (up to 0.25m thick in places) was a grey-brown, moderately compacted silty clay with frequent small to medium stones (0.04-0.10m maximum dimension). Regular charcoal, some charred hazelnut shell and marine-shell fragments, slag, a considerable quantity of animal bone, and a variety of artefacts were recovered from this deposit. This occupation layer occurred mostly in the western and northern half of the cutting (best preserved in Cutting H1), outside of the area cleared in early modern/modern times. It also survived in bedrock hollows and in the tops of grykes – even in the cleared part of the cutting. Beneath house (100), the occupation layer (36) is the equivalent of (102).

In Cutting H, early activity was represented by a group of features in the south-western corner – four gryke features, a post-setting, and a small deposit of burnt material. The largest of the gryke features comprised the enlarging of a gryke to probably act as a post-hole. The hole (210) was sub-rectangular in shape with a relatively flat bottom, measuring 0.5m north-south, 0.24m east-west, and 0.22m deep. It contained a moderately compact mid-brown silty clay (209), quite similar to the overlying early occupation layer (36). Post-setting (211/212) occurred 0.8m directly south of this feature. This comprised a roughly triangular arrangement of three large stones set into the underlying levelling material (37). Surrounded by early occupation material (36), the sides of the setting were vertical, and the base flat (212). Externally, it measured 0.67m north-south and 0.52m east-west and, internally, measured 0.18m north-south and 0.13m east-west. It contained a moderately compact brown sandy silt, with occasional pebble inclusions and two fragments of animal bone (211).

A row of three smaller gryke features occurred in a line curving to the northwest, 1.6m to 0.85m east of the two larger settings. All comprised a widening of a gryke into a straight-sided opening with a relatively flat base, and all were filled with early occupation material (36). The southernmost example (214) was sub-oval in shape and measured 0.2m north-south, 0.17m east-west, and 0.14m deep. The middle example (215), also sub-oval in shape, was located 0.95m north of this and measured 0.2m north-south, 0.8m east-west, and 0.2m deep. The third example (216) was sub-rectangular in shape and lay 1.7m northwest of (215). It measured 0.15m north-south, 0.14m east-west, and 0.24m deep. All five settings/features were capable of supporting the base of a vertical timber.

The final early feature in this area was located 1.2m west of post-setting (212), comprising a discrete deposit of charcoal-rich burnt material near the base of early occupation material (36). Sub-oval in shape, the deposit (213) also contained some small pieces of burnt clay and animal bone. It measured 0.54m north-south, 0.9m east-west, and 0.07m thick. It represents burnt material cleared from elsewhere, suggesting the possibility of an early hearth in the vicinity. The post settings may reflect the existence of a structure or shelter also in this area. Unfortunately, later disturbance and clearance immediately east of this group of features has removed any other traces of related activity.

Fig. 18 Footprint of circular structure outlined with pink markers (west wall of house (100) marked in yellow).

The footprint of a circular structure occurred in the north-eastern part of Cutting H, but ran into the eastern baulk (Fig. 18). Approximately half of this structure, if originally a complete circle, fell within Cutting H. It was delimited by an arc of seven large slabs (up to 0.7m maximum dimension) and two smaller slabs, all horizontally laid, and all limestone (225). These were laid on top of (37) levelling and bedrock (00), and represent the foundation of a circular or semi-circular/perhaps open-sided structure measuring 3.4m north-south internally. It contained a medium to strongly compacted mid- to dark-brown silty clay with frequent pebbles and small stones (0.01 – 0.06m average), approximately 5% of which were fragments of heat-reddened and fractured sandstone (0.17m maximum thickness of deposit). Also frequent/very frequent were small fragments of both burnt and unburnt animal bone, some carbonised hazelnut shell, coprolite, charcoal, and ten pieces of metalworking slag. Finds included small quern fragments, a bronze bar and rod, a bronze dress pin, an awl-like iron tool, whetstones, crucible sherds, and clay-mould fragments. All of this, in conjunction with its proximity to the furnace identified in Cutting F in 2015, suggests that this structure was associated with metalworking, perhaps more specifically non-ferrous metalworking. It occurred at the same level as the primary house of the cashel (115), and immediately west of it. If a complete circuit, rather than an open-sided structure, it may even have conjoined the western side of that house.

A burnt deposit was located approximately 6m west of this structure, sealed within occupation layer (36). Sub-oval in shape, this deposit (222) spread 1.22m north from beneath later wall (48), measured 1m east-west and 0.07m thick. It comprised a charcoal-rich dark-grey silt with moderate quantities of animal bone, the charcoal most concentrated at its centre. On-site

sieving of 80% of the deposit produced carbonised hazelnut shell and grains. The remaining 20% was bulk sampled for lab processing. Finds from the deposit included a rubbing stone, a hammer stone, and a fragment of an iron sewing needle. No evidence of *in-situ* burning suggests that this deposit was the result of domestic-refuse dumping.

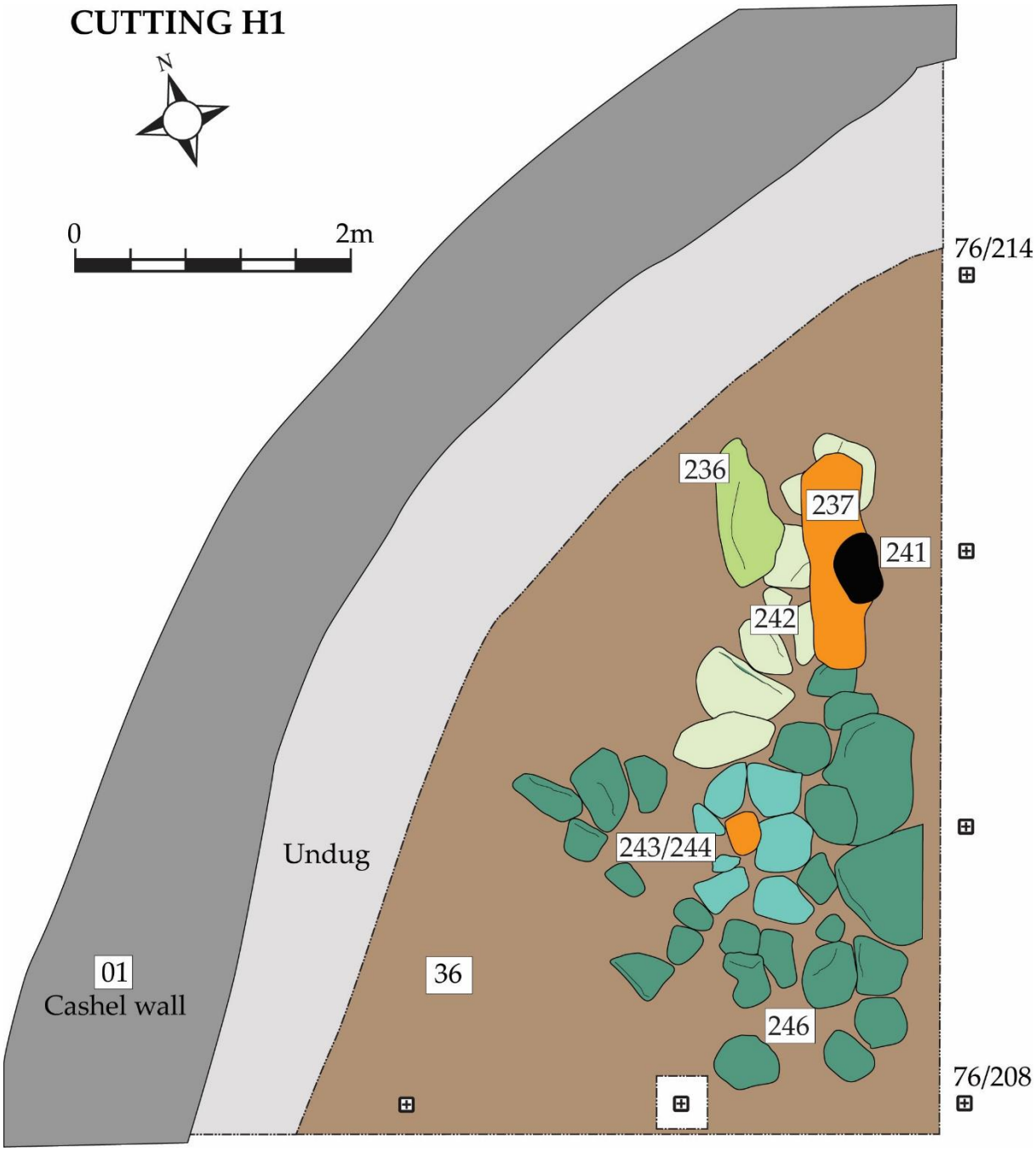

Fig. 19 Select contexts from Phase 4: Early occupation in Cutting H1.
(NOTE – compiled plans from cuttings H and H1 are presented in Appendix 5)

Extension Cutting H1 produced several features also sealed within occupation layer (36) (Fig. 19). Shortly after occupation material began to accumulate in this area, a slab surface was laid down (246 and 242). Part of this surface, (242), was designed to cover the top of a 0.4m-wide gryke. A linear arrangement of seven horizontal limestone slabs (0.44 – 0.7m maximum

dimension, 0.05 to 0.23m thick) ran northeast-southwest for 2.66m over the top of the gryke. The gryke contained a moderately compact, light to mid-brown sandy clay with frequent charcoal inclusions, and occasional bone fragments (245). The gryke appears to have functioned as a covered drain. Possibly designed to level off the area around this drain cover, a wider spread of horizontal slabs was laid down (246). These slabs measured from 0.42 to 0.8m in maximum dimensions, and 0.11 to 0.22m thick. They covered an area of 3.6m north-south, and 2.8m east-west, running into the eastern baulk of the cutting.

Fig. 20 Hearth (243)/(244). Scale 0.3m.

A slab-defined hearth also occurred as part of the general (246) surface, its slabs forming part of the larger surface (Fig. 20). Located 5m northeast of burnt deposit (222), the hearth comprised an arrangement of six limestone slabs (244) defining a sub-square opening in the slab surface. The slabs provided a flat working area around this slightly sunken hearth that had an uneven, heat-shattered limestone base. It contained a charcoal-rich dark-brown silty clay with a small sand component (243). Also present were occasional bone fragments, many burnt, and occasional small patches of yellow/orange burnt soil/ash. The hearth measured 1.14m north-south and 1.15m east-west externally, 0.42m north-south and 0.4m east-west internally, and was 0.15m deep (from top of slabs to base of hearth).

A less well-defined hearth, and associated large slab, were located roughly 2m north of hearth (244). The large limestone slab (236) was sub-triangular in shape and horizontally laid, measuring 1m north-south, 0.48m east-west, and 0.07m thick. At the same level as the (246) surface, it may have acted as a convenient work surface for the hearth located immediately to its east (237). The remains of this hearth comprised a spread of burnt material – yellow and orange ash with some burnt clay, burnt stone fragments, and very frequent charcoal. Not

contained by a stone setting, this material spread 1.1m south of the main concentration/*in situ* hearth area. The core of the hearth measured 0.31m north south by 0.32m east-west, and was up to 0.11m thick. Contained within the spread of hearth material, approximately 0.25m from the hearth core, was a discrete deposit of charcoal-rich, dark-grey silt (241). This had gathered within a hollow in the underlying stones, and was covered by half of a rotary quern (find no. 1444). Probably cleared from the adjacent hearth (237), the deposit measured 0.39 by 0.2m, and was 0.19m thick.

Phase 5: Middle occupation (Fig. 21)

The start of the next phase of occupation is marked by the deliberate laying of a slab surface across parts of the cutting. This, lower, slab surface (33) was originally relatively well constructed from irregularly shaped limestone slabs, measuring up to 1.25m in maximum dimension. Later subsidence of organic material beneath it, and pressure from heavy stone-laden contexts above caused the shifting of some of the slabs from their original flat, level positions. In places of high bedrock, the slabs often run up to it, forming a level surface with the bedrock. In the south of the cutting, it appears that most of the slabs of (33) – and of the later upper slab surface (28) (see below) – were dug up to build structure (195) in the 19th/20th century. The slabs survived best in the western part of Cutting H1, where all layers were protected by later tumble from the cashel wall. Here, six large slabs (0.65m maximum dimension), and about a dozen medium-sized slabs (0.3m maximum dimension) were relatively well laid and tightly fitted together. They covered an area 2.3m north-south and 1.9m east-west, and probably ran right up to the cashel wall. This cannot be confirmed, however, as an undug strip was left along the base of the cashel wall to avoid destabilising its inner face.

Several features were associated with this slab-surface level, being constructed on top of (33) or on top of (36) where no slabs were present – the slab surface did not extend inside the contemporary house (100). The line of the back wall of house (100) was located in the northeast quadrant of Cutting H, north of the later wall (48) – it did not survive south of this later wall, its stones probably taken to build that wall, or even the modern animal pen in that area. The 0.9m-wide wall was represented by its basal course only (0.11m high), a double-faced wall with larger slabs and stones forming the faces and smaller stones comprising a rubble core. Some of the slabs had been slightly displaced (being quite close to the modern ground surface), giving the originally straight wall a now slightly curved appearance. It ran from the later wall (48) north into the northern baulk of Cutting H, resulting in original internal dimensions of 9m north-south by 9.2m east-west for house (100). The early occupation material inside the house (101) comprised a moderately to strongly compacted mid-brown sandy silt with regular small stones (0.02 to 0.12m maximum dimension), mostly limestone, though with an occasional piece of burnt sandstone. Of the regular animal-bone fragments, approximately 5% were burnt. Also recovered were samples of charcoal and hazelnut shell. Finds included an iron hook, iron loop, a quern fragment, and a bone harp-peg. This occupation material was recorded as (205) south of cross-wall (48), where it had been disturbed by later collapse from that wall and traffic through a late gap in same.

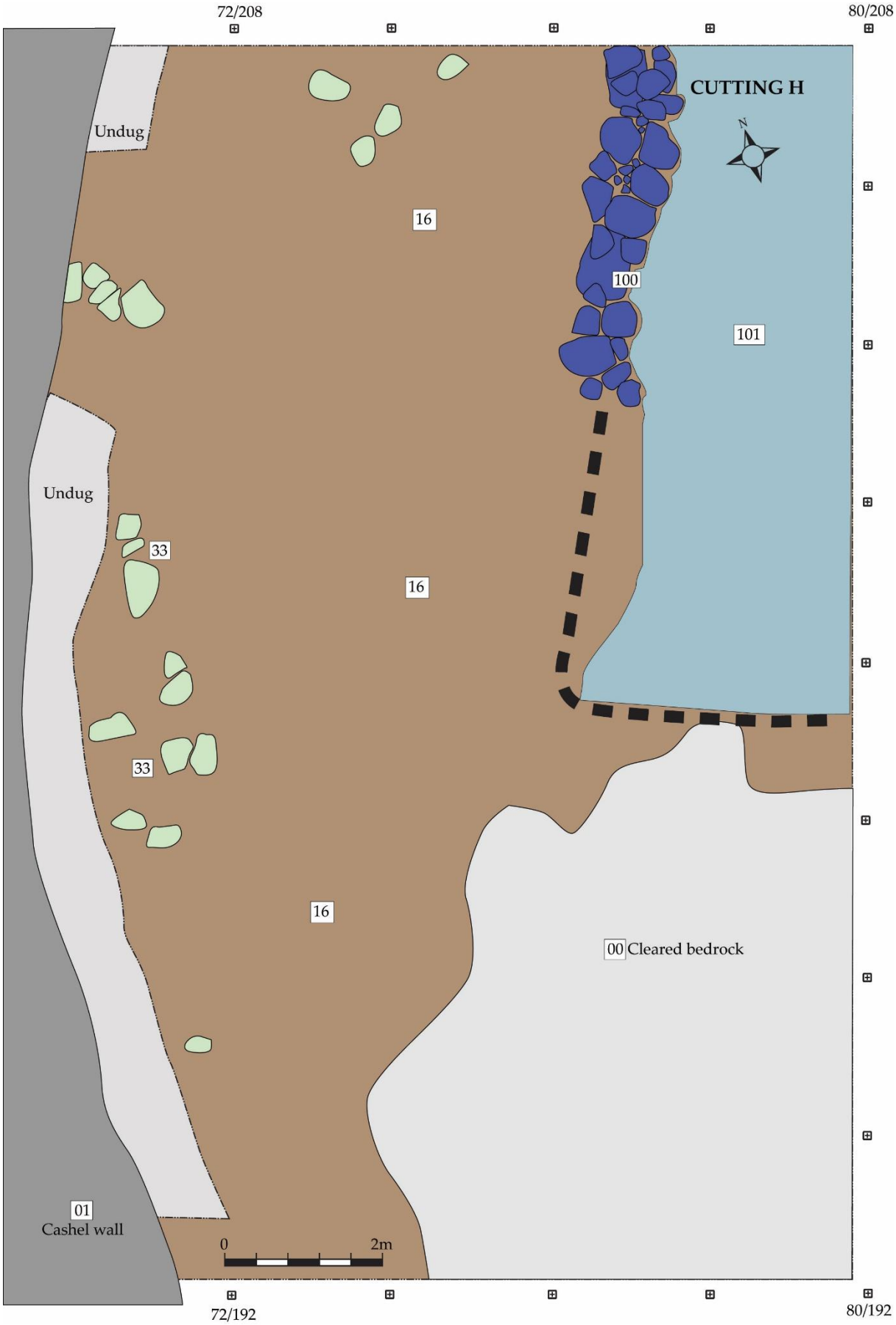

Fig. 21 Select contexts from Phase 5: Middle occupation in Cutting H.

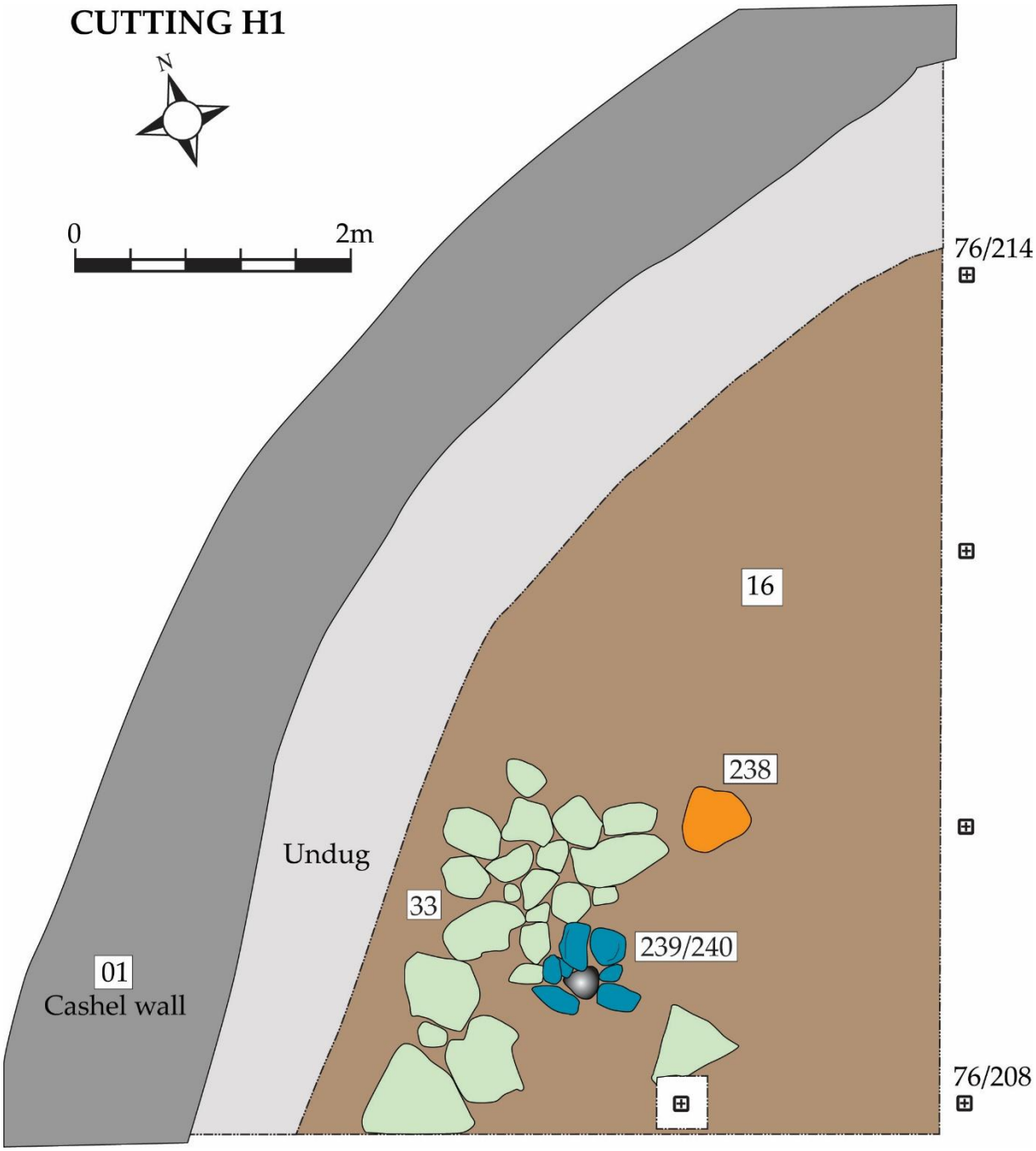

Fig. 22 Select contexts from Phase 5: Middle occupation in Cutting H1.

In Cutting H1 (Fig. 22), a hearth and post-setting date to this phase of activity. The hearth (238) comprised an irregular deposit of material burnt *in-situ*, though not contained within a stone setting (Fig. 23). Measuring 0.58m north-south, 0.68m east-west, and 0.09 – 0.15m thick, the remains comprised a cream-coloured ash covering an orange core, sitting on a grey-brown ash, with much charcoal surrounding it. Regular small fragments of burnt bone occurred throughout. The fire appears to have been lit from the (33) surface, its base partially resting on the western slabs of the earlier (244) hearth. Located in this manner, some continuity of use from Phase 4 to Phase 5 is suggested in this part of the site.

Fig. 23 Section through hearth (238) (top), and post setting (239/240) (bottom). Scale 0.3m.

A stone-built post-setting (239) was located just over 1m to the southwest of hearth (238) (Fig. 23). Set into the underlying occupation layer (36), an arrangement of seven stones enclosed a sub-rectangular space. All limestone, four of the seven were well-set vertically, the others angled. The fill contained by these stones comprised the burnt remains of a timber post (240). Marked by a concentration of charcoal/fragments of carbonised wood, it measured 0.1m in diameter and 0.08m deep. It was surrounded by a charcoal-rich silty clay (0.26m north-south, 0.27m east-west) with occasional bone fragments. An almost vertical packing stone was located on the east side of the burnt-timber remains, with the 0.27m depth of the setting suggesting that only the very base of the burnt timber was represented in the fill.

Covering the slab surface (33), the early occupation layer (36), and the aforementioned features, was an occupation layer (16), up to 0.14m thick. This mid- to dark-brown silty clay occurred everywhere except the cleared southeast quadrant. Beneath the late structure (195) (see below), layer (16) was disturbed and partially mixed with the much later organic deposit (203). Where undisturbed, it contained regular charcoal inclusions (more frequent in Cutting H1, probably due to the presence of hearth (238)), coprolite, hazelnut and marine-shell fragments, frequent stones (0.02–0.11m maximum dimension) and animal bone, and a small number of finds.

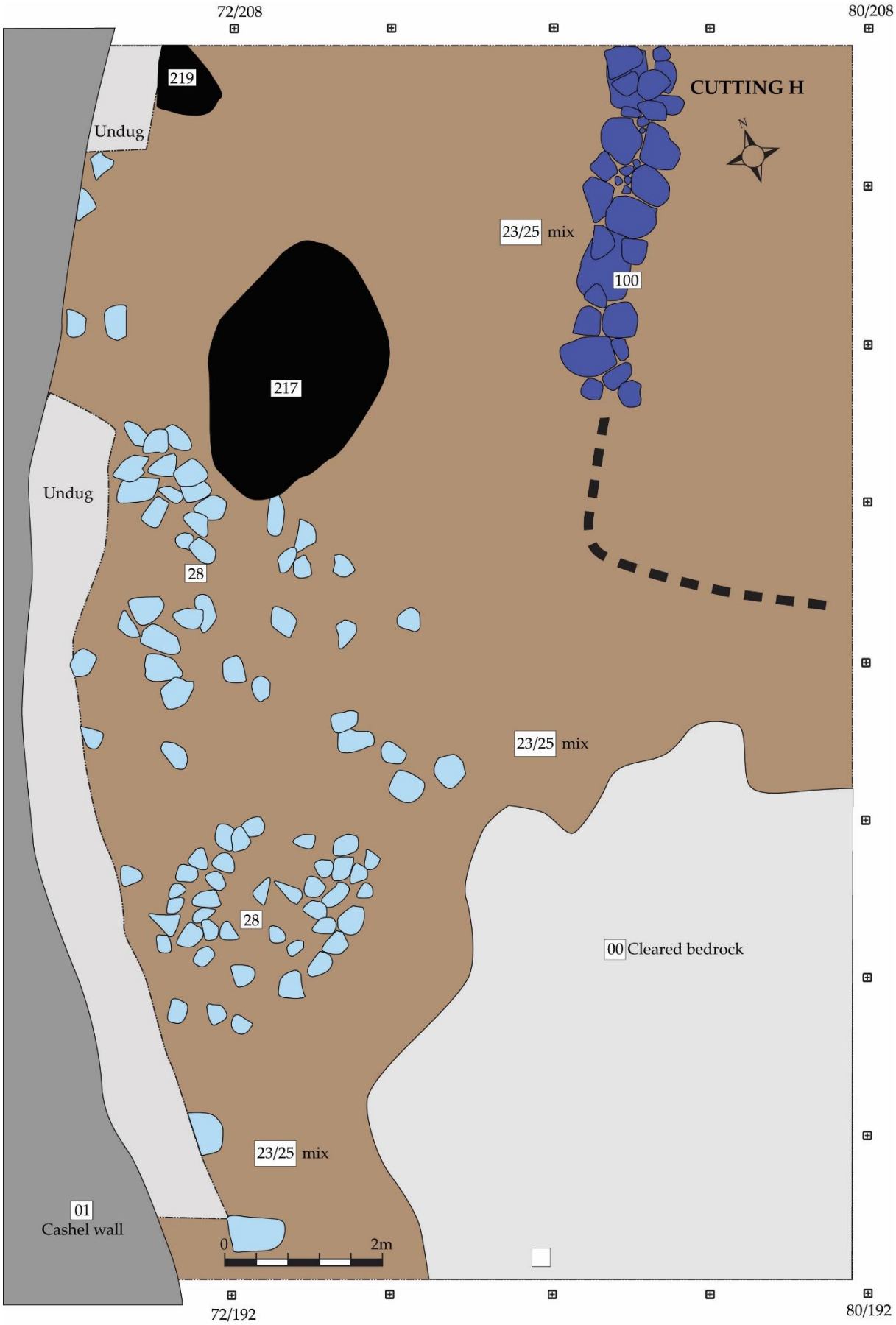

Fig. 24 Select contexts from Phase 6: Late occupation in Cutting H.

Phase 6: Late occupation (Fig. 24)

Sometime after this a second slab surface (28) was laid down on top of occupation layer (16). This, too, consisted of local limestone slabs (0.2m to 0.4m in maximum dimension, up to 0.1m thick), but it appeared rougher in construction than its predecessor, and only survived in patches within Cutting H. It was completely absent from areas of high bedrock/thin stratigraphy and from the cleared southeast quadrant. As in previous seasons, it did not occur within the area of house (100), suggesting that this house continued in use during this phase of activity.

A relatively level surface was produced originally, though many areas were damaged by later disturbance and the collapse/settling of lower contexts. Built up atop the slabs, or earlier contexts where the slabs were absent, was an occupation layer (25), continuing the stratigraphic sequence identified in previous cuttings. This layer comprised a moderately to strongly compact stone (up to 0.09m maximum dimension) and gravel deposit in a brown silty matrix, rich in animal bone. It also contained slag, charcoal, and hazelnut shell. It was patchy south of cross-wall (48) and completely absent in the cleared southeast corner of the cutting. Elsewhere it reached a maximum thickness of 0.09m. Recorded as (25H) within the area of house (100), this occupation material now physically blends with (25) outside the house, as there are no longer any upstanding house walls to separate them. The two are almost identical, with (25H) forming a slightly more compact and level surface and containing a higher frequency of heat-fractured sandstone pieces (approximately 1% of the total stone content) – both related to the domestic nature of the house.

A discrete area of 'paving' formed by (28) slabs, but delimited by a number of other features (Fig. 26 below), was recorded as a separate context (228). Located in the western half of Cutting H1, this roughly rectangular area measured 1.24m north-south, and extended 1.28m east from the undug strip at the base of the cashel wall. It comprised relatively well laid horizontal limestone slabs, measuring 0.49m in maximum dimension. This area of paving was delimited to the north by linear feature (223), to the east by a row of angled stones (230), to the south by a line of four vertical stones (229), and to the west disappeared beneath the undug strip along the base of the cashel wall. Immediately east of this group of features was a hearth (234/235) and post-setting (232/233).

A linear arrangement (Fig. 25) of approximately 17 medium and large stones (223) (0.55m maximum dimension) extended east-west along the northern edge of paving (228). A mix of vertical, angled, and well-set stones, these formed a double-sided feature that may once have acted as a drain or, more likely, a foundation setting for a fence – upright and angled stones supporting the sides, with flat stones forming a base. The features extended 2m east from the undug strip, and was 0.5m wide (i.e. north-south), with a maximum standing height of 0.37m.

Fig. 25 Linear feature (223).

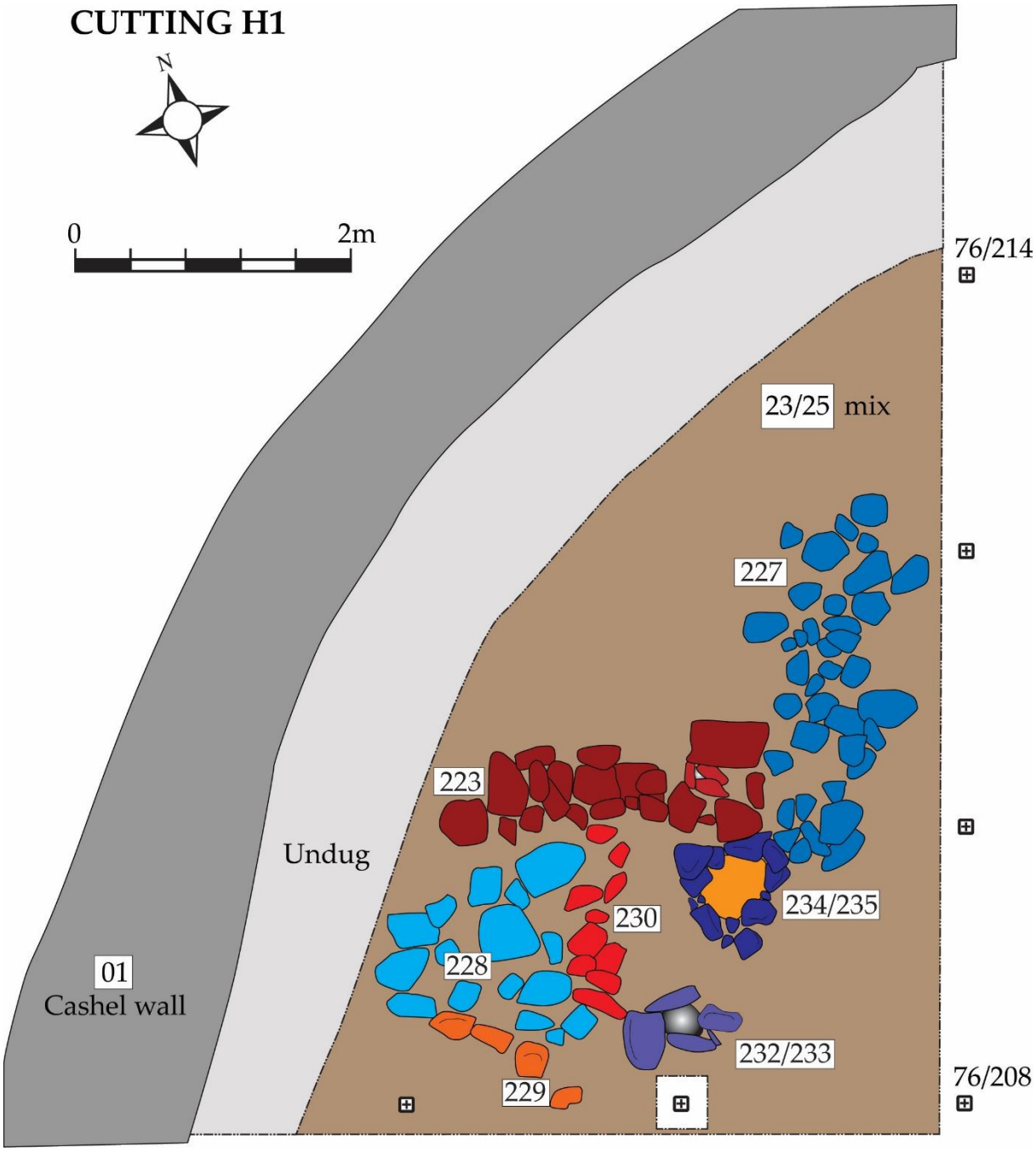

Fig. 26 Select contexts from Phase 6: Late occupation in Cutting H1.

A line of vertical and angled stones (230) ran north-south along the eastern edge of paving (228). All limestone, and on different axes, these stones (0.18 – 0.28m maximum dimension) were relatively well set, forming a line 1.38m north south and 0.46m east-west. They may have simply fallen into this position due to the presence of the paving edge, or may have once acted as packing stones for the base of timbers. An east-west row of four well-set stones (229) occurred along the southern edge of the paving (228). All limestone, two were in vertical positions, and two horizontal. They covered a distance of 1.46m, and may or may not mark the base of a wall or fence line.

A stone-lined hearth occurred just south of the east end of linear feature (223). The hearth comprised a sub-circular arrangement of four small and seven medium stones, three of which were vertically set (235) (Fig. 27). Three of the stones were of burnt sandstone, the others limestone. Externally, it measured 0.85m north-south and 0.7m east-west. The setting contained a dark-brown silty clay with charcoal flecking, occasion tiny bone fragments, and three more pieces of burnt sandstone (234). The hearth fill measured 0.44m north-south, 0.37m east-west, and 0.07m thick. Located just 0.2m south of the earlier hearth (238) (itself adjacent to earlier hearth (244)), continuity of use is once again suggested in this part of the cashel.

Fig. 27 Hearth (234/235) (left), post setting (232/233) (right).

A stone-built post-setting occurred just 0.4m south of the hearth, at the southern end of the line of angled stones (230). The sub-rectangular setting (233) comprised a vertical limestone slab on the north and south, a large horizontal stone on the west, and two small verticals on the east (Fig. 27). The base was formed by a flat slab. The tallest slab, that on the south, reached a height of 0.23m. The fill (232), 0.25m north-south, 0.3m east-west, survived to a depth of 0.09m. It comprised a mid-brown silty clay, relatively sterile in appearance, containing only occasional pebbles (0.01 to 0.03m), no charcoal, and one tiny fragment of bone. Taken together, these features may represent the remains of a small timber structure associated with a hearth, located to the rear of the (100) house that remained in use at the time.

An irregular spread of small and medium stones (227) occurred to the east of this group of features, possibly thrown down to fill a gap in the (28) slab surface on the east side of hearth (235). All limestone, the stones ranged from 0.08 to 0.2m in maximum dimension, and covered an area 2.9m north-south, extending 1.14m west from the cutting baulk, and 0.15m thick.

Two deposits of burnt material occurred to the south, in the northern part of Cutting H. These may have derived from the cleaning of hearth (235), or perhaps from the hearth inside house (100). A large spread of ash and charcoal in a dark-grey silt (217) ran beneath the later wall

(48). It measured 3.2m north-south, 2.25m east-west, with an average thickness of 0.05m and maximum thickness of 0.12m. Just north of this, a very charcoal-rick deposit (219) was uncovered in the northwest corner of Cutting H. This dense concentration contained charcoal pieces up to 0.02m in dimeter. It measured 0.95m north-south, extended 0.7m east from the undug strip at the base of the cashel wall, and was 0.04m thick. It contained a small corroded iron loop and chain, and probably represents a single dumping of domestic refuse.

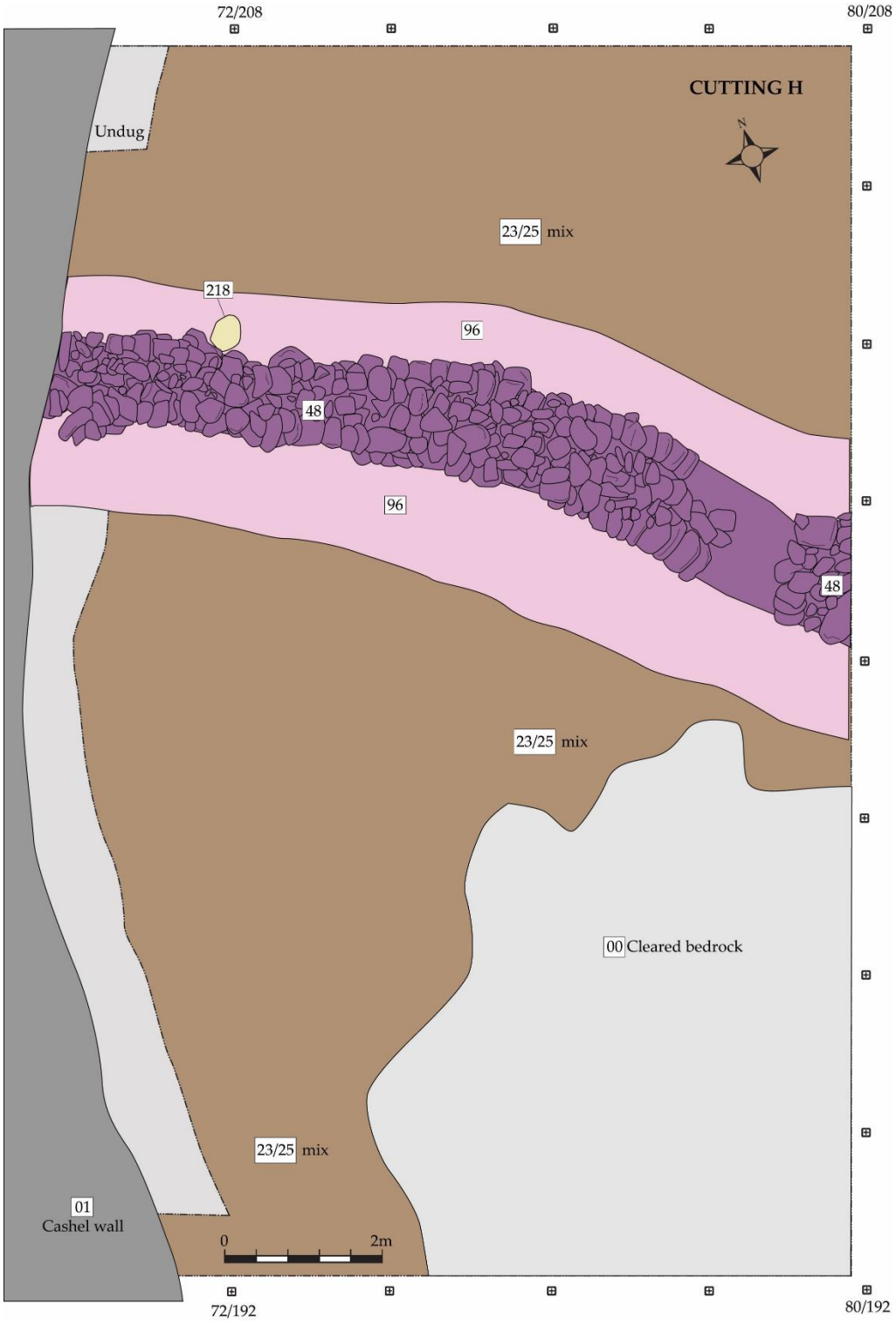

Fig. 28 Select contexts from Phase 7: Final occupation in Cutting H.

Phase 7 Final occupation (Fig. 28)

The final human occupation of the cashel is marked by the reconstruction of the cashel entrance (2010 Cutting A), construction of a rectangular house (120) (trial excavation 2007, and 2015 Cutting F), and a drystone wall (Cuttings C, E, G, and H) dividing the cashel interior in two.

The substantial drystone wall (48) extended for a length of 10.45m within Cutting H, and measured 1.17m in width. Constructed of limestone slabs averaging 0.3m in maximum dimension, the wall ran in a slightly curving line through the cutting, from northwest to southeast. The wall comprised two faces, with a rubble core between. The base and lower courses of the faces are composed of transverse slabs on edge set at an approximate 45-degree angle (Fig. 29), topped by up to five horizontal courses reaching a maximum height of 0.98m in the western part of Cutting H where the wall forms part of the later structure (195). A later partial gap through the wall in the eastern part of the cutting has refined the construction feature identified in Cutting G in 2016. It then appeared that the line of the wall was first marked out by a central basal row of large irregular shaped stones and slabs laid end-to-end in a single course. In Cutting H, this middle row is of the same construction as the two faces – transverse slabs stacked at an angle.

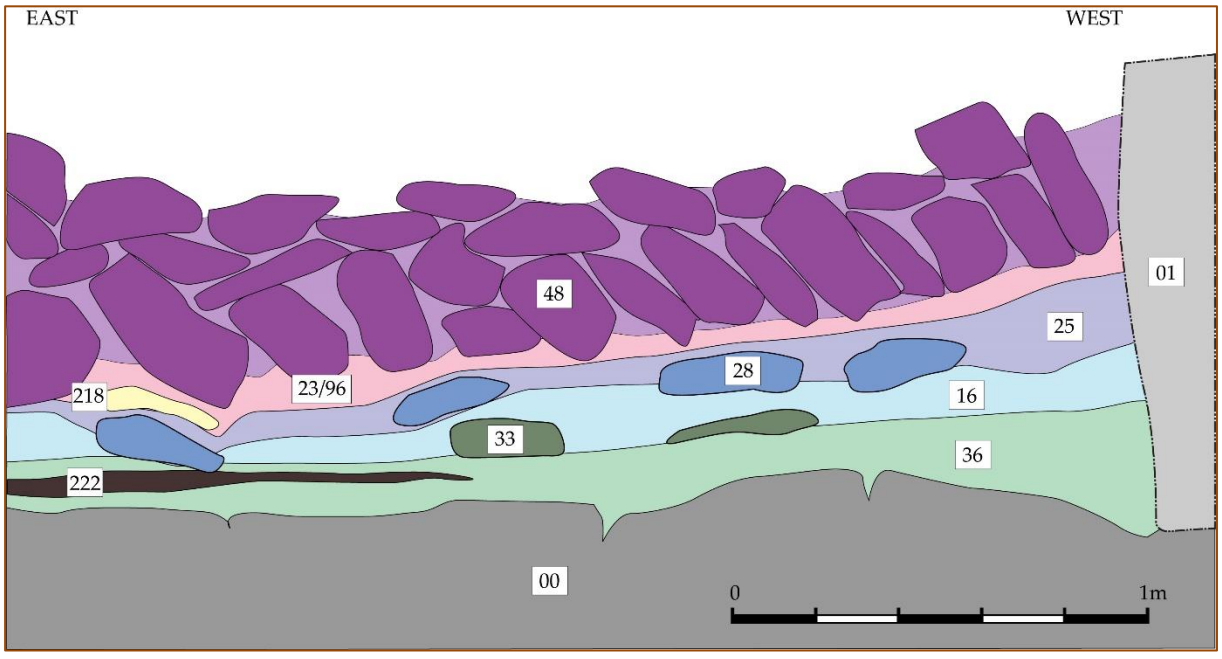

Fig. 29 North-facing elevation of wall 48 and section through underlying layers.

An occupation layer built up on top of the earlier habitation material (25). This new occupation layer (23) comprised irregular patches of mid- to dark-brown stony silt scattered across the cutting, though largely absent from the cleared southeast quadrant of the cutting. A moderately compact humic material, it was best preserved beneath fallen slabs and the later stone tumble from wall (48). Here, directly beneath the tumble, this material (now 96) contained more cobble-sized stones, 0.08 – 0.25m in maximum dimension, and was up to 0.20m thick, perhaps reflecting the original appearance of (23) before later animal disturbance

of same. It survived in a band 2.2m wide along the north side of wall (48), and 1.8m wide along the south side. It also survived in disturbed patches in Cutting H1, damaged by later animal activity and collapse from the cashel wall.

House (100) appears to have been demolished at the start of this phase, providing building stone for wall (48) and house (120) (Cutting F). A small deposit of mortar (218), 0.35m diameter and 0.13m thick, with three adjacent 'splashes' of the same material (none more than 0.1m diameter and 0.05m thick), was discovered immediately adjacent to the north face of wall (48), as if dropped accidentally. This strongly compacted cream-coloured lime mortar contained regular rounded pebbles (0.01 – 0.02m) and was identical to the material used to form the floor within the 15th/16th-century house from this phase (Cutting F).

Phase 8 Post human-occupation (Fig. 31)

The final layers present in the cashel represent structural collapse and building, layer disturbance, deliberate digging, demolition and/or accidental knocking, all related to the use of the site as a stock enclosure right up into the 20th century.

Fig. 30 Transverse slabs of wall (195).

Before any major collapse of the cross wall (48) occurred, a sub-triangular stone structure was built up against its south face. The wall of this structure (195) abutted wall (48), running southwest from it until gradually turning to abut the cashel. A 0.7m-wide entrance gap occurs mid-way along the wall. South of this entrance, the drystone wall comprises a single course of transverse limestone slabs stacked on edge and at a slight angle, the slabs ranging from 0.2m to 0.7m in maximum dimension (Fig. 30). North of the entrance gap, the wall widens into a double-faced triangular feature. The faces are constructed in the same manner as the southern part of the wall, but contained a haphazard rubble fill (204) of limestone pieces ranging in maximum dimension from 0.08m to 0.35m. Why this length of wall was built in such a manner is uncertain, though perhaps a wider, stronger wall was required in this part of the structure. It seems likely that the slabs used to build this structure were dug up from the adjacent parts of both slab surfaces (33) and (28) – resulting in the clearance of most early material from this part of the cashel interior, and the exposure of bedrock.

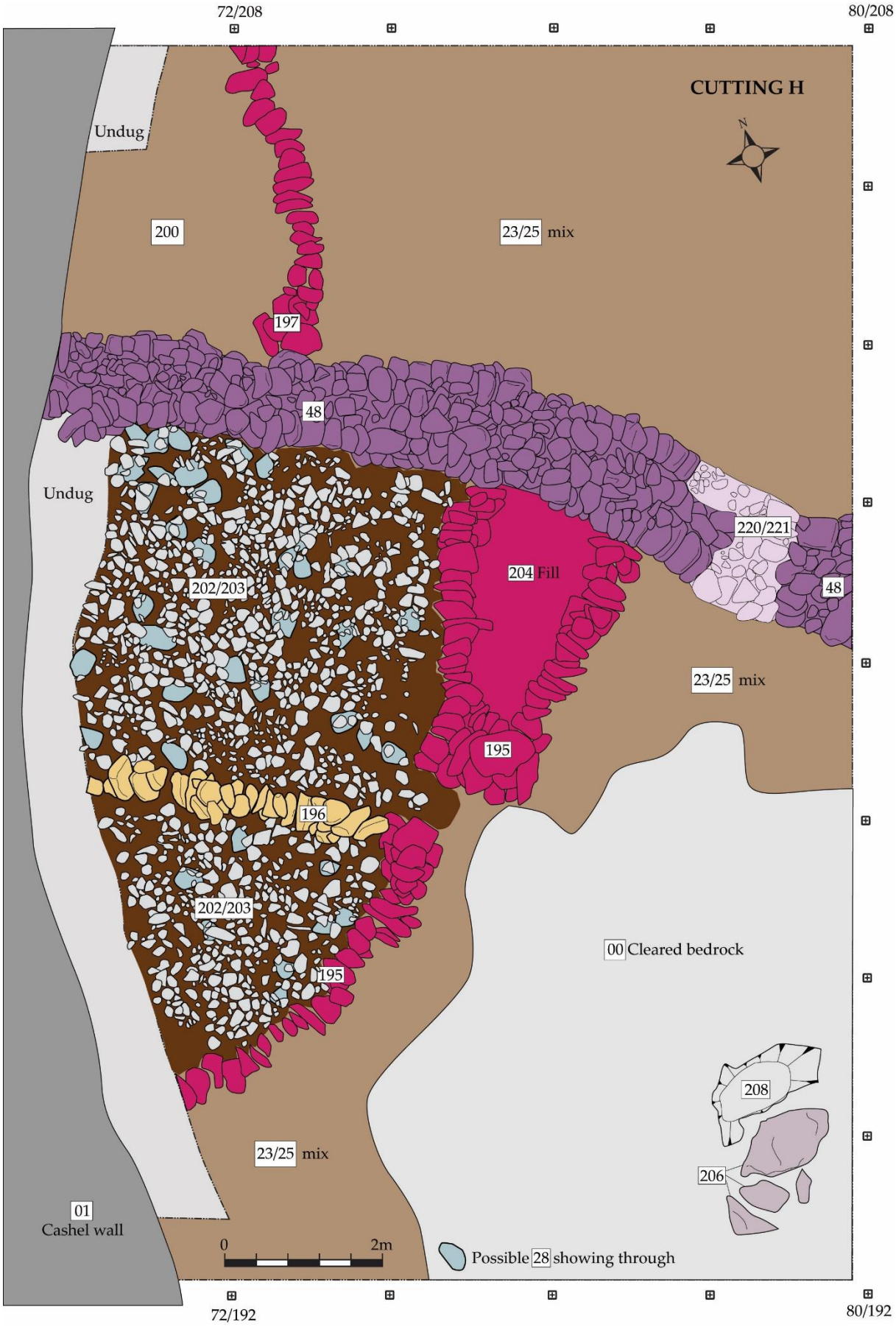

Fig. 31 Select contexts from Phase 8: Post human-occupation in Cutting H.

A rough layer of stone (202) was laid down inside wall (195) and also abutting wall (48) to the north, forming a somewhat stable surface, the stones averaging 0.1m to 0.2m in maximum dimension. The stones were quite compact, though somewhat disturbed inside the entrance through (195). They were pressed into the top of underlying (and disturbed) occupation layers (25) and (16), perhaps when it became apparent that the removal of most of the slabs (33) and (28) inside/beneath the structure left the surface very soft.

A dark-brown organic clayey-silt (203) accumulated on top of this stony surface. Very wet, plastic, and humic, this material derives from livestock use of the structure. It varied in thickness from 0.1m to 0.3m, and contained animal bone and 19th/20th-century glass-bottle fragments, fragments of an iron pot, and an iron chain and collar used in goat husbandry in the 20th century. At some point during the use of structure (195), a small internal dividing wall was constructed (196), running from the south side of the entrance west to the cashel wall. It comprised roughly-stacked transverse slabs, 0.15m to 0.45m in maximum dimension. The chamber formed by this wall has no apparent entrance. All of the evidence suggests that structure (195) was an animal pen used in the 19th/20th century, possibly with small/young animals confined to the smaller southern chamber – by either lifting them over the wall or temporarily removing some slabs and replacing them once the animals had been moved.

During the later use of structure (195), some stones seem to have collapsed from wall (48) - (49) to the north and (50) to the south. Inside structure (195), these were roughly moved from the centre of the structure and stacked against the south face of wall (48). This irregular pile (201) averaged two courses/1m deep and seven courses/0.9m high, with stones ranging from 0.31m to 0.58m in maximum dimension (Fig. 32). It stretched 3.3m east-west. Parts of a modern animal carcass were found mixed throughout the stones.

Fig. 32 Rebuilt skin (201) against south face of (48) wall.

Two other lengths of wall display the same construction method as wall (195), and occurred at the same stratigraphic level. An arc of stones (197) curved from the northern face of existing wall (48), to the cashel wall (01), enclosing an area measuring a maximum of 4.5m north-south and 3m east-west. Most of the wall comprises transverse slabs up to 0.55m high, with a collapsed area to south and north, one of which may represent a filled entrance gap. This may have functioned as a small animal pen. A much shorter length of similar wall was identified in Cutting H1 (226). Aligned north-south, it comprised nine limestone slabs set transversely, forming a line 1.5m long, 0.42m wide, and 0.3m high. Its relatively isolated position might suggest a late attempt to revet tumble from the cashel wall – it does not appear to have formed part of an enclosure.

The stone tumbled to the north of the wall (49) formed an irregular, lightly compacted, jumble of limestone slabs and stones, ranging in size from 0.1m to 0.45m in maximum dimension and

from 0.05m to 0.15m thick. These were piled up to three courses in height immediately adjacent to wall (48), and extended up to 1.75m north of the wall. On the south side, the tumbled stones (50) ranged from 0.10m to 0.42m in maximum dimension and 0.04m to 0.20m thick. These were piled up to four courses high against the wall face, and extended up to 1.2m south of the wall. A lower, disturbed section of wall occurred towards the eastern end of wall (48) in Cutting H. This gap (220) had irregular sides and contained a loose jumble of disturbed wall stones (221). It measured a maximum of 1m wide, its slumped fill stretching 1.5m north-south, providing a gradual 'ramp' over this section of lowered wall (only the stones of the basal course survived *in situ*). This was clearly used as a pathway from one side of the interior to the other in early modern/modern times.

Also probably during the 19th/20th century, a large limestone slab was prised up from the then exposed bedrock in the southeast corner of the cutting (Fig. 33). The slab (206) measured 1.27m by 0.74m and 0.23m thick. It was left lying beside the hollow its removal had created (208). Its humic fill (207) contained no finds, however a similar feature in the adjacent part of Cutting G to the east (approximately 1m away) contained a fragment of a 19th/20th-century iron pot.

Fig. 33 Bedrock cut (208) with slab (206).

All of this activity coincided with, or was followed by, animal and/or weather-induced collapse of stones from the upper parts of structure (195), its internal dividing wall (196), and the cashel wall (01) – (198), (199), and (22), respectively. Tumble from the cashel wall was particularly heavy in the metre-wide stretch along its base in Cutting H, and over most of Cutting H1 which was enclosed on two sides by the cashel wall (Fig. 34). The loosely tumbled stones ranged in maximum dimension from 0.2 to 0.95m, and the deposit measured

up to 1m thick in places. The disturbed remains of modern animal carcasses were found throughout.

Fig. 34 Stone tumbled from the cashel wall (22) in Cutting H, looking southwest.

All were overlain by humus (04) and sod/moss (03) that was up to 0.21m thick in places, reflecting the churning, exposing, and manuring of the upper levels of the interior during early modern and modern use as a stock enclosure.

Backfilling (Fig. 35)

The entire cutting was backfilled and re-sodded, bringing the surface back level with the rest of the cashel interior. As this site is the focus of a visitor centre, an attempt is made to leave certain features visible or marked on the surface – this was discussed with Ann Lynch of the National Monuments Service during a site visit in 2015. In Cutting H, the tumbled stones from the cross-wall (48; 49/50), structure (195; 198/199), and cashel wall (01; 22) were not replaced, leaving the walls themselves more visible. The line of wall (100) was marked on the surface of the backfill with flat limestone slabs and a low wall will be built on top of these to join this with the rest of the house (100) reconstructed walls. Explanations of these will be added to the 2018 version of the visitor booklet, to aid visitor understanding of the site and its phases of activity.

Fig. 35 Pre-excavation (top), post-excavation with walls of animal pen left exposed (bottom).

Finds

A list of finds is given as Appendix 3, the detailed catalogue of 2017 artefacts also completed but not included here. Approximately 170 artefacts were recovered from Cuttings H and H1, and each can be attributed to one of the phases identified above. Items of stone, fired clay, bone, iron, bronze, lead, silver, and glass were discovered.

Fig. 36 Fragment of a decorated rotary quernstone.

Fig. 37 Whetstones.

Fig. 38 Rubbing stones.

Fig. 39 Hammer stones.

Fig. 40 Lignite ring.

Fig. 41 Chert lithics, including half of leaf-shaped arrowhead (centre).

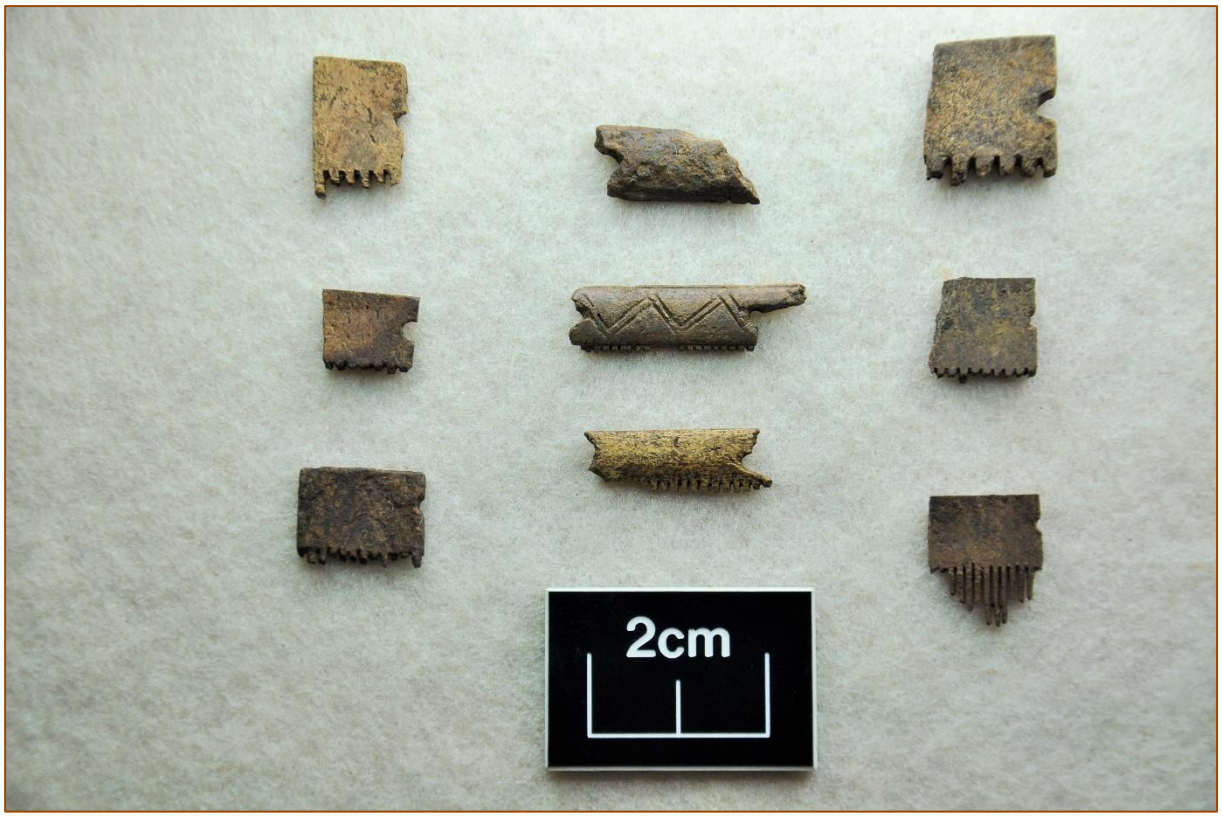

Fig. 42 Bone-comb fragments.

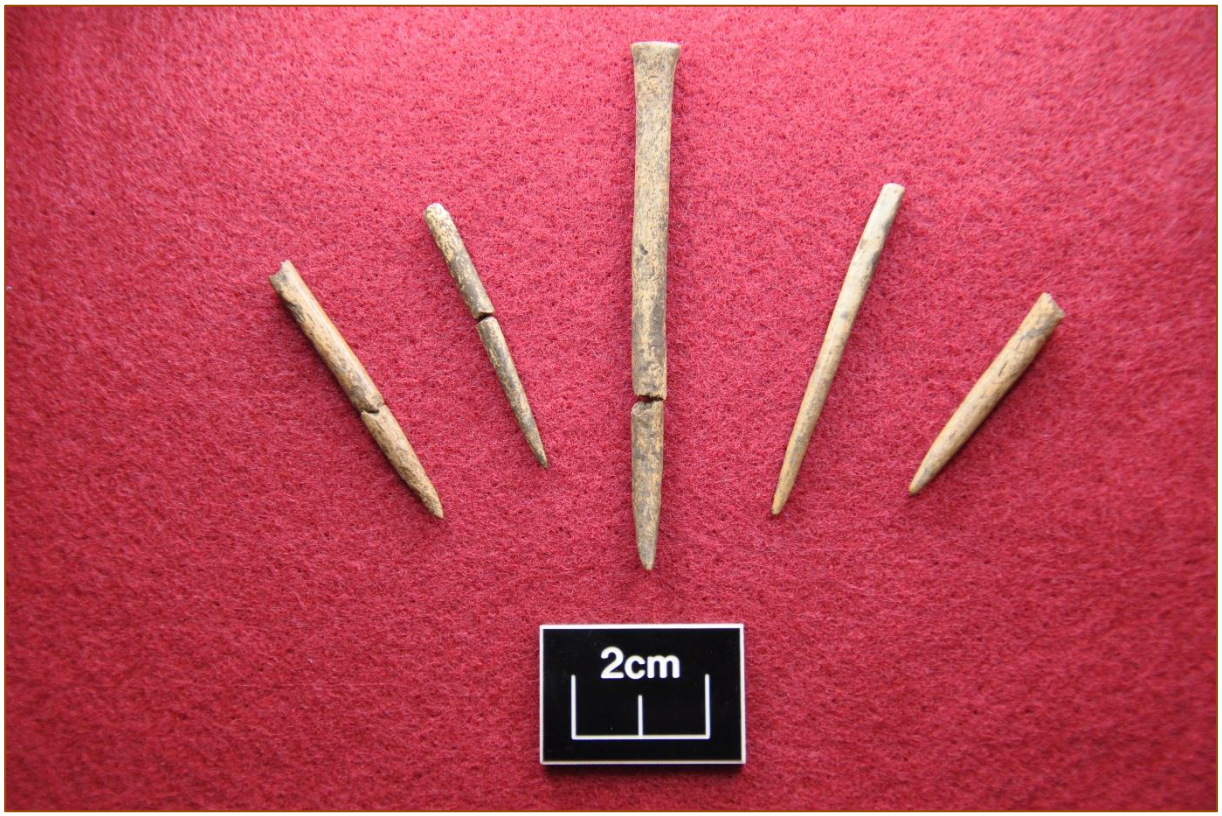

Fig. 43 Bone pins.

Fig. 44 Iron nails.

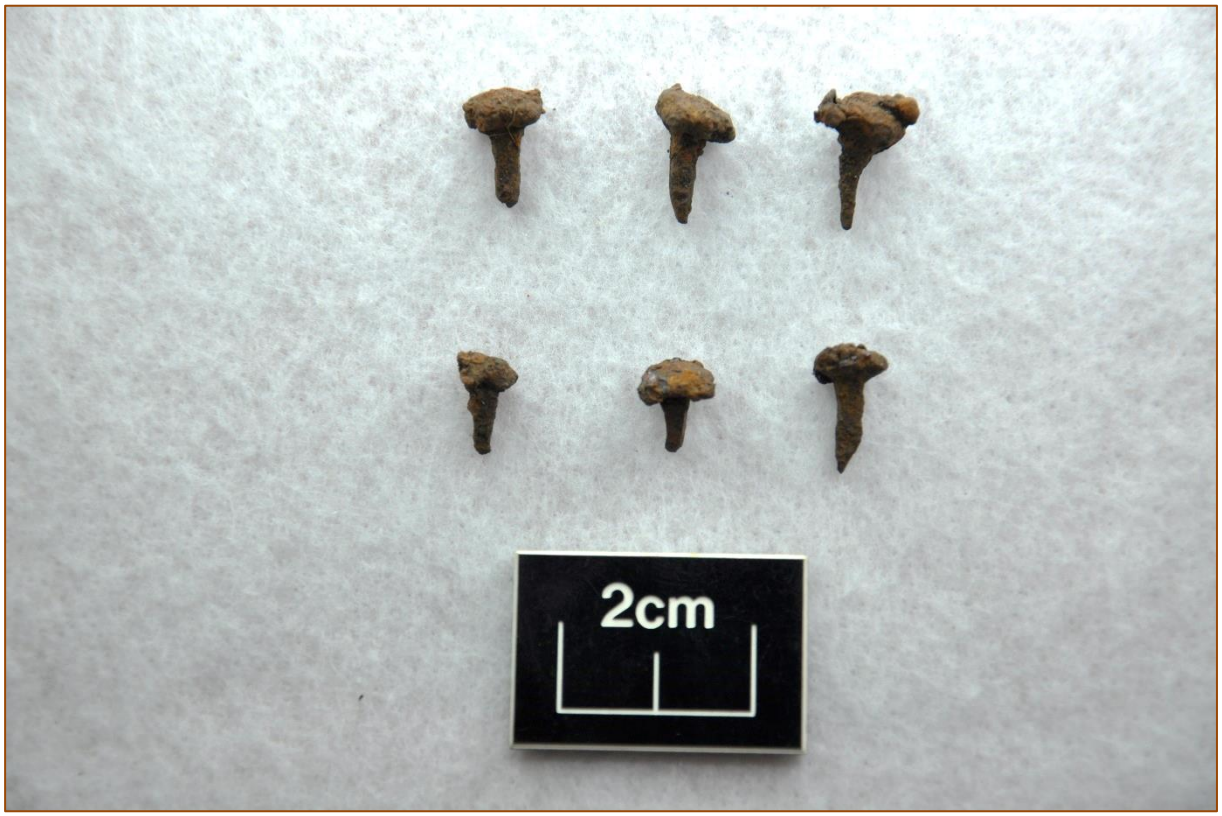

Fig. 45 Iron tacks.

Fig. 46 Iron pins.

Fig. 47 Iron blades (including shears blade).

Fig. 48 Iron awls/points.

Fig. 49 Miscellaneous iron implements, including punch/wedge (top right).

Fig. 50 Miscellaneous iron objects, including clench bolt (right).

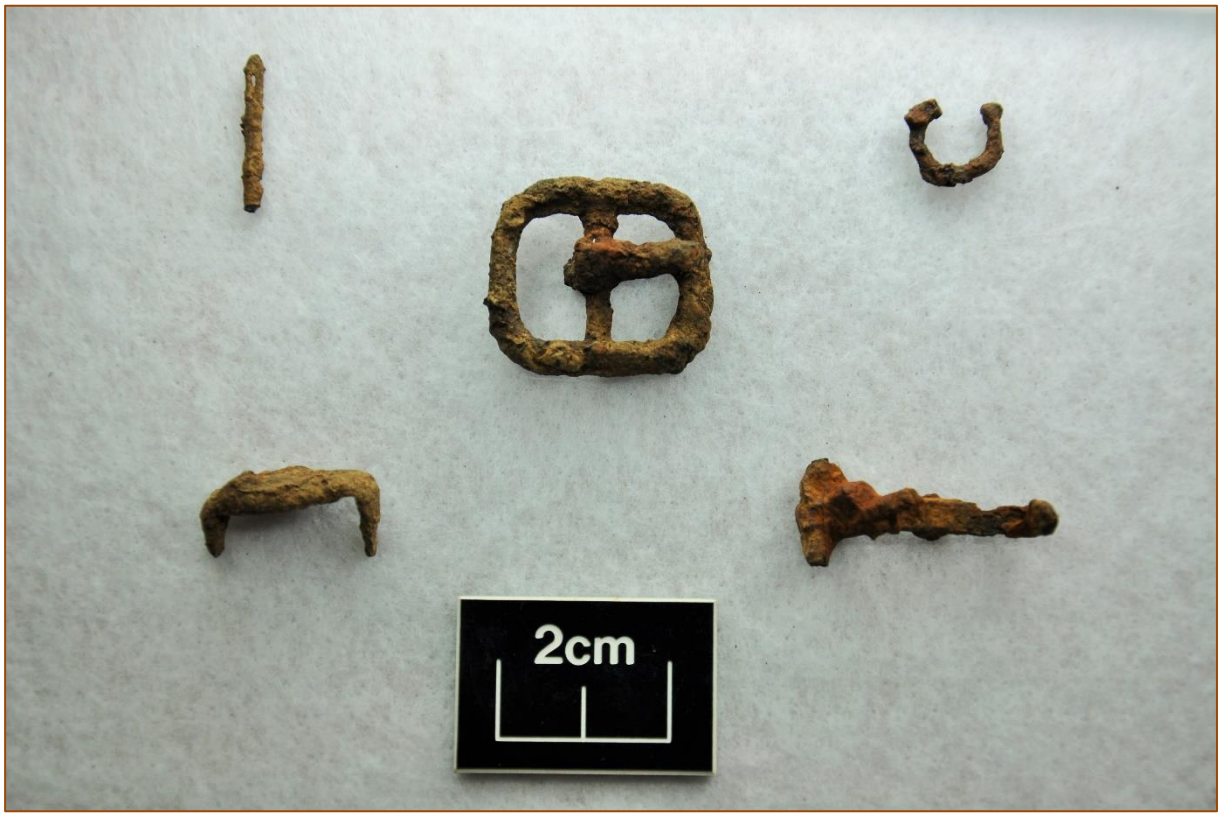

Fig. 51 Collection of iron items, including sewing-needle fragment and buckle.

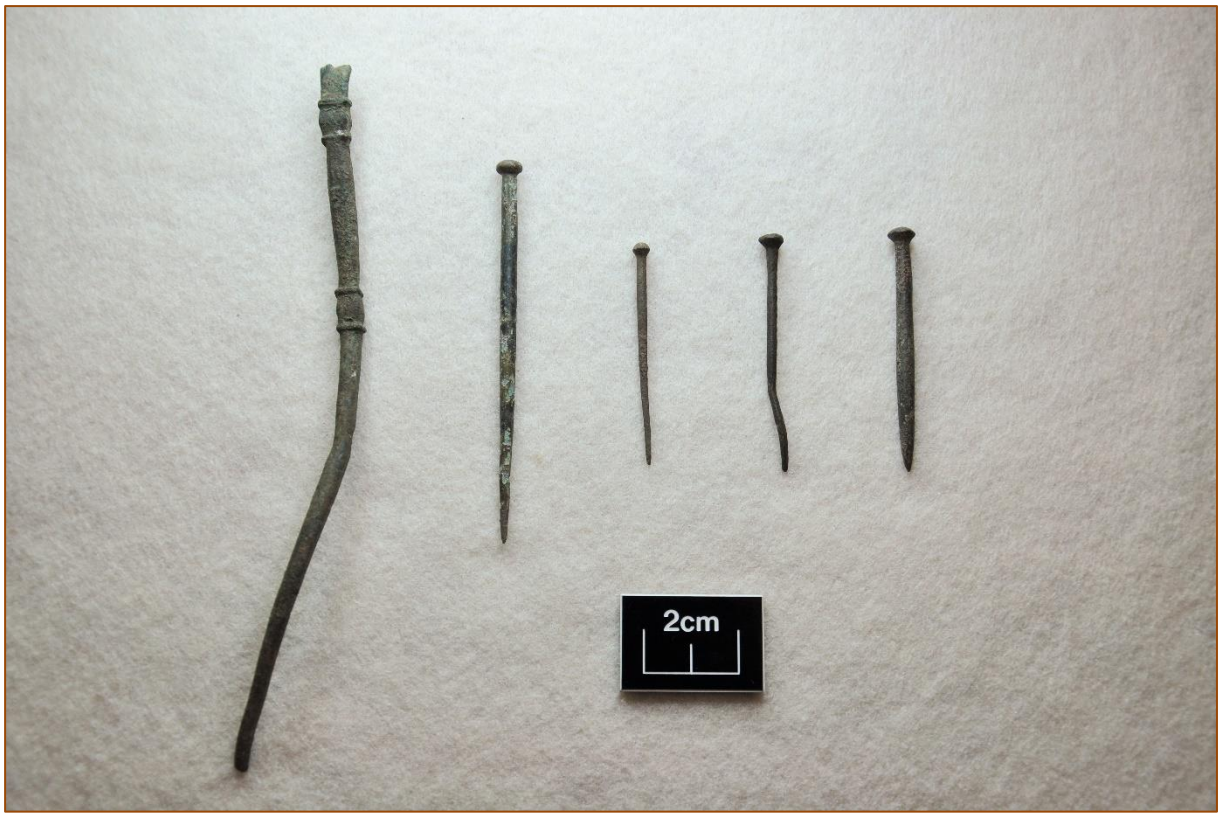

Fig. 52 Bronze stick pins.

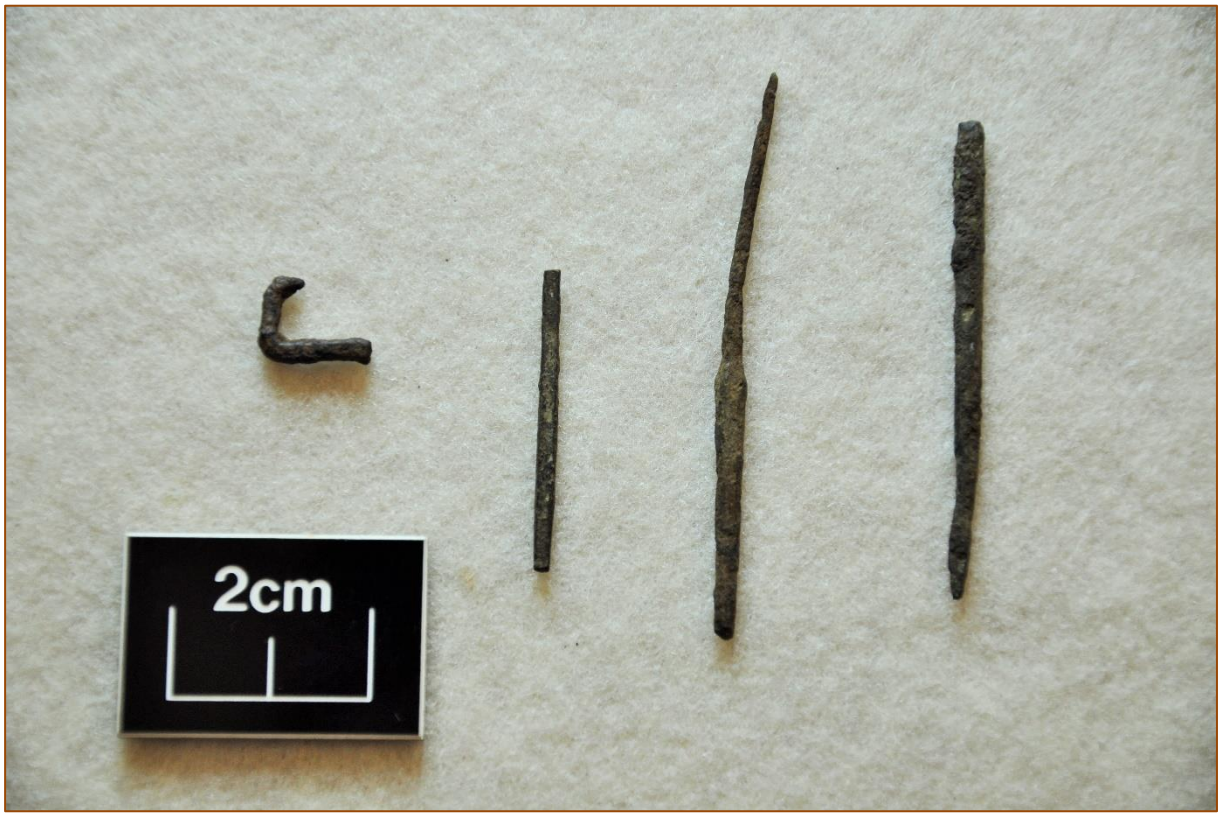

Fig. 53 Miscellaneous bronze items, including awl.

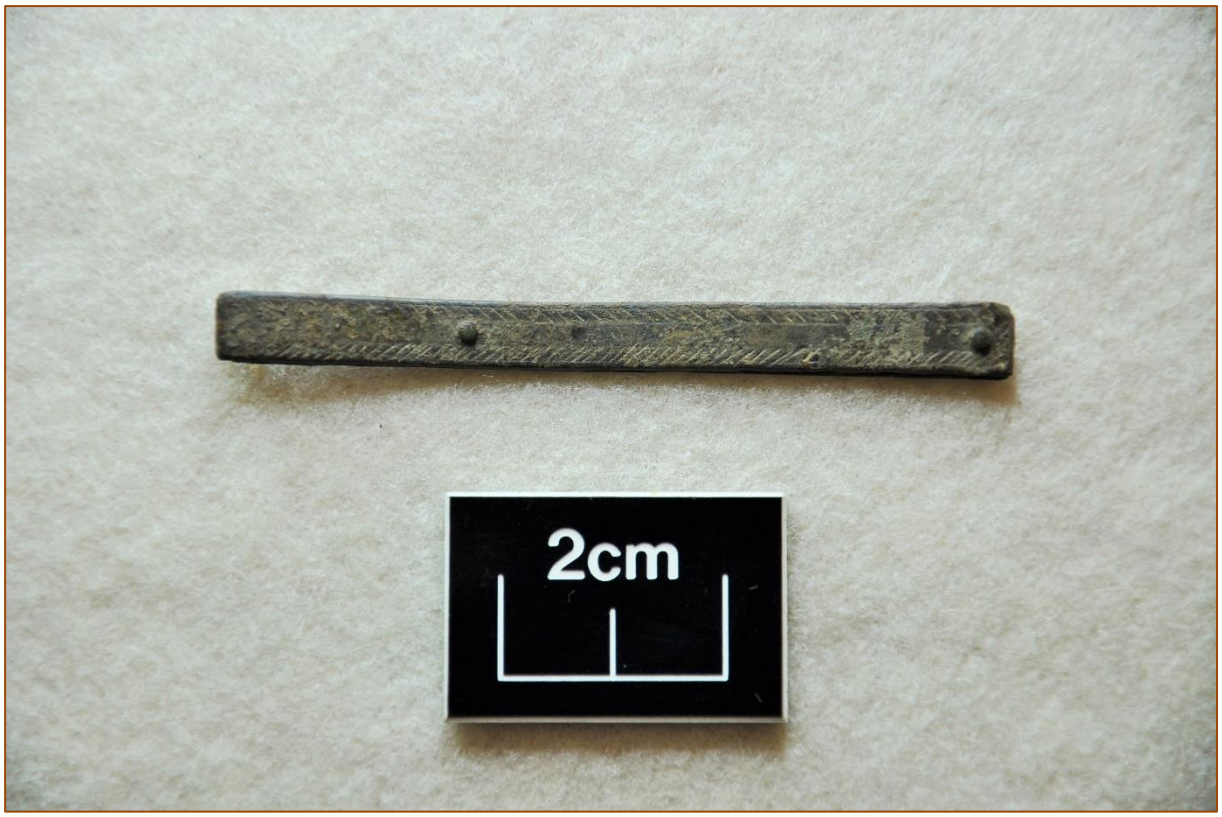

Fig. 54 Bronze strap-end.

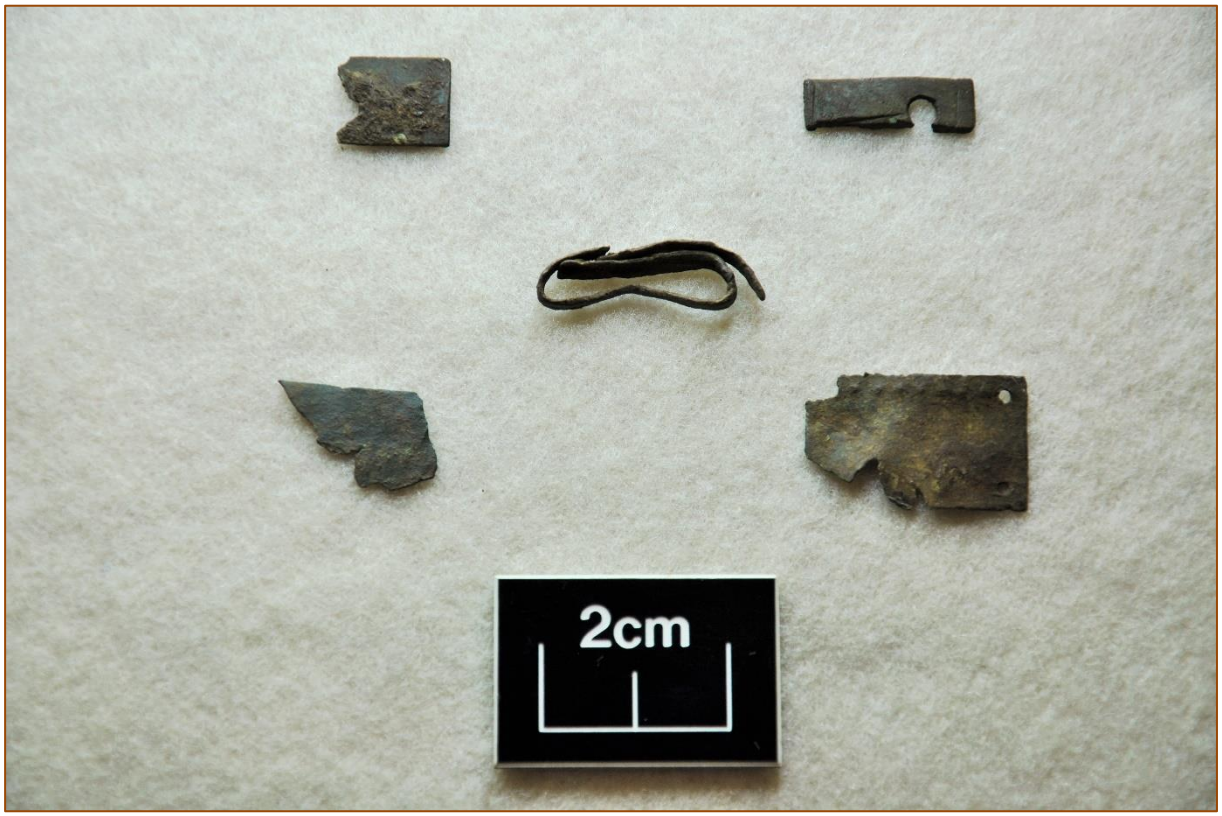

Fig. 55 Miscellaneous bronze fragments.

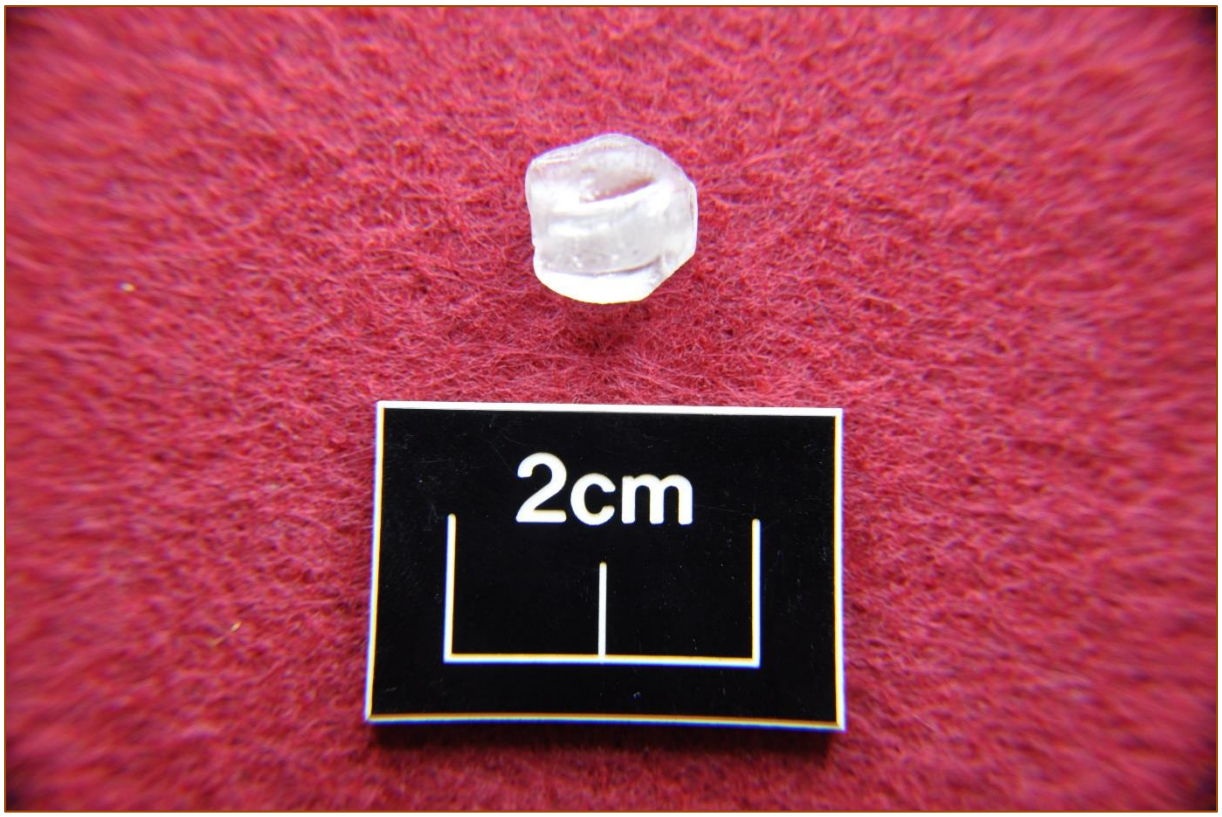

Fig. 56 Clear bead.

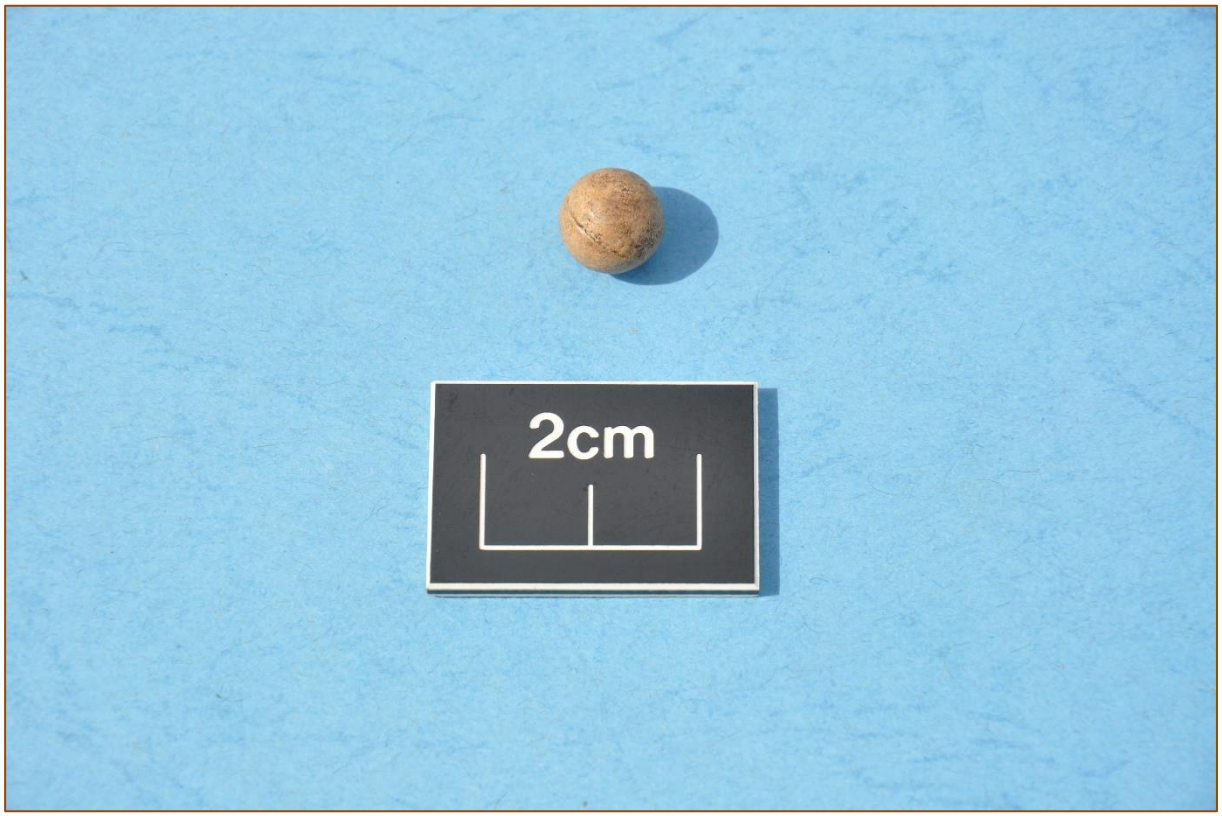

Fig. 57 Lead shot.

Stone artefacts include 6 fragments of rotary querns, two of which were decorated (Figs. 36 and 60), 4 whetstones (Fig. 37), 2 rubbing/polishing or food-preparation stones (Fig. 38), 5 hammer-stones (Fig. 39), a fragment of a decorated lignite ring (Fig. 40), 11 chert lithics including half of a leaf-shaped arrowhead (Fig. 41), and 7 flint lithics. Bone was used in the manufacture of composite bone combs (Fig. 42), dress-pins (Fig. 43), a sewing needle, a harp-peg (Fig. 67), and handles for knives. Evidence of on-site bone-working comprised two pin roughouts, a comb roughout, and a worked fragment (Fig. 59). The iron remains vary in form and degree of preservation. They include 11 nails and tacks (Figs. 44 and 45), 1 shaft, 2 fragmentary dress-pins (Fig. 46), 5 knives/blades (Fig. 47), 4 possible projectile heads (Fig. 61), miscellaneous objects or tools including possible punches and awls (Figs. 48 and 49), a sewing needle (Fig. 51), 2 possible buckle fragments, fragments of an early modern cooking pot (Fig. 69), and various miscellaneous fragments (Fig. 50). Bronze items include 5 decorated stick-pins including one very large example (Fig. 52), a shaft, a possible buckle fragment, an awl (Fig. 53), a horse's bridle link (Fig. 66), a decorated strap end (Fig. 54), a 17th-century coin (Fig. 69), and six other fragments/items (Fig. 55). Other materials represented include 22 clay crucible fragments (Fig. 58), 7 fragments of clay pipe (Fig. 69), 3 possible clay-mould fragments, a complete clear glass bead (Fig. 56), a complete lead shot (Fig. 57), and a fragment of a silver ingot (Fig. 62).

These artefacts reflect something of the activities that took place within the cashel, and the status of its occupants. An assemblage of slag weighing 450g, the whetstones, silver-ingot fragment, awls, mould fragments, and crucible sherds (Fig. 58) reflect metalworking (with an emphasis on non-ferrous work) in and near the north-eastern end of Cutting H. It is possible, if not probable, that the metal artefacts recovered during excavation were manufactured at Caherconnell. The range of miscellaneous metal and bone tools were undoubtedly employed in a number of craft activities taking place within the enclosure.

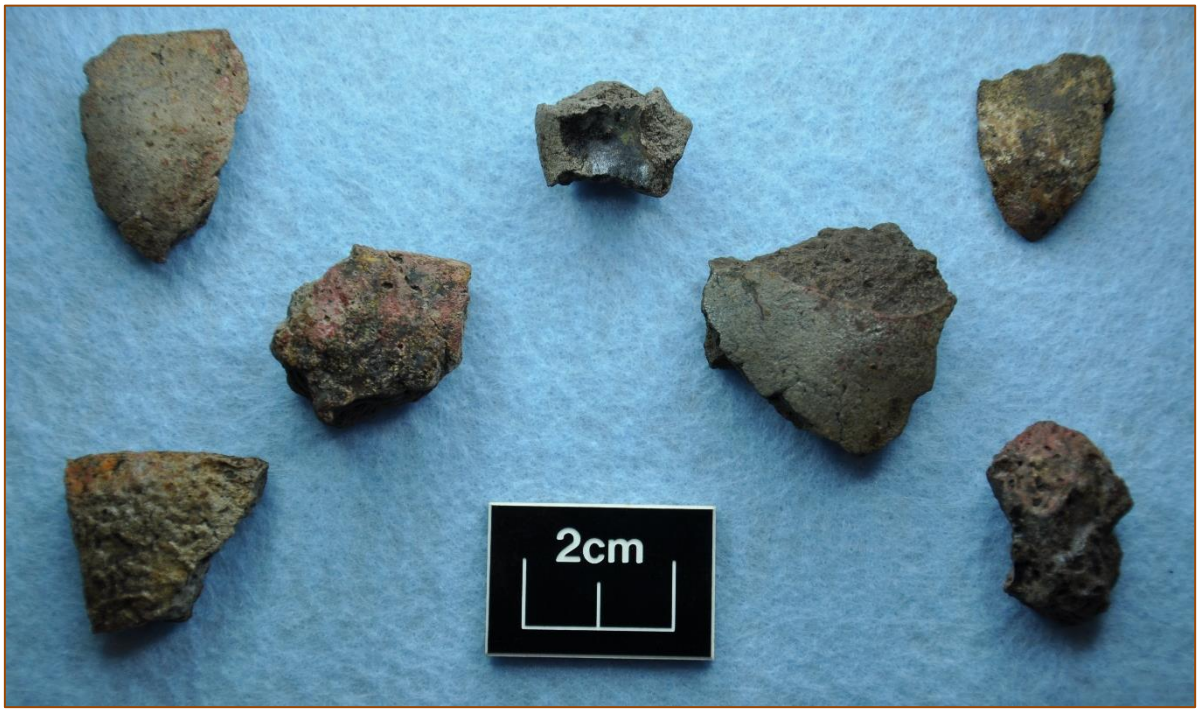

Fig. 58 Crucible sherds.

Woodworking is suggested by the presence of iron nails and other tools. Many, if not all, of the stone objects were probably made locally, though (with the exception of possible lithic debitage) there is no definite proof of this. The plentiful supply of raw material, a few partially-worked fragments (from 2011, 2016 and 2017 – Fig. 59), and a range of finished items (combs, pins, spindle-whorls, bead, gaming-piece, points and needles) suggest that bone-working occurred at Caherconnell. In addition, a deliberately sawn/cut section of deer antler (comprising two tines) was uncovered in cutting E. The bone and stone spindle-whorls from cuttings B, D, E, F and G, the probable weaving sword from Cutting B, the bone points/awls and the sewing needles from Cuttings C, D, F, G and H, and the stone needle punch from Cutting G reflect textile and leather-working, while the quern fragments (e.g. Fig. 60) indicate the processing of grain.

Fig. 59 Evidence of on-site bone-working: pin roughouts, comb roughout, worked fragment.

Fig. 60 Decorated rotary quernstone.

Less ‘domestic’, high-status activities are represented by armour-piercing arrowheads from Cuttings D, E, and H (Fig. 61), the barbed arrowhead from Cutting F, the harp-pegs from Cuttings A and H (and perhaps the shaft/peg from Cutting E), the gaming piece from Cutting D1 and fragment of another possible gaming piece from Cutting E, and the slate pencil from Cutting G. Trade is evident in the presence of coins, bronze, silver (Fig. 62), glass and amber at the site, and possibly in the representation of a ship on the whetstone discovered in 2014. The red, white and blue glass bead from 2016 clearly represents trade, having originated in Venice in the late 15th or 16th century, as does the 10th-century Baltic amber bead. The clear bead discovered in 2017 may also have Scandinavian origins.

Fig. 61 Iron projectile heads.

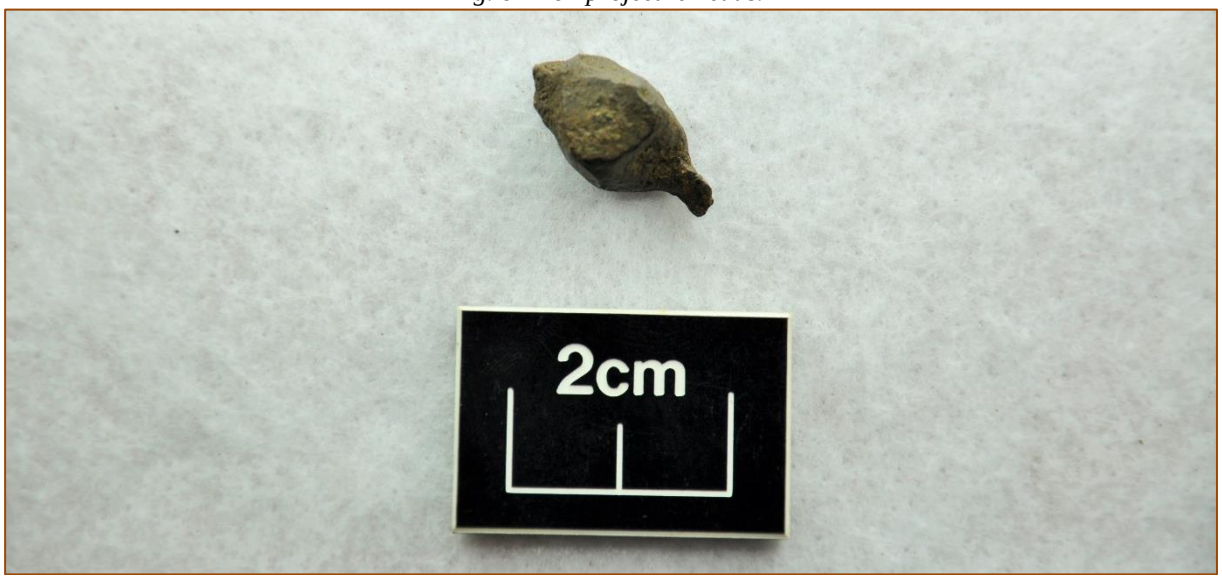

Fig. 62 Fragment of a silver ingot.

Samples (Appendix 4)

Bulk soil samples were taken from sixteen deposits, including post-hole fills and charcoal-rich spreads. These will be 100% sieved and floated for charred plant remains and wet sieved for small artefacts and ecofacts. A small collection (eleven samples) of charred seeds/grains and hazelnut-shell fragments was recovered during excavation.

Fig. 63 Collection of marine shells, and animal bone.

Four small samples of marine shells (Fig. 63), thirty-seven (mostly large) samples of animal bone, four samples of coprolite, and ten samples of charcoal were recovered (Fig. 64). 450g of metallurgical slag was recovered in 2017 (approximately 36 individual samples, all relatively small and possibly associated with non-ferrous metalworking) (Fig. 65). The slag, animal bone and shell will be examined as single (large) assemblages at the conclusion of the cashel excavations. Charcoal samples are retained for species identification.

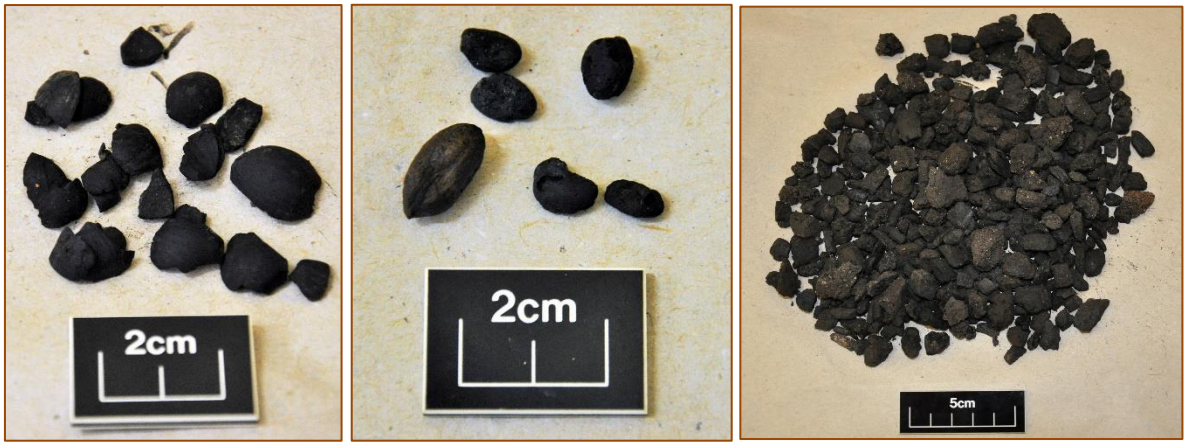

Fig. 64 Burnt hazelnut shell, carbonised grains, and charcoal.

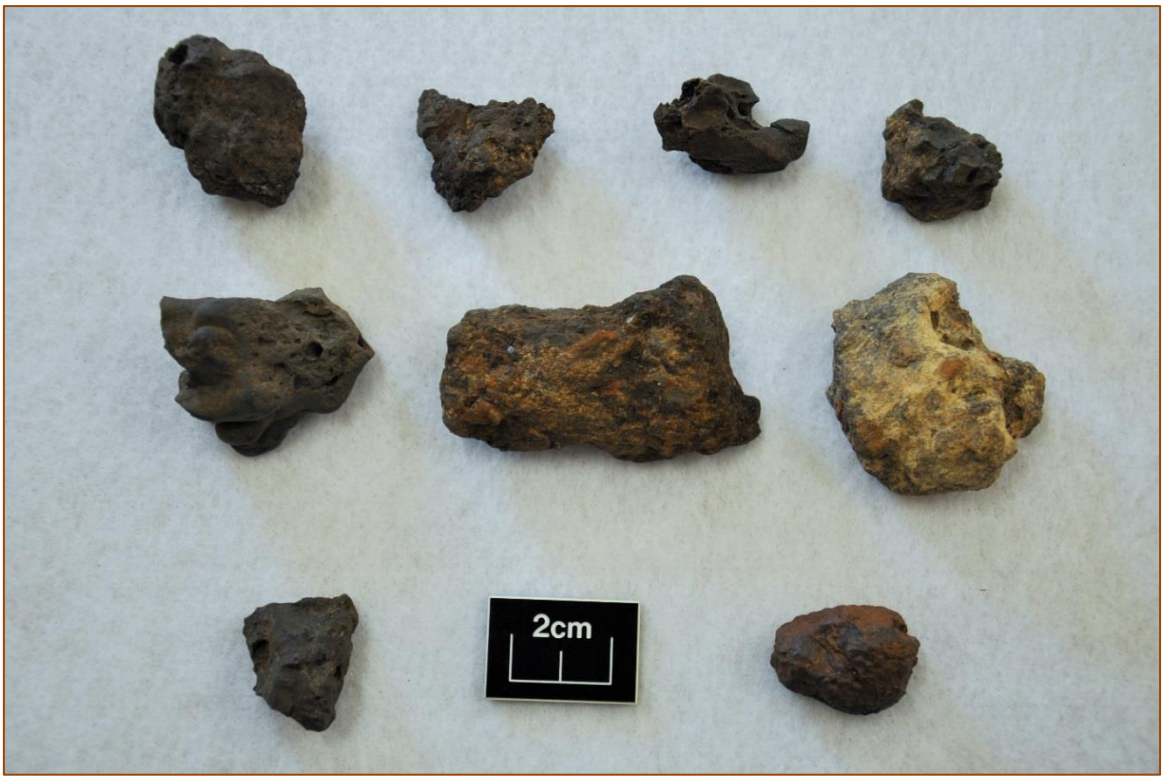

Fig. 65 Fragments of metalworking slag.

Discussion

Phasing

Thus far, Phase 1 is represented only in Cutting D1 (2013), by the pre-cashel burial mound, the cists within it, and the human remains preserved inside the cists. No grave goods were recovered. Radiocarbon dating places these burials in the late 6th to early 7th century AD.

Phase 2 dates to the second half of the 7th century so there is only a slight chance of an overlap between phases 1 and 2. It comprises the remains of a fire-pit found in Cutting B. No Phase 2 features were identified in 2017.

Phase 3 levelling and construction was represented in Cuttings H and H1 by the deposition of levelling material (37) in places before the construction of the cashel wall (01). The slightly uneven limestone bedrock necessitated this action.

Phase 4 activity, the earliest occupation phase, is marked by the construction and use of the 10m-diameter central circular house (115), the adjacent metalworking area/workshop (163, 225 etc.), the group of features in the southwest corner of Cutting H, and the hearths and slab surface in Cutting H1. Definite Phase 4 artefacts, derived from context (36) etc., include iron knives, awls, nail, point, punch, ring, pins, sewing needle, clench bolt, bronze dress pins, decorated strap end, awl, miscellaneous fragments, and a link from a horse bridle (Rena Maguire pers. Comm., Fig. 66), stone quern fragments, whetstones, rubbing stone, and hammer stones, bone dress pins, comb fragments, sewing needle and pin roughouts, chert and flint lithics, crucible sherds, clay-mould fragments, a clear bead of Scandinavian type, and a fragment of a silver ingot.

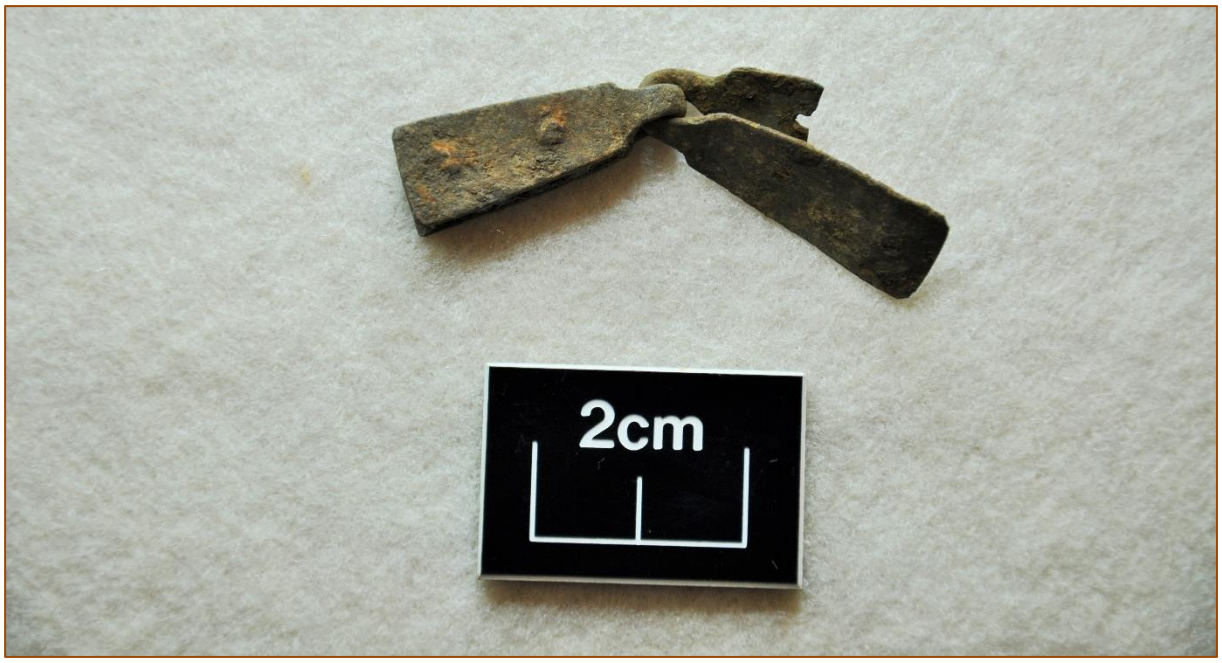

Fig. 66 Bronze bridle link.

Features from Phase 5, the middle occupation, include the remnants of the slab surface (33), part of the rectangular house (100), hearth (238), and post-setting (240), all covered/surrounded by occupation layers (16), (205), and (101). The slab surface, where surviving, appears to have been used to create a more level living surface inside the cashel, levelling off areas of high bedrock. Artefacts from the occupation layer include iron shears, nail and tacks, hook, and bodkin point, large bronze dress pin, possible buckle fragment of bronze, bone-comb fragments and an unfinished comb fragment, a bone-pin roughout, bone handle and harp peg (Fig. 67), hammer-stone, rubbing stone, whetstone, quernstone, possible shale core, and chert lithics.

Fig. 67 Bone peg from a harp.

Phase 6 activity includes laying of slabs (28) in parts of the cutting. The slab surface suggests a yard surface that had become muddy and required covering/stabilising in places. Also relevant are the continued house of house (100), the possible structure in Cutting H1 (228 etc.), the associated hearth (235) and burnt deposits (217, 219). Finds from Phase 6, the late occupation – occupation layer (25)/(25H) – include an iron arrowhead and nail, a bronze stick pin, bone-comb fragments, a large portion of a decorated lignite finger-ring (Fig. 68), and a couple of flint lithics.

Fig. 68 Decorated lignite finger ring.

The final occupation, Phase 7, is represented by the construction and use of the wall crossing the interior of the cashel (48). The occupation material from this phase (23 and 96) contained iron nails and tacks, an iron buckle and tongue, a quern fragment, lead shot, and a chert lithic.

Fig. 69 Iron vessel, coin, and clay pipe fragments.

Phase 8 is marked by the construction and use of an animal pen (195) and smaller enclosure (197), attempted revetting of tumble from the cashel wall (226), and by tumbled and collapsed stone from various walls. It also saw the burial of modern animal carcasses in cuttings C, D, F, and H. Clearance occurred in Cutting H to provide building stone for structure (195), whilst a trampled path developed across the western end of the cross-wall (48) adjacent to structure (195). This phase marks a change in cashel use, from human habitation to animal enclosure. Finds from post human-occupation Phase 8 layers include pieces of an iron cooking pot, iron tacks (probably from shoes/boots), 17th-century farthing of St. Patrick, and fragments of clay pipes (Fig. 69).

Chronology

With a growing number of radiocarbon dates obtained so far, a tentative chronology is proposed for the various phases identified above (Table 1). Future radiocarbon dates will, no doubt, help refine this scheme. Phase 1, late 6th/early 7th century AD, probably represents the earliest evidence so far excavated though, stratigraphically, it is constructed on bedrock, similar to the fire-pits from Phase 2 (Cutting B) and Phase 4 (Cutting G). Phase 2, represented by the fire-pit excavated in 2011, has produced a radiocarbon date in the 7th century AD. This feature is cut into bedrock and pre-dates the construction of the cashel by several hundred years. The square enclosure located 100m south of the main cashel was in use between the 7th and 9th century AD (10E119), its occupants possibly responsible for this early activity. A 7th/8th century date from an animal-bone fragment recovered from beneath the cashel wall in 2015 may also reflect such activity.

Phases 3 and 4 saw the construction and initial use of the cashel, with a date of the 10th/11th century now suggested by four radiocarbon dates, and possibly a fifth whose range extends well into the 10th century (from the base of the rock-cut pit excavated in 2015). The finds do not disagree with this date, and the identification of two Congals in the records of the late 10th century support it (see below). The middle occupation of Phase 5 was also radiocarbon dated to the 10th/11th century, while the late occupation of Phase 6 produced radiocarbon dates of 11th to 14th century. No gaps in use have been identified during excavation, with no sod layers or buried ground surfaces present in the stratigraphy. In addition, continuity of use is reflected in the close positioning of an external hearth inside the northwest wall of the cashel through phases 4, 5 and 6 (as excavated in Cutting H1, 2017).

The final occupation layers of Phase 7 have yet to be radiocarbon dated in cuttings A–H. However, the dressed entrance stones, jetton and coins from 2015, and Venetian bead from 2016, all suggest a 15th/16th-century date for this phase, making it roughly contemporary with the 2007 radiocarbon dates for Structure A. All of this suggests a relatively tight sequence for phases 3 through 7, from the late 10th to the late 16th/early 17th century AD, with no obvious gaps yet visible in the dating evidence (or stratigraphy).

Phase 8 post-dates all of these, dating from the 17th century to modern times. Radiocarbon dates have not been obtained for these upper layers, though a late 17th-century coin was recovered in 2017.

10E087 C14 DATES

Phase 1 — **6th/7th century AD**

c.(92) from 2013, Cutting D1 – Adult female
UBA-24260 cal AD 541-645 (2 sigma, 1.000)
c.(86) from 2013, Cutting D1 – Infant
UBA-24261 cal AD 535-649 (2 sigma, 0.972)

Phase 2 — **7th century AD**

c.(42) from 2011, Cutting B – lower fill of fire-pit
UBA-18915 cal AD 641-689 (2 sigma, 0.986)
c.(37) from 2015, Cutting F – under cashel wall
UBA-30797 cal AD 666-778 (2 sigma, 0.901)

Phases 3/4 — **10th/11th century AD**

c.(65) from 2007, trial cutting – deposit on bedrock
UBA-8564 cal AD 967-1046 (2 sigma, 0.903)
c.(37) from 2012, Cutting C – levelling/occupation layer
UBA-24259 cal AD 950-1053 (2 sigma, 0.761)
c.(115) from 2014, Cutting E – hazelnut immediately beneath circular-house wall
UBA-27545 cal AD 971-1047 (2 sigma, 0.914)
c.(144) from 2015, Cutting F – lowest fill of rock-cut pit
UBA-30795 cal AD 798-972 (2 sigma, 0.915)
c.(171) from 2016, Cutting G – metalworking hearth
UBA-33277 cal AD 876-1015 (2 sigma, 0.994)

Phase 5 — **10th/11th century AD**

c.(16) from 2011, Cutting B – occupation layer
UBA-18914 cal AD 981-1045 (2 sigma, 0.939)
c.(102) from 2015, Cutting E – immediately beneath rectangular-house wall
UBA-27544 cal AD 983-1049 (2 sigma, 0.820)

Phase 6 — **11th – 14th century AD**

c.(55) from 2007, trial cutting – pre-house occupation layer
UBA-9068 cal AD 1044-1099 (2 sigma, 0.452) and 1147-1210 (2 sigma, 0.401)
c.(18) from 2010, Cutting A – under Phase 6 entrance slabs
UBA-18913 cal AD 1285-1326 (2 sigma, 0.419) and 1344-1395 (2 sigma, 0.581)
c.(25) from 2011, Cutting B – occupation layer
UBA-18916 cal AD 1075-1155 (2 sigma, 0.673) and 1022-1059 (2 sigma, 0.310)
c.(190) from 2016, Cutting G – hearth in annexe
UBA-33278 cal AD 1063-1154 (2 sigma, 0.676)
c.(25) from 2016, Cutting G – occupation layer
UBA-32902 cal AD 1150-1225 (2 sigma, 0.869)

Phase 7 — **15th – 17th century AD**

c.(57) from 2007, trial cutting – structure A occupation
UBA-8562 cal AD 1442-1525 (2 sigma, 0.653) and 1556-1632 (2 sigma, 0.347)

Table 1. Radiocarbon dates from the cashel
(after Reimer, P.J. et al. 2009 Radiocarbon 51, 1111-1150 and Reimer, P.J. et al. 2013 Radiocarbon 55, no.4).

This tentative chronology can be tied to known historical/political events in the area. A 10th/11th-century date might suggest construction of the cashel by a branch of the Dál Cais (Uí Thoirdelbaig) who were asserting control over the native Corcomruad at that time. Two 'Congals' (*Cathair Congal* possibly = Caherconnell) are present in the historical records from this time – one a lord of the native Corcomruad ruling family, the other a brother of one of the imposed Dál Cais kings. Surviving medieval documents indicate that Caherconnell was held by descendants of Uí Thoirdelbaig, the O'Loughlins, right up to the start of the 17th century (1607), making the Dál Cais Congal perhaps the more likely of the two placename candidates. It was then briefly held by the O'Briens, before being taken from them by the English in 1641 and given to the Comyns, 'transplanted papists' from Limerick (Comber and Hull 2010, 135–7). The end of O'Loughlin (most likely) or O'Brien ownership probably marked the start of Phase 8, the movement away from human occupation of the cashel.

Conclusion

Excavations to date clearly demonstrate the significance of this site, and its potential to provide much-needed information on native settlement in medieval Ireland. The recovered evidence points to continuity of native tradition – the incorporation of ancestral burials into the settlement, the deliberate use of a centuries-old native settlement form, the continuation of long-established processes such as metalworking, textile-production and grain processing, and the use of traditional artefact types such as the bone comb, bronze pin, and rotary quern. The curious lack of pottery thus far from the cashel excavations reinforces this idea of native tradition. That this may have been a deliberate choice might be implied by evidence that the occupants did have access to non-traditional/'intrusive' items, such as the lead shot found in the cashel in 2010 and 2017, the German jetton and the English coins (14th and 16th century) found in the doline outside the cashel in 2008, and within the 15th/16th-century house in 2015, and the Venetian bead found in 2016. Other items of Anglo-Norman/English/Continental origin could surely have found their way to the cashel if desired by its occupants. If the pottery absence is upheld in future excavations, then it would appear that the O'Loughlins of Caherconnell made a deliberate effort to assert their native tradition in the face of increasing political pressure from beyond their territory.

Further work

Artefacts in need of conservation will be x-rayed, cleaned and conserved by a recognised conservator (Susannah Kelly UCD). This process has already commenced, with all metal artefacts excavated to the start of 2017 having been x-rayed and examined by the conservator. With the exception of the nails and a few miscellaneous pieces, all have been conserved, and some of the unconserved pieces have been deemed unworthy of conservation by Susannah Kelly.

The slag and related material will be examined by an archaeometallurgist (possibly Dr. Gerry McDonnell who has examined the material from the square enclosure 10E119) at the end of excavation at the site. The animal bone and marine shells will be washed and sent to a

zooarchaeologist for reporting (Dr. Emily Murray, QUB completed the analysis of the material from the square enclosure 10E119 / Dr. Fiona Beglane, Sligo IT examined some of the material being excavated on site last summer) at the end of excavation at the site. The flint and chert artefacts will also be catalogued and reported (by Dr. Killian Driscoll who has examined the material from the square enclosure 10E119) at the end of excavation at the site.

Samples (all animal bone) for radiocarbon dating will be selected from the following contexts and submitted to Queen's University Belfast for AMS radiocarbon dating.

Context 222, burnt deposit
Context 225, beneath wall of workshop
Context 238, hearth material
Context 243, hearth material
Context 245, under (242) slabs

A final archaeological report, suitable for editing for publication, will be produced at the conclusion of the cashel excavation. Interim reports/articles will be published, and public talks delivered, during the life-span of the project. Annual excavation reports are available online via the Caherconnell Archaeological Field School website (www.caherconnell.com).

A summary of the findings of the excavation is being submitted/uploaded to *Excavations 2017*.

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Dr Michelle Comber, MA
Caherconnell Archaeological Field School
August 2017

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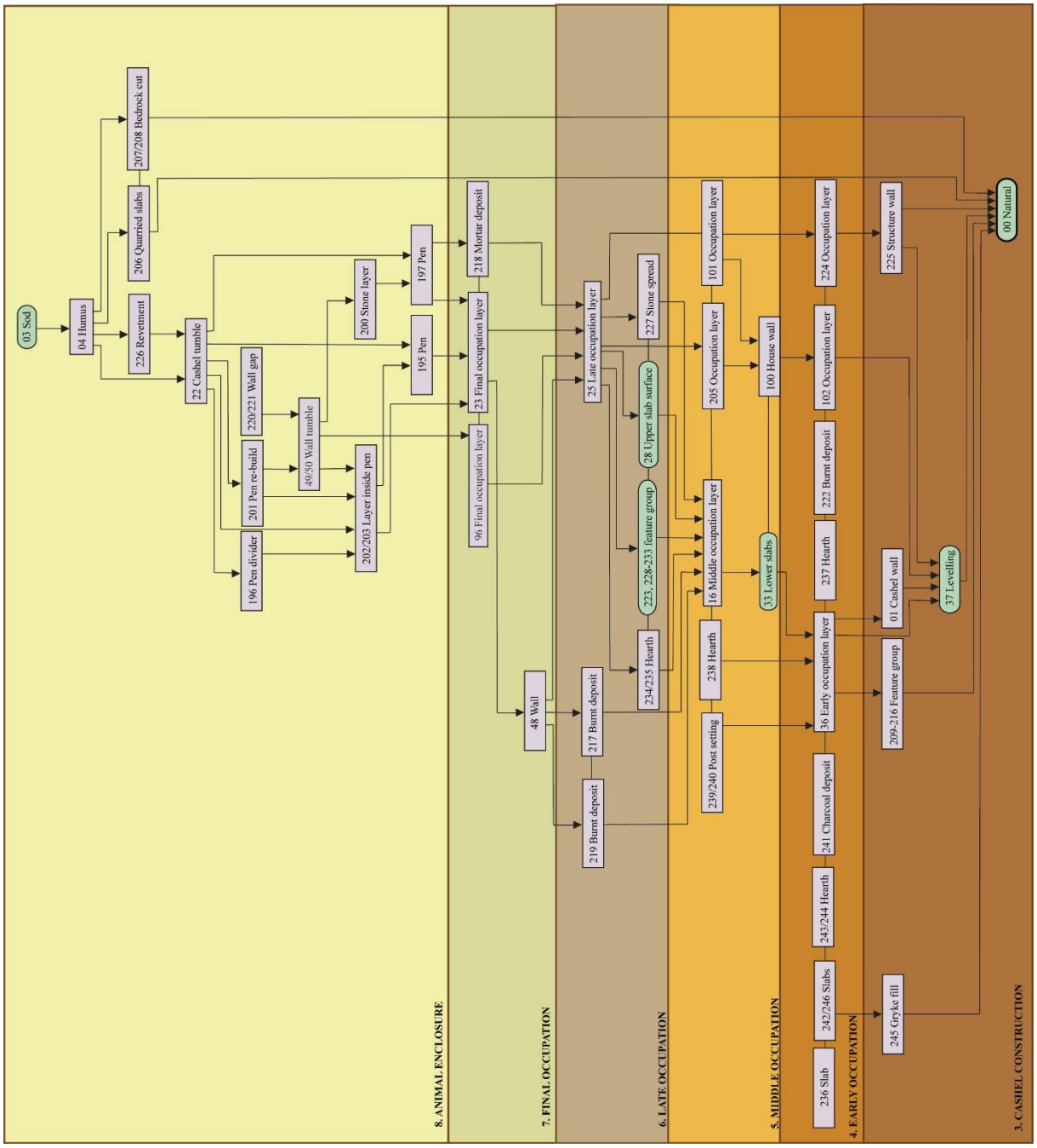
Appendix 1: List of Cuttings H and H1 Contexts

No.	Description	Cutting	Grid square	Sample	Date assigned
0	Bedrock	ALL	ALL	-	2010
3	Sod	ALL	ALL	41, 75	2010
4	Humus	ALL	ALL	Multiple	2010
16	Occupation layer, 11th century	ALL	ALL	Multiple	2010
23	Stony occupation material, 15th/16th century	ALL	ALL	Multiple	6/11
25	Gravelly occupation layer, 11th – 14th century	ALL	ALL	Multiple	6/11
28	Upper slab surface	ALL	ALL	36	6/11
33	Lower slab surface	ALL	ALL	-	8/8/11
36	Occupation layer, 10th century	ALL	ALL	Multiple	9/8/11
37	Levelling material, 10th century	ALL	Multiple	Multiple	11/8/11
48	Wall across cashel interior	C, E, G	Multiple	-	2012
49	Tumble to north of wall	C, E, G	Multiple	-	2012
50	Tumble to south of wall	C, E, G	Multiple	-	2012
96	Stony occupation material under tumble = 23	E, G	Multiple	-	2014
115	Wall of 10th-century circular house	E, G	Multiple	-	2014
195	North-south wall of structure/pen	H	70-76/194-200	-	31/5/17
196	East-west dividing wall of structure/pen	H	70-74/196-198	-	31/5/17
197	Arc of slabs on edge/pen wall	H	72/204-206	-	31/5/17
198	Collapse from (195)	H	70-76/194-200	-	31/5/17
199	Collapse from (196)	H	70-74/196-198	-	31/5/17
200	Stone layer inside (197)	H	72-74/204-206	586	9/6/17
201	Stone re-build against south face of (48)	H	70-74/200/202	-	9/6/17
202	Cobbled' surface inside (195)	H	70-74/194-200	-	9/6/17
203	Dark-brown matrix of (202)	H	70-74/194-200	587	9/6/17
204	Stone fill of (195) wall	H	74-76/198-200	588	12/6/17
205	Occupation layer south of (48) = (101)	H	76-78/198-200	592, 600	14/6/17
206	Quarried slabs in southeast corner of cutting	H	78/192	-	19/6/17
207	Brown humic fill of (208)	H	78/194	606	19/6/17
208	Bedrock cut	H	78/194	-	19/6/17
209	Fill of (210)	H	74/194	-	20/6/17

210	Gryke possibly used as post support	H	74/194	-	20/6/17
211	Fill of post-setting (212)	H	72-74/192	610, 611	21/6/17
212	Post setting	H	72-74/192	-	21/6/17
213	Burnt deposit	H	72/192	613	21/6/17
214	Bedrock feature	H	74/192	-	21/6/17
215	Bedrock feature	H	74/194	-	21/6/17
216	Bedrock feature	H	74/194	-	21/6/17
217	Burnt deposit	H	70-72/202-204	618	10/7/17
218	Mortar deposit	H	70-72/202-204	622	10/7/17
219	Charcoal-rich deposit	H	70/206	624	10/7/17
220	Tumble fill of gap in wall (48)	H	76-78/200	-	12/7/17
221	Partial gap in wall (48)	H	76-78/200	-	12/7/17
222	Charcoal-rich burnt spread	H	70-72/202-204	629, 630-33, 635	13/7/17
223	East-west linear stone feature	H1	72-74/210	-	25/7/17
224	Occupation layer inside wall (225)	H	78/202-204	640-43, 645-46, 667-73 etc.	13/7/17
225	Base of curving wall	H	76-78/202-204	-	13/7/17
226	Short length of transverse slabs - revetment?	H1	72-74/208-210	-	25/7/17
227	Spread of smaller stone at (28) level	H1	74/208-212	-	27/7/17
228	Area of slabs	H1	72/208	-	28/7/17
229	Row of four stones south of (228)	H1	72/208	-	28/7/17
230	Row of angled stones east of (228)	H1	72-74/208	-	28/7/17
231	Possible post setting	H1	74/210	-	28/7/17
232	Fill of post-setting (233)	H1	72-74/208	680	28/7/17
233	Post setting	H1	72-74/208	-	28/7/17
234	Fill of (235) hearth	H1	74/208	681	28/7/17
235	Stone-setting of hearth	H1	74/208	-	28/7/17
236	Large slab	H1	72/212-214	-	1/8/17
237	Hearth next to (236)	H1	74/212-214	688	1/8/17
238	Hearth, no setting	H1	74/210	689, 691	1/8/17
239	Post setting	H1	72/208	-	1/8/17
240	Fill of post-setting (239)	H1	72/208	690	1/8/17
241	Charcoal deposit	H1	74/212-214	692, 693	1/8/17
242	Slabs over gryke	H1	74/210-212	-	2/8/17

243	Fill of (244) hearth	H1	74/208	695, 696	2/8/17
244	Stone setting of hearth	H1	74/208	-	2/8/17
245	Material in gryke, under (242)	H1	74/210-212	697-700	3/8/17
246	Basal slabs	H1	72-74/208-210	-	3/8/17

Appendix 2: Harris Matrix
Cuttings H and H1



Appendix 3: List of Cuttings H and H1 Artefacts

No.	Description	Cutting	Easting	Northing	Context	Date
1288	Quern fragment	H	72.45	202.36	48	29/05/17
1289	Iron vessel fragment	H	79.24	197.47	04	29/05/17
1290	Lead shot	H	76.19	193.44	04/23	31/05/17
1291	Crucible sherd	H	76.30	207.13	25	02/06/17
1292	Crucible sherd	H	76.00	206.90	25	02/06/17
1293	Iron nail	H	76.15	206.15	23	05/05/17
1294	Comb fragment	H	Sieve	Sieve	25	05/06/17
1295	Crucible sherd	H	76.40	206.66	25	05/05/17
1296	Iron vessel fragment	H	75.10	196.30	04	05/06/17
1297	Bronze pin	H	78.65	205.90	25H	05/06/17
1298	Clay pipe stem	H	78.61	198.53	04	06/06/17
1299	Iron nail	H	78.12	196.08	23	06/06/17
1300	Clay pipe fragment	H	78.34	197.95	04	06/06/17
1301	Clay pipe stem	H	75.78	197.24	04	08/06/17
1302	Iron buckle	H	71.08	196.27	23	08/06/17
1303	Iron buckle tongue	H	71.16	197.70	23	08/06/17
1304	Chert	H	72.63	207.70	23	09/06/17
1305	Lignite ring fragment	H	78.78	207.75	25H	13/06/17
1306	Lithic	H	78.78	207.66	25H	13/06/17
1307	Flint	H	81.48	195.12	203	13/06/17
1308	Iron vessel fragment	H	73.73	196.83	203	13/06/17
1309	Clay pipe fragment	D2	92-98	212.00	23	13/06/17
1310	Clay pipe stem	H	82.38	199.77	203	14/06/17
1311	Iron arrowhead	H	78.90	206.52	25H	14/06/17
1312	Flint	H	78.74	206.45	25H	14/06/17
1313	Clay pipe fragments	H	78.84	198.66	04	14/06/17
1314	Iron nail	H	78.77	198.50	205	14/06/17
1315	Iron nail	H	78.82	205.76	25H	14/06/17
1316	Iron object	H	73.46	193.39	36G	14/06/17
1317	Iron pin	H	75.17	195.87	36G	14/06/17
1318	Clay pipe stem	H	77.16	195.20	04	15/06/17
1319	Clear bead	H	77.52	196.42	36/23?	15/06/17
1320	Chert arrowhead	H	75.20	197.05	36G	15/06/17
1321	Iron tack	H	76.15	196.22	23	15/06/17
1322	Bronze ring	H	Sieve	Sieve	16	15/06/17
1323	Hammer stone	H	78.75	200.26	205	15/06/17
1324	Iron tack	H	73.07	201.10	16	15/06/17
1325	Iron tack	H	Sieve	Sieve	16	15/06/17

1326	Bone-pin roughout	D	-	-	16	16/06/17
1327	Chert	H	Sieve	Sieve	36	16/06/17
1328	Chert	H	78.11	199.23	36	16/06/17
1329	Bronze pin	H	78.02	199.46	36	16/06/17
1330	Iron awl	H	77.26	198.82	36	19/06/17
1331	Chert	H	79.06	196.87	36G	19/06/17
1332	Crucible sherd	H	Sieve	Sieve	36	19/06/17
1333	Iron projectile head	H	79.13	199.54	36	19/06/17
1334	Comb fragment	H	78.20	199.35	36	19/06/17
1335	Comb fragment	H	73.05	193.22	36	19/06/17
1336	Comb fragment	H	Sieve	Sieve	36	20/06/17
1337	Copper-alloy coin	H	77.06	198.10	04	20/06/17
1338	Flint	H	73.70	194.96	209	20/06/17
1339	Iron blade point	H	77.23	198.59	36	20/06/17
1340	Chert	H	77.33	198.56	36G	20/06/17
1341	Bronze shaft	H	70.64	200.70	36	20/06/17
1342	Comb fragment	H	79.35	205.11	25H	20/06/17
1343	Comb fragment	H	Sieve	Sieve	36	20/06/17
1344	Iron fitting	H	87.95	200.72	36	21/06/17
1345	Bronze pin	H	72.16	192.52	16	21/06/17
1346	Chert	H	71.60	201.46	36	21/06/17
1347	Rolled bronze strip	H	70.92	200.11	36	21/06/17
1348	Iron nail	H	72.48	201.05	36	21/06/17
1349	Comb fragment	H	Sieve	Sieve	36	21/06/17
1350	Bronze pin	H	71.42	202.11	36	22/06/17
1351	Chert	H	79.48	199.87	36	22/06/17
1352	Iron	H	71.16	22.42	36	22/06/17
1353	Comb fragment	H	Sieve	Sieve	36	22/06/17
1354	Iron knife	H	72.13	195.74	36	22/06/17
1355	Comb fragment	H	Sieve	Sieve	36	22/06/17
1356	Bronze sheet fragment	H	75.96	200.07	36	22/06/17
1357	Bone-pin roughout	H	72.22	196.40	36	22/06/17
1358	Hammer stone	H	78.02	199.87	36	22/06/17
1359	Comb fragment	H	Sieve	Sieve	36	22/06/17
1360	Bronze bridle link	H	71.93	202.11	36	23/06/17
1361	Iron point	H	73.96	198.92	36	23/06/17
1362	Bone pin point	H	72.12	202.23	36	23/06/17
1363	Bone pin	H	72.03	201.67	36	23/06/17
1364	Flint	H	Sieve	Sieve	36	23/06/17
1365	Comb fragment	H	Sieve	Sieve	36	23/06/17
1366	Iron tack	H	Sieve	Sieve	203	23/06/17

1367	Iron tack	H	Sieve	Sieve	203	23/06/17
1368	Iron tack	H	Sieve	Sieve	203	23/06/17
1369	Iron loop	H	71.56	207.23	219	11/07/17
1370	Bronze fragment	H	78.71	206.40	101	11/07/17
1371	Comb fragment	H	Sieve	Sieve	16	12/07/17
1372	Comb fragment	H	75.16	204.75	16	12/07/17
1373	Shale core?	H	76.11	204.59	16	12/07/17
1374	Chert	H	71.56	206.92	16	12/07/17
1375	Iron hook	H	78.26	203.25	101	12/07/17
1376	Iron loop fragment	H	79.44	202.98	101	12/07/17
1377	Chert	H	71.54	206.77	36	12/07/17
1378	Bronze fragment	H	74.42	206.20	36	12/07/17
1379	Iron clench bolt	H	71.50	206.30	36	12/07/17
1380	Iron pin	H	75.99	205.84	36	12/07/17
1381	Hammer stone	H	71.60	205.10	36	13/07/17
1382	Crucible sherd	H	78.74	204.83	101	13/07/17
1383	Hammer stone	H	72.93	207.29	222	13/07/17
1384	Rubbing stone	H	72.50	204.95	222	13/07/17
1385	Crucible sherd	H	77.32	208.88	36	13/07/17
1386	Iron object	H	74.87	206.16	36	13/07/17
1387	Iron awl	H	75.82	204.82	36	14/07/17
1388	Iron knife	H	75.77	204.44	36	14/07/17
1389	Quern fragment	H	78.56	203.91	224	14/07/17
1390	Bronze fragment	H	76.04	206.66	36	14/07/17
1391	Iron nail/hinge	H	73.59	204.92	36	14/07/17
1392	Comb fragment	H	76.81	207.51	36	14/07/17
1393	Bronze awl	H	70.98	206.06	36	14/07/17
1394	Bone pin fragments	H	74.46	206.50	36	14/07/17
1395	Comb fragment	H	75.81	206.03	36	14/07/17
1396	Worked bone	H	75.52	206.11	36	14/07/17
1397	Crucible sherd	H	75.61	207.22	36	14/07/17
1398	Comb fragment	H	Sieve	Sieve	36	14/07/17
1399	Iron needle fragment	H	71.04	205.86	222	17/07/17
1400	Quern fragment	H	78.44	203.18	224	17/07/17
1401	Iron knife	H	73.30	206.73	36	17/07/17
1402	Iron shaft	H	77.27	204.18	102	17/07/17
1403	Silver ingot fragment	H	75.29	207.19	36	17/07/17
1404	Bone pin	H	77.31	204.49	102	17/07/17
1405	Chert	H	77.20	204.51	102	18/07/17
1406	Crucible sherd	H	78.08	207.76	102	18/07/17
1407	Crucible sherd	H	79.50	203.43	224	18/07/17

1408	Crucible sherd	H	79.46	203.65	224	18/07/17
1409	Iron awl	H	79.34	203.69	224	18/07/17
1410	Crucible sherd	H	76.06	207.69	36	18/07/17
1411	Crucible sherd	H	77.54	107.01	102	18/07/17
1412	Bone needle	H	71.20	206.10	36	18/07/17
1413	Crucible sherd	H	77.60	206.70	102	18/07/17
1414	Crucible sherd	H	77.71	206.74	102	18/07/17
1415	Bone tuning peg	H	78.12	207.24	101	18/07/17
1416	Comb fragment	H	Sieve	Sieve	36	18/07/17
1417	Crucible sherd	H	Sieve	Sieve	36	19/07/17
1418	Comb fragment	H	71.29	206.38	36	19/07/17
1419	Bronze rod	H	78.42	203.39	224	19/07/17
1420	Iron object	H	71.44	206.33	36	19/07/17
1421	Iron 'staple'	H	Sieve	Sieve	102	20/07/17
1422	Flint	H	Sieve	Sieve	36	20/07/17
1423	Comb fragment	D	Sieve	Sieve	16	21/07/17
1424	Bronze pin	H	78.30	204.03	224	24/07/17
1425	Clay mould fragment	H	78.13	203.69	224	24/07/17
1426	Clay mould fragment	H	78.57	205.22	224	25/07/17
1427	Whetstone	H	78.22	205.04	224	25/07/17
1428	Whetstone	H	78.21	293.82	224	26/07/17
1429	Quern fragment	H	78.09	203.61	101	26/07/17
1430	Lithic	H1	71.98	208.54	16	27/07/17
1431	Bone handle	H1	73.96	211.47	16	28/07/17
1432	Unfinished comb fragment	H1	Sieve	Sieve	16	28/07/17
1433	Whetstone	H1	75.72	213.21	16	31/07/17
1434	Iron object	H1	73.29	210.04	36	31/07/17
1435	Crucible sherd	H1	75.63	212.71	36	31/07/17
1436	Crucible sherd	H1	75.59	212.70	36	31/07/17
1437	Crucible sherd	H1	75.60	212.74	36	31/07/17
1438	Bronze strap end	H1	73.00	209.91	36	31/07/17
1439	Iron arrowhead	H1	75.20	212.05	16	31/07/17
1440	Iron punch	H1	74.59	212.66	36	31/07/17
1441	Crucible sherd	H1	74.26	212.59	36	31/07/17
1442	Small iron ring	H1	Sieve	Sieve	36	31/07/17
1443	Crucible sherd	H1	Sieve	Sieve	36	01/08/17
1444	Quern fragment	H1	75.24	212.01	36	01/08/17
1445	Crucible sherd	H1	75.35	211.45	36	01/08/17
1446	Rubbing stone	H1	73.02	209.08	16	01/08/17
1447	Iron shears blade	H1	73.13	211.09	16	01/08/17

1448	Quern fragment	H1	73.32	209.74	36	02/08/17
1449	Crucible sherd	H1	73.86	209.14	36	02/08/17
1450	Bronze strip terminal	H1	73.55	211.02	36	02/08/17
1451	Hammer stone	H1	74.78	208.33	36	02/08/17
1452	Whetstone	H1	73.68	209.62	36	02/08/17
1453	Iron object	H1	74.63	208.18	36	02/08/17
1454	Clay mould fragment	H1	74.56	211.01	245	03/08/17

Appendix 4: List of Cuttings H and H1 Samples

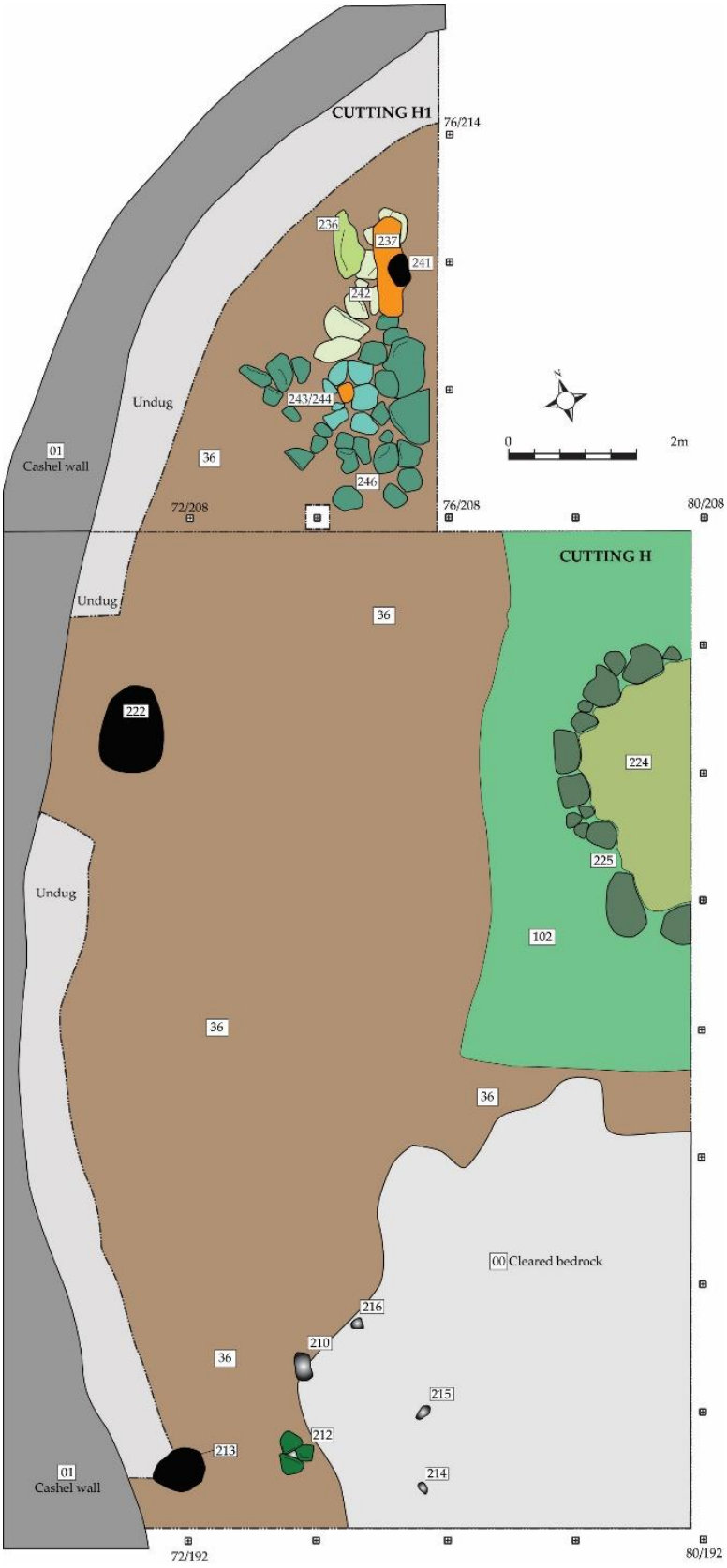
Sample no.	Description	Cutting	Easting	Northing	Context	Date
581	Furnace bottom	G	90.27	190.80	194	03/08/16
582	Animal bone	G	86-88	190-194	36*	04/08/16
583	Animal bone	H	76	194	04	29/05/17
584	Shell	H	70-78	192-206	23	31/05/17
585	Animal bone	H	70-78	192-206	04/23	31/05/17
586	Animal bone	H	72-74	204-206	200	12/06/17
587	Animal bone	H	70-74	194-200	203	12/06/17
588	Animal bone	H	74-76	198-200	204	12/06/17
589	Animal bone	H	78	202-206	25H	13/06/17
590	Animal bone	H	78	202-206	25H	13/06/17
591	Hazelnut shell	H	78	202-206	25H	13/06/17
592	Shell	H	76-78	198-200	205	14/06/17
593	Animal bone	H	-	-	36G	14/06/17
594	Slag	H	-	-	36G	14/06/17
595	Animal bone	H	70-78	192-206	36	15/06/17
596	Soil - bulk sample	H	72	192	36	15/06/17
597	Animal bone	H	70-78	192-206	36	15/06/17
598	Animal bone	H	70-78	192-206	16	15/06/17
599	Animal bone	H	70-78	192-206	16	15/06/17
600	Animal bone	H	76-78	198-200	205	15/06/17
601	Slag	H	79.76	206.89	25H	16/06/17
602	Slag	H	79.03	207.01	25H	16/06/17
603	Slag	H	79.23	199.05	36	19/06/17
604	Slag	H	78.23	199.56	36	19/06/17
605	Charcoal	H	78	202-206	25H	19/06/17
606	Animal bone	H	78	194	207	19/06/17
607	Slag	H	86.85	199.61	36	20/06/17
608	Soil - bulk sample	H	72	192	36	20/06/17
609	Charcoal	H	70-78	192-206	36	21/06/17
610	Animal bone	H	72-74	192	211	21/06/17
611	Soil - bulk sample	H	72-74	192	211	21/06/17
612	Slag	H	71.87	201.75	36	21/06/17
613	Soil - bulk sample	H	72	192	213	21/06/17
614	Slag	H	Sieve	Sieve	36	22/06/17
615	Slag	H	71.80	202.99	36	23/06/17
616	Hazelnut	H	70-78	192-206	36	23/06/17

617	Coprolite	H	70-78	192-296	36	23/06/17
618	Soil - bulk sample	H	70-72	202/204	217	10/07/17
619	Soil - bulk sample	H	78	296	101	10/07/17
620	Animal bone	H	78	200-206	101	10/07/17
621	Charcoal	H	78	200-206	101	10/07/17
622	Soil - bulk sample	H	70-72	202-204	218	10/07/17
623	Hazelnut	H	78	200-206	101	10/07/17
624	Soil - bulk sample	H	70	206	219	10/07/17
625	Animal bone	H	70-78	200-206	16	12/07/17
626	Charcoal	H	70-78	200-206	16	12/07/17
627	Hazelnut	H	70-78	200-206	16	12/07/17
628	Slag	H	Sieve	Sieve	16	12/07/17
629	Soil - bulk sample	H	70-72	202-204	222	13/07/17
630	Animal bone	H	70-72	202-204	222	13/07/17
631	Seeds / Grain	H	70-72	202-204	222	13/07/17
632	Hazelnut	H	70-72	202-204	222	13/07/17
633	Animal bone	H	70-72	202-204	222	13/07/17
634	Slag	H	79.15	204.67	101	13/07/17
635	Charcoal	H	70-72	202-204	222	13/07/17
636	Slag	H	Sieve	Sieve	36	13/07/17
637	Slag	H	Sieve	Sieve	36	13/07/17
638	Slag	H	76.02	206.51	36	14/07/17
639	Animal bone	H	78	200-206	102	14/07/17
640	Animal bone	H	78	202-204	224	14/07/17
641	Coprolite	H	78	202-204	224	14/07/17
642	Soil - bulk sample	H	78	202-204	224	17/07/17
643	Slag / bloom ?	H	78.87	204.63	224	17/07/17
644	Slag	H	78.64	206.03	102	17/07/17
645	Charcoal	H	78	202-204	224	17/07/17
646	Hazelnut	H	70	202-204	224	17/07/17
647	Charcoal	H	78	200-206	102	17/07/17
648	Animal bone	H	78	200-206	102	18/07/17
649	Animal bone	H	70-72	202-204	222	18/07/17
650	Slag	H	Sieve	Sieve	36	18/07/17
651	Slag	H	77.21	204.39	102	18/07/17
652	Slag	H	72.70	207.50	36	18/07/17
653	Slag	H	79.44	203.32	36	18/07/17
654	Slag	H	76.26	207.68	36	18/07/17
655	Slag	H	Sieve	Sieve	102	18/07/17
656	Slag	H	77.90	205.20	102	18/07/17
657	Animal bone	H	78	202-204	224	19/07/17

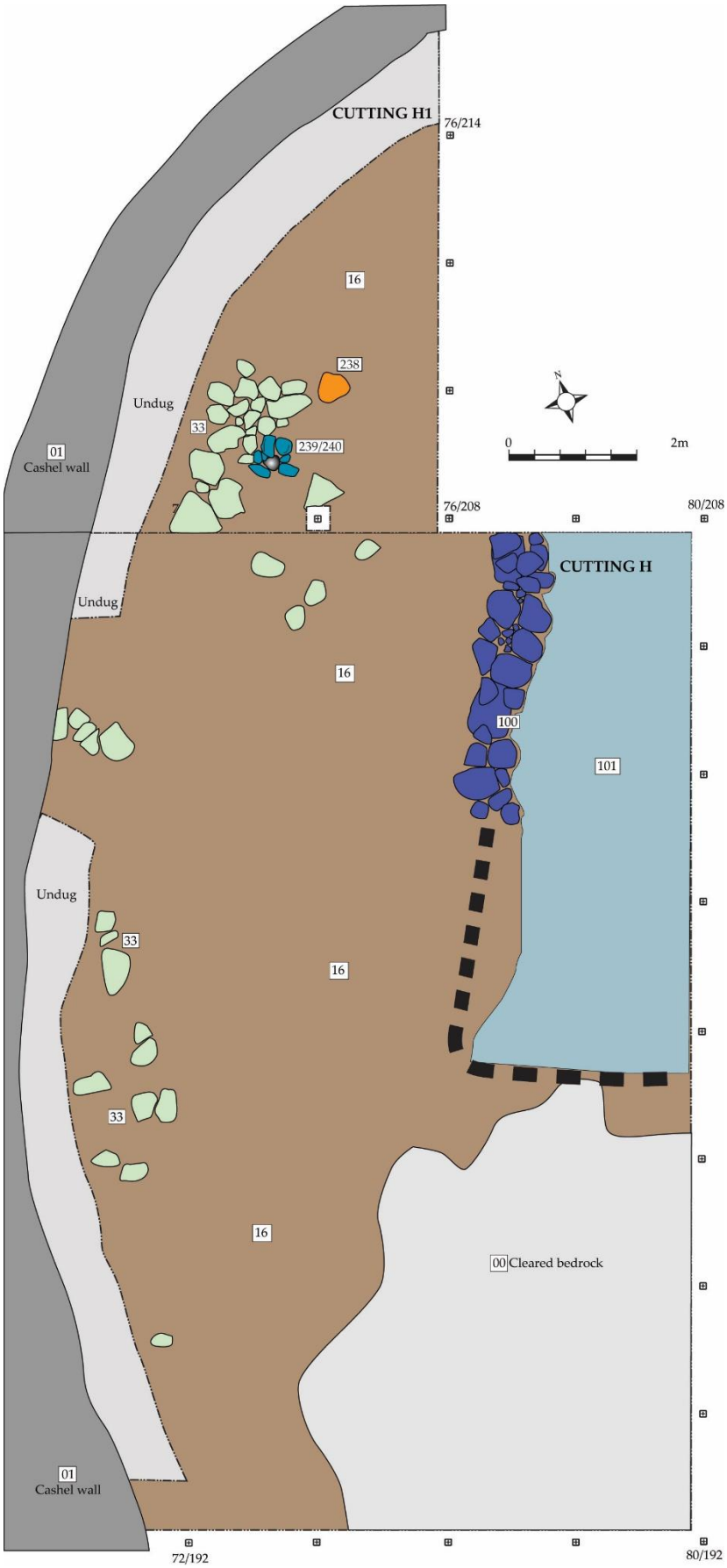
658	Slag	H	Sieve	Sieve	102	19/07/17
659	Slag	H	71.46	206.27	36	19/07/17
660	Slag	H	Sieve	Sieve	36	20/07/17
661	Slag	H	78.70	205.00	224	20/07/17
662	Slag	H	78.80	204.76	224	20/07/17
663	Animal bone	H	-	-	-	20/07/17
664	Slag	H	78.66	204.60	224	20/07/17
665	Animal bone	H	78.90	205.57	-	25/07/17
666	Animal bone	H	78.14	204.85	-	25/07/17
667	Slag	H	78.34	205.51	224	25/07/17
668	Slag	H	78.49	205.79	224	25/07/17
669	Slag	H	78.62	205.24	224	25/07/17
670	Slag	H	78.69	205.15	224	25/07/17
671	Slag	H	78.45	205.13	224	25/07/17
672	Slag	H	78.51	205.14	224	25/07/17
673	Slag	H	78.55	205.12	224	25/07/17
674	Animal bone	H1	70-74	208-214	16	27/07/17
675	Charcoal	H1	70-74	208-214	16	27/07/17
676	Animal bone	H1	70-74	208-214	16	27/07/17
677	Carbonised legumes/nuts?	H1	70-74	208-214	16	28/07/17
678	Shell	H1	70-74	208-214	16	28/07/17
679	Coprolite	H1	70-74	208-214	16	28/07/17
680	Soil - bulk sample	H1	72-74	208	232	28/07/17
681	Soil - bulk sample	H1	74	208	234	28/07/17
682	Animal bone	H1	70-74	208-214	36	31/07/17
683	Animal bone	H1	70-74	208-214	36	31/07/17
684	Charcoal	H1	70-74	208-214	36	31/07/17
685	Shell	H1	70-74	208-214	36	31/07/17
686	Hazelnut	H1	70-74	208-214	36	31/07/17
687	Coprolite	H1	70-74	208-214	36	31/07/17
688	Soil - bulk sample	H1	74	212	237	01/08/17
689	Soil - bulk sample	H1	74	210	238	01/08/17
690	Soil - bulk sample	H1	72	208	240	01/08/17
691	Animal bone	H1	74	210	238	01/08/17
692	Soil - bulk sample	H1	74	212-214	241	01/08/17
693	Animal bone	H1	74	212-214	241	01/08/17
694	Animal bone	H1	72	208	240	01/08/17
695	Soil - bulk sample	H1	74	208	243	02/08/17
696	Animal bone	H1	74	208	243	02/08/17
697	Animal bone	H1	74	210-212	245	03/08/17
698	Animal bone	H1	74	212	245	03/08/17

699	Charcoal	H1	74	212	245	03/08/17
700	Hazelnut	H1	74	212	245	03/08/17
701	Nut/pip/legume	H1	Sieve	Sieve	36	03/08/17

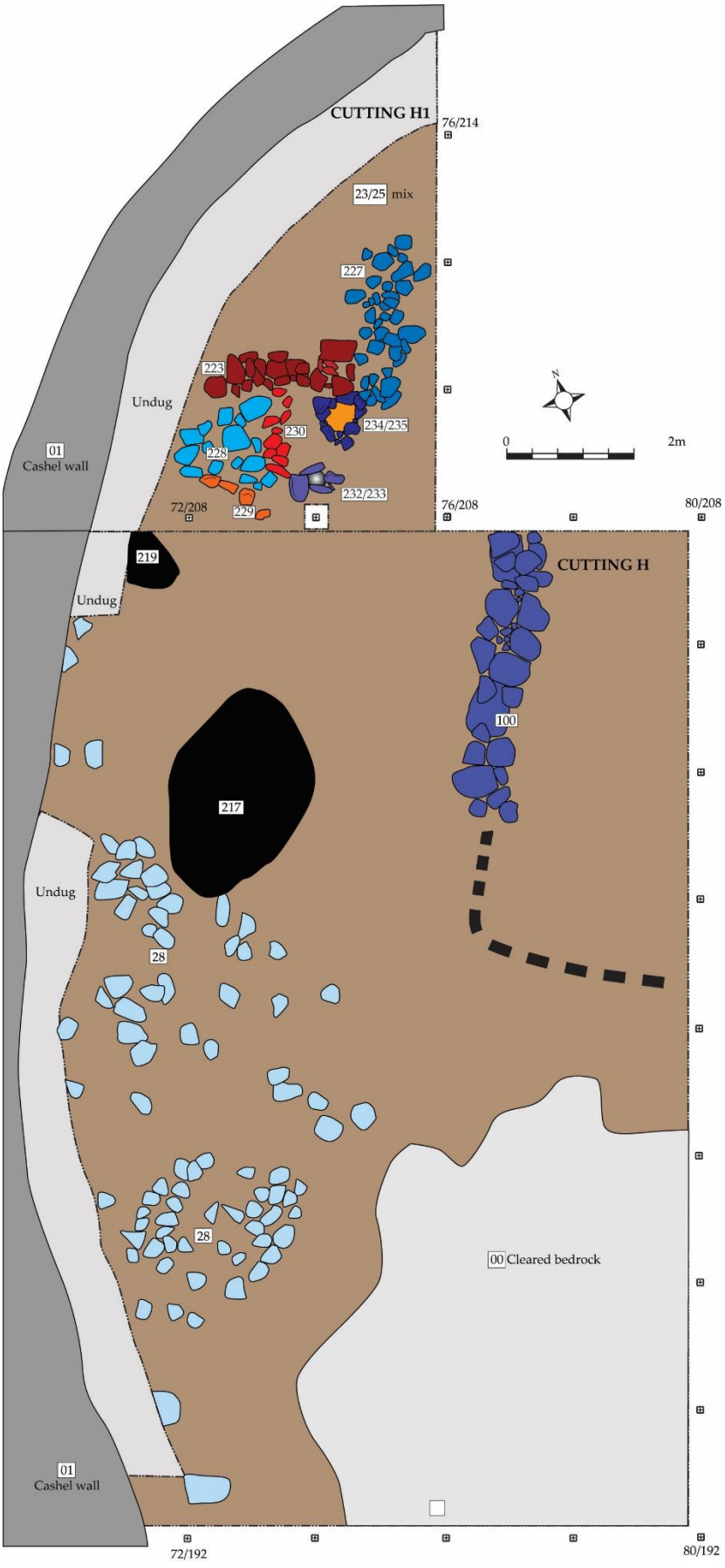
Appendix 5: Compiled plans from Cuttings H and H1



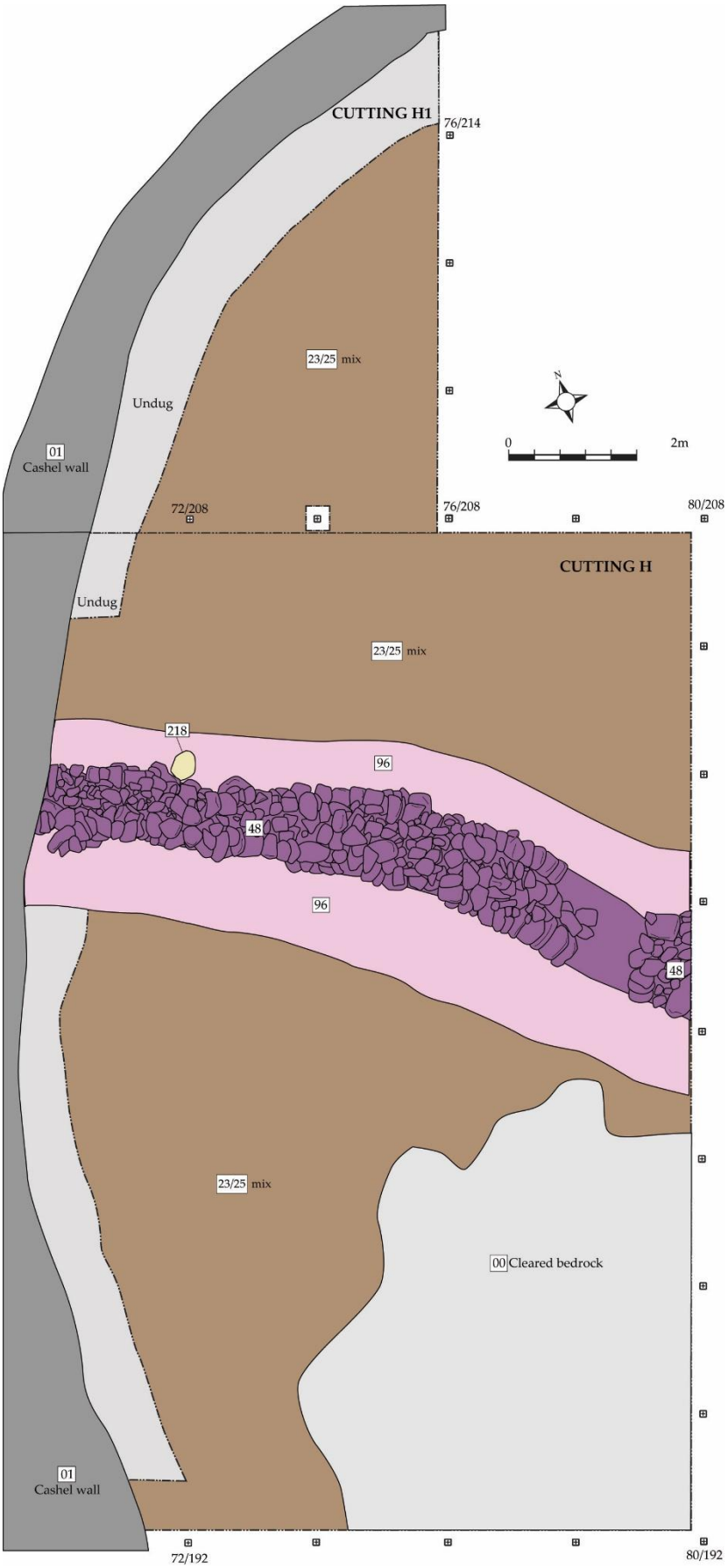
Phase 4 Early occupation



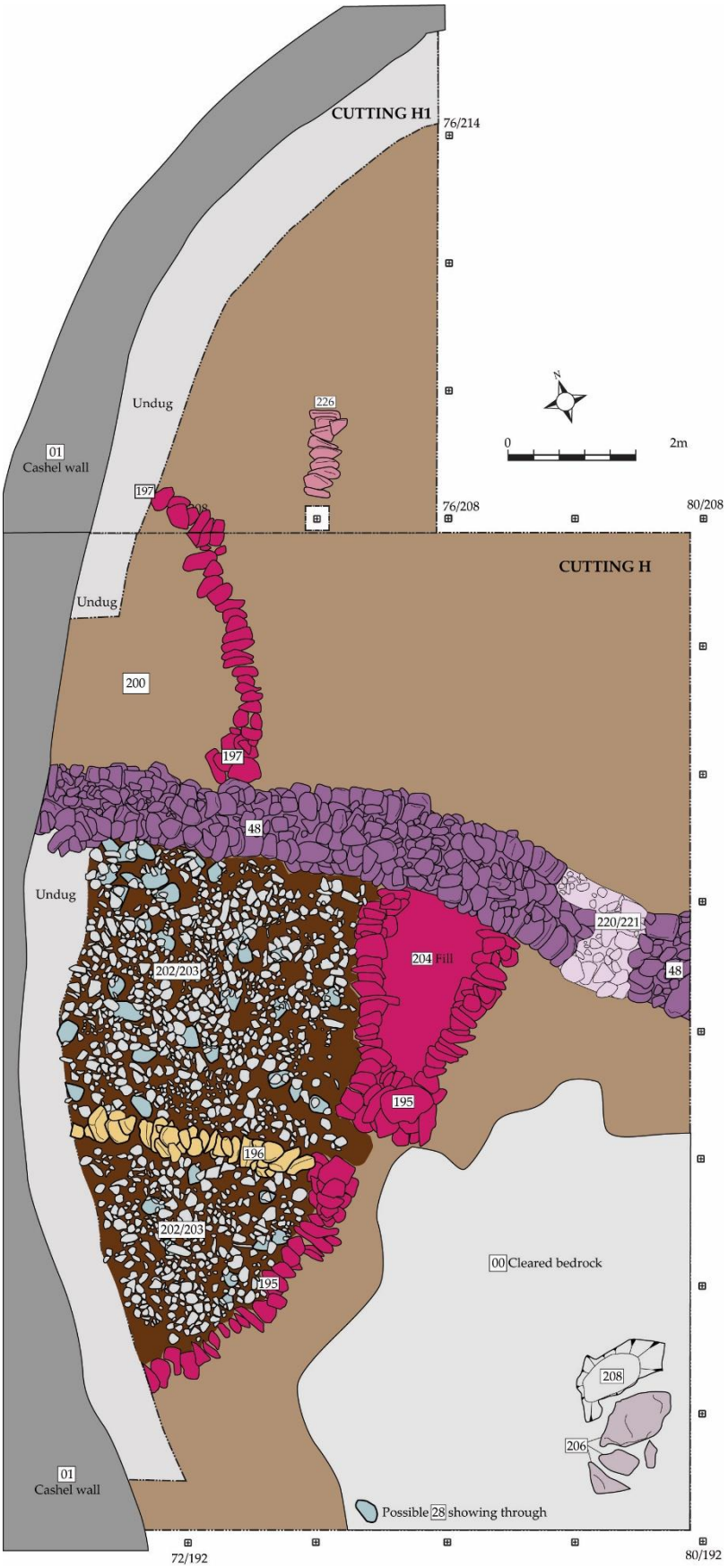
PHASE 5 MIDDLE OCCUPATION



PHASE 6 LATE OCCUPATION



PHASE 7 FINAL OCCUPATION



PHASE 8 POST HUMAN-OCCUPATION