

ROSEMARKIE CAVES PROJECT

Archaeological Excavation in Learnie 1A and 1B Near Rosemarkie, Ross-shire

Data Structure Report 2018 Excavations



Rosemarkie Caves Project

Archaeological Excavation in Learnie 1A and 1B

Near Rosemarkie, Ross-shire

Data Structure Report 2018 Excavations

National Grid Reference	NH 756 608 (centred)
Site Code	L1A18 and L1B18
Date	20th January 2019
Authors	Birch, S. & Peteranna, M.
Illustrations	Peteranna, M. & Teufel, L.

Table of Contents

	Acknowledgements.....	5
1	Summary.....	6
2	Location and Geology	9
3	Archaeological and Historical Background.....	9
	3.1 2010 Caird's Cave excavation.....	9
	3.2 2011-2015 Test Pitting.....	9
	3.3 Excavation in Learnie 2B in 2016 and 2017.....	11
	3.4 Excavation in Learnie 2C in 2016 and 2017.....	13
	3.5 Excavations in Learnie 1A and Learnie 1B in 2017	13
4	Aims and Objectives	17
5	Methodology	17
6	Results	23
	6.1 Learnie 1B	23
	6.2 Learnie 1A	34
7	Discussion.....	43
	7.1 The 2017/18 excavations in Learnie 1B and 1A caves.....	43
8	Conclusions and Recommendations	49
9	References	51

List of Tables

<i>Table 1: Learnie 1B and Learnie 2B radiocarbon dates</i>	14
---	----

List of Figures

<i>Figure 1: South and west-facing sections of Test Pit 1 from Learnie 1B in 2013</i>	10
<i>Figure 2: Location of Learnie and the Learnie group of caves</i>	15
<i>Figure 3: Plan showing the Learnie headland and location of the four caves excavated</i>	19
<i>Figure 4: Plan showing the area excavated in Learnie 1B and Post Medieval surface features and extent of stone piles (141) and (201) - Phase 6b/c</i>	20
<i>Figure 5: Plan showing the area excavated in Learnie 1A and Post Medieval surface features and extent of stone piles (311) and (303) – Phase 4b/c</i>	21
<i>Figure 6: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval post settings in Phase 1a</i>	55
<i>Figure 7: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 1b</i>	57
<i>Figure 8: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 2a</i>	59
<i>Figure 9: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 2b</i>	60

<i>Figure 10: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 3</i>	62
<i>Figure 11: Mid-excavation plan of the trench in Learnie 1B showing Post Medieval deposits and features in Phase 6a</i>	63
<i>Figure 12: Mid-excavation plan of the trench in Learnie 1B showing Post-Medieval deposits and features in Phase 6b/c</i>	64
<i>Figure 13: Mid-excavation plan of the trench in Learnie 1A showing Early Medieval deposits and features in Phase 1 including smithing hearth</i>	65
<i>Figure 14: Pre-excavation plan and NW-facing section through smithing hearth in Learnie 1A</i>	66
<i>Figure 15: Mid-excavation plan of Early Medieval floor deposits and features in Learnie 1A – Phase 2</i>	67
<i>Figure 16: Mid-excavation plan of medieval floor deposits and features in Learnie 1A – Phase 3</i>	68
<i>Figure 17: Mid-excavation plan of Post-Medieval floor deposits and features in Learnie 1A – Phase 4a</i>	69
<i>Figure 18: Mid-excavation plan of Post-Medieval floor deposits and features in Learnie 1A . Phase 4b/c</i>	70

List of Plates

Cover: Excavations taking place in Learnie 1A

<i>Plate 2: Looking WNW towards the Learnie buttress containing the Learnie group of caves (entrances of Learnie 2B (left) behind tree and Learnie 2C (right) behind rock rib covered in Ivy</i>	8
<i>Plate 3: The spacious interior of Learnie 1B before the start of open area excavations</i>	8
<i>Plate 4: Looking WNW towards the cave entrances at Learnie 1A (left) and Learnie 1B (right) showing the inclined bedding of the bedrock that has helped to shape the morphology of these caves</i>	16
<i>Plate 5: Looking WNW into the entrance of Learnie 1A before the start of excavations in 2017</i>	16
<i>Plate 6: Looking NW over excavations within Learnie 1B</i>	22
<i>Plate 7: Looking ENE over excavations in Learnie 1A</i>	22
<i>Plate 8: Early Medieval floor deposits in Learnie 1B with hearth (153) back left corner and old test pit (foreground)</i>	24
<i>Plate 9: Early Medieval Hearth (153) in Learnie 1B – Phase 2b</i>	24
<i>Plate 10: Early Medieval post setting (202) showing evidence for in-situ burning of post</i>	25
<i>Plate 11: Early Medieval hearth setting (176) in Learnie 1B – Phase 2b</i>	25
<i>Plates 12 and 13: Horse skull in stone deposit (105/137) and articulated vertebral column with overlying stone slab</i>	29
<i>Plate 14: Horse remains in stone deposit (105/137) after removal of overlying stone slab</i>	29
<i>Plates 15 and 16: Photogrammetry models showing the articulated horse remains in Learnie 1B – Phase 4/5 (James McComas)</i>	30
<i>Plate 17: Horse skull after removal from Learnie 1B showing circular hole from poleaxe</i>	31

<i>Plate 18: Close view of fish scales (context 136) in Learnie 1B – Phase 6a</i>	33
<i>Plate 19: Post Medieval wall base (146) and cobbled surface (145) in Learnie 1B – Phase 6b</i>	33
<i>Plates 20 and 21: The Early Medieval smithing hearth located in the outer chamber of Learnie 1A - Phase 1</i>	35
<i>Plates 22 and 23: The smithing hearth during excavation showing stone slab and elongated shape of cut</i>	35
<i>Plates 24 and 25: The smithing hearth under excavation showing vitrified furnace wall fragments (350) and stone slab (352)</i>	36
<i>Plates 26 and 27: The smithing hearth after section excavation showing in-situ vitrified furnace wall (350) attached to stone slab (352)</i>	36
<i>Plate 28: The smithing hearth after section excavation showing in-situ vitrified furnace wall (350), stone slab (352), slag/hearth base (354) and lower fill of pit (353)</i>	37
<i>Plate 29: Shattered stone slabs from roof collapse (327) overlying Early Medieval deposits and smithing hearth – end of Phase 2</i>	38
<i>Plate 30: Stone wall (314) sealing off NW alcove of inner chamber of cave and stone pile (311)</i>	40
<i>Plate 31: Stone wall (313/306) dividing inner and outer chambers of cave and covering stone pile (303)</i>	40
<i>Plate 32: Stone wall (313/306) showing double-faced and single revetting elements</i>	41
<i>Plate 33: Stone wall (313/306) showing outer face surviving to two courses high</i>	41
<i>Plates 34 and 35: Remains of leather boot recovered from the Rosemarkie Caves</i>	44
<i>Plate 36: Grooved sharpening stone recovered from Learnie 1B</i>	47
<i>Plate 37: Worked antler or ivory stopper or gaming piece from the Early Medieval deposits in Learnie 1B</i>	48
<i>Plate 38: Polished bone point fragment SF108 from Learnie 2B</i>	48
<i>Plate 39: The people of Tinker's Cave, Wick c.1886</i>	49
<i>Plate 40: People in Tinker's Cave, Wick during the early 20th century</i>	50
<i>Plate 41: Penknives with antler and bone handles and knife handle fragment from Learnie 1A and 1B caves (SF347, SF281, SF353 and SF33)</i>	52
<i>Plate 42: Elements from oil or paraffin lamp (top) and remains of bulkhead clock or clinometer (bottom – SF417) Learnie 1B and 2B caves</i>	53
<i>Plate 43 – Post-holes and post-pads defining structure in Learnie 1B during Early Medieval use - Phase 1a (Photogrammetry model by James McComas)</i>	56
<i>Plate 44 – Phase 1b Early Medieval floor horizon in Learnie 1B (Photogrammetry model by James McComas)</i>	58

<i>Plate 45 – Phase 2b Early Medieval floor horizon in Learnie 1B (Photogrammetry model by James McComas)</i>	61
<i>Plate 46: Revealing the Early Medieval deposits in Learnie 1B</i>	117
<i>Plate 47: Leather boot overlying floor surface (103) in Learnie 1B</i>	123

List of Appendices

List of Contexts by Phase	71
Small Finds Register	107
Samples Register	112
Drawing Register	118
List of Photographs	119

Acknowledgements

We would like to thank the project funders: the Cromarty Trust, the Highland Council, the Hunter Historical and Archaeological Trust, Cromarty Firth Port Authority and Archaeological Research Services and SUERC (CARD Fund). We would also like to thank Scottish Natural Heritage and James Gibbs for their help and support including access arrangements to the caves. We are appreciative of the help and support of the following individuals who have assisted with the excavations and post-excavation analyses: Steven Birch, Dame Professor Sue Black, Tim Blackie, Dr Kate Britton, Karen Clarke, Anne Coombes, Dr Gemma Cruickshanks, Katharina Dulias, Paul Dungey, Duncan Dyker, Dr Ceiridwen Edwards, Susan Findlay, Johnnie Gallacher, Samantha Goodchild, Eric Grant, Simon Gunn, Dr Derek Hamilton, Dr Jennifer Harland, Andy Hendry, Michael Huntington, Bob Jones, Rosemary Jones, Karen Kennedy, Doug Kippen, Viviane Lira, Dr Ingrid Mainland, Colin Macaulay, James McComas, Dr Gordon Noble, Mary Peteranna, Doug Redwood, Daniel Robson, Dr Chris Ryan, Roland Spencer-Jones, Michael Tulloch, Sam Williamson, Janet Witheridge, Robin Witheridge, Jonathan Wordsworth and Micol Zuppello.

1 SUMMARY

- 1.1 The purpose of the Rosemarkie Caves Project is to investigate the archaeology of 19 caves on the southeast side of the Black Isle, near Inverness. The project is run by a team of voluntary professional and amateur archaeologists. Previous fieldwork included excavation at Caird's Cave in 2010, baseline survey of the caves and test pit excavation in eight caves between 2011 and 2015, excavation at Learnie 2B and 2C in 2016, and excavations at Learnie 1A, 1B, 2B and 2C in 2017.
- 1.2 During 2016, the Learnie 2B excavation uncovered significant archaeological results. In a side alcove of the cave, the grave of a 5th-6th century AD male inhumation ~~deviant~~ burial was uncovered, representing the earliest activity in the cave. After this, adjacent to the burial site, iron smithing took place within a defined area that respected the location of the grave. Later use of the cave took place during the medieval and post-medieval periods, with significant occupation material representing at least transient use during multiple periods. In 2017, further excavation was undertaken in Learnie 2B to complete excavation in the back of the cave. Below a c.19th century hearth and associated ash deposits, a burial setting contained the mostly complete skeleton of a juvenile cow. The remains of the cow had been placed over the rising natural bedrock towards the back of the cave and in close proximity to the human inhumation; with a rectangular stone setting constructed over the animal.
- 1.3 In 2013 in Learnie 1B, two test-pits revealed significant archaeological potential for this cave. The 2017 excavation in Learnie 1B covered the location of the test pit within an area extending 7m into the cave from the entrance along the northern wall of the cave. An extensive burnt ash surface dated to the Early Medieval period formed the termination point for excavation in 2017 at a depth of 0.8-0.9m below the modern floor level near the cave entrance. It was located below a deep stone and sediment layer that formed a break in the occupation sequence dividing the underlying Early Medieval activity in the cave from the upper sequence of post-medieval archaeological layers, which included a bracken mat floor, spot fires and small hearth settings, and an array of artefacts including worked bone/horn, leather shoe fragments and personal objects. A rubble stone wall and stone clearance pile formed remnants of built features still visible on the surface of the cave floor.
- 1.4 In Learnie 1A, a small trench was excavated near the entrance of the cave in 2017, revealing a deep stratigraphic sequence below post-medieval occupation horizons. A sherd of possible medieval pottery was found within the lower sequence of archaeological deposits, which also contained animal bone and shell midden material. This, in turn, overlay an ash/charcoal-rich deposit containing shellfish and animal bone, indicating that this cave had potential for further investigation, and possibly had occupation horizons contemporary with the activity taking place in Learnie 1B and Learnie 2B.
- 1.5 Excavation was also undertaken in Learnie 2C in 2017. A narrow, dark cave, the archaeological material survived as a short sequence of layers, including spot fires, that contained mostly late 19th century artefacts including worked horn, ceramic and bottle glass sherds.
- 1.6 This report contains the full results of the 2018 excavations in Learnie 1A and Learnie 1B caves, which was undertaken in June 2018. As in previous excavations, some of the best evidence for the use and function of the caves to emerge related to the 19th to early 20th centuries, including the usual leather shoe soles and leather off-cuts, snips of metal, sherds of window glass and worked bone/horn. The excellent preservation found in many of these caves also produced other organic remains including worked wood in Learnie 1B. Other artefacts associated with this period of use included ceramics, bottle glass, a metal spoon, knife blades and handles, the remains of a small penknife including a part of the finely decorated bone handle, iron fittings, bone and mother of pearl buttons, several potential stone tools, and the ubiquitous clay pipe fragments. Several objects manufactured from copper alloy were also recovered including studs, pins, three low-denomination coins and fragments from an oil or paraffin lamp. In the upper levels of Learnie 1A, we recovered a large number of old shotgun cartridges, which may have been used to shoot rabbits and birds (the recent analysis of the animal bones from previous years' excavations by Karen Kennedy has indicated high numbers of rabbit bones in the faunal assemblage from this period). Both caves have

produced good economic evidence relating to their use during the post-medieval period, which once analysed, will provide some detail with regards to how the people lived and what they ate. One particularly interesting discovery this season was in Learnie 1B, where we uncovered a substantial deposit of fish scales. The analysis of the fish scales and any fish bones recovered from these archaeological layers will tell us more about the exploitation of marine fish, including salmonids, during the post-medieval period. The excavations in Learnie 1B and 1A produced a significant number of hearths and spot-fires relating to their use during the post-medieval period, ephemeral stone dividing walls, cobbled surfaces and possible sleeping areas . the latter indicated by layers of decayed bracken and small branch wood.

- 1.7 Below the post-medieval deposits in these two caves, the archaeological sequence displayed some variation. In Learnie 1A, it would seem that intermittent occupation was fairly continuous, extending back through the Medieval and Early Medieval periods. Much of the evidence for the medieval activity comprised dumps of midden, which generally took place around the periphery of the cave walls and was sometimes demarcated by ephemeral rubble walls; while a series of well-laminated lenses through the centre of the cave indicated trampling and access by the passage of feet. The lower part of the shell midden produced several sherds of medieval ceramic including green-glazed redware (13th-15th centuries AD) and more importantly, Scottish White Gritty Ware (potentially 11th-12th centuries AD). Several hearths were associated with these periods of use, creating a complex sequence of ash lenses. At the base of the sequence in Learnie 1A, a substantial circular pile of wood ash and charcoal represents a hearth relating to the Early Medieval use of the cave, along with associated shell midden and animal bone deposits; while the remains of a well-preserved smithing hearth was uncovered overlying the natural sand, representing the earliest use of the cave.
- 1.8 The sequence of deposits in Learnie 1B was quite different to that observed in Learnie 1A. Here, the layers representing the post-medieval activity lay directly on top of a deep spread of stone and beach cobbles. During the 2017 excavations, this deposit of stone produced the largest assemblage of faunal remains from the cave sequence including some larger bone elements and an articulated fragment from the lower spine/tail of a fairly large ungulate. The excavations this year produced yet more well-preserved animal bone including articulated vertebrae, scapula, mandibles and mandible fragments. However, the most impressive remains included the complete skull of a horse, complete with articulated vertebral column, which had been poleaxed through the top of the cranium. Removal of the stones forming the base of this deposit revealed the Early Medieval occupation horizon, although it is possible that the upper part of this complex, but shallow sequence of layers, may relate to Medieval activity in the cave (in the 2017 excavations, at least two ceramic sherds appear to be of medieval date). The floor deposits comprised lenses of wood ash, charcoal-rich deposits, midden, deposits with high organic content (potential bedding or floor deposits), and slabs of stone burnt a vivid red; all of which were associated with a number of hearths. Removal of the lowest occupation deposits revealed well-preserved evidence for the division and use of space. A roughly circular hearth towards the back of the cave produced burnt animal bone and most likely formed a domestic cooking area. A sequence of post and stake-holes, and post-settings, formed a roughly rectangular area . the long sides roughly mirroring the undulating cave walls; while the connecting back screen also appears to block off the rear, darker area of the cave. It is possible that a similar arrangement of posts also formed a screen closing off the front of the structure and the outside world, although this could not be confirmed due to the deep overburden forming a talus at the cave entrance.
- 1.9 No in-situ metalworking hearths were revealed during the excavations in Learnie 1B, but we did recover all of the components that would support this activity including slag, fragments of vitrified hearth wall, hearth base fragments and hammer-scale. Artefacts, as with most of the Rosemarkie Caves holding Early Medieval deposits, are rare and with the exception of a knife sharpening stone, two possible coarse cobble tools and a couple of iron objects, the only other small find was a small, conical-shaped piece of antler or marine ivory which may be a small stopper or gaming piece.
- 1.10 The full data lists from the fieldwork are supplied in the appendices. Recommendations have been made for post-excavation analysis.



Plate 2: Looking WNW towards the Learnie buttress containing the Learnie group of caves (entrances of Learnie 2B (left) behind tree and Learnie 2C (right) behind rock rib covered in Ivy)



Plate 3: The spacious interior of Learnie 1B before the start of open area excavations

2 LOCATION AND GEOLOGY

- 2.1 The Rosemarkie Caves Project (RCP) identified 19 caves on the Moray Firth shoreline northeast of Rosemarkie on the Black Isle in Ross-shire, Scotland. The most southerly cave is situated approximately 9 miles northeast of Inverness. The group of south- and east- facing caves are located between 3-10m above the present high-water mark and most would have been large enough to be occupied permanently or intermittently. The Learnie group of caves are located in a small headland on the east-facing coastline below Learnie Farm (NH 755 610) (**Figure 2**).
- 2.2 The caves have been formed at the base of cliffs comprising psammite, a brittle and easily fractured stone that over time has formed talus mounds at the entrances to many of the caves. The 2-mile stretch of coastline runs northeast to southwest comprising rocky outcrops and offshore reef complexes that would have been accessible only to small boats, while a number of access tracks descend the steep, vegetated slopes from the northwest. The section of coast is a Site of Special Scientific Interest (SSSI), under the protection of Scottish Natural Heritage.
- 2.3 Learnie 1B is the biggest of the 19 caves, is located at 5m OD, and has an entrance 7 metres wide and 5 metres high, and extends for 21 metres into the headland. At its widest, the interior measures 10 metres across. The back of the cave splits into 2 tunnels and the floor is mostly flat. Against the south wall, just inside the entrance, was a small, low rubble wall retaining a small stone pile, while a second stone pile was located against the north wall within an interior alcove.
- 2.4 Located to the south of Learnie 1B, Learnie 1A is 9 metres deep and has a maximum width of 6.5 metres across. The floor is strewn with shattered stone deriving from the roof and walls of the cave, and included two small stone piles located against the base of the north wall.
- 2.5 Most of the cave entrances are located between 5m and 7m above the current High Water Spring Tide mark and although they may have been used during the Mesolithic and Neolithic periods, any associated archaeological deposits have most likely been washed out of the caves during the Main Postglacial Marine transgression which occurred between approximately 7500BP and 3500BP. It is possible that the caves would only have become dry and suitable for use again during the Bronze Age (Dawson *pers comm.*).

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 2010 Caird's Cave Excavation

- 3.1.1 In 2010, the Rosemarkie Caves Project undertook an excavation in Caird's Cave, located southeast of the Learnie group of caves. The purpose of the fieldwork was to establish the extent of antiquarian excavations by Maclean and Hall (1907-1912), which had yielded an important assemblage of prehistoric bone and antler tools and the associated manufacturing debris. The 2010 excavation revealed the presence of in situ deposits, from which a bone pin and bone working debris similar to Maclean and Hall's assemblage were recovered. Charcoal and bone samples from the excavated sequences were radiocarbon dated and provided results ranging from the 4th-3rd century BC to the 2nd-3rd century AD, with further radiocarbon assays obtained from worked bone and antler artefacts from the Maclean and Hall assemblage dating to the 2nd-3rd century AD and the 7th-8th century AD. Also, as part of this work, a small stone structure outside of the cave that had been occupied by travellers during the late 19th to early 20th centuries was also investigated (Anderson-Whymark 2011).

3.2 2011-2015 Test Pitting

- 3.2.1 The Rosemarkie Caves Project conducted test pitting in eight of the caves (Gunn and Peteranna 2016), four of which were located in the Learnie group (1B, 2B, 3B and 3C). Stratified samples of animal bone and charcoal recovered from archaeological layers in the test pits provided evidence for occupation during multiple periods within the 6th-9th centuries AD in the Learnie cave group, with 2nd-

4th century and 11th-12th century AD dates also derived from material in Learnie 3C. Significant evidence for 19th-20th century AD traveller occupation was found across the caves, particularly in the Learnie group and Ivy Cave, with frequent evidence for leather shoe-making or repair. Learnie 1B and Learnie 2B were highlighted as particularly intriguing given a depth of at least 1m of archaeological deposits, especially near the front of the caves. Archaeological sequences were also recorded in Broad Cave and Through & Through Cave, where dated samples indicated that the caves were used within the 10th-12th and 14th-17th centuries AD. In 3 Peaks Cave, whose entrance is buried deep below a build-up of talus, charcoal obtained from a small stone-built setting provided a 1st-3rd century AD date.

3.2.2 In Learnie 1B, three test pits were excavated: in the cave entrance, on the south side of the cave through a stone pile and inside the cave floor within the north alcove. Test Pit 1 was located at the entrance to the cave and contained a sequence of up to 14 stratified layers (**Figure 1**). Material comprising 19th / 20th century midden material (iron, glass, ceramics and leather) was confined to the upper layers. Below context 104, the sequence of deposits indicated a lengthy continuity of occupation, with animal bone and shellfish remains appearing alongside evidence for burning. In particular, a slabbed layer (110) within an ash/charcoal lens (108) was interpreted as a possible hearth structure. A fragment of cattle bone from context (111) provided a radiocarbon date of 689-889 calAD (SUERC-49920) and a single entity hazel charcoal sample from (112) provided a radiocarbon date of 769-965 calAD (SUERC-49919) (**Table 1**). Test Pit 2 was excavated against the south wall, inside the cave, through a pile of sharp stone sherds of similar size and type. The spread of the stone covered a linear rubble-built wall (207) comprising 1-3 courses of large stone clasts and cobbles, interpreted as a late 19th century/ early 20th century feature that could have formed a wind-break or partition within the cave; similar in style to later walls recorded within Learnie 2B. The small finds in test pit 2 included a penknife with a bone handle, a metal clasp, a clay pipe bowl, a child's leather shoe, an iron axe head, newspaper clippings and a copper coin. Thin underlying layers contained shell midden material and finds of a similar period and the lowest archaeological horizon (205) excavated indicated a transition, being free of post-medieval material while animal bone was still present. Test Pit 3 was excavated inside the cave, to the north of a ridge of guano (bird droppings). The shallow sequence of archaeological deposits contained remains of a spot fire associated with 19th / 20th century objects including leather offcuts and broken pot sherds, glass bottles and clay pipes before reaching bedrock.

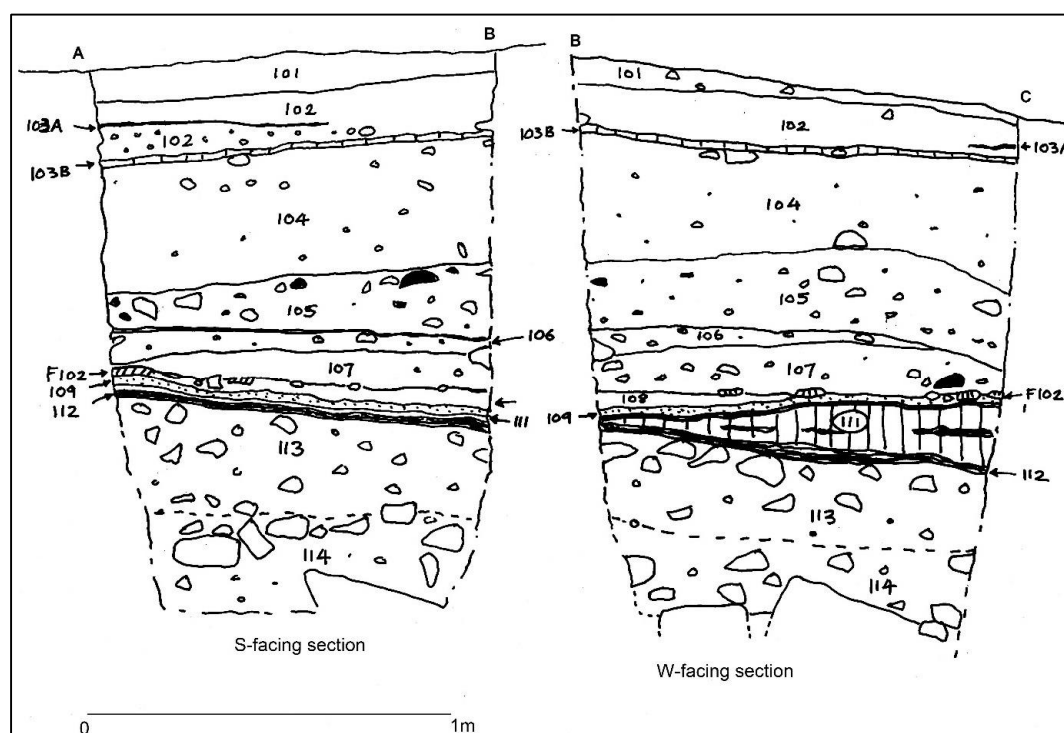


Figure 1: South and west-facing sections of Test Pit 1 from Learnie 1B in 2013 (Gunn and Peteranna 2016)

3.3 Excavation in Learnie 2B in 2016 and 2017

- 3.3.1 Prior to 2016, excavation had been undertaken in Learnie 2B during 2006 and 2013 using test pits, further details of which can be found in previous reports (Gunn and Wood 2008; Gunn and Peteranna 2016; Birch and Peteranna 2017). One surprise finding during analysis of the 2006 archive was the identification of an uncatalogued 2nd century Tetricus I Roman coin (SF235), with the context of discovery remaining a mystery.
- 3.3.2 The 2016 open-area excavation produced significant archaeological results (Birch and Peteranna 2017), including evidence for Early Medieval metalworking activity and a 5th-6th century AD male inhumation burial (whom the Project named Rosemarkie Man). Found in a dark alcove below a post-medieval cobbled floor and midden deposits, the burial comprised the well-preserved remains of a young male who had suffered severe, multiple trauma to the head. The individual had been placed in an unmarked grave in a position with splayed legs and with stones weighting down the limbs showing similarities to deviant-type burials; a burial practice in which individuals are treated differently from the norm for a range of potential reasons including as a communal ritual offering, an act of remembrance, or to render a corpse safe from returning after death. An offering of cattle and horse bones (Kennedy 2018) had been laid over the location of the head, while additional cattle bones were found around the chest area of the inhumation. A series of four radiocarbon dates (**Table 1**), two from rib fragments of Rosemarkie Man and two from the animal bone offering, have indicated that his death occurred between the first half of the 5th century AD and the first half of the 6th century AD.
- 3.3.3 During a period after the burial was inserted in the cave, the cave was used for small-scale metalworking . most likely smithing. A group of pits and cobbled features associated with iron slag, iron scale, furnace base fragments and a fragment of a tuyère showed that metal-smithing was undertaken inside a defined area that respected the site of the burial. The suite of features indicated that the industry took place around an area of small work surfaces and hearth settings, within a defined work zone in the central area of the cave. Three archaeological contexts 232, 233 and 234 were isolated within the lowest deposit overlying the basal sand layer (235) where the metal-working features were clearly identified. One radiocarbon date on alder charcoal from context (235) provided a date range of 670-770 cal AD (SUERC-77435) and corresponds with three radiocarbon date ranges obtained from 3 samples of indeterminate mammal/sheep bone and hazel charcoal from layers at the base of test pits excavated in 2013 that provided ranges of 604-757 cal AD, 645-767 cal AD and 660-770 cal AD (**Table 1**). Although the test pit layers had been tentatively linked to contexts (232/233) by the author, the correlation of the horizons was found to be difficult to establish with any accuracy. Overall the dating results cover the 7th and 8th centuries AD, but metal-working likely precedes this. The animal bone material potentially represents later debris mixed in from occupation immediately above the metalworking horizon, given the very mobile nature of the sand sediment. By considering the age of the wood when it was burnt in the metalworking horizon, it is likely that iron-smithing was the first activity to take place in the cave after Rosemarkie Man was buried inside the alcove . and that the cave could have been selected for this elite industry because of its association with this special event. There is a growing body of evidence that the dark, liminal space provided by a cave could be seen as a more unusual venue than an open location, imbuing more meaning to the site and thus highlighting the specialised and elite skill as well as the location of a ritualised, overkill burial act.
- 3.3.4 Learnie 2B continued to be used after the period of metalworking activities. Thin lenses of material inside the cave contained mostly animal bone, shell and charcoal fragments, layers that deepened towards the front of the cave. An absence of artefacts from these layers has made interpretation of function and chronology difficult, although several probably medieval ceramic sherds have been found in the cave. Subsequent significant use, likely during the late medieval or post-medieval period, was represented by the construction of two mortared stone walls. Built across the entrance, the walls were separated by an access where a wooden door was most likely used. Other interior features included a small hearth setting against the south wall and a cobbled floor in the north wall alcove. A sheep bone sample from an occupation layer (239) below the cobbled floor provided a radiocarbon date of 1495-1799 cal AD (SUERC-70995) . (**Table 1**). While the chronology of the wall was unclear,

secondary sediment built up against it contained a small amount of mostly 18th-19th century finds that appear to have been deposited before the wall was put out of use by a build-up of shattered talus material that covered the walls and blocked the entrance. The cave continued to be in use subsequent to this, probably by itinerant dwellers, who may have been employed specifically in shoe manufacture or repair on the basis of a large quantity of shoes, shoe fragments and cut leather fragments found inside the cave.

- 3.3.5 In 2017, a 2m-wide by 4m-long extension to the east side of the 2016 trench was excavated through the talus outside the cave to evaluate the potential for metal-working activity in this area. This revealed that the deep sequence of archaeological layers identified in 2016 dissipated towards the outside of the cave. These layers represented material generated within the caves through time and corresponded with previous interpretations (Birch and Peteranna 2017). They contained further fire-cracked stone, charcoal and ash layers, shell, animal bone (cattle, sheep and pig) and large fish (cod, ling) bone. This area of the cave, located below the drip-line was not an ideal place to carry out activities - a number of large rocks were uncovered here that had fallen from the cliff above. Of particular note during the excavation were further finds of metalworking residues including a hearth base, three pieces of iron slag, and one fragment of vitrified furnace wall and a fragment of worked antler (SF287) from the occupation layer (232), which overlay the metal-working activity zone excavated in 2016 in the back of the cave.
- 3.3.6 Inside the cave, the 2016 excavation trench west edge was extended to finalise excavation of the archaeological deposits that dissipated towards the back of the cave over the rising bedrock. At the base of the archaeological sequence within a roughly-built, subrectangular setting of stones (511), the skeleton of a juvenile cow was uncovered overlying the natural sand and set between inclines of natural bedrock. The setting measured 1.4m long N-S and comprised angular stones. The spinal column of the calf was partially covered by the setting on the east side, while stones were placed across the limbs on the west side. As a result, the setting did not contain the animal, but rested on top of it, with two larger stones over the lower abdomen area, and smaller stones over the chest area. Strangely, the right mandible, right pelvis and cranium of the cow were missing. The bones displayed minimal evidence for butchery or intervention . in the form of a cut-marks and burning on one femur as well as blue-green staining on some of the bones (Kennedy 2018). The cut-mark on the femur could indicate that the missing right pelvis had been removed before the carcass was placed in the grave, while the green staining indicates that something had chemically affected the condition of the bone after the flesh had deteriorated away. The loose silt layer (510) to the outside of the burial setting and the silting fill (511) within the setting and around the cow skeleton contained some late 19th century material including clay pipe stems, bottle glass, pot sherds, leather fragments and leather shoes. The loose nature of the surrounding sediment and the voids within the burial environment surrounding the skeleton, call into question whether there had been some disturbance to the burial during 19th/20th century activities in the cave. Radiocarbon dating of a bone sample from the young animal should confirm if this was the case.
- 3.3.7 The cow burial was located below a shallow sequence of post-medieval occupation material, at the top of which was a slabbed hearth setting (508), situated between two ash deposits (507) and (509). It had been built to the east of the stone setting (511) covering the calf skeleton, using the stones on its east side as a backing for the hearth (to which were added additional smaller stones to form a more circular setting on this side of the hearth). Above the (509) layer, another hearth (514) had been constructed in the back of the cave, between two bedrock ribs on the natural sand, using a large and flat inclined slab of rock. Ash from the use of the hearths had filtered down into the burial setting, and above this midden and floor deposits accumulated, completely burying the setting and hearths. A substantial amount of post-medieval artefacts was recovered from the layers overlying the hearths and burial, in particular from context (222) and (227) . including ceramic fragments, glass bottle fragments, leather shoes and offcuts, clay pipe stems and iron fragments and nails.
- 3.3.8 Chronologically, the excavation indicates that Learnie 2B was selected during the 5th-6th centuries AD as a special burial site, followed by its use for metalworking (**Table 1**). This was followed by periodic

occupation, which appears to have included a medieval activity horizon, during or after which a stone wall was built across the entrance. While it has proved difficult to assign the wall to a specific function, it was obviously designed to enclose the space within the cave. Some potential ideas for function include a livestock enclosure, church/worship/eremitic site and storage for smugglers. The cave was also occupied intermittently between the 15th to 19th centuries AD, especially by travellers during the late 19th century, with a range of everyday and more industrious craft activities represented.

3.4 Excavation in Learnie 2C in 2016 and 2017

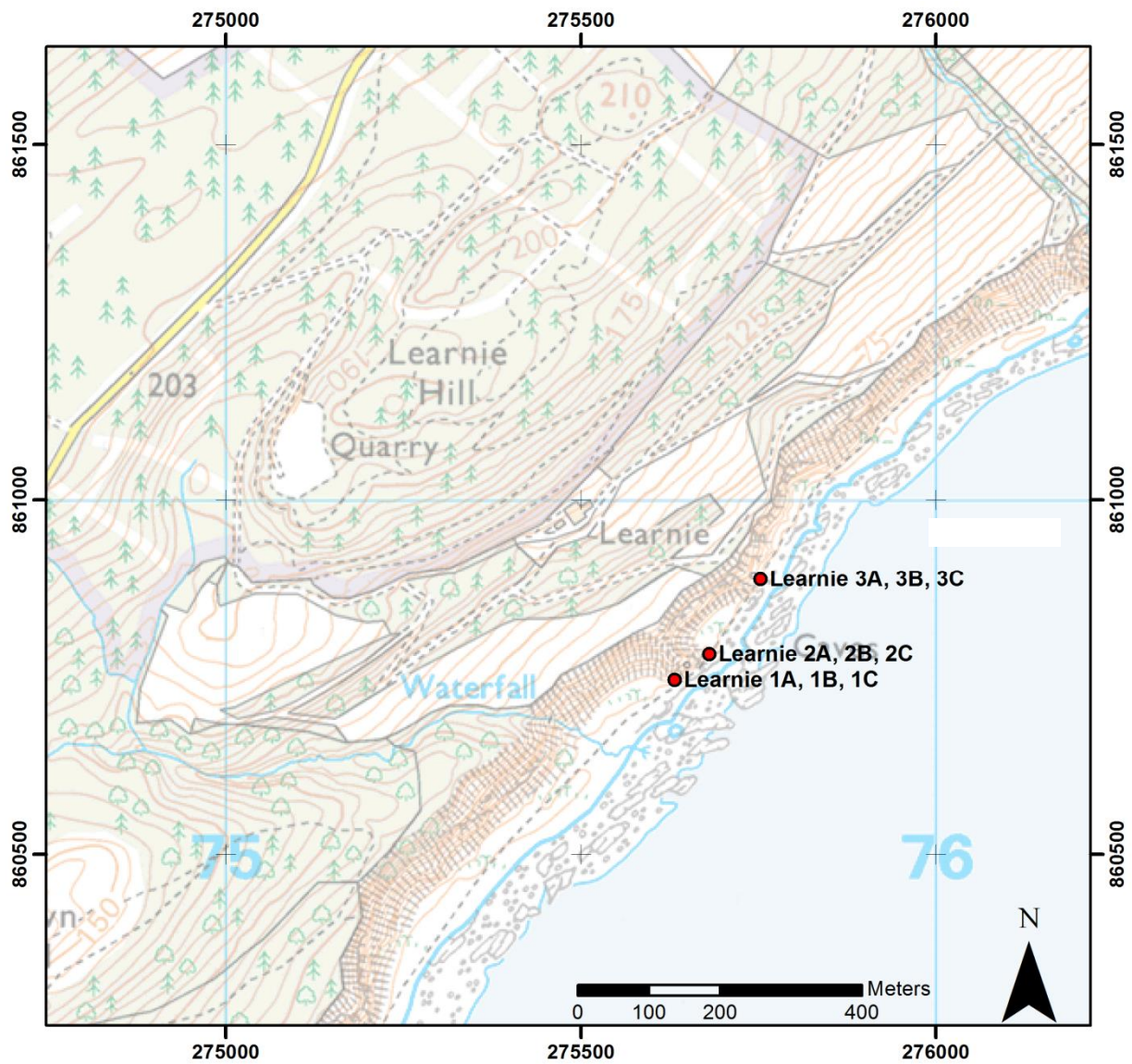
- 3.4.1 Excavations conducted in Learnie 2C, a dark and narrow cave with a roughly circular terminal chamber, were carried out in 2016 and 2017. Below the modern disturbance, layers containing Victorian ceramics and iron debris (501) and (502) covered possible structural stonework and charcoal-rich ash lenses. However, the archaeological sequence inside the cave was shallow, with upper layers (301-302, 201-202, 101) containing mostly late 19th century material including ceramic sherds, bottle glass fragments, leather offcuts and occasional personal items such as buttons and clay pipes. Interestingly, several worked horn cores (SF017) were recovered, with similar objects recovered from Learnie 2B and contexts (101) and (127) in Learnie 1B.
- 3.4.2 Trench 2 contained an upper ash layer (203), below a shallow rubble wall (204), and upper shell midden (208/209). These overlay an organic soil (205) containing shell and mammal bone and 19th century material such as ceramic sherds, clay pipes and bottle glass. Below this, an ashy silt layer containing charcoal (206) had formed over a cobbled surface (207) within the natural sand . potentially representing the earliest archaeological horizon in the cave.
- 3.4.3 Trench 3 contained a shallow sequence of layers, with an upper hearth or spot-fire layer (304) overlying a compact soil (305) that contained mammal bone, iron fragments and clay pipe stems. There was no continuation in the back of the cave of the sequence of layers forming the lower stratigraphy recorded in Trench 2.
- 3.4.4 While the results show there was late 19th century use of Learnie 2C, the rather limited depth of deposits within the stratigraphic sequence indicated that the cave was unlikely to have been used significantly before the post-medieval period.

3.5 Excavations in Learnie 1A and Learnie 1B in 2017

- 3.5.1 In 2017, a small trench 3m E-W by 2m was excavated against the north cave wall of Learnie 1A, which covered part of a small pile of loose stone (303) located against the north wall and extended through the cave entrance.
- 3.5.2 Open area excavation was undertaken in Learnie 1B in 2017. An area measuring 7m E-W by 4m with a central baulk was excavated against the north cave wall and over the location of the 2013 test pit 1, which had revealed deep archaeological layers in the front of the cave (**Figure 1**). Prior to excavation, two further test pits (2 and 3) in 2013 had evaluated the cave deposits and recorded the location of two loose stone piles built up against the north and south cave walls.
- 3.5.3 The excavations carried out in both caves in 2017 revealed a complex of features and archaeological deposits, indicating potentially long sequences of occupation. Due to these complexities and the overall depth and extent of the archaeology encountered, it was decided that we would return to these two caves in 2018 to finalise our work. In order to provide a more complete and coherent narrative for the use of Learnie 1A and Learnie 2B caves through time, the results of the 2017 and 2018 excavations will be summarised together in Section 6 of this Data Structure Report.

Table 1: Learnie 1B and Learnie 2B radiocarbon dates

Lab Code	Cave	Test Pit No.	Sample or Find No.	Context No.	Description	Uncal (BP)	Calibrated 1-sigma (68.2%)	Calibrated 2-sigma (95.4%)
SUERC-49919 (GU32429)	Learnie 1B	T1	7	112	Charcoal from 100cm deep at base of charcoal-ash layer over natural	1177±32	777-889 AD	769-965 AD
SUERC-49920 (GU32430)	Learnie 1B	T1	16	111	Cow bone sample from deposit rich in animal bone, 90cm deep	1225±32	720-870 AD	689-886 AD
SUERC-77423 (GU46476)	Learnie 2B	Main Trench	L2B16-3	264	Human bone, rib fragment from Rosemarkie Man	1538±24	433-564 AD	427-580 AD
SUERC-70721 (GU42494)	Learnie 2B	Main Trench	L2B16-2	264	Human bone, left rib from Rosemarkie Man	1508±31	537-603 AD	430-631 AD
SUERC-77840 (GU46707)	Learnie 2B	Main Trench	214	264	Cow radius frag: Bos sp from over Rosemarkie Man burial	1610±31	400-532 AD	390-539 AD
SUERC-77836 (GU46706)	Learnie 2B	Main Trench	209	264	Horse scapula frag - Equus sp from over Rosemarkie Man burial	1574±29	429-536 AD	415-550 AD
SUERC-77435 (GU46515)	Learnie 2B	Main Trench	Quad D	235	Alder charcoal from lowest archaeological horizon, contains metal-working residues	1282±24	683-766 AD	670-770 AD
SUERC-70720 (GU42493)	Learnie 2B	Main Trench	L2B16-1	234	Sheep rib from metalworking horizon (sand below main occupation horizon)	1197±30	775-873 AD	718-941 AD
SUERC-49921 (GU32431)	Learnie 2B	T1	53	108=233	Animal bone from base of deposit at 110cm deep	1372±32	640-672 AD	604-757 AD
SUERC-49923 (GU32433)	Learnie 2B	T2	54	210=232	Sheep bone from 100cm deep in context	1337±32	651-769 AD	645-767 AD
SUERC-49922 (GU32432)	Learnie 2B	T2	13	210=232	Hazel charcoal at 105cm deep from base of context, transition to underlying Context 211	1299±32	669-764 AD	660-770 AD
SUERC-70995 (GU42644)	Learnie 2B	Main Trench	113	239	Sheep left rib from midden deposits overlying metalworking horizon and burial	269±33	1524-1793 AD	1495-1799 AD



Cartographic data reproduced under Ordnance Survey licence no. 100023757 and derived from OS Open Data Crown copyright 2017.

Figure 2: Location of Learnie and the Learnie group of caves



Plate 4: Looking WNW towards the cave entrances at Learnie 1A (left) and Learnie 1B (right) showing the inclined bedding of the bedrock that has helped to shape the morphology of these caves



Plate 5: Looking WNW into the entrance of Learnie 1A before the start of excavations in 2017

4.0 AIMS AND OBJECTIVES

- 4.1** The aim of the excavations in the Learnie group of caves in 2018 was to finalise the work initiated in 2017 and to better understand the archaeology of the caves, including defining, if possible, cave function through time. Open-area excavations in Learnie 1B had already defined the complexity and depth of the archaeological sequence within this large cave. In the smaller cave to the south of it, Learnie 1A, a small excavation trench investigated its archaeological potential and relationship with 1B.
- 4.2** The programme of fieldwork in Learnie 1A and Learnie 1B was designed to continue the investigation of the overall chronology of use of the caves and their inter-relationships, and function. The results are providing valuable information about the caves occupation during the post-medieval, medieval and Early Medieval periods. The project continues to provide an opportunity for volunteers and students to learn archaeological techniques in the unique remote coastal location of the Cromarty-Rosemarkie shoreline environment.
- 4.3** The overall aims of the archaeological excavation were:
- ❖ To establish the character and extent of surviving archaeological deposits in the caves
 - ❖ To conduct excavation inside Learnie 1A and Learnie 1B, finalising the work initiated in 2017
 - ❖ To improve our understanding of the types of activities taking place in the caves and to compare this evidence with the findings of the test pitting programme
 - ❖ To enhance the archaeological record
 - ❖ To provide training in archaeological excavation and recording techniques to students and volunteers
 - ❖ To encourage the inclusion of local people in the discovery, discussion and outcome of the project, and to develop practical, research and educational benefits for the community as a whole
 - ❖ To publish and report on the archaeological results to the wider public and research community
- 4.4** The specific objectives of the archaeological evaluation were:
- ❖ To conduct open area excavations in Learnie 1A and Learnie 1B, to expose in plan any structures, features or deposits of archaeological significance
 - ❖ To excavate, by context, the archaeological horizons in the cave
 - ❖ To expose the extent of archaeological deposits and features inside the caves
 - ❖ To recover environmental samples and artefacts which will assist interpretation and chronology of the past activities taking place in the caves, and inform on overall site function
 - ❖ To collate the 2017 and 2018 fieldwork data and undertake a full programme of further research relating to our findings
 - ❖ To make proposals and prepare materials for post-excavation specialist analysis

5.0 METHODOLOGY

5.1 Permissions

- 5.1.1** Prior to excavation, the landowner's permission was obtained, and the cave was assessed for any changes since the 2017 excavations. Fieldwork was scheduled to comply with Scottish Natural Heritage guidance on bat nesting seasons.

5.2 Learnie 1A and Learnie 1B

- 5.2.1** In Learnie 1A, the small trench excavated in 2017 was extended to the east and west, into the interior chamber of the cave. However, in order to access the interior of the cave, a wide baulk was left in place adjacent to the south wall. The resulting trench was up to 7m long E-W and up to 5.5m wide, with deposits varying between approximately 0.4m deep within the inner chamber and in excess of

0.8m deep in the outer chamber. Cross-baulks were retained across the trench to control the recording of the complex stratigraphy.

- 5.2.2 In Learnie 1B, open area excavation was undertaken within a trench that was extended in 2017 and during excavations in 2018 to a maximum of 6m E-W by 7m N-S. It covered the location of the 2013 test pits and abutted the north and south walls of the cave. Contexts were excavated in plan and correlated with the 2013 stratigraphic sequence, where possible, although variations across the site had to be taken into consideration and a new sequence of context numbers allocated. Cross-baulks were retained to control the complex stratigraphy before final removal in order to obtain better-quality digital images and overall trench plans of features and deposits.

5.3 Excavation

- 5.3.1 Open area excavation was undertaken, following a single context recording system based on standard stratigraphic principles. Excavation was undertaken using baulk standing sections with a base site datum set up at the mouth of the caves opposing a second datum set up at the back of the cave and forming the baseline for excavation and recording. Baseline levels were calculated using a standard dumpy level, with measurements taken from a fixed point on the shore retrieved using a Trimble Geo-XR rover using VRS-Now (RTK) corrections rated at centimetre accuracy.
- 5.3.2 All artefacts and ecofacts were hand retrieved and sorted on site. Dry sieving was undertaken on site for certain key deposits. Bulk sampling of all archaeological layers was undertaken and a minimum of 50% of cut fills were sampled for environmental analysis. A strong magnet was used within both caves to pick up metalworking residues by 1m grid squares, in order to locate the extent of metalworking within the caves. This was particularly important in Learnie 1B, where no definite in-situ smithing hearth could be located.
- 5.3.3 Recording was undertaken using standard recording sheets, plan and section drawings (scales of 1:20 and 1:10) and high-resolution digital photography. All excavation and recording was carried out in accordance with *CIfA (Chartered Institute for Archaeologists) Code of Conduct (2014)* and the *Highland Council Standards for Archaeological Work (2012)*.

5.4 Sample and finds processing

- 5.4.1 A single context recording system was utilised and individual artefacts or groups of finds were given small find numbers. Where possible, finds and samples were recorded following on from the sequence established in the caves from previous excavations in 2013 and 2017. Upon completion of the fieldwork, small finds and samples were checked, rapidly assessed and stored in a controlled environment, ready for post-excavation analysis.

5.5 Backfilling and Site Landscaping

- 5.5.1 At the end of the excavations in 2018, backfilling and landscaping of all trenches was carried out. Teram/geotextile fabric was used to protect any upstanding features or complex sections. Any walls or similar types of features dismantled during the excavations were not reinstated.

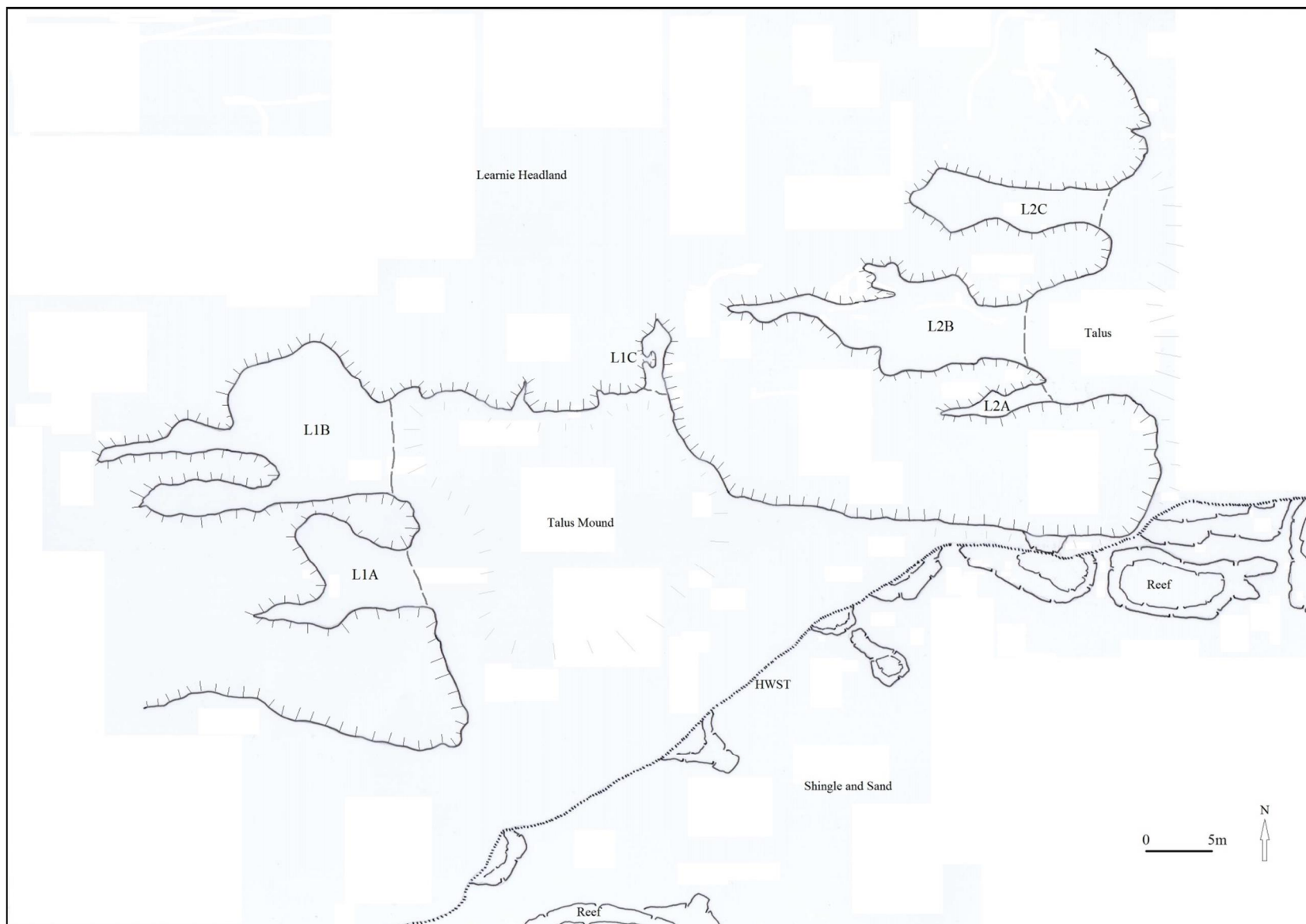


Figure 3: Plan showing the Learnie headland and location of the four caves excavated

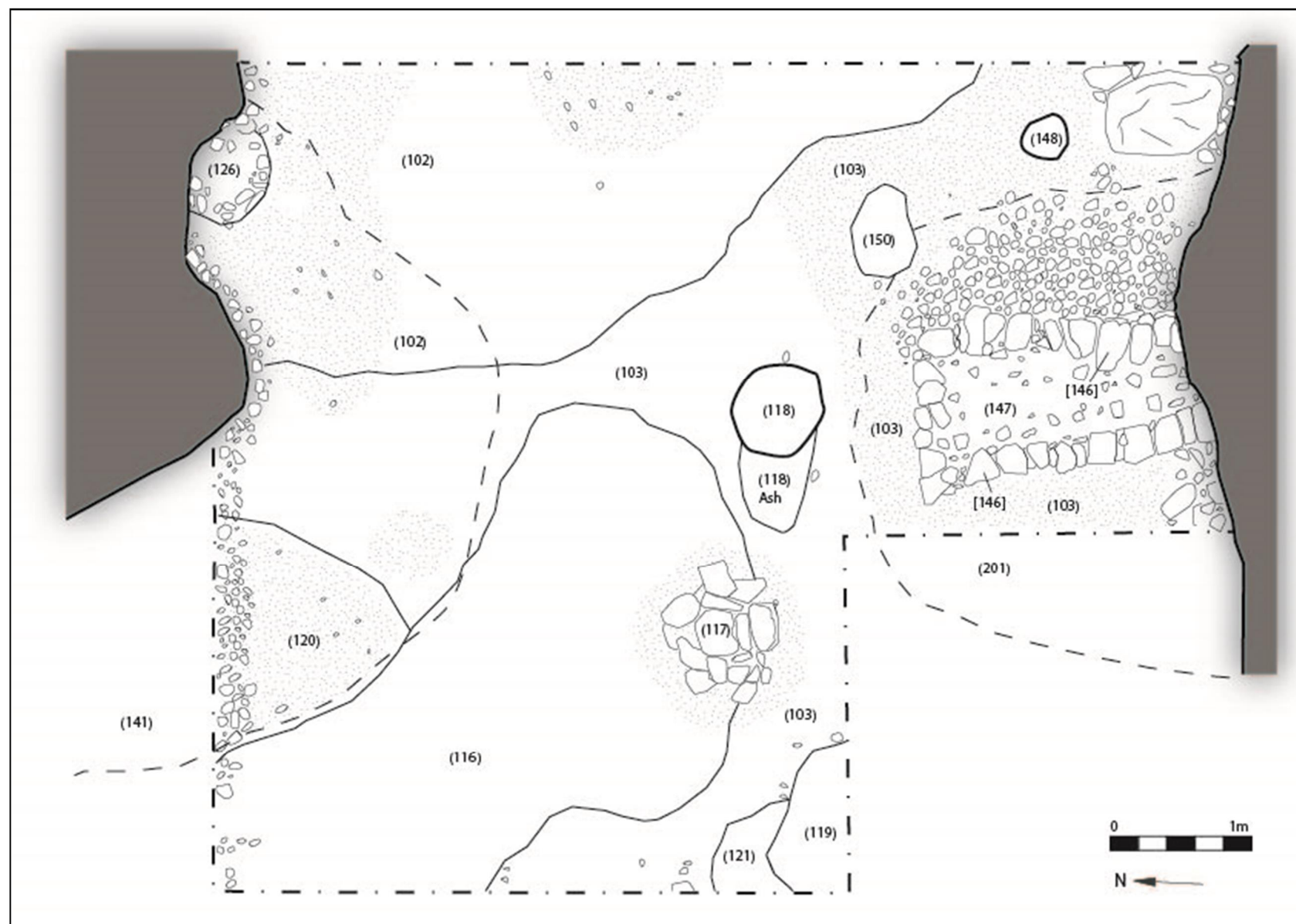


Figure 4: Plan showing the area excavated in Learnie 1B and Post Medieval surface features and extent of stone piles (141) and (201) - Phase 6b/c

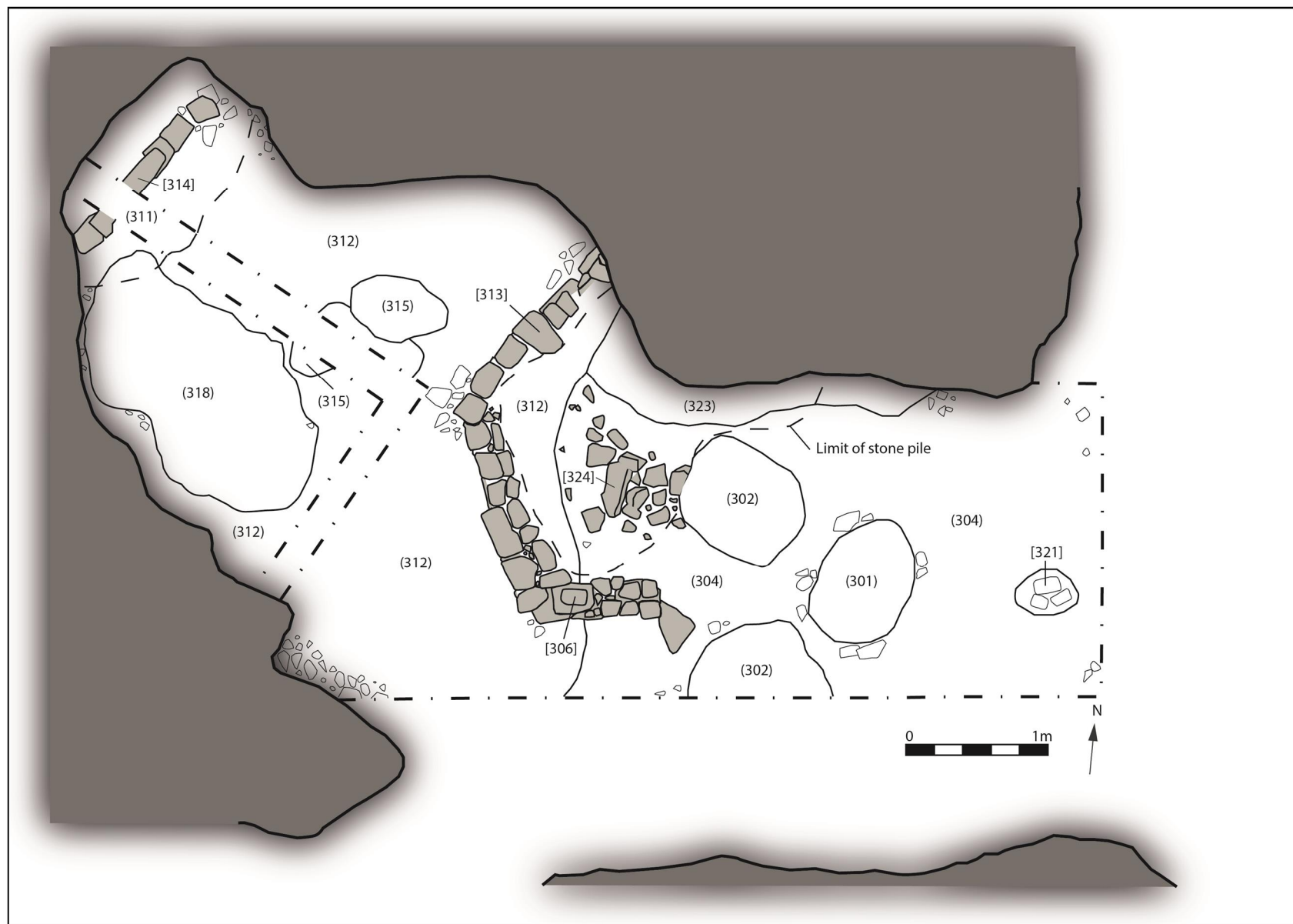


Figure 5: Plan showing the area excavated in Learnie 1A and Post Medieval surface features and extent of stone piles (311) and (303) – Phase 4b/c



Plate 6: Looking NW over excavations within Learnie 1B



Plate 7: Looking ENE over excavations in Learnie 1A

6 RESULTS

6.1 Learnie 1B

6.1.1 Open area excavation was initially undertaken in Learnie 1B in 2017, and was finalised in 2018. An area measuring 7m E-W by 5.5m N-S was excavated against the north cave wall and over the location of the 2013 test pit 1, which had revealed deep archaeological layers in the front of the cave (**Figure 4**). Prior to excavation, two further test pits (2 and 3) in 2013 had evaluated the cave deposits and recorded the location of two loose stone piles built up against the north and south cave walls. Control baulks were used to quarter the area defined by the trench in 2017, but these were removed in 2018 with the continuation of the baulk sections recorded as excavation progressed. The results of the 2017 and 2018 excavations are combined in this report, to present a review of the features and associated deposits which have been separated into six phases, starting in the Early Medieval period (Phase 1) and with occupation in the caves ending in the late 19th or early 20th century.

6.1.2 *Phases 1 and 2 – Early Medieval*

6.1.2.1 The earliest activity in Learnie 1B dates to the Early Medieval period, for which we have some of the best structural evidence from any of the caves investigated. A series of post-holes cut into the underlying natural sand form a roughly rectangular space, the sides generally mirroring the adjacent natural cave walls to the north and south. The limits of the structure were defined at the west end, within the interior of the cave, but were not found at the opposing east end. where it is possible that the structure continues under the east baulk of the excavation trench. Forming timber screens, or potentially the supports for a building inserted into the cave space, the width (NNW-SSE) measures between 3.4m at the west end and just under 3m at the east end where disappears under the baulk of the trench. The structure has been placed fairly centrally within the main cave space, leaving areas around 1.6m to 1.8m wide between the post-holes and natural cave walls (**Figure 6; Plate 43**).

6.1.2.2 A total of sixteen negative features formed the outline of the structure, with the main post-pipes (where these could be identified) measuring between 0.18m and 0.22m in diameter. Some of the features retained packing stones or post-pads (for example, see [187], [182], [188b], [190] and [205]) while two features displayed larger cuts containing different coloured fills (169) and (195). Some of the features only became visible after the removal of overlying Early Medieval deposits in the cave interior, suggesting that the structure may have been relatively short-lived. During the period the structure was in use, it appears that most of the activities generating residues and deposits were taking place within; with the areas lying between the walls of the structure and the natural cave walls displaying only small accumulations of material. It is possible that these external spaces may have comprised sleeping areas. The only features surviving within the interior of the structure defined by the posts were a rough kerb of medium-sized beach cobbles and stones aligned NE-SW, with a lightly cobbled surface abutting this to the SE; and the remains of a hearth comprising black, ashy deposits (198) lying over heat-shattered stones and pebbles. An area of thin, trampled occupation deposits (177) extended ENE from the hearth and ran under the east baulk of the excavated area.

6.1.2.3 Located within the WSW end of the post-built structure, a series of large, heat-shattered stone slabs gave way to a strip of dirty sand running to the NW and measuring up to 0.8m wide. This walkway, which is kerbed with beach cobbles at the NW end, provided access to the back of the cave from the structure and terminated at possible hearth setting (172). The cobbles forming the hearth overlay a black silty ash (173), which may relate to some of the earliest activity in the cave.

6.1.2.4 Within the northern area formed by the structure and the cave wall, thin lenses of midden material contained shellfish and fish bone (215). Interspersed and lying above this midden lens was an area of reddened sandy silt containing thin, burnt red sandstone slabs (216). These may have derived from a disturbed hearth setting, or area of paving. Otherwise, the alcove comprised the natural sand (140) containing mainly small rounded beach pebbles. The southern alcove, located between the post-built

structure and the southern cave wall, mainly comprised fine natural sand (140) with little stone present.



Plate 8: Early Medieval floor deposits in Learnie 1B with hearth (153) back left corner and old test pit (foreground)



Plate 9: Early Medieval Hearth (153) in Learnie 1B – Phase 2b



Plate 10: Early Medieval post setting (202) showing evidence for in-situ burning of post



Plate 11: Early Medieval hearth setting (176) in Learnie 1B – Phase 2b

6.1.2.5 Modifications to the interior of the cave during the Early Medieval period included the construction of a new cobbled hearth (153) in the SW corner of the cave (**Plate 9**), which overlay a small area of black ash (192) and the natural sand (140). The hearth residues included pale-cream coloured ash which contained unburnt animal bone and a significant amount of heavily calcined bone . suggesting that this was most likely a domestic hearth. Material generated during this period of use continued to be deposited in the alcoves to the north and south. A roughly built, low stone wall just a single course thick (161) was aligned SW-NE and partially closed off the small alcove located in the north wall of the cave. A midden deposits (152) containing marine shellfish filled the alcove and was retained by the wall. Within the southern alcove localised dumps of material (164, 165 and 158) were identified which may have derived from hearth rake-outs and midden disposal . mainly in the SE corner of the excavation area. Some of these deposits contained animal bone, shellfish and fish bone, while context (164) also produced some iron slag. This area also produced a relatively significant amount of hammer-scale, indicating that smithing may have been taking place in this area. In the NE corner of the excavation area, midden deposit (214) contained shellfish (some of which had been burnt), charcoal-rich ash and fire-cracked pebbles (**Figure 7, 8 & 9; Plates 8, 44 & 45**).

6.1.2.6 Running under the east baulk of the excavation area and adjacent to the cave entrance, two slab-built features may have formed hearths or large pads for structural posts. In the NE corner of the area and overlying post-hole (190) was an arcing area of thin, red, sandstone slabs (160) that had been exposed to intense heat. In some areas the slabs overlay each other up to three slabs deep, and some of which inclined steeply downwards into the underlying post-hole. In the SE corner of the trench, what appears to be a hearth or large post-pad (168) measured approximately 1.35m wide N-S and contained a smaller inner ring of stones 0.4m in diameter. The feature also included a buff to yellow-coloured ash deposit (155), while a similar ash deposit (181) extended from post-hole (182), forming a narrow strip running south. A larger spread of ash (180) covered an area in the SE corner of the excavation area over-running the post settings on this side of the cave. Another extensive area of ash containing charcoal (108) indicating some heavy burning was located to the north of context (180). These deposits were interspersed with areas of sand and darker midden-type deposits containing more of the heat-affected red sandstone slabs.

6.1.2.7 The extensive spreads of ash and residues displaying intense burning, along with the heat-affected sandstone slabs and the localised areas of burning above some of the post settings, suggest that the structure defined by the post-holes burnt down. If this was the case and the remains of the structure were dismantled, then there must have been little time until occupation in the cave resumed.

6.1.2.8 The only dates we have so far for activity in Learnie 1B during the Early Medieval period derive from contexts sampled in the main test pit excavated in 2013. Samples from contexts (111) and (112) provided respective results of cal AD 669-886 (SUERC-49920) and calAD 769-985 (SUERC-49919).

6.1.3 ***Phase 3 – Early Medieval***

6.1.3.1 The Phase 3 deposits are characterised by a continuation of the modifications within the cave, after the structure represented by the post settings had most likely been destroyed by fire. Structural changes included the construction of a hearth (166) over the earlier hearth/post-pad (168) and ash deposits (155), within the SE corner of the excavation area. Rake-out deposits comprising orange ash extended NNW from the hearth. Another possible hearth setting was located roughly in the centre of the cave, but towards the entrance, comprising a circular spread of pale cream to orange ash (162) flanked by four fire-cracked pebbles on the south side. A further small and compact hearth setting (176) located 2m to the SW of hearth (162) comprising a small arc of stones forming a setting on the NE side. Within the setting was a bowl-shaped hollow 0.22m in diameter filled with a bright orange ash. Underlying this was a lower black silty ash (**Figure 10**).

6.1.3.2 The features described above were set within floor deposits comprising a dark brown to black greasy silt embedded over cobbles in some areas and containing charcoal, animal bone, shellfish and fragments of fire-cracked stone (contexts 106, 107 and 142). Within the north alcove of the cave

(within the NE corner of the excavation area), midden deposits containing shellfish and some stone (213) continued to accumulate. Other, localised pockets of midden containing shellfish and animal bone (156) and ash deposits - possibly rake-outs from hearths (157) and (163) - were recorded abutting the south wall of the cave and stone setting (159).

6.1.3.3 The features in the back half of the cave including hearths and the walkway were covered by floor deposits (142) and it appears that there was less activity in this part of the cave at this time. These upper Early Medieval horizons have not yet been radiocarbon dated and it is still unclear how the overlying deposits represented by Phases 4 and 5 fit into the overall chronological sequence.

6.1.3.4 Artefacts recovered from the Early Medieval contexts in Learnie 1B were incredibly rare, a fact which is mirrored in other Early Medieval archaeological horizons investigated within the Rosemarkie Caves. The finds recovered included a flint flake (SF339) from context (177); a possible gaming piece or stopper manufactured from antler or marine ivory (SF337 . **Plate 37**) from context (156); corroded iron object SF317 from context (108); iron object (SF181) from context (177); and metalworking residues including hammerscale from contexts (177), (179), (180) and (181). Three iron hearth base fragments (SF164) were also recovered from context (181). A fragment of burnt flint (SF160) was recovered from context (106/7), along with a fragment of iron (SF159), a small iron ingot (SF204), a piece of pumice (SF157) and possible worked stone fragments (SF326). A piece of iron slag (SF151) was also recovered from context (164) and a fragment of vitrified ceramic or furnace wall (SF152) and iron fragment (SF140) from context (142). In addition to the finds mentioned above, fragments of worked antler and possible worked bone have also been identified during analysis of the animal bone assemblage from the cave. These will be included in the final analysis of artefacts from the caves before final publication.

6.1.4 ***Phases 4 and 5 – Early Medieval, Medieval or Post-Medieval***

6.1.4.1 Above the floor horizons defining the occupation sequence in Phase 3, a number of ephemeral features and archaeological deposits were recorded. The only structures identified were a slightly built L-shaped stone setting (178) running off the south cave wall and built with boulder talus fragments and beach cobbles; and a degraded rubble wall just one course high (143) closing off the alcove in the north wall of the cave and retaining midden deposit (129), which contained shellfish within a mid-brown silt. Otherwise, it appears that similar types of dumping activities were taking place against the south wall of the cave. These included midden deposits containing shellfish, well-preserved animal bone and angular stone fragments (179); a gritty silt containing shellfish (151) within the SE corner of the excavation area; and a mound of dark grey silty ash (154) with charcoal flecks and some animal bone, forming a distinct mound against the south cave wall.

6.1.4.2 Generally, a trampled spread of material (139) extended through the excavation area comprising dark brown/black silts with patches of yellow/white ash, and containing some small to medium-sized stone . mainly angular clasts, but also including some beach cobbles. This deposit covered the earlier floor horizon (106), (107) and (142). The only artefacts recovered from context (139) were 2 pieces of clay pipe bowl and one piece of clay pipe stem (SF189) and 2 fragments of iron (SF190), all of which were recovered from thinning and potentially disturbed/mixed contexts lying against the north and south walls of the cave; along with mammal and fish bone, shell and hazelnut shells. A possible stone tool (SF184) was recovered from midden context (129).

6.1.4.3 Sealing the Early Medieval occupation horizons and the Phase 4 deposits and features of as yet, unknown date, was a significant and extensive layer of stone (105/137). Extending over the excavation area, but thinning towards the north and south cave walls, towards the back of the cave, and towards the entrance/drip-line, the context comprised of a mixture of large beach pebbles, smaller beach pebbles, some large fragments of psammite from the cave walls or talus outside the cave, within a matrix of mid-brown silty soil/sand. Within the central area of the cave, the layer of stone reached depths in excess of 0.5m and was punctuated by numerous voids of varying size. The deposit also contained some fire-cracked pebbles and burnt stone; the latter including fragments of

reddened sandstone slabs, similar to those recovered from Early Medieval contexts (106/7), (108) and (160).

6.1.4.4 The most remarkable feature of the stone deposit was the inclusion of a large assemblage of well-preserved animal bone . the most significant assemblage of animal bone recovered from any context within the Rosemarkie Caves that have been investigated. This material is still undergoing analysis, so a detailed breakdown cannot be included here. However, the assemblage included elements from cattle and horse, including mandibles, the articulated lower vertebral column from large ungulate, and the articulated vertebral column from a horse complete with the attached cranium. The horse remains were found lying within the base of context (137) and two sandstone slabs appear to have been placed over the upper section of the vertebral column, adjacent to where it is attached to the cranium. It was only as we lifted the horse cranium that we were confronted with the most-likely cause of death. A circular hole, around 20-25mm in diameter was noted penetrating the front of the cranium, just above the eyes. The killing of the horse using a poleaxe and its deposition in a semi-articulated state within the stone layer poses a number of questions, while the discovery of two horse bones in a feasting deposit associated with the burial of *Rosemarkie Manq* in the nearby Learnie 2B cave indicates the potential importance of the horse in Early Medieval funerary contexts (**Plates 12-17**).

6.1.4.5 It was initially thought during excavation of the stone layer in 2017 that the deposits represented material brought in, or moved around from inside the cave, to create a level floor during 19th century re-occupation. This was substantiated to some extent by the discovery of artefacts of 19th century date including small sherds of Industrial period ceramics (SF161, SF214 and SF320), a fragment of clay pipe stem (SF222), a bone button (SF221), a ceramic bottle stopper (SF224), bottle glass (SF189, SF213 and SF319) and small fragments of leather (SF163, SF223 and SF318). Other objects included a possible quern stone (SF151), worked stone (SF325), iron concretions (SF215, SF225 and SF226), copper-alloy fragments (SF212 and SF222), whetstone (SF220), fragments of worked wood (SF321) and worked bone (SF322). However, many of these finds were recovered from areas adjacent to the north and south walls of the cave where contexts thin and have become prone to mixing. Also, the small size of some of the objects would have enabled them to move down into the stone layer through the numerous air-filled voids.

6.1.4.6 While the initial interpretation of the stone layer used as levelling within the cave may still be valid, removal of the deposit to reveal the earlier occupation horizons presented a uniform and level surface which could have been utilised without any modification. The effort required to collect stone from the beach and talus outside the cave to form the stone layer would also have been labour-intensive, while the resulting surface would have presented trip-hazards and an uneven occupation space. Finally, the significant deposits of well-preserved animal bone including cattle and horse is in marked contrast to the animal bone assemblage represented in the 19th century occupation deposits above, which generally comprises rabbit, birds and only relatively small quantities of sheep/goat and cattle. The significant deposits of cattle and horse elements present in the stone deposit compares more favourably with the Early Medieval bone assemblage recovered from Learnie 2B and to the increase in these species elements in Learnie 1A during the same periods (see Section 6.2). Radiocarbon dating of bone elements from context (105/137) remains a priority, so that we can interpret with some confidence the chronology of the stone deposit and why/how it formed within the cave.

6.1.5 ***Phases 6a, 6b and 6c – Post-Medieval occupation of the cave***

6.1.5.1 The stone deposits (105/137) were overlain by mostly homogenous sandy silts (104) on the east side of the excavation area that contained a small amount of Industrial period (c.19th century) ceramics. At the same horizon, but towards the cave interior on the west side of the trench, contexts (123), (120), (121), (127), (131) and (138) were identified as relating to 19th century activity in the cave. The transition between layers was difficult to distinguish . with the material comprising highly mobile, organic-rich silts and representing multiple periods of occupation within the post-medieval period. These occupation horizons have been divided into three individual periods of activity, which have focused on a suite of hearths and other contemporary features.



Plates 12 and 13: Horse skull in stone deposit (105/137) and articulated vertebral column with overlying stone slab



Plate 14: Horse remains in stone deposit (105/137) after removal of overlying stone slab



*Plates 15 and 16: Photogrammetry models showing the articulated horse remains in Learnie 1B – Phase 4/5
(James McComas)*



Plate 17: Horse skull after removal from Learnie 1B showing circular hole from poleaxe

6.1.5.2 The earliest of these occupation horizons (Phase 6a) overlay the extensive stone spread represented by contexts (105/137) . see Section 6.1.4 above. Two hearth features at this horizon included stone setting (128) and fire-pit (130), with hearth (128) located in the back/SW corner of the excavation area. Interestingly, this hearth lay directly above Early Medieval hearth (153), although separated by thin, intervening deposits. A roughly-built single skin stone division wall (207), up to three courses (0.35m high), was found abutting the south cave wall and extended 1.5m into cave. The remains of two spot fires (174 and 175) were identified just to the east of wall (207) and set 0.4m apart, comprising circular and oval pads of buff to cream-coloured wood ash with a surrounding black halo of charcoal-rich ash. Occupation deposits associated with these features included a bracken matt floor containing some small branch-wood and fish scales (103), located in the SE corner of the excavation area adjacent to the cave entrance; a mid to light brown silty sediment with small to medium angular stone and round beach pebbles (some fire cracked) small charcoal flecks, some shellfish, some animal bone (top of context 105) located in the central area of the cave adjacent to the entrance; and a mid-brown sandy silt (120, 123, 127, 131 and 138) extending across the trench in the centre of the cave and to the west end of the excavation area containing sub angular stones averaging 1-2cm across, but with some larger clasts (**Figure 11**).

6.1.5.3 These major contexts were overlain by small ashy spreads and rake-outs relating to the hearth settings (contexts 122, 121, 124, 133, 135 and 149) and midden deposit (125) located adjacent to the cave entrance containing some shellfish; a larger midden (136 and 132) consisting of periwinkles and limpets, small amount of fish bone, some animal bone and fish scales, running along the north wall of the cave. The deposit of fish scales (**Plate 18**), which generally runs along the base of the bracken matt floor in context (103) is particularly extensive and shows evidence of been trampled within the

central area of the cave. However, where the deposit extends under a rock overhanging on the south side of the cave, the scales had survived well and comprised an intermittent layer up to 40mm thick. The absence of a sediment matrix within the fish scale deposit would indicate that the layer had formed relatively quickly and possibly as a one-off event. The big question surrounding the fish scale deposit is where are the bones from the fish? Although we have recovered some fish bones from the midden layers, especially from the more extensive shell midden excavated in Learnie 1A, their numbers appear to relate to the consumption of a small number of fish by the inhabitants. The deposit of fish scales appears to relate to a larger-scale activity, perhaps associated with de-scaling fish prior to smoking or brining. Identification of the fish scales will be a priority during the post-excavation analysis.

- 6.1.5.4 During Phase 6b (**Figure 12**), a substantial fragment of wall (146) was built off the southern cave wall (almost overlying the earlier Phase 6a wall (207) comprising drystone construction up to four courses high and extending 1.8m into the cave, with a squared-off terminal (**Plate 19**). The wall has two faces forming a structure 1.2m wide and was filled by a rubble core (147), overlain by smaller stone chips (201). A small area of cobbled surface (145) abutted the outer E face of wall (146), measuring 2m N-S by 0.8m E-W. Other features associated with this occupation horizon included a hearth setting (117) comprising a circular setting of large irregular stones with a central slab surrounded on the south side by uprights; a rough circular setting of angular stones up to 20cm long (126) forming a hearth within the prominent alcove in the north wall of the cave, adjacent to the entrance; and three spot fires represented by a circular area of white wood ash with a black, charcoal-rich halo (148), a circular spread of buff to orange ash overlying a charcoal-rich ashy spread (118), and an oval-shaped patch of charcoal-rich sediment up to 20mm thick, which may be a spot-fire or a hearth rake-out (150).
- 6.1.5.5 Floor deposits associated with the Phase 6b features included a bracken matt layer (103), which had a thin gravel layer spread over the top of it (probable beach/shingle gravel brought in to resurface the underlying occupation layers); and a dark brown organic layer containing butchered animal bone and a small amount of shell, at the base of which was an organic matt containing bracken and small twigs, which thins towards the back of the excavation area (**Plate 47**). Context (102) was spread across the cave mouth (especially on the north side), and comprised fine silty sediments, light brown in colour, with small stony inclusions (102). This deposit may have resulted from silting due to wind-blown sand and other fine sediments accumulating at the cave entrance.
- 6.1.5.6 Finally, the Phase 6c contexts relate to post-abandonment and periodic activity within Learnie 1B cave during the early 21st century. These included a pile of small stone chips (141) deposited in the large alcove in the north cave wall; a second pile of small stone chips (201) located against the south wall of cave, over-running stone wall (146) and almost opposing (141) on the opposite side of the cave. Within the cave interior and covering almost the entire excavation area, a build-up of animal dung, bird guano and silting had formed over the earlier post medieval occupation horizons, after the abandonment of the cave. However, a scatter of ceramics, glass and other objects indicate that some activity was still taking place at this time (**Figure 12**).
- 6.1.5.7 Shellfish, some fish bone and mammal bone (especially rabbit and bird bones) were recovered throughout the contexts comprising the Phase 6 deposits, which also contained a mixture of Industrial period (c.19th century) ceramics, bottle glass, clay pipe fragments, stone tools and other objects representing everyday activities. Of particular interest was a small cobble with central worn hollow in one side (SF164) that may have been used as a grinder or anvil-type tool, a large animal rib bone with sawn ends (SF152), the remains of an iron cauldron and personal items such as a thimble (SF111), a clothes pin (SF109), buttons, a number of low-denomination coins, cobble tools, iron concretions and nails, worked and burnt wood, and a significant number of spent shotgun cartridge cases. Other artefact associated with this period of use included a metal spoon, knife blades and handles (**Plate 41**), the remains of a small penknife including a part of the finely decorated bone handles (**Plate 41**), and a range of copper-alloy objects including studs, pins and a copper-alloy oil lamp wick-holder (SF251) . (**Plate 42**).

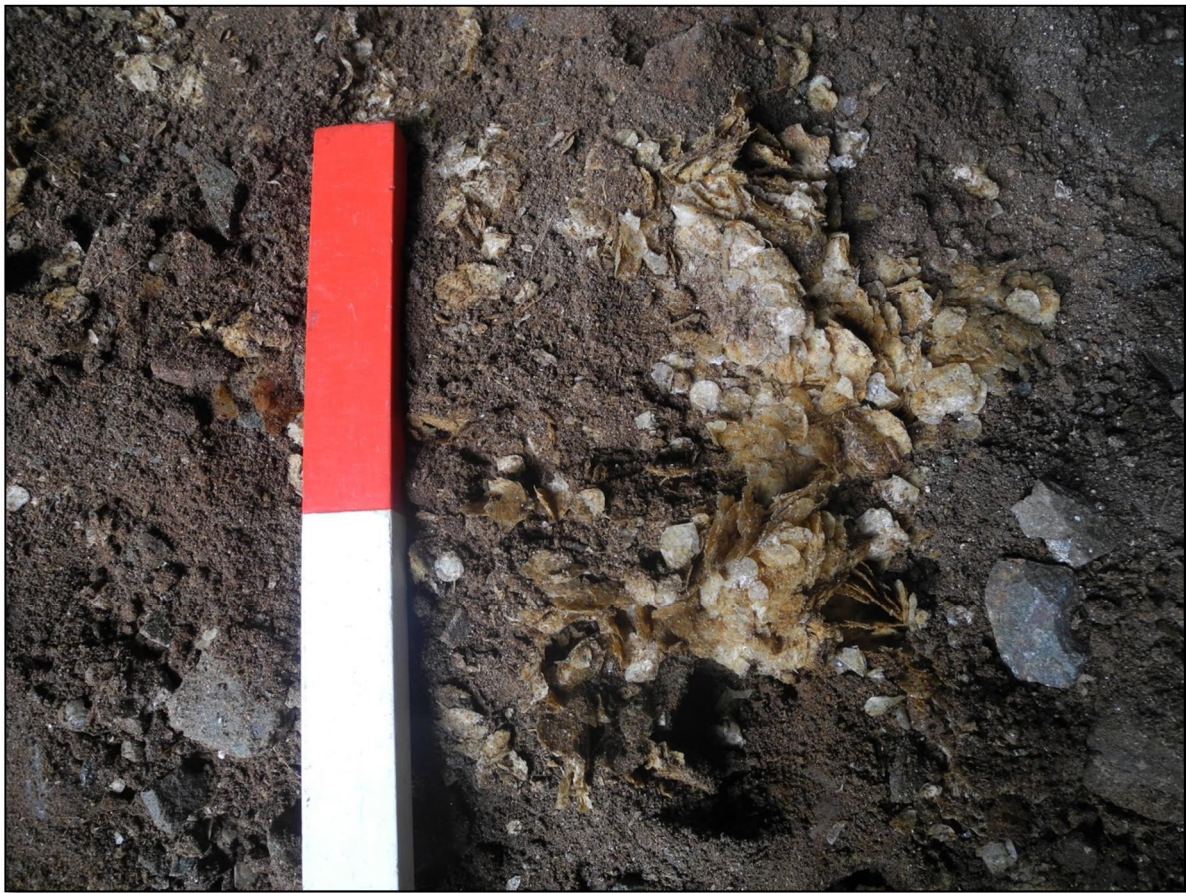


Plate 18: Close view of fish scales (context 136) in Learnie 1B – Phase 6a



Plate 19: Post Medieval wall base (146) and cobbled surface (145) in Learnie 1B – Phase 6b

6.1.5.8 As in previous excavations, some of the best evidence for the use and function of the caves to emerge during the 2018 excavations related to the 19th to early 20th century occupations, including the usual leather shoe soles and leather off-cuts, snips of metal, sherds of window glass and worked bone/horn. The excellent preservation found in many of these caves also produced other organic remains including worked wood, with some of the more recognisable wood elements comprising fragments of roundwood around 6-8mm in diameter, some of which had trimmed ends. Further analysis of these finds is required, but it is possible that some of this material derives from the manufacture of baskets or fish traps. The activity represented by these periods of use has, in particular, provided an interesting glimpse into the 19th and early 20th century lives of the occupants of the Learnie caves. The artefacts and ecofacts represent everyday activities and debris left behind by potentially itinerant inhabitants . who may have been using the caves on an almost permanent basis. This period seems to be associated with small scale industry represented by the shoe and leather finds, worked horn, iron scraps, other small finds such as the knives and cobble and bone tools; and of course, the large dumps of fish scales representing the processing of fish. Further specialist analysis on these individual elements (leather, iron and horn) together with the everyday items and midden material will assist in building this story. Further documentary research may also enhance our story for this period of use, as revealed by some initial results on archival material which has found references from a man living at a cave at Learnie regarding the burial of his wife (R. Jones pers comm 2017).

6.2 Learnie 1A

6.2.1 A small trench measuring 3m E-W by 2m N-S was excavated against the north cave wall of Learnie 1A in 2017, which indicated the potential for the use of the cave over a significant period of time. The deep sequence of deposits also displayed more continuity of use, although some phases of activity were punctuated by periods of hiatus. Radiocarbon dating of the archaeological sequence in the cave has not yet been completed, so the results from the 2017 excavations will be combined here with the larger-scale open area excavations conducted in 2018. Phases of activity have been assigned to historical periods based on artefacts recovered and by comparing these materials and the associated archaeological deposits with those recorded and radiocarbon dated in the Learnie 1B and Learnie 2B caves, located within the same headland. The open area excavations in 2018 explored the inner, roughly circular chamber of Learnie 1A (an area approximately 4.5m NW-SE by a maximum 3.6m NE-SW), with a trench extending from the mouth of the chamber to just beyond the drip-line of the cave entrance measuring 3.2m E-W by 3.3m N-S (**Figure 5**). Control baulks were retained in able to record sections through the complex deposits, which varied significantly between the darker inner chamber and the entrance area where more light, could penetrate. Headroom was adequate to allow a person to stand in most areas of the cave, although an overhanging section of cave wall protruding into the outer cave from the north created a deadqarea that had been used for the deposition of midden and stone throughout its use.

6.2.2 *Phases 1 and 2 – Early Medieval*

6.2.2.1 The earliest archaeological horizon identified in Learnie 1A lay directly on the natural sand (342) and was confined to the outer chamber of the cave where light penetration was at a maximum. Although these deposits did not extend back into the darker inner chamber, it is possible that they may have been removed during the extensive use of this area during the post-medieval period. However, the early use of the cave during Phase 1 appears to have been limited in its function and involved metalworking. Such industrious activities would have required relatively good ventilation, so the location of the smithing hearth in the outer chamber would have allowed obnoxious fumes to funnel out (**Figures 13 & 14; Plates 20 & 21**).

6.2.2.2 The remains of the smithing hearth (351) were located roughly central within the outer chamber of the cave, around 1.5m in from the drip-line at the cave entrance. A roughly oval pit (355) had been excavated into the natural sand between boulders measuring 0.75m NE-SW by 0.55m SE-NW 0.22m deep, into which the hearth was constructed. The remains of the hearth had been partially destroyed

on the southwest to west arc, but sufficient structure remained to allow its general outline and form to be interpreted. A slab of stone (352) measuring 0.3m NE-SW by 0.32m SE-NW and 0.08m deep had been set into the pit on the north side. The slab of stone had been heavily fractured by the heat generated by the hearth and displayed numerous cracks and discolouration. The clay wall of the hearth (350), which could not have stood much more than 0.15-0.2m in height, was constructed on top of the southern edge of the stone slab and the remaining sections appear to have formed a square feature measuring approximately 0.2m wide over a wall measuring around 0.06m wide. It is possible that the stone slab supported the bellows for the hearth, although it may also have provided a surface to use as an anvil (however it is also possible that an adjacent boulder set into the sand, located 0.6m to the WNW of the smithing hearth, may have formed the anvil) . (Plates 22-28).



Plates 20 and 21: The Early Medieval smithing hearth located in the outer chamber of Learnie 1A - Phase 1



Plates 22 and 23: The smithing hearth during excavation showing stone slab and elongated shape of cut

6.2.2.3 Iron slag (354) was noted adhering to the inner, vitrified clay walls of the hearth, while a section of the plano-convex hearth base was also still attached. This provided a unique section through the remains of the hearth. The pit underlying the hearth was filled with a mid-brown to black silty sediment (353) containing some charcoal, small slag fragments, fragments of vitrified furnace lining and detached fragments of hearth base. The upper fill of the pit (334) comprised a black, charcoal-rich gritty silt containing charcoal, hammerscale and furnace wall fragments. This deposit had spread over the outline of pit (355) and the hearth feature (351) covering an area 1.4m NNW-SSE by 1.2m SW-NE. A

distinctive lobe of the sediment extended to the SSE between two small boulders set into the underlying sand and it is possible that this may indicate the location of the bellows. A grid comprising 1m squares was set surrounding the smithing hearth and a strong magnet was used to collect hammerscale from the surrounding sand horizon. Grab samples were also collected from the individual grid squares and the combined sampling may provide additional evidence to provide a location for the anvil. No additional artefacts or features were found associated with this early metalworking horizon, which comprises the first activity to take place in the cave. Interestingly, the metalworking taking place within Learnie 2B was also early in the sequence of use, although this was predated by the insertion of human remains and the associated feasting deposits (see 7.2 below).



Plates 24 and 25: The smithing hearth under excavation showing vitrified furnace wall fragments (350) and stone slab (352)



Plates 26 and 27: The smithing hearth after section excavation showing in-situ vitrified furnace wall (350) attached to stone slab (352)

6.2.2.4 During the use of the smithing hearth, a thin occupation horizon formed above the natural sand and comprised a mid-to dark brown gritty sediment containing small angular stone fragments, some shellfish and hammerscale (338). These deposits dipped away at a slight angle to the SW below the standing baulk of the trench and it was possible to record in section an earlier occupation horizon consisting of a mix of ash and shellfish midden (339).

6.2.2.5 The Phase 2 Early Medieval activities continued after the smithing hearth had been decommissioned and extended back into a part of the inner chamber of the cave (**Figure 16**). Two rubble walls (341) and (343) had been constructed adjacent to and mirroring the SW and NW walls of the cave respectively. These features had no real structure to them and only extended to a maximum height of 0.25m. Feature (341) was roughly built with angular stones and beach cobbles, aligned NW-SE, measured up to 0.6m wide and stood up to three courses high. The wall incorporated a large boulder at its NW terminus and retained a discrete shellfish midden (340). Division wall (343) shut off a shallow alcove below a low overhang in the NE side of the cave and comprised degraded stone rubble including angular stone and aligned NW-SE. Surviving up to 0.25m high, the alcove behind the wall had been used for the deposition of a shell midden (307b), comprising mid grey to brown sandy silts containing a few small and larger angular stones. The shells included mainly periwinkle (95%), but some whelk and occasional limpet, along with ash deposits, charcoal fragments and occasional larger lenses of ash within the very loosely compacted midden.



Plate 28: The smithing hearth after section excavation showing in-situ vitrified furnace wall (350), stone slab (352), slag/hearth base (354) and lower fill of pit (353)

6.2.2.6 A hearth was uncovered roughly in the centre of the cave space comprising a roughly circular spread of light grey to black wood ash, with a black halo (331), measuring 0.7m in diameter and up to 60mm thick. The hearth deposit contained some charcoal, shellfish and animal bone, and a compacted ash deposit (most likely overspill from the hearth) surrounded the feature. The deposit comprised a milky white ash (310) with occasional fragments of charcoal and rounded small stones 1.5-8cm long embedded within it. A similar spread of material was located just over a metre to the east of the hearth and may be rake-out material. The floor horizon surrounding the hearth (332) was mid-brown gritty sediments containing some angular stone and beach cobbles, shellfish and small bone

fragments. A thin (>20mm thick) orange/brown lens of material (337) ran off hearth deposit (331) to the NW and contained two small fragments of vitrified furnace lining. Below the drip-line of the cave and adjacent to the entrance, floor deposits included mid-brown to black gritty sediments containing intermittent wood ash and black charcoal-rich lenses of material, some shell and small angular stone fragments (335/309).

6.2.2.7 It appears that a major roof collapse occurred at some stage during the final phase of Early Medieval activity in Learnie 1A (**Plate 29**); this event may even have triggered the end of activities during this phase of use. Located on the SSW side of the outer cave chamber was an area of shattered stone slabs/blocks pitched at angles (327), with some voids between the slabs. The collapse had originated from above the overhanging projection of rock protruding from the north wall of the cave and the material directly overlies and seals the Early Medieval occupation horizon.



Plate 29: Shattered stone slabs from roof collapse (327) overlying Early Medieval deposits and smithing hearth – end of Phase 2

6.2.3 **Phase 3 – Medieval activity**

6.2.3.1 As mentioned in Section 6.2.2.7, the failure of the cave roof leading to the collapse most likely resulted in the termination of the Phase 2 Early Medieval activity at Learnie 1A. The stratigraphic sequence above the collapsed material suggests that activity resumed in the cave sometime after this event had occurred. A close inspection of the interface between the Phase 2 and 3 deposits did show some fine silt that may be the result of abandonment and wind-blown accumulations of material, although these were not substantial.

6.2.3.2 Overall, the layout of features and accumulating deposits relating to the Phase 3 activities in the cave mirrored those recorded in Phase 2 (**Figure 16**). Retaining wall (341) remained in-situ, although shell midden (340) had become more substantial and had overrun parts of the feature on the SW side. The midden deposits (307a) accumulating against the NE wall of the cave increased significantly during this phase of activity and a rough alignment of stone (356) retained these deposits. The midden deposits (307a) included a mid-grey to brown sandy silt containing a few small stones and some larger angular clasts, ash deposits, charcoal fragments and shellfish (mainly limpet . up to 95%), some dog whelk and occasional periwinkle shells (up to 5%). The deposit also contained some well-preserved mammal bone including small and large ungulates. Midden deposits (328) continued towards the entrance of the cave from (307a), abutting the cave wall and lying amongst some larger stone clasts. The midden content was different to (307a) and included a mixed deposit comprising shell and animal bone, fish bone, some angular stone and a number of blackened beach cobbles. The matrix of the midden comprised very dry silts and contained some charcoal lumps.

6.2.3.3 Two hearths provided warmth and a source for cooking activities during Phase 3. As with Phase 2, one spot hearth (325) was located roughly central within the outer chamber of the cave comprising a circular spread of pale cream-coloured wood ash with a black, charcoal-rich halo measuring 0.6m in diameter and up to 60mm thick. Ash deposits radiated away to the NW from the hearth (335) including trampled mid-brown to black gritty sediments containing intermittent wood ash and black charcoal-rich lenses of material, along with some shell and small angular stone fragments. This deposit had spilled over a trampled and compacted floor horizon (326) leading back into the inner chamber of the cave, comprising mid-brown silty sediments with a few angular stone clasts. This deposit appeared to be quite sterile and may have been introduced to form a clean floor. Located at the entrance to the inner chamber of the cave was the second larger hearth feature (319), comprising a spread of pale grey to black wood ash measuring 1.6m NE-SW by 1.2m NW-SE. Two overlapping and superimposed layers of ash formed this significant ash deposit, suggesting that the hearth was in use over a considerable period of time.

6.2.3.4 A small number of artefacts were recovered from the Phase 3 deposits including medieval ceramic sherds (SF191), (SF158) and (SF258), a small fragment of blue glass (SF192) and three corroded iron objects (SF193) and (SF359) from midden context (307a). A fragment of clay pipe bowl (SF260) is most likely intrusive, from the accumulating and highly mobile midden deposits above. One small piece of glass (SF161) was also recovered from context (335), which may also be intrusive.

6.2.4 ***Phase 4 – Post Medieval occupation of the cave***

6.2.4.1 The occupation of Learnie 1A cave during the post-medieval period, as with Learnie 1B, Learnie 2B and Learnie 2C, provides substantial evidence for the manner in which the cave space was utilised, along with the contemporary craft and economic activities that were taking place. During Phase 4a (**Figure 17**), the way in which the cave space was utilised was in many ways similar to that seen during previous phases of occupation; although all sections of the cave, including the inner, darker chamber provided evidence for use. The earlier midden deposits which had accumulated against the north wall of the cave received more material during Phase 4a, which necessitated the modification of the earlier revetting wall (356). Additional stones were added to the wall (324) to retain the midden and stop it spilling onto the adjacent floor surfaces. The midden deposits (323) comprised shellfish, fish bone and fish scales, and a small number of artefacts including bottle glass (SF252), iron object (SF253) and a fragment of Scottish White Gritty Ware ceramic (SF149).

6.2.4.2 Two hearths were recorded; one placed centrally within the outer chamber of the cave which comprised a circular spread of white wood ash within a charcoal-rich black halo, measuring 0.6m in diameter and up to 50mm thick (322); and a larger feature located at the entrance to the inner chamber of the cave comprising an oval-shaped deposit of buff to cream-coloured wood ash (317), with a halo of black charcoal-rich material, measuring 0.65m NW-SE by 0.6m E-W, with areas of compacted beach cobbles and angular stone fragments on the S and SW sides.



Plate 30: Stone wall (314) sealing off NW alcove of inner chamber of cave and overlying stone pile (311)



Plate 31: Stone wall (313/306) dividing inner and outer chambers of cave and covering stone pile (303)



Plate 32: Stone wall (313/306) showing double-faced and single revetting elements



Plate 33: Stone wall (313/306) showing outer face surviving to two courses high

- 6.2.4.3 The hearths overlay a series of trampled floor deposits including mid-brown sandy silts mottled with darker organic-rich material and containing some small stones, animal bone and a few shells (304/316). Clean and quite sterile sand patches were noted showing adjacent to the cave walls of the inner chamber. The animal bone recovered from the floor contained some elements from cow, sheep/goat and pig, although the assemblage was dominated by the bones of birds and rabbit. These floor deposits ran from the entrance of the cave through to the start of the inner chamber and contained a number of artefacts included an array of c. late 19th century objects, including a thimble (SF131), copper-alloy and bone buttons (SF138), clay pipe fragments (SF187, SF267 and SF154), a bone knife handle (SF140), a small leather shoe fragment (SF139), shotgun cartridge cases (SF132, SF138 and SF266), low denomination copper alloy coin (SF145), as well as window glass, bottle glass, a range of iron objects including nails, and various broken pot sherds relating to Industrial period ceramics. Context (316) also produced one sherd of Scottish White Gritty Ware (SF156).
- 6.2.4.4 The inner chamber of the cave contained differing floor deposits including ashy spreads most likely resulting from rake-outs from hearth (317) and patches of relatively clean sand with some small angular stone chips (318) located in the SW side of the inner chamber of cave. This may have been introduced as levelling material to form a new floor, within an area that may have been retained for sleeping. No artefacts were recovered from the inner chamber from the Phase 4a deposits.
- 6.2.4.5 The continued use of Learnie 1A during the post-medieval period (Phase 4b) included some major modifications to the division of the useable space within the cave (**Figure 18**). A revetting wall (314) comprised a short fragment of drystone wall blocking off a small alcove in the inner chamber of the cave and consisted of a single skin of angular stones surviving up to two courses high (**Plate 30**). The wall retained a small and discrete deposit of shellfish (periwinkles) within the alcove. A more substantial wall (313/306) was constructed separating the inner and outer chambers of the cave and included two distinct elements: a drystone double-skin of boulders up to four courses high, with a rubble core; and a revetting-type wall using a single skin of stones. The wall initially ran in a SW direction from where it abuts the north wall of the cave (single skin revetting-type wall), before turning to the SSE, and then to the E; terminating in a squared-off end (double-skin construction with core). In conjunction with the south wall of the cave, the wall created an entrance 1.6m wide (**Plates 31-33**).
- 6.2.4.6 A single hearth was formed slightly NE of the centre of the inner chamber of the cave and comprised an oval spread of black, charcoal-rich ash and pale cream/grey wood ash measuring 0.7m E-W by 0.45m N-S (315). Two further hearth settings were located within the outer chamber of the cave. The first (301) was set close to the north wall of the cave and comprised a spread of ash measuring 0.85m NW-SE by 0.7m NE-SW. The second comprised of three fire-cracked angular stone slabs (321) measuring approximately 0.35m E-W by 0.25m N-S with slabs up to 80mm thick. A small amount of grey to black ash was found overlying the hearth, which is located almost below the drip-line of the cave, at the entrance.
- 6.2.4.7 The floor surface had changed little since the Phase 4a occupation, although deposits had accumulated prior to the construction of wall (313/306), at the interface between the inner and outer chambers of the cave. Context (312) contained dark brown gritty sediments containing some bone fragments, shellfish, glass and ceramics. Within the outer chamber of the cave, located to the NW and SW of hearth (301) were two areas of bracken matt (302), which may have formed bedding or activity areas to sit on around the hearth.
- 6.2.4.8 Artefacts recovered from the occupation deposits in the outer chamber of the cave in Phase 4b included Industrial period ceramic sherds, bottle and window glass, a clay pipe bowl and stem with the lettering **MSq** (SF294), shotgun cartridge cases (SF293), leather shoe fragment and offcuts (SF145) and miscellaneous iron and copper alloy fragments. Context (312) in the inner chamber also produced Industrial period ceramics, glass sherds, a copper-alloy spoon (SF243), a clay pipe bowl (SF247), a clay pipe stem (SF354), a copper-alloy primus-type burner (SF245), a low denomination copper-alloy coin (SF330) and small fragments of iron and copper-alloy.

6.2.4.9 The final activity identified within the post-medieval period in Learnie 1A (Phase 4c) generally included episodes of short-term, periodic activity (**Figure 18**). Within the back alcove of the cave, sandy silt (300) formed the upper activity horizon and included midden deposits including shellfish and animal bone. The deposit contained a large window glass fragment and clear glass vessel (SF148), Industrial period ceramic sherds, leather offcuts and shoe fragments (SF238, SF315 and SF328), a fragment of a bottle cork (SF240), clay pipe stem (SF241), three fragments of clay pipe bowl and three fragments of clay pipe stem (SF308), clay pipe fragment (SF355), one fragment of slate pencil (SF309), one Victorian period penny dated 1890 (SF310), a mother of pearl button (SF329), a bone knife handle with part of the blade (SF353 . **Plate 41**) and a number of small iron and copper-alloy fragments. The only other deposits identified relating to this activity included piles of small to medium-sized angular stone shatter (311), deposited in the alcove in the NW corner of inner cave chamber. The deposit included a dark brown gritty matrix, which increased with depth. The deposit covered wall (314) and contained some animal bone and shellfish (periwinkles), Industrial period ceramics and glass, and assorted metal objects. A similar stone pile had been deposited to the east of wall (313) and north of wall (306), which almost reached the roof of the low overhanging rock spur. This deposit (303) comprised a mix of angular talus and fragmentary stone, as well as some rounded beach cobbles, with a dusty and dry silty matrix. This deposit also produced Industrial period ceramic and glass sherds, and shotgun cartridge cases. Similar deposits of stone chips were found in Learnie 1B cave, one pile of which covered a division wall protruding from the south wall of the cave. It is possible that the stone chips and associated debris relate to clearance of the cave floors between periodic episodes of use, the material gradually forming a higher screen behind which shelter from the wind and light could be sought. Alternatively, it is possible that the deposits had been piled over the walls to put them out of use.

7 DISCUSSION

7.1 The 2017/18 excavations in Learnie 1B and 1A caves

- 7.1.1 The results of the excavations and preliminary analysis of the finds from the Learnie 1B and Learnie 1A have provided significant information about activity inside the two caves during the 1st millennium AD. The scale of the open area excavations has allowed the project to investigate in some detail the use of the available space within the caves and to interpret the activities that were taking place during the different phases of use. The post-excavation analysis from the excavations and a detailed assessment of the complex stratigraphy within the two caves are still being processed, but the initial interpretations suggest that metalworking was one of the earliest activities to take place in the caves; a function that has also been established for Early Medieval activity in Learnie 2B. The use of the caves for craft activities and basic subsistence is also evident from the wide range of materials recovered relating to Post-Medieval occupation. Other major discoveries relating to the use of the caves during the Early Medieval and Post-Medieval periods is the structural evidence defining the modification of the caves and the division of space.
- 7.1.2 As in previous years of excavation, some of the best evidence for the use and function of the caves to emerge from the excavations in 2017-18 related to the 19th to early 20th centuries, including the usual leather shoe soles and leather off-cuts (**Plates 34, 35 & 47**), snips of metal, sherds of window glass and worked bone/horn. The excellent preservation found in many of these caves also produced other organic remains including worked wood in Learnie 1B. Some of the more recognisable wood elements comprised fragments of roundwood around 6-8mm in diameter, some of which had trimmed ends. Further analysis of these finds is required, but it is possible that some of this material derives from the manufacture of baskets or fish traps. Wooden items also included two wooden tent pegs. Other artefact associated with this period of use included ceramics, bottle glass, a metal spoon, knife blades and handles, the remains of a small penknife including a part of the finely decorated bone handle, iron fittings, bone and mother of pearl buttons, several potential stone tools, and the ubiquitous clay pipe fragments. Several objects manufactured from copper alloy were also recovered including studs, pins, three low-denomination coins and fragments from an oil or paraffin lamp (**Plate**

42). In the upper levels of Learnie 1A, we recovered a large number of old shotgun cartridges, which may have been used to shoot rabbits and birds (the recent analysis of the animal bones from previous years excavations by Karen Kennedy has indicated high numbers of rabbit bones in the faunal assemblage from this period).



Plates 34 and 35: Remains of leather boot recovered from the Rosemarkie Caves

- 7.1.3 Both caves have produced good economic evidence relating to their use during the post-medieval period, which once analysed, will provide some detail with regards to how the people lived and what they ate. One particularly interesting discovery this season was in Learnie 1B, where we uncovered a substantial deposit of fish scales (**Plate 18**). Smaller pockets of fish scales were recovered from Learnie 1A and during excavations in Learnie 2B in 2016/17, with Jen Harland of UHI Orkney telling us that these are indeed rare finds on archaeological sites. The deposits of fish scales found this year in Learnie 1B had been trampled within the main part of the cave, but within the overhanging alcove on the south side of the cave the scales had survived well and comprised an intermittent layer up to 40mm thick. The absence of a sediment matrix within the fish scale deposit would indicate that the layer had formed relatively quickly and possibly as a one-off event. Although it can sometimes be difficult to identify the fish that the scales derive from, Jen at UHI has offered to submit a sample for isotopic analysis which can at least identify them to general species level. The big question surrounding the fish scale deposit is where are the bones from the fish? Although we have recovered some fish bones from the midden layers, especially from the more extensive shell midden excavated in Learnie 1A, their numbers appear to relate to the consumption of a small number of fish by the inhabitants. The deposit of fish scales appears to relate to a larger-scale activity, perhaps associated with de-scaling fish prior to smoking or brining. Could this activity be related to the curing of fish for their use by the inhabitants of the caves, or preparation prior to selling into a wider marketplace? Hopefully, the analysis of the fish scales and any fish bones recovered from these archaeological layers will tell us more about the exploitation of marine fish during the post-medieval period.
- 7.1.4 Previous excavations in Learnie 1B and Learnie 2B had produced a significant number of hearths and spot-fires relating to their use during the post-medieval period, ephemeral stone dividing walls, cobbled surfaces and possible sleeping areas . the latter indicated by layers of decayed bracken and small branch wood. This year, we recovered additional evidence of structures within both caves under excavation. In Learnie 1B, the removal of a domed pile of small stone shatter located against the south wall revealed an underlying drystone-built structure. The wall provided some division of space, possible deflecting the wind and creating a small sheltered area within an otherwise open space . maybe for sleeping? It is possible that some organic superstructure was used to provide additional height to the screen, although from additional evidence for similar structures revealed in Learnie 1A, it seems more likely that the walls merely retained the small stone chips that were piled on top. Through time, the stone shatter had merely overrun the walls eventually hiding them from view. Interestingly, a second and slightly earlier dividing wall was uncovered just 0.5m further in to the cave in Learnie 1B, also abutting the south wall.
- 7.1.5 A much more impressive suite of walls was uncovered however in Learnie 1A, also relating to the latest phase of activity during the post-medieval period. Within this cave, which is roughly aligned E-W another pile of small stone shatter was found extending from the north wall. Removal of this revealed a well-constructed double-skin wall with rubble core, that would have guided access into the inner cave and chamber, blocked off the light entering the chamber, and deflected the wind. A second, smaller linear wall some 1.5m long blocked off a small recess in the west wall of the inner cave chamber. The wall, up to three courses high, was also hidden by a pile of small stone shatter and it appears likely that both of the walls in Learnie 1A revetted and supported the stone piles, creating a dark chamber within. At least two hearths, comprising roughly circular mounds of wood ash, were identified within the inner chamber (**Figure 18; Plates 30-33**).
- 7.1.6 Below the post-medieval deposits in these two caves, the archaeological sequences were quite different in character. In Learnie 1A, it would seem that intermittent occupation was fairly continuous, extending back through the Medieval and Early Medieval periods. Much of the evidence for the medieval activity comprises dumps of midden, which in general takes place around the periphery of the cave, adjacent to the natural walls and particularly under low overhangs that would not have been useable for other everyday tasks. The midden deposits had been revetted and demarcated by ephemeral rubble walls; while a series of well-laminated lenses of material through the centre of the cave indicating trampling and access by the passage of feet. This had resulted in quite compacted deposits running roughly through the centre of the cave into the inner chamber, with midden

deposited to each side; that lying against the north wall in particular comprising loose marine shells and containing animal and fish bone. The lower part of the shell midden also produced several sherds of medieval ceramic including green-glazed redware (13th-15th centuries AD) and more importantly, Scottish White Gritty Ware (potentially 11th-12th centuries AD). Several hearths were associated with these periods of use, creating a complex sequence of ash lenses.

- 7.1.7 The base of the stratigraphic sequence in Learnie 1A, which most likely relates to Early Medieval activity in the cave, contained domestic hearths and their associated spreads of ash and midden deposits. These deposits overlay the natural sand in the base of the cave, and it is here, between outcrops of bedrock and some larger stone clasts that our final major discovery was made relating to the use of the cave for metalworking. The well-preserved smithing hearth, most likely of Early Medieval date, is a rare and nationally important find and will add to a growing corpus of information relating to metalworking in caves through the prehistoric and historic periods in Scotland (**Figures 13 & 14; Plates 20-28**).
- 7.1.8 As mentioned above, the sequence of deposits in Learnie 1B was quite different to that observed in Learnie 1A. Here, the layers representing the post-medieval activity lay directly on top of a deep spread of stone comprising shattered fragments from the cave walls and roof, and beach cobbles of differing size; with some of the stone displaying evidence to suggest they had been exposed to burning at high temperatures. The stone deposit, which extended across the excavated area in the cave, comprised a significant effort in time and labour especially if this was laid down to merely form a new floor horizon. However, what really sets this deposit apart from the other contexts excavated in the Learnie Caves, is the quantity and composition of the well-preserved animal bone assemblage integrated into the layer of stone. This included some larger bone elements, an articulated fragment from the lower spine/tail of a fairly large ungulate (possibly a cow), other fragments of articulated vertebrae, scapula, mandibles and mandible fragments. However, the most impressive remains included the complete skull of a horse, complete with articulated vertebral column (**Plates 12-17**). No ribs or limbs were attached to these elements, although we did recover individual ribs and limb bones that may have derived from it. The fact that the animal had been dispatched using a poleaxe or similar type of weapon presents additional speculation regarding the significant bone assemblage within the stone layer. This barbaric method of despatching horses is banned in most countries today. However, the poleaxe was not a weapon designed solely for the killing of horses – this was a formidable weapon, designed to disable knights in full armour, and usually used by knights and men-at-arms fighting on foot during the medieval period.
- 7.1.9 The stone layer and associated animal deposits, which has not yet been radiocarbon dated, separates the Post-Medieval and earlier deposits in Learnie 1B, removal of which revealed the Medieval/Early Medieval occupation deposits. These deposits comprised lenses of wood ash, charcoal-rich deposits, midden, deposits with high organic content (potential bedding), and slabs of stone burnt a vivid red. The deposits forming this kaleidoscope of differing colours and textures derived from a sequence of hearths and fire-spots within the cave, some of which were domestic cooking hearths (as evidenced by the recovery of burnt and heavily calcined animal bone and some fire-cracked stone), hearths with a potentially more industrious function and floor/occupation horizons. And, while no in-situ smithing hearth was revealed during the excavations in Learnie 1B, we did recover all of the components that would support this activity including slag, fragments of vitrified hearth wall, hearth-base fragments and hammer-scale. Sampling of the floor of the cave using a one metre grid along with the use of a strong magnet to recover metalworking residues at the time of the excavation, will hopefully have established the location of the smithing hearth and anvil. From the use of the magnet, it would appear that the main focus of the hammer-scale and other metalworking residues is in the south side of the cave, just in from the entrance.
- 7.1.10 The main area of Learnie 1B comprised quite level, trampled deposits, although low overhangs and areas with alcoves and rock projections formed the main focus of midden deposition . especially shellfish . which is also paralleled in Learnie 1A. Some fish bone and animal bone was also recovered from these deposits, although on a small scale when compared to the extensive stone

deposit mentioned above. Artefacts, as with most of the Rosemarkie Caves holding Early Medieval deposits, are indeed rare finds! With the exception of a knife sharpening stone (**Plate 36**), two possible coarse cobble tools (hammers/pounders) and a couple of iron objects, the only other finds was a small, conical-shaped piece of antler or ivory which may be a small stopper or gaming piece (**Plate 37**), and several fragments of worked antler.



Plate 36: Grooved sharpening stone recovered from Learnie 1B

7.1.11 Removal of the lowest occupation deposits in Learnie 1B however, revealed some wonderfully-preserved evidence for the division and use of space (**Figures 6-9; Plates 43-45**). A roughly circular hearth towards the back of the cave produced burnt animal bone and most likely formed a domestic cooking area. A sequence of post and stake-holes, and post-settings, formed a roughly rectangular area . the long sides roughly mirroring the undulating cave walls; while the connecting back screen appears to have blocked off the rear, darker area of the cave. It is possible that a similar arrangement of posts also formed a screen closing off the front of the structure, although this could not be confirmed due to the deep overburden forming a talus at the cave entrance. It is possible that the interior of this structure formed a major activity area in the cave, while the alcoves formed between the cave walls and the structure could have been utilised for other activities including sleeping. A trampled walkway overlying the natural sand leads from the back of the screen structure at an angle into the back of the cave, where further evidence of burning was recovered. It is indeed remarkable to find such division of space within natural caves, although we did recover similar evidence in Learnie 2B in 2016, but on a smaller scale.



Plate 37: Worked antler or ivory stopper or gaming piece from the Early Medieval deposits in Learnie 1B



Plate 38: Polished bone point fragment SF108 from Learnie 2B

7.1.12 The excavation of the Early Medieval deposits overlying the post-holes and features relating to this structure in Learnie 1B revealed extensive spreads of ash and heat-affected stones; the latter including thin sandstone slabs showing reddening from exposure to heat. The intensity of the burning indicates that a major conflagration event took place in the cave, most likely involving the wooden

structure that it contained. This is borne out to some extent by areas of intense burnt residues overlying some of the post-holes associated with the structure, which had initially been recorded as spot-fires, or small hearth settings; which most likely relate to the burning of the posts in-situ (**Plate 10**). Analysis of the bulk sediment samples recovered from this occupation horizon will hopefully reveal more detail relating to this event.

8 CONCLUSION AND RECOMMENDATIONS

- 8.1 Results from the excavations in the Learnie group of caves (Learnie 1B, Learnie 1A, Learnie 2B and Learnie 2C) have shown that the caves contain a wealth of material from the post-medieval periods of activity. The activity represented by these periods of use has, in particular, provided an interesting glimpse into the 19th and early 20th century lives of the occupants of the Learnie caves. The artefacts and ecofacts represent everyday activities and debris left behind by potentially itinerant inhabitants . who may have been using the caves on an almost permanent basis. This period seems to be associated with small scale industry represented by the shoe and leather finds, worked horn, iron scraps, window glass, other small finds such as the knives and cobble and bone tools; and of course, the large dumps of fish scales representing the processing of fish. Further specialist analysis on these individual elements (leather, iron and horn) together with the everyday items and midden material will assist in building this story. Further documentary research may also enhance our story for this period of use, as revealed by some initial results on archival material which has found references from a man living at a cave at Learnie, regarding the burial of his wife (R. Jones pers comm 2017).



Plate 39: The people of Tinker's Cave, Wick in 1886 (The Johnston Collection/Wick Society)

- 8.2 The ethnography and ethnohistory of Scotland are rich in records of cave use spanning the late medieval and post-medieval periods including accounts by the famous travellers such as Martin Martin and Thomas Pennant and records from official government papers such as the Statistical Accounts and the Census Returns. Cave dwelling in Scotland (**Plates 39 & 40**), as in other parts of

the UK, came to a fairly abrupt end in 1915, under the Defence of the Realm Act, when cave dwelling was strictly prohibited . possibly due to fires in coastal caves attracting the attention of enemy submarines. Before this time, many caves appear to have been used on a regular, but intermittent basis by some travelling people, possibly confining their movements to traditional, or ancestral, areas within which caves and rockshelters were known and used. Caves appeared to have been used for temporary residence and storage, and while residence is the most common use, it is obvious that many travellers were also itinerant craftsmen . essentially tinsmiths and basket-makers . and so were used as workshops as well as homes. Ethno historians have commented on the level of spatial organization within these caves including rudimentary furnishings, hearths, bedding, screens and windbreaks; the latter including low stone walls

- 8.3 The evidence we have recovered for the earlier periods of activity, in particular the medieval period, are more difficult to define. A lack of artefacts suggests that people either carried the tools and other equipment away with them from the caves for use elsewhere; or that cave function was based around very basic subsistence activities, storage, or as fugitive hideaways! And while the lack of artefactual material continues into the Early Medieval period, we have at least found good evidence for metalworking on a small scale in three of the four caves investigated at Learnie. And although we still await radiocarbon dates to confirm the date of metalworking activity in Learnie 1B and Learnie 1A, this activity appears to take place early; as was the case in Learnie 2B. It is also obvious that after the metalworking ceased, temporary occupation continued in all three caves during the Early Medieval period . although it is difficult to tie-down function to anything other than general subsistence.



Plate 40: People in Tinker's Cave, Wick during the early 20th century (The Johnston Collection/Wick Society)

- 8.4 Did these caves function as craft workshops during the Early Medieval period, with connections to the emerging power centre at Rosemarkie? Interestingly, the excavations at Caird's Cave by Maclean and Hall during the early 20th century, and later excavations by the Rosemarkie Caves Project in 2010, failed to find any specific evidence for metalworking; but it appears that the cave had been used for manufacturing objects in antler and bone. An important ecclesiastical site was eventually established in Rosemarkie and could have provided a central authority to control and direct elite skills and industries such as metal-working. Martin Carver's excavations at Portmahomack have provided

substantial evidence to suggest that these power centres were also the venues for major industrial and craft activities. Otherwise, were the caves being used by travelling itinerant craftsmen, in much the same way as during the post-medieval period? Whatever the case may be, caves are liminal and dark places and there is a growing awareness that these special natural locations in the landscape were selected for a whole range of activities in the past including craft working and metalworking. Metalworking in particular was viewed as a powerful and magical process . one befitting an unusual venue that served to highlight specialised and elite skills.

- 8.5 Connections between metalworking and burial practices (in our case with regards to the execution and deposition of Rosemarkie Man in Learnie 2B) have been identified at other late prehistoric sites in Scotland, such as the burial of a woman placed below the slabbed floor of a metal and craft-working structure at Mine Howe in Orkney. Many of the earliest burials recorded on monastic sites such as Whithorn, the Isle of May, Portmahomack, Govan, and St Andrews Kirkhill have also been linked with craft working and industrial activity - especially metalworking. Some of their burials were inserted into craft-working areas at these important centres. The discovery of such a complete skeleton from the Early Medieval period is rare, especially beyond burial complexes such as those recorded at nearby Portmahomack and Balintore. This man's death, whether brutal murder or a selfless act of sacrifice for the good of the local community, provides the potential to investigate a narrative associated with Late Iron Age and Pictish cultural traditions, and the arrival of Christianity.
- 8.6 And, it perhaps should be no surprise that we have since found what can only be described as some quite unusual animal deposits, both in Learnie 2B and Learnie 1B. The surprise discovery of the juvenile calf burial in the back of the former cave, overlying the natural sand and bedrock, below later midden and hearth layers, caused speculation for the archaeologists. An unusual burial of a young cow, showing minimal butchery and deliberate placement below a stone setting, appeared to display similar characteristics to the unusual burial of Rosemarkie Man, who was also placed on the natural sand/bedrock and had associated with him the butchered bones of the main meat-bearing limbs from at least eight cows and the scapula and tibia from a horse . possibly the remains of a feast to mark the death of the individual. The remains of the articulated juvenile cow were found just 1.5 metres away from the pit containing Rosemarkie Man. And during the excavations in Learnie 1B we have recovered the horse skull and articulated vertebral column, along with other semi-articulated and disarticulated animal remains . most of which appear to be from horse and cattle. The additional evidence for the poleaxing of the horse (**Plate 17**) is also intriguing considering the trauma inflicted on Rosemarkie Man.
- 8.7 The significance of horse bones in particular has been noted at a number of cave sites in Europe spanning the Iron Age and Early Medieval periods. With their associations with kingship, nobility, warfare, transport and economic use, the evidence for horses as cult-animals may be traced back as far as the Bronze Age. Both horse and human-horse burials are linked to non-Christian burial and sacrificial practices of the Iron Age and Early Medieval period and are particularly associated with Anglo-Saxon and Viking Britain. At Cloghermore Cave in Ireland, the excavators recovered butchered horse bones which most likely formed part of a ritual feast associated with Hiberno-Scandinavian human burials; and also included evidence for the dismemberment of horses before placement of parts of the skeleton in the cave. The burial of parts of horse are known from some Swedish Viking sites, and a selection of bones, mostly comprising skulls and extremities, was often included with human burials (Connolly *et al* 2005, 74-8).
- 8.8 The archaeological evidence based on the stratigraphy alone in Learnie 1B is not conclusive regarding the date when these animal remains were interred in the cave. The majority of the well-preserved animal bone was recovered from the significant stone infill context in the cave, which we initially thought may have formed some type of levelling deposit . placed at the end of the Early Medieval activities, within the subsequent Medieval period, or even before activities resumed in the cave during the Post-Medieval period. However, the Early Medieval floor horizon onto which this raft of stone had been deposited was already quite level, so why go to the effort of importing this large amount of stone into the cave? In many ways, significant deposits of material such as this, especially

containing increased numbers of artefacts or well-preserved or unusual animal bone deposits (as in this case), hark back to activities that are being increasingly recognised on prehistoric sites including High Pasture Cave and the Fiskavaig Rockshelter, Skye, or at Howe in Orkney (Birch *et al* in press; Waddington 2014). At these sites, the deposits appear to be associated with closing events, marking significant passages in time in the sites' complex biographies. In the case of Learnie 1B, did this significant stone deposit and the animal bone it contained, mark the closure of the Early Medieval occupation horizon in the cave, including the burning down of the wooden structure it contained? Radiocarbon dating of bones from the calf burial and the articulated elements recovered from the extensive stone layer in Learnie 1B will be a priority in the post-excavation programme.

- 8.8 The excavations conducted in the Rosemarkie Caves in 2018 will conclude the extensive fieldwork phase that has been running since 2006. Future work will include bringing together and finalising the post-excavation analysis of recovered data and materials, before moving forward to publication. The publication will also include the re-analysis and interpretation of the archive associated with the Maclean and Hall excavations carried out between 1907 and 1912 at Cairns Cave (which were never published), with input from Trevor Cowie and Hugo Anderson-Wymark from National Museums Scotland.



Plate 41: Penknives with antler and bone handles and knife handle fragment from Learnie 1A and 1B caves (SF347, SF281, SF353 and SF33)



Plate 42: Elements from oil or paraffin lamp (top) and remains of bulkhead clock or clinometer (bottom – SF417) Learnie 1B and 2B caves

9 REFERENCES

Anderson-Whymark, H 2011 *Excavation at Caird's Cave, Rosemarkie, 2010: Data Structure Report*

Armit, I., Schulting, R., Knusel, C.J. & Shepherd, I.A.G. 2011 'Death, Decapitation and Display?: The Bronze and Iron Age Human Remains from the Sculptor's Cave, Covesea, North-East Scotland' *Proceedings of the Prehistoric Society* 77, pp. 251-78

Birch, S. and Peteranna, M. 2017 *Rosemarkie Caves Project Data Structure Report 2016: Archaeological Excavation in Learnie 2B*. Unpublished report

Birch, S. and Peteranna, M. 2018 *Rosemarkie Caves Project Data Structure Report 2017: Archaeological Excavation in Learnie 1A/1B and 2B/2C*. Unpublished report

Birch, S., Cruickshanks, G. and Mackenzie, J. (in press) *High Pasture Cave: Ritual, Memory and Identity in the Iron Age of Skye*. Oxbow Books

Chartered Institute for Archaeologists (CifA), 2014 *By-laws of the Institute for Archaeologists: Code of Conduct*. Reading: CifA

Connolly, M., Coyne, F. and Lynch, L.G. *Underworld: Death and Burial in Cloghermore Cave, Co. Kerry*. Wordwell Ltd, Bray, Co. Wicklow, Ireland

Dowd, M. 2015 *The Archaeology of Caves in Ireland*. Oxbow Books

Gunn S. and Wood J. 2008 *Community Archaeology Project, Learnie Caves 2006: Summary Report*. Highland Archaeology Services, unpublished report

Gunn, S. and Peteranna, M. 2016 *Rosemarkie Caves Project: Programme of Archaeological Survey and Test Pitting in 2011-2015*

Highland Council 2012 *Standards for Archaeological Work*, v.1
[Http://www.highland.gov.uk/yourenvironment/conservation/archaeology/developmentguidance.htm](http://www.highland.gov.uk/yourenvironment/conservation/archaeology/developmentguidance.htm)

Kennedy, K 2018 *Rosemarkie Caves Project - Animal Bone Report*. Unpublished report

Waddington, K. 2014 'The Biography of a Settlement: An Analysis of Middle Iron Age Deposits and Houses at Howe, Orkney' *Archaeological Journal*, 171: 1, 61-96

Wood J 2008 *Community Archaeology Project, Learnie Caves 2006: Summary Report*. Highland Archaeology Services, unpublished report



Plate 43 – Post-holes and post-pads defining structure in Learnie 1B during Early Medieval use - Phase 1a (Photogrammetry model by James McComas)

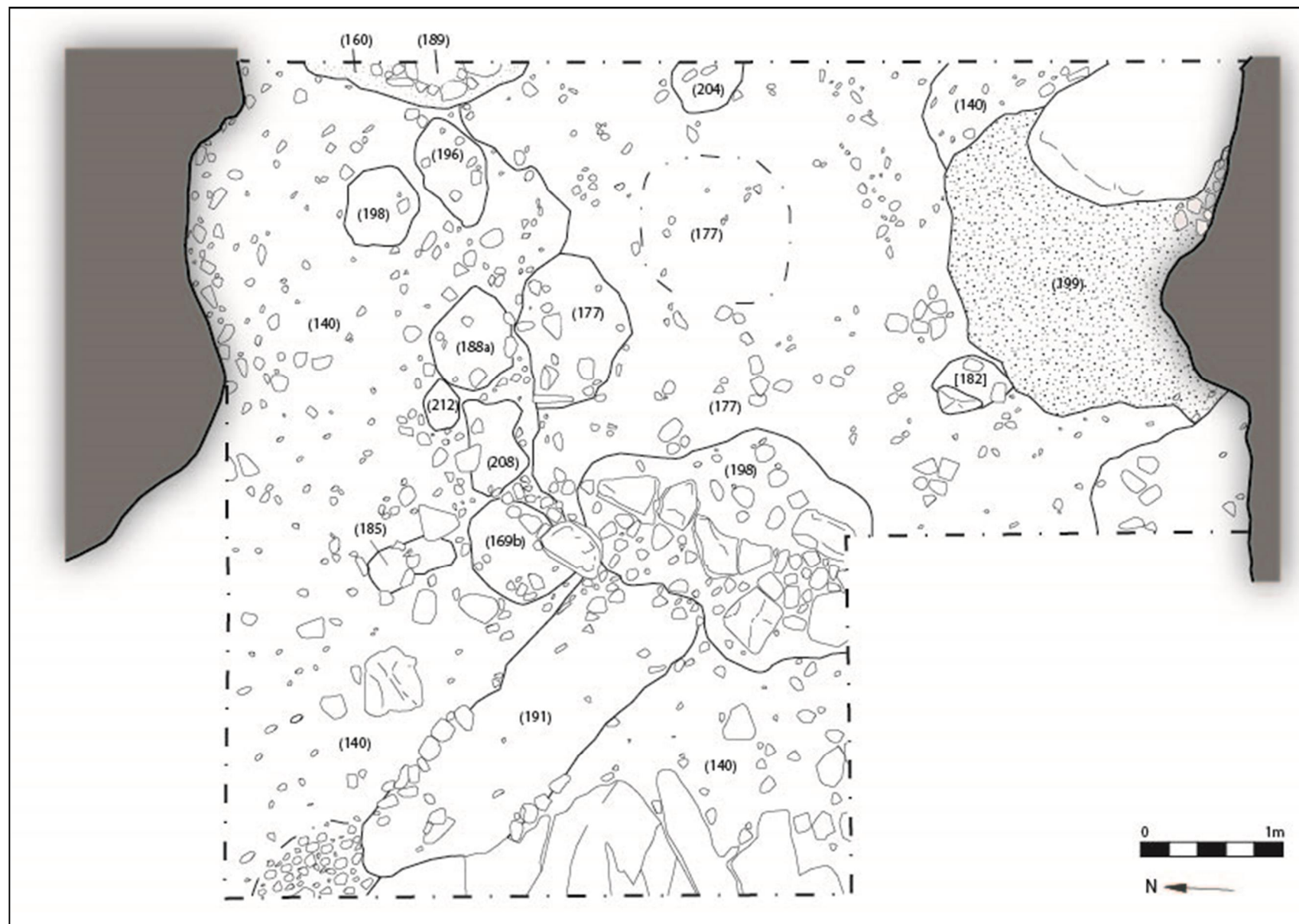


Figure 7: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 1b



Plate 44 – Phase 1b Early Medieval floor horizon in Learnie 1B (Photogrammetry model by James McComas)

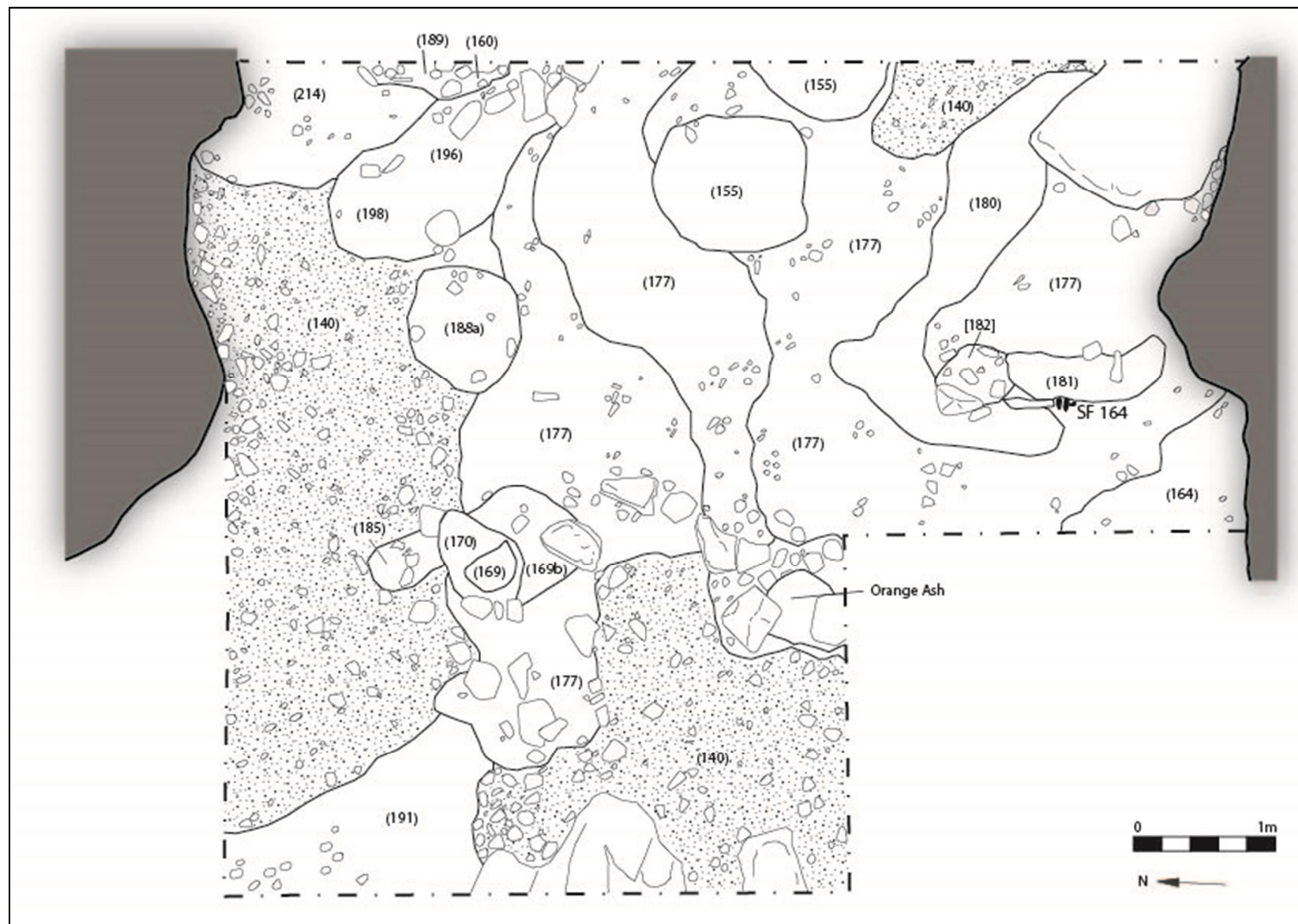


Figure 8: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 2a

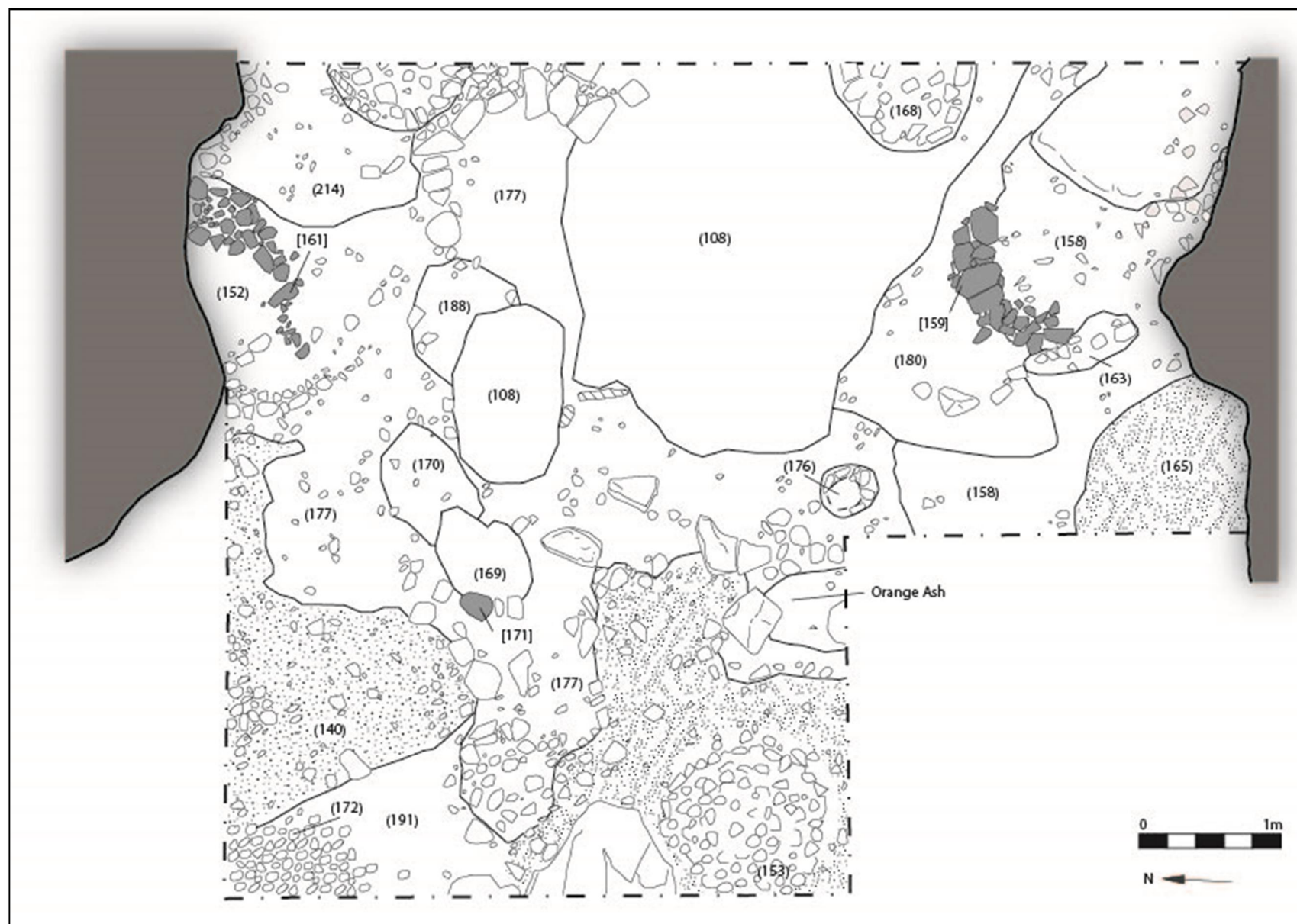


Figure 9: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 2b



Plate 45 – Phase 2b Early Medieval floor horizon in Learnie 1B (Photogrammetry model by James McComas)

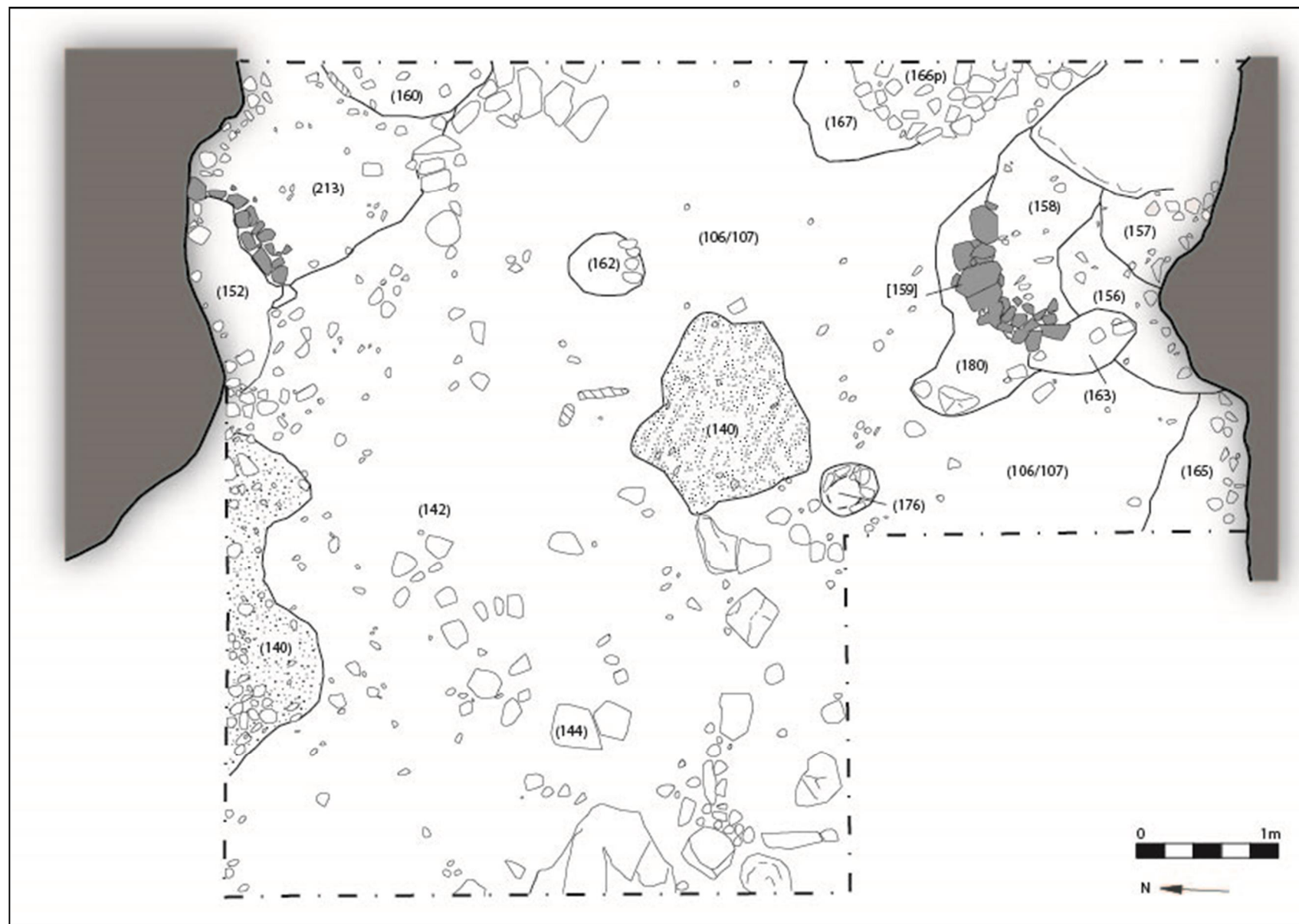


Figure 10: Mid-excavation plan of the trench in Learnie 1B showing Early Medieval deposits and features in Phase 3

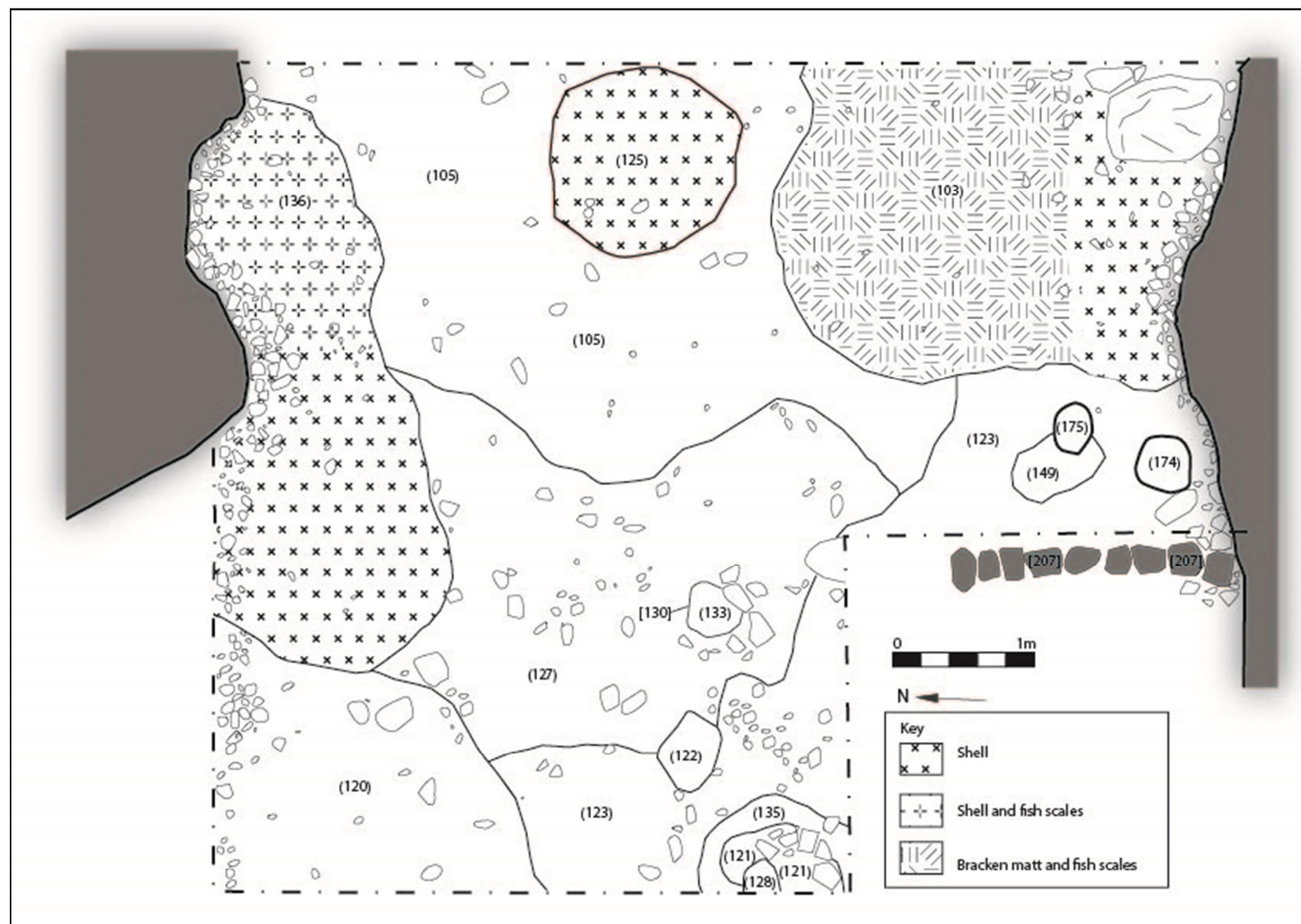


Figure 11: Mid-excavation plan of the trench in Learnie 1B showing Post Medieval deposits and features in Phase 6a

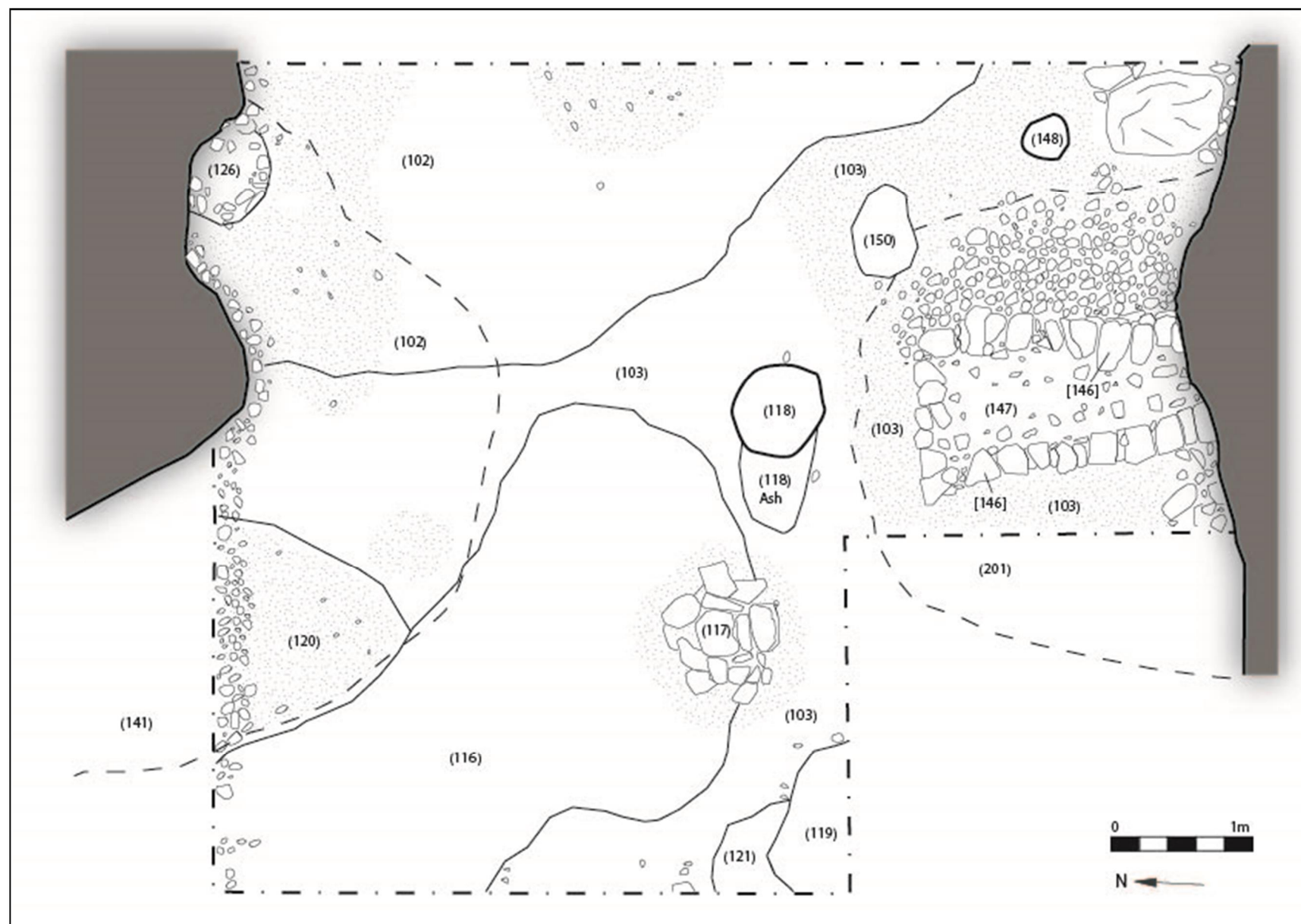


Figure 12: Mid-excavation plan of the trench in Learnie 1B showing Post-Medieval deposits and features in Phase 6b/c

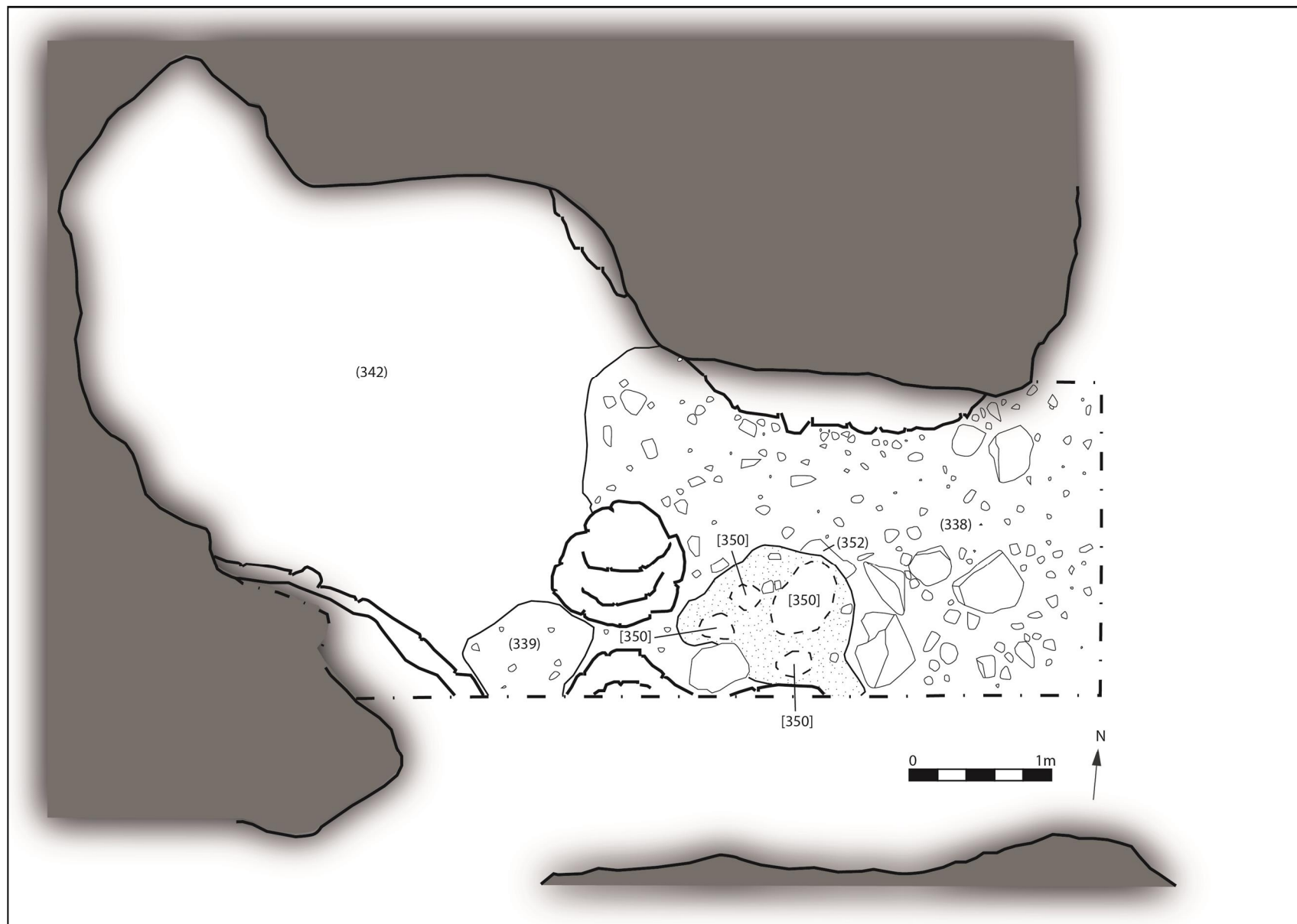


Figure 13: Mid-excavation plan of the trench in Learnie 1A showing Early Medieval deposits and features in Phase 1 including smithing hearth (350)

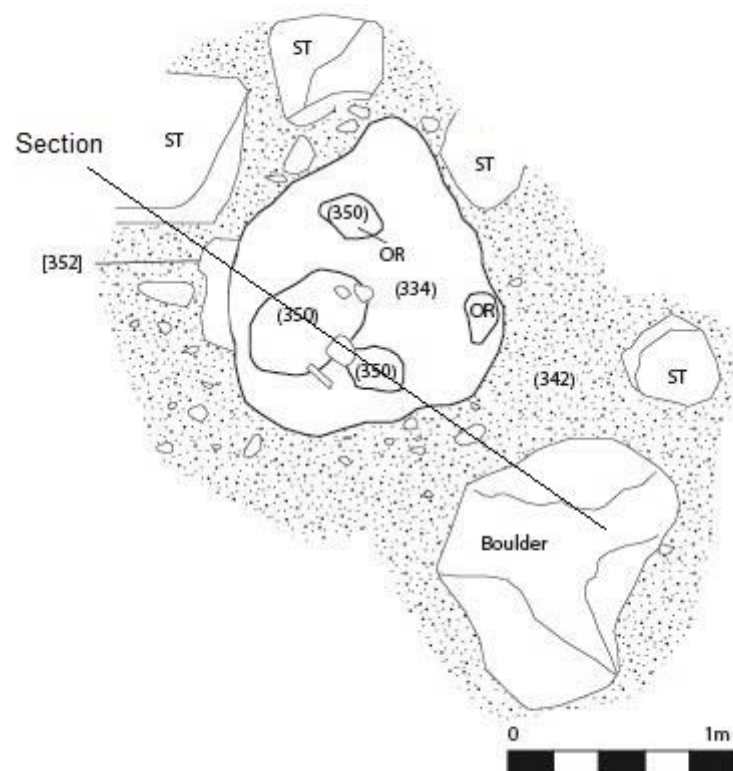
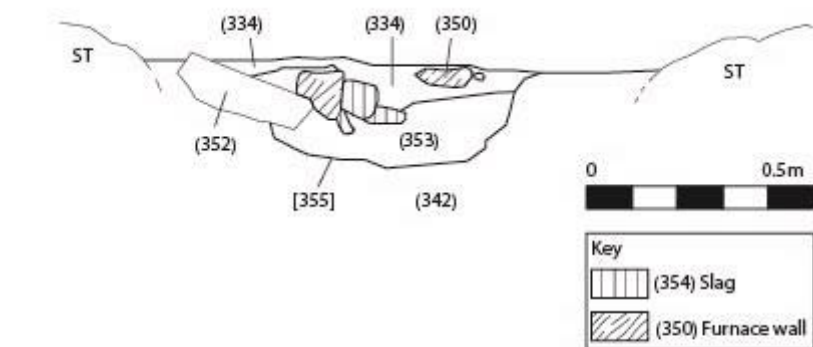


Figure 14: Pre-excavation plan and NW-facing section through smithing hearth in Learnie 1A



Figure 15: Mid-excavation plan of Early Medieval floor deposits and features in Learnie 1A – Phase 2

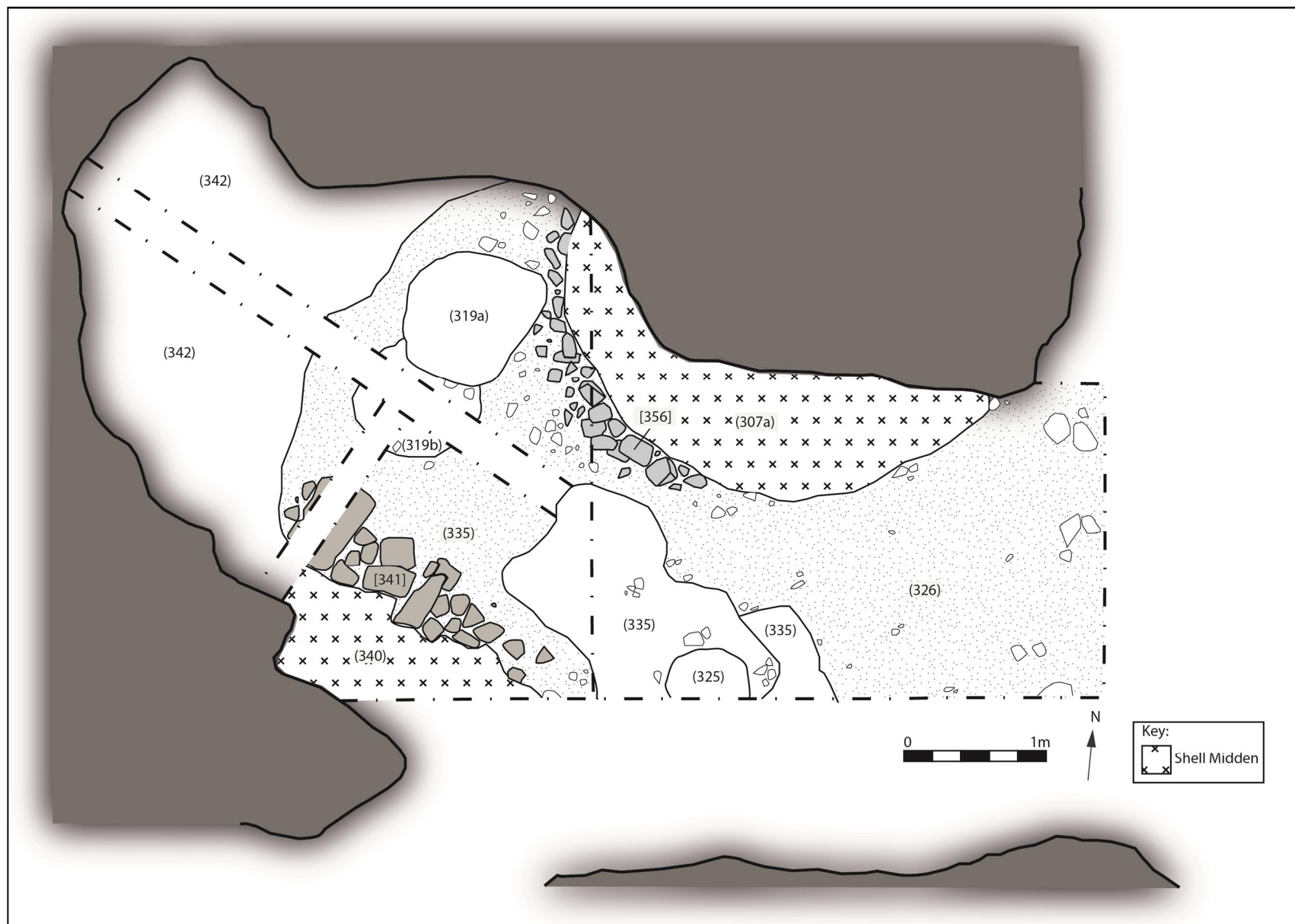


Figure 16: Mid-excavation plan of medieval floor deposits and features in Learnie 1A – Phase 3

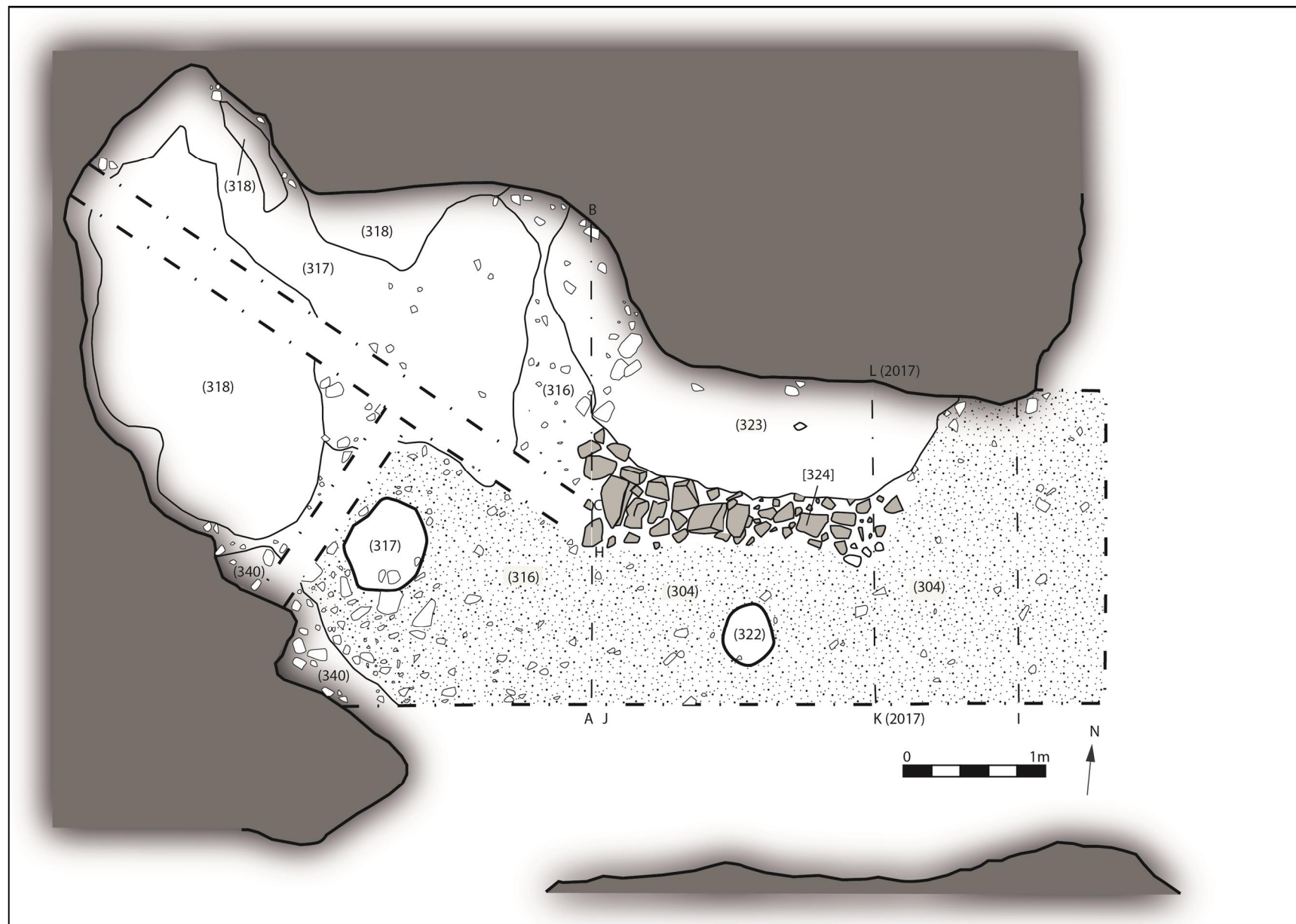


Figure 17: Mid-excavation plan of Post-Medieval floor deposits and features in Learnie 1A – Phase 4a

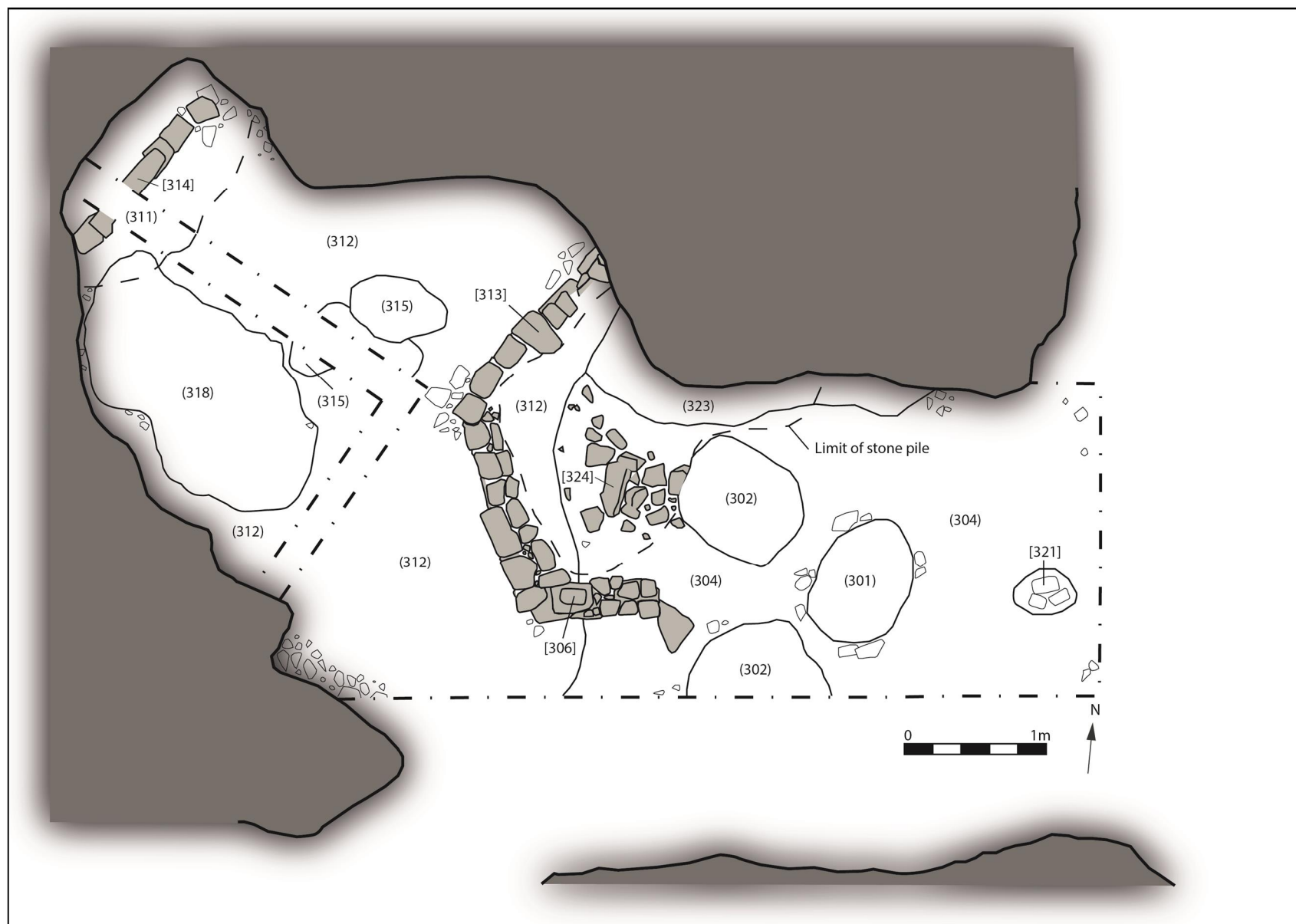


Figure 18: Mid-excavation plan of Post-Medieval floor deposits and features in Learnie 1A – Phase 4b/c

Appendix 1 List of Contexts by Phase

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
Learnie 1A							
Phase 4c		Post-Medieval Activity – Tinkers/Travellers and Recent Use					
300	Deposit	Slightly sandy silt, upper most horizon of trench. Towards back of cave amount of midden increases including shellfish and animal bone, and glass, ceramics and metal objects	-	301, 312			Final activity and abandonment /post-abandonment deposits
303	Deposit / Structure?	Mound of stone fragments below overhang of cave wall; stone is mix of angular talus and fragmentary stone, as well as some rounded beach cobbles. Abuts 306 to the south side	-	306			Stone clearance from cave floor masking underlying stone wall (306) / (313)
311	Deposit / Structure?	Small to medium-sized angular stone shatter, deposited in alcove in NW corner of inner cave chamber, as a dark brown gritty matrix. The matrix increases with depth in the deposit and context includes post-medieval glass, ceramics, animal bone and shellfish	-	312, 318			Stone clearance from cave floor masking underlying stone wall (314)
Phase 4b		Post-Medieval Activity – Tinkers/Travellers					
301	Deposit	Small ash spread, about 1m x 0.8m NNE-SSW aligned. Partly covered by trench edge.	300	304			Small fire/hearth, c. late 19/20th century
302	Deposit	Matted bracken WSW of fireplace 301. Possibly a bed/mat. Degraded, 1.25m x1m. N-S aligned.	300	304			Bracken mat/floor surface c.19/20th century use
312	Deposit	Post-medieval cave floor deposits comprises a dark brown gritty sediment containing some bone fragments, shellfish, glass and ceramics	300, 311	316, 317			Post-medieval floor in back chamber of cave
315	Deposit	Sub-circular spread of black, charcoal-rich ash and pale	312	316			Spot-fire/hearth setting

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		cream/grey wood ash lies at base of context (312). Located roughly in centre of back chamber of cave					
313	Structure	Located under stone pile (303) is a drystone revetment wall up to four courses high and with a rubble core. Wall runs NE-SW from cave wall for approx. 1.8m before turning at right angles to ESE. The feature may form a revetment for the stone pile (303), but is certainly forms a division of space guiding people into the back chamber of the cave and providing a barrier from the outside	303	316			Division wall of post-medieval date
306	Structure	Double faced wall of fairly large angular stone and with rubble core, aligned ESE-WNW. Butt-ended at the ESE	303	316			Low wall is continuation of (313)
314	Structure	Short fragment of drystone wall blocks off alcove in back chamber of cave. Single skin surviving up to two courses high. Shell midden deposited in alcove and retained by wall	311	318			Post-medieval division wall
321	Structure	Three fire-cracked angular stone slabs on surface of (304) measures approx. 0.5m across with slabs >80mm thick, forms hearth setting at entrance to cave. Small amount of grey to black ash overlying hearth	303	304			Hearth setting
Phase 4a		Initial Post-Medieval Activity – Tinkers/Travellers					
304	Deposit	Mid brown sandy silt	301, 302	308			Redeposited midden
317	Deposit	Oval-shaped deposit of buff to cream-coloured wood ash, with halo of black charcoal-rich material,	312	316			Fire spot/hearth setting

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		forms a spot-fire/hearth setting in the back chamber of the cave. Located on surface of context (316), with patch of compacted beach cobbles and angular stone fragments on the S to SW side					
318	Deposit	Patches of relatively clean sand with some small angular stone chips is located in SW side of inner chamber of cave. Levelling material.	312, 317	336, 342			Sand levelling layer in back chamber of cave
316	Deposit	Mid-brown sandy floor horizon is mottled with darker organic-rich material. Some small stones running through context and some cleaner sand patches showing around edge of cave walls. A few shells within context	301, 312, 313	317, 320			Occupation horizon/floor, or redeposited midden
305	Deposit	Grey white mottled ash	304				Thin ash lens, probably 19/20th century fire (same as 322)
322	Deposit	Spot-fire in centre of outer cave comprises white wood ash within a charcoal-rich black halo. Measures 0.5m E-W by 0.6m N-S and deposit is > 50mm thick	304	308			Spot-fire / hearth setting
308	Deposit	Mid brown-grey silty sand with 60% shattered stone. 0.3-0.4m deep	304	307			Cave wall/ceiling collapse/shatter
320	Deposit	Mid-brown gritty sand forms a floor horizon and contains some sand patches and angular stones . these increasing to the SSW	316, 319	335			Floor deposits in cave
323	Deposit	Midden deposit located in NNE half of outer cave, under projecting rock overhang, comprises shellfish, fish bone and fish scales. Midden is retained by	304, 316	307a			Redeposited midden

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		rough alignment of boulders (324)					
324	Structure	Rough alignment (WNW-ESE) of angular stones defines and retains midden deposits (323), with trampled floor deposits of (320) and (308) to SSW	303, 304, 316	356, 307a			Dividing / retaining wall within outer cave
Phase 3		Medieval Activity					
307a	Deposit	Mid grey brown sandy silt, few small stones and some large. Rich in shellfish and ash with mainly limpet (95%), rare whelk and occasional wrinkle (5%) and some mammal bone mostly at top of layer. Some fragments of charcoal and occasional large chunks and lenses of ash and midden very loosely compacted. 1 x fragment of probably medieval pottery (SF158) recovered from this	323, 308	307b, 309			Archaeological layer - build-up of midden thrown to side of cave and retained by rubble stone alignment
325	Deposit	Spot-fire/hearth located in SSW side of outer cave measures 0.6m in diameter and comprises pale cream-coloured wood ash and a black, charcoal-rich halo. Deposit >60mm thick	308, 316	326, 335			Spot-fire / hearth setting
326	Deposit	Trampled floor deposits accessing inner cave >60mm thick lenses out between shell midden dumps to NNE. Comprises mid-brown silty sediment with a few angular stone clasts. Deposit appears quite sterile and may have been introduced to form a clean floor. Deposit abuts context (335) moving deeper into the cave	308, 316	307, 336			Redeposited material to form floor (same horizon as 335)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
335	Deposit	Mid-brown to black gritty sediment containing intermittent wood ash and black charcoal-rich lenses of material. Also contains some shell and small angular stone fragments. At SSW end of deposit in section, the deposit is split by two grey ash lenses, which merge into a single black charcoal-rich lens	320, 307a, 356	336, 328			Floor horizon within outer cave chamber - same as (326)
309	Deposit	Light grey ash deposit, very fine, including rounded stones 2-10cm long and some angular stone. Some animal bone and occasional shell.	307	310			Mixed ash and midden deposit . same as (335)
328	Deposit	Abutting slabs/stone blocks on N side of outer cave is a mixed midden deposit comprising shell and animal bone, fish bone, some angular stone and a number of blackened beach cobbles. Matrix is very dry silt and contains some charcoal lumps	307, 335	329, 336			Midden deposit and possible floor horizon
319	Deposit	Spread of pale grey to black wood ash 1.6m NE-SW by 1.2m NW-SE, forms remains of major hearth within cave that was in use over a considerable period of time (medieval). Context split into upper (319a) and lower (319b) spits	316, 335	320, 336			Hearth within cave
356	Structure	Ephemeral boulder wall aligned NW-SE retains midden 307a (located to the NE). Context (320) abuts the SW side of the feature. Wall feature (324) was built over top of this structure maintaining the revetting of the accumulating midden	324	335, 307a			Wall retaining midden
Phase 2		Early Medieval Activity					

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
327	Deposit	Located on SSW side of outer cave is area of shattered stone slabs/blocks pitched at angles, is major collapse of cave roof material. With some voids between slabs, the context overlies and seals the Early Medieval occupation horizon and possibly resulted in the abandonment of the cave at this time	307a, 335	336			Roof collapse and shatter onto Early Medieval deposits
307b	Deposit	Located under low overhang on NNE wall of cave is an midden comprising mid grey to brown sandy silt, with a few small and larger stones. Rich in shellfish and ash with mainly periwinkle (95%), rare whelk and occasional limpet. Some fragments of charcoal and occasional large chunks and lenses of ash and midden very loosely compacted. Merges with shell midden (307a) above and is defined/retained on SSW side by ephemeral wall (343)	307a	343, 342			Redeposited shell midden under low overhang
340	Deposit	Discrete shell midden mirrors cave wall on SSW side and is defined by division wall (341). Midden starts to form during Early Medieval use of cave and continues through to medieval period	312, 317	338			Shell midden
310	Deposit	Compacted ash deposit, nearly white in colour with occasional fragments of charcoal and rounded small stones 1.5-8cm long embedded in it.	309	338			Ash deposit . deriving from hearth (331)
330	Deposit	Compact circular-shaped pad of grey to black wood ash with	329, 336	329, 336			Hearth

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		charcoal flecks lies within context 329 (336) and measures 0.6-0.7m in diameter. Shell midden and black ash surrounding hearth deposit, and including some blackened beach cobbles					
329	Deposit	Midden deposit including shellfish, fish bone and small animal bone fragments underlies fallen roof collapse (327) and midden (328). Contains some black charcoal-rich ash patches and small angular stones/shatter	335, 327, 319	331, 337			Floor horizon - same as (336)
336	Deposit	Mid to light brown gritty sediment containing angular stone fragments, some beach cobbles, shellfish and charcoal flecks. Contains a thin lens of grey wood ash and a black charcoal rich horizon which merges into stone and shell midden	335, 327, 319	331, 337			Floor horizon - same as (329)
337	Deposit	Thin (>20mm thick) orange/brown lens of material runs off hearth deposit (331) and contain two small fragments of vitrified smithing furnace lining. May contain some iron pan, but is contemporary with last stages of metalworking horizon	336, 343	338, 342			Floor horizon, same as (332)
332	Deposit	Floor horizon contemporary with hearth (331) and (337) is mid-brown gritty sediment containing some angular stone and beach cobbles, shellfish and small bone fragments. Deposit is drier and more silty to NNE under projecting overhang	329, 336, 331	338, 342			Floor horizon, same as (337)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
331	Deposit	Roughly circular spread of light grey to black wood ash (with black halo) is located on floor surface and measures 0.7m diameter and >60mm thick. Hearth setting containing some charcoal, shellfish and animal bone	329, 336	337, 338			Hearth
341	Structure	Stone division /revetting wall is roughly built with angular stones and beach cobbles and is aligned NW-SE mirroring cave wall. Up to three courses high, the wall also includes a large boulder. Shellfish deposited on SW side of feature	312, 317	338			Division / revetting wall
343	Structure	Located in alcove on NE side of cave is a degraded stone rubble wall comprising angular stone and aligned NW-SE. Surviving up to 0.25m high, the alcove behind comprised a shell midden	307, 307b	337, 342			Division / revetting wall
Phase 1		Early Medieval Activity – Metalworking and first occupation deposits					
333	Deposit	Mid to light brown gritty sand containing rounded cobbles and some angular stone. Dirty sand containing some shell and charcoal flecks, and hammerscale.	337, 331	342			Metalworking horizon . earliest activity in cave and same as (338)
338	Deposit	Occupation horizon sandwiched between ash lenses (331) and (339) is a mid-to dark brown gritty sediment containing small angular stone fragments, and some shellfish. Contains hammerscale and is contemporary with smithing activities					Metalworking horizon . earliest activity in cave and same as (333)
339	Deposit	Mix of ash and shellfish midden dips away to the south from just behind the	338	342			Earliest midden deposits in cave and contemporary

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		metalworking structure (351)					with Metalworking horizon
334	Deposit	Black, charcoal-rich gritty silt containing charcoal, Hammerscale and furnace wall fragments. Forms oval patch 0.8m SW-NE by 0.6m NW-SE.	332, 337	333, 351, 352, 353			Upper deposits covering smithing hearth and metalworking horizon
350	Structure	Fragments of vitrified smithing hearth (lining) from hearth (351),	331, 336,	353, 342			Fragments of vitrified smithing hearth lining
351	Structure	Remains of smithing furnace comprising elements (350), (352), (353) and (354)	331, 336, 334	353, 355, 342			Smithing furnace in basal cave deposits
352	Structure	Flat stone slab located on E side of smithing furnace is possible anvil. Comprises a heavily burnt and heat-fractured slab of psammite	334	355, 342			Stone anvil slab from smithing hearth (351)
354	Structure	Slag deposits associated with smithing hearth (351) may also contain hearth base fragments. Some slag fragments may also comprise part of the hearth wall/lining as they are attached to vitrified ceramic	334	353, 355			Slag deposits associated with smithing furnace (351)
353	Deposit	Lower fill of pit forming base of smithing hearth is a mid-brown to black silty sediment containing some charcoal, small slag fragments, vitrified furnace lining and fragments of hearth base. Contained within cut (355)	334, 351	355, 342			Lower fill of smithing hearth pit
355	Cut	Cut of pit containing smithing hearth is a roughly circular hollow 0.37m diameter and 0.12m deep and has steep to shallow sides, with stone anvil slab (352) set into the E-ESE side. The pit for the hearth is	334, 351	342		334, 350, 351, 352, 354	Cut for pit containing smithing hearth

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		located between bedrock or large stone boulders overlain by the natural sand (342)					
Natural							
342	Deposit	Natural sand in base of cave	343, 341, 355, 338, 318, 317				Natural sand
Learnie 1B							
Phase 6c		Post-Medieval Activity – Tinkers/Travellers and Recent Use					
141	Deposit	Loose stones, closes and cobbles packed in pile inside N side alcove of cave		120, 123			Clearance of stone to the side of the cave
101	Deposit	Upper soil horizon, formed by degraded dung and soil build-up		102			Build-up of dung and silting after cave abandonment
201	Deposit	Pile of small stone chips located against south wall of cave and almost opposing (141) on opposite side of cave. Covers and overruns walls (146) and (207)	-	146, 147, 207			Clearance of stone to side of cave
Phase 6b		Post-Medieval Activity – Tinkers/Travellers					
126	Deposit	Angular stones up to 20cm long, set in a rough circle right up against the alcove wall; no ash or burning layer survives but some chunks of charcoal visible over it	101	102			Hearth setting in NE alcove of cave, within (102) - would be visible to anyone approaching from S
102	Deposit	Fine silty sediment, light brown with small stony inclusions	101	103			Natural silt build-up in cave
145	Structure	Small area of cobbled surface abutting outer, E face of wall 146. Measures 2m by 0.8m in extent and a single cobble thickness	101	103			Cobbled surface

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
146	Structure	Low wall structure built against south cave wall comprises drystone construction up to 4 courses high. Extends 1.8m into cave and is max. 1.2m wide, with squared off end.	201	103		147	Shelter/division wall in south side of cave
147	Fill	Fill of wall structure comprises angular stone rubble, fine silt and some ceramics, glass and iron	201	103	146		
148	Deposit	Circular lens of white wood ash with black halo measures 0.2m diameter and >50mm thick.	102	103			Spot fire/hearth
150	Deposit	Oval-shaped patch of charcoal-rich deposit measures 0.6m E-W by 0.35m N-S and >20mm thick. May be fire-spot/hearth or hearth rake-out	102	103			Spot-fire/hearth or hearth rake-out
117	Structure	Circular setting of large irregular stones with central slab surrounded on S side by uprights - 0.85m NE-SW x 0.6m. "Puss in Boots" mug fragment (SF154) within it the fill from (102)	102	116		102	Fire/hearth 20th century
118	Deposit	Buff-pale orange ashy sandy silt layers with a charcoal lens at base. Overlies floor surface 103	102	103/116			Fire/Hearth-ash
119	Deposit	Buff-pale orange ashy sandy silt layers with a charcoal lens at base. Overlies floor surface 103	102	103/116			Fire/Hearth-ash deposit
116	Deposit	Dark brown organic layer under (101)/102). Butchered animal bone, small amount of shell. At base is vegetation mat which disappears towards cave wall. To the west wide of baulk, probably same as (103)	101, 102	104/120			Bracken mat surface late 19th C.

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
Phase 6a		Initial Post-Medieval Activity – Tinkers/Travellers					
104	Deposit	Light to mid brown fine sediment with small stone inclusions and occasional thin lenses of organic material.	103	105/137			Also excavated in test pit
103	Deposit	Bracken mat layer, same but base of (116), has a thin gravel layer over the top of it, probable beach/shingle gravel brought in to resurface this layer and lower thick organic layer. Within base of context, against south cave wall and extending into main area, is a well-preserved deposit of fish scales. Possibly a one-off event	102	104			Bracken mat surface late 19th C., same as 116
174	Deposit	Circular pad of buff to cream-coloured wood ash with surrounding black halo is 0.4m diameter by 30mm thick. Located against S wall of cave	102	104			Spot fire/hearth
175	Deposit	Oval-shaped pad of pale cream wood ash with surrounding black halo is >0.45m across and between 25-35mm thick. Located 0.3m to NE of spot-fire (174)	102	104			Spot fire/hearth
120	Deposit	Mid brown sand-silt deposit below bracken mat in NW quadrant	103/ 116, 141	127, 131			Silting in back of cave - occupation surface?
122	Deposit	Mixed dark brown-black and mid brown silty ash, part of 123	116	137			Surface with burnt patches from fires
121	Deposit	Pale yellow-brown ashy silt forming the remains of probable hearth/fire	119	122, 123			Base of fire/hearth (119)
128	Structure	Disorganised setting of small stones extending below WSW trench edges; rounded and sub angular stones up to 25cm long and 121 is within and over it;	121	135			Hearth setting - post-medieval

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		measures 0.8m NNW-SSE 0.6m					
133	Fill	Black sandy silt with some charcoal fragments and a few shattered small fragments of stone	116	130	130		Fill of fire pit (130)
130	Deposit	Oval-shaped cut for small pit: 0.6m NE-SW x 0.4m. 0.08m deep, bowl-shaped profile but heavily bioturbated	116	127		133	Fire pit
135	Deposit	Ashy black deposit below hearth setting (128) with charcoal fragment and some fire cracked stone.	128	123			Hearth deposit
123	Deposit	Mid-brown sandy silt extending across the trench; contains sub angular stones about 1-2cm, with some larger; same as 131	116, 122	122, 137			Silting in back of cave - occupation surface?; same as (127)
138	Deposit	Dark brown compact loamy sandy with small gravel and fragments decayed wood	116	137			same as 123
131	Deposit	Dark brown almost black crumbly silt lens with possible windblown sand within it; same as (123)	116	137			Same as (123)?
127	Deposit	Dark brown silt, some organic material and few whelk and limpet shells	116, 120	132, 137			Occupation layer in back of cave, same as (123)
125	Deposit	Mid brown silt with some shell, within top of 105	104	105			Midden deposit?
132	Deposit	Light brown and orange sandy soil in NW quadrant of trench; contains small fragments of broken stones and occasional fire-cracked stone; contains discrete deposit of fish scale in NE corner and some large stones within	127	137			Built-up material near cave walls - cleared out material or occupation debris?
136	Deposit	Large midden consisting of winkles and limpets, small amount of fish bone, rare pieces of animal	141, 120	139			Midden layer- same as/part of 134

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		bone and fish scales on surface					
134	Deposit	Dark brown crumbly loam with some shell and bone fragments near N cave wall in centre of cave	141	139			Midden layer
124	Deposit	Between 103 and 104, lens of dark brown-black burnt silty soil; less than 5cm deep	103	104			Small fire
207	Structure	Roughly-built single skin stone division wall, up to three courses (0.35m high) abuts south cave wall and extends 1.5m into cave. Earlier in date than wall (146)	201	104			Division wall
149	Deposit	Circular lens of pale cream-coloured wood ash with some charcoal flecks is located under cobbled surface (145) and measures 0.25m diameter and >50mm thick	145	104			Spot fire/hearth/ hearth rake-out
Phase 5							
105	Deposit	Mid to light brown silty sediment with small to medium angular stone and round beach pebbles (some fire cracked) small charcoal flecks, some shellfish, some animal bone	104	106			Excavated in test pit, same as (137)
137	Deposit	Stone layer, consisting of a mixture of large beach pebbles, smaller beach pebbles, some large pieces of samite with a matrix of mid-brown silty soil/sand. Contains well-preserved animal bone including articulated horse skull and vertebral column	122, 123, 104	139			Significant stone deposit over top of earlier occupation levels covers entire trench area; same as (105) from test pit
144	Structure?	Two large stones on west side of cobble fill (137)	123	137			Unknown?

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
Phase 4							
154	Deposit	Mid to dark grey silty ash with charcoal flecks and some animal bone, forms a distinct mound that banks up against the south wall of the cave. Covers area approximately 1.5m across and up to a maximum depth of 0.2m	137	156			Significant deposit of ash may have derived from industrious activity in cave
178	Structure	Ephemeral L-shaped stone setting runs at right angles to S cave wall and comprises beach cobbles and angular boulder talus.	137, 154	158			Division / partition
139	Deposit	Dark brown-black-yellow-white ash and sandy silt patches	137, 134	140, 142			Layer over surface (142/106)
129	Deposit	Mid brown silt with some intact whelk and limpet shell, within bounds of the cave alcove in the NE corner of trench; probably part of (106) but a discrete midden deposit?	102	106			Midden deposit within the surface of (106)
143	Structure?	Disorganised possible stone rubble wall in NE alcove-encloses (129)	102	106			Rubble wall?
151	Deposit	Mid-brown gritty silt within SE corner of cave, thickest under E baulk and lenses out onto surface of 106/107. Some shellfish present in deposit at interface with (137) above	137	106/107			Occupation deposit. Possibly same as (129)
179	Deposit	Located adjacent to S wall of cave under overhanging projection is a loosely compacted grey to mid-brown gritty sediment containing angular stone, periwinkle shells and well preserved animal bone.	137, 158	106/107			Redeposited midden

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
Phase 3							
176	Structure	Small hearth setting located in NW corner of trench extension comprises small arc of stones forming a setting on the NE side. Within setting was a bowl-shaped hollow 0.22m in diameter filled with a bright orange ash >20mm deep. Underlying this was a lower black silty ash >50mm deep	139	106/ 107			Small hearth setting
106 / 107	Deposit	Loosely compact, dark brown silty sediment with small shell fragments, animal bone and charcoal flecks. Contains angular fire-cracked stone. Difficult to distinguish between 106/107. A black charcoal rich lens with heat affected angular and cobble stones and deposits of shellfish was contained within it. SF204 (iron ingot?) retrieved from this.	105/ 137	108, 140			Floor surface, same as 142
142	Deposit	Compact dark brown greasy silt over embedded cobbles. Compact floor. 106 is in N 1/2 of trench, excavated as both 106 and 107 as difficult to distinguish	139	140			Floor surface, contemporary or part of (106/107)
213	Deposit	Located in NE corner of trench is shell midden with periwinkles and limpets. Loosely compacted and with a fine silt matrix and some stone content	129	214, 215			Shell midden
156	Deposit	Located under overhang against S cave wall is localised patch of gritty brown sediment containing a little shell and animal bone	154	157, 199			Midden deposit

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
157	Deposit	Lens of light orange to grey ash has distinct outline, but is only 40mm deep. Contains some degraded shell and is located in south side of trench against cave wall	154	158			Ash lens may be rake-out from hearth
163	Deposit	Bright orange localised area of ash abutting W side of stone setting (159)	106/ 107	177, 180			Localised ash deposit
162	Deposit	Oval area of pale cream to orange ash located roughly central in cave, measures 0.6m across and is >40mm thick. The deposit is flanked by an alignment of burnt beach cobbles on the S side	165	108			Possible hearth setting
167	Deposit	Rake out from hearth (166) comprises orange ash extending to 0.53m across and containing some charcoal flecks and burnt shell. Originally identified as a hearth	106/ 107	168, 108			Rake out from hearth (166)
166	Structure	Hearth setting within E baulk of trench is roughly circular and measures 0.95m N-S and extends 0.6m into trench. Edged with small stones and containing some stone slabs and pale grey wood ash	106/ 107	168, 108			Hearth setting
Phase 2		Early Medieval Activity					
152	Deposit	Shell midden deposit located in alcove in N wall of cave and retained by wall (161)	134	140			Shell midden
161	Structure	Roughly built stone setting aligned SW-NE closes off alcove in N wall of cave and contains shell midden (152)	152, 134	140		152	Retaining wall
159	Structure	Roughly built arcing stone setting, partially closes off area under overhang on S side of cave. Aligned SW-NE, the structure is up to	154, 156	158			Retaining / enclosing wall

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		two courses high (0.35m), two stones wide (>0.40m) and 0.8m long					
108	Deposit	Dark brown/black charcoal-rich surface, patchy and very compacted. White ashy patches mixed with heat cracked slabs. Black and yellow compact lenses come out, surface rising towards north. Extends across half of the W side of the trench. Contained some animal bone.	106/107	180, 155			Extensively burnt surface with probable hearth settings - not excavated but top of layer where excavation stopped in 2017 - early medieval or earlier?
180	Deposit	Pale grey to buff wood ash deposits located in SE corner of trench extends SE-NW, is intermittent, but >20mm thick in places	106/107, 108, 168	177, 154			Redeposited ash
214	Deposit	Located in NE corner of trench and butting up against N wall of cave, are lenses of black, charcoal-rich silty ash containing some shell and burnt shell, and a layer of heat-fractured pebbles	129, 213	215			Redeposited ash and midden
181	Deposit	Buff to yellow compact ash deposit extends south from large beach cobble used as packing in post-hole (182). Deposit is max. 0.4m wide and 1.1m long and >50mm thick. Three fragment of hearth smithing base/slag found at W edge of deposit, where a linear black halo abuts (181)	154	199			Ash deposit with slag
182	Fill	Mid to dark brown silty ash deposit fills post-hole (183), with small stones, animal bone and fish bone	154	183	183		Deposit filling post-hole after it had gone out of use/post had been removed
185	Fill	Fill of post-hole cut (186) is oval-shaped patch of mid-brown gritty sediment with some charcoal flecks,	106/107	186, 140	186		Fill of post-hole (186)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		fragments of animal bone and small angular stones, while a larger stone to one edge may be a packing stone					
188	Fill	188a . Upper fill of post-hole (195) is mid to dark brown silty sediment with some ash content, small angular stones and beach cobbles and some stones at edge angling down into feature. 188b . Lower fill of pit containing post-pipe (195) is mid brown to grey ashy silt with charcoal flecks and small fragments of bone	106/ 107	195, 140	195		Fill of post-hole (195)
189	Fill	Underlying hearth feature (160) is complex fill of post-hole (190). Upper fill (.0.1m deep) comprises burnt red sandstone slabs from hearth, while lower fill is mixed sand and ash with some charcoal flecks. Upright stone slab on west side may be packing stone in fill	106/ 107	190, 140	190		Fill of post-hole (190)
196	Fill	Fill of small post-hole comprises a grey ash, silty sand with charcoal flecks	106/ 107	197, 140	197		Fill of post-hole (197)
208	Fill	Fill of small post setting (207) is dark brown silty sand with small stones, charcoal flecks and small fragments of animal bone	177	207, 140	207		Fill of post-hole (207)
210	Fill	Fill of post-hole (209) is mid-brown to black silty sand with small stones and charcoal flecks. Underlies small hearth setting (200).	177	209, 140	209		Fill of post-hole (209)
212	Fill	Fill of post-hole (211) comprises mid-brown to grey silty sand with some ash content and small charcoal flecks	177	211, 140	211		Fill of post-hole (211)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
160	Structure	Arcing area of burnt red sandstone slabs runs under E baulk of trench and measures 0.6m E-W by 0.8m N-S, Slabs up to 30mm thick, with some resting more than three slabs deep	106/ 107	189, 190			Paved hearth setting covers post hole and fill
155	Deposit	Buff to yellow-coloured ash deposit located against east baulk of trench, up to 70mm thick	108, 180	177			Localised, but thick ash deposit may relate to more industrious activity
168	Structure	Underlying hearth (166) is a second stone-edged hearth measuring 1.35m N-S and extends into trench 0.8m (from E baulk of trench). The hearth contained an inner ring of stone 0.4m in diameter	166, 106 /107	108			Hearth setting
158	Deposit	Grey to mid-brown sandy silt or ash, located in SE corner of trench under overhanging side wall	157	177, 181			Hearth rake-out or redeposited ash
165	Deposit	Black, charcoal-rich sediment containing some shell and animal bone. Located in SE corner of trench and quite localised dump of material	158	164			Redeposited midden
164	Deposits	Mid-brown gritty sand rich in shell remains and animal bone, located against S wall of cave. Slag fragment recovered from context	179	165			Redeposited midden
169	Deposit	169a - Black, charcoal rich deposit located centrally in cave measures >0.4m by 0.3m across and >30mm thick. 169b . Mixed midden and ash deposits containing stone packing for post-hole (187) forms larger halo in pit surrounding the post-pipe	106/ 107	170			Burnt deposits within spot fire setting . (169a) also fills post-hole (187)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
170	Deposit	Light orange silty ash deposit underlies and abuts (169) and arc of three slightly burnt stones to W	169	187			Possible remains of spot fire overlying post setting (187)
171	Structure?	Arc of three slightly burnt stones may be remains of hearth setting within central area of cave; overlain by ash deposits (169) and (170)	169, 170	187			Remains of hearth overlies post setting (187)
153	Structure	Hearth comprising circular ring of stones 1.2m diameter located in back SW corner of trench. Contains wood ash and charcoal, burnt and calcined bone. Hearth covered by clean lens of sand (140)	142	192, 140			Domestic cooking hearth
Phase 1		Early Medieval Activity					
172	Structure?	Located in NW corner of trench is compacted cluster of beach cobbles with intermittent ash deposit lying in and around them	106/ 107	173			Possible hearth base
173	Deposit	Located below possible hearth setting (172) in NW corner of trench is spread of black, charcoal-rich silty ash containing some charcoal lumps	106/ 107, 172	140			Possible hearth location or hearth rake-out deposit
215	Deposit	Located in NE corner of trench is loosely-compacted shell midden deposit comprising periwinkles, some limpet, fish bone and small stone fragments. Deposit is slightly subsiding into top of post-hole cut (190)	213, 214	216, 160, 177			Redeposited shell midden deposit
216	Deposit	Wedge of material in NE corner of trench bounded to S by hearth (160) and post setting (190). Comprises a mid-brown silty matrix including thin burnt red sandstone slabs	160, 215	140			Heavily burnt stone slabs may comprise earlier hearth displaced/disturbed by post setting (190)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		and areas of degraded red slabs					
177	Deposit	Irregular-shaped trampled floor deposit runs through main part of cave, is dark brown to black and containing some grey ash pockets, complete shell and trampled shell	180, 108, 106/107, 155	189, 198, 140			Trampled occupation deposits
201	Deposit	Located to NW of post setting (182) is oval area of buff to yellow ash with some stones defining edge. Measures >0.35m across E-W by 0.3m, with ash >40mm deep	177	140			Hearth setting
200	Structure, cut and fill	Small setting of angular stones and beach cobbles (blackened) form hearth. Some grey ash and charcoal flecks lying over slabs, but very thin and ephemeral. The slabs overlie a cut (200a) in the sand forming a post-setting which measures 0.28m diameter by 0.16m deep and has steep sides. Fill of post-hole (200b) is mid-brown and grey mottled silty ash with no stones and very small charcoal flecks	177, 180	140		200b	Hearth setting and underlying post setting
199	Deposit	Located adjacent to S wall of cave and extending into main cave area as far as post setting (182) - for 1.3m . is mid brown and grey mottled sand sediment with some ash content. Deposit is almost stone-free and contains periwinkle shells, charcoal flecks and small bone fragments. Located under projecting / overhanging cave wall	179, 177	140			Redeposited midden

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
198	Deposit	Black and grey mottled ash deposit lying among stones of hearth, within centre of cave	177	140			Ash deposit in hearth
184	Structure?	Triangular-shaped beach cobble with a conical top displaying some damage has been used as a packing stone for post-hole (183). Was thought to be an anvil stone for a possible smithing hearth. Hammer scale and three hearth base fragments found in close proximity	137, 154	140			Packing stone, which may have been used as a smithing anvil
206	Structure	Post setting comprises a flat stone pad with two upright flanking stones, forms part of back screen/division in cave	177	140			Post setting
183	Cut	Cut of post-hole is oval and measures 0.3m by 0.28m and 0.24m deep, Steep sides and packing stones, including a large pointed beach cobble on the W side, which was initially thought to be an anvil stone (see 184)	182	140		182	Post setting
186	Cut	Cut of post-hole is oval-shaped and shallow with steep sides. Measures 0.28m NE-SW by 0.26m and 80mm deep. Pink stone at one edge may be packing stone	185	140		185	Post setting
187	Cut	Cut of post-hole is 0.22m diameter by 0.38m deep and has steep sides and packing stones. The post-hole is surrounded by a larger cut containing mixed midden and ash material	169a	169b, 140		169a	Post setting
190	Cut	Amorphous-shaped cut for post-hole underlies hearth slabs (160), has sloping	189, 160	140		189	Post setting

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		sides, and measures 0.48m across (max.) by 0.48m deep. Packing stone on west side defines post-pipe					
193	Cut and fill	Cut of small stake-hole is 50mm diameter and 180mm deep, and has steep sides. Fill of stake-hole (193b) is dark brown to black silty sand with some ash content	106/ 107	140		193b	Stake hole
194	Cut and fill	Cut of small stake-hole is 40mm diameter and 160mm deep, and has steep sides. Fill of stake-hole (194b) is dark brown silty sand including mottled grey ash and some charcoal flecks	106/ 107	140		194b	Stake hole
195	Cut	Cut of post-hole is steep-sided and measures 0.24m diameter and 0.55m deep. Flat stones in base and packing stones forming well-defined post-pipe	188	188a, 140		188a, 188b	Post setting
197	Cut	Cut of small post-hole measures 0.17m diameter by 0.12m deep, and has steep sides	196	140		196	Post setting
202	Cut and fill	Cut of small post-hole is 0.22m diameter by 0.12m deep and has steep sides and undulating base. Fill of feature (202b) comprises mottled mid brown and grey silty ash with some charcoal flecks, but no stone content	177	140		202b	Post setting
203	Cut and fill	Cut of stake-hole is 0.15m diameter and 0.15m deep and has step sides. Fill of feature (203b) comprises mid brown to grey mottled silty sand with some charcoal flecks and small stones	177	140		203b	Post setting

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
204	Cut and fill	Cut of small post-hole is 0.2m diameter and 0.18m deep and has steep sides. Fill of feature (204b) is mid-brown silty sand with small stones and some charcoal flecks	177	140		204b	Post setting
205	Cut and fill	Post-hole defined by packing stones in 0.2m diameter and 0.12m deep and has steep sides. The fill of the feature (205b) comprises a mid-brown silty sand with charcoal flecks and small angular stones	177	140		205b	Post setting
207	Cut	Cut of small post hole is 0.18m diameter and 0.1m deep with steep sides	177, 208	140		208	Post setting
209	Cut	Cut of post-hole is 0.2m diameter and 0.12m deep with steep sides	177, 210	140		210	Post setting
211	Cut	Cut of post-hole is 0.14m diameter by 0.1m deep and has steep sides with undulating base	177, 212	140		212	Post setting
191	Deposit	Strip of compacted dirty sand with charcoal flecks runs NE-SW in back half of cave. Forms a walkway between clean sand deposits and was covered by a layer of clean sand (140). Measures >0.8m wide, the feature is quite level and runs to area of burning (possible hearth) at rear of cave. Possible remnants of cobble kerb on NW side of feature	140	140			Trampled walkway
192	Deposit	Sandwiched between layers of clean sand (140) within SW corner of trench is isolated mid to dark brown silty sand deposit with some ash content and small charcoal flecks	140	140			Isolated and early occupation deposit

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
Natural							
140	Deposit	Coarse orange sand contains some rounded beach stones.	177, 198				Natural sand, but possibly modified
Learnie 2B							
Phase 5c		Post-Medieval Activity – Tinkers/Travellers and Recent Use					
201	Deposit	Thin layer of loose, dark brown soil with scattered, small, angular stones. Vegetation and some evidence of recent campfire.	-	202			Abandonment, recent soil layer and modern disturbance
202	Deposit	Mid brown, silty soil with small to large, sub-angular stones. Rubble on east side (wall tumble) overlies stony layer similar to 205 but very compact	201	205			Soil layer
216	Deposit	Mid brown sandy silt with small stones. The upper deposit inside the wall sitting over 217.	201	217, 205			Same as (103) from Test Pit 1, contains post-medieval material
500	Deposit	Upper deposit/top surface	-	501, 502			Recent soil layer, modern disturbance
Phase 5b		Post-Medieval Activity – Tinkers/Travellers					
209	Deposit	Comprises medium stone slabs and some small sub-angular cobbles. Overlies 204.	201	204			Soil layer
205	Deposit	Pale orange-light brown sandy silt with large boulders and small sub-angular clasts on the west and east sides of walls [204] and [213]; clean layer, no mortar or artefactual material; has been levelled against wall faces	202, 216, 217	222, 223, 246			Same as (105) from Test Pit 1, same as (217); thick layer of natural talus, appears to have been landscaped off against both sides of wall to level off cave floor for re-use, predating late 19th/early 20th century use of the cave
215	Deposit	Collapse of rubble and wall 204 with thin mortar leaching on the surface. Consists	202	205			Compacted surface over (205)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		of hard packed broken stones in silty soil of a mid-brown colour. Very similar to 205.					
217	Deposit	Orange-brown soil with large stones over small sub-angular stones on west of wall 204 and 209 and overlying 206. No mortar in this layer, very clean ~ possibly a backfill layer behind wall? Appears to stretch beyond trench to below 201 topsoil	216	205, 222			Same as (105) from Test Pit 1, same as (205); thick infill layer to landscape off level of cave floor to the top of walls [204] and [213]; post-medieval (late 19th c?) closure event to stop use of cave
218	Deposit	Dark brown clayey soil overlying 219.		219			Post-medieval soil layer
253	Deposit	Dark brown loam at back of cave overlying 222. Probably same as 102/101.	202	222			Victorian layer
501	Deposit	Mid to dark brown silty sand with large angular stones, a few beach pebbles and some ash. Contains bones, 19th and 20th century ceramics and metal.	500				Occupation layer, Victorian and later
Phase 5a		Initial Post-Medieval Activity – Tinkers/Travellers					
226	Deposit	Ashy spread comprising several discrete patches of grey or orange or black and grey colour.	205				Scattered lenses of ash along the edge of the south side of the cave - possibly residual material from 2006 excavation
223	Deposit	0.6 x 0.8m spread of a thick deposit of compact grey clay located against the N wall of cave and W inner wall of entrance. Slopes down to the S and overlies floor surface 222. Underlies 205. May have formed a clay bonded structure - related to wall	205	222, 225			Collapsed clay layer? Same as (106 from Test Pit 1), possibly formed part of structural remains related to the wall? But post-dating formation of floor (222)

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
225	Deposit	Cache of fish bones and scales under 205 and 223 and abutting the inside of wall 204.	205, 223	222			Midden material
220	Deposit	Upper deposit of NW corner alcove. Dark brown clay like deposit with rounded beach pebbles and small to medium angular stones. Inclusions of shells (oyster, scallops, winkles and whelks), some iron nails, animal bones and a ceramic ball.	253	221			Upper deposit of NW corner alcove, late-19th-20th century layer
219	Deposit/ Structure	Partly cobbled deposit under 218 at the edges of cave. It is more disturbed away from the edges and stones become more angular. Some finds including a broken bone knife handle as well as limpets and winkles embedded in the layer.	218	238, 239, 227			Cobbled floor in north alcove of cave; post-medieval/Victorian?
238	Deposit	Dark brown earth under cobbles containing bone and a few pieces of pottery and clay pipe and 2 steel pins. Under cobbles 219.	219	239			Post-medieval layer in back of cave
230	Deposit	Bright orange and white/grey ash within 228.	253	222			Part of hearth (228)
228	Structure	Roughly circular spread of ash (bright orange and white/grey) contained within a rough stone setting. A hearth contemporary with context 222.	253	222			Hearth, built against the S wall of the cave, post-medieval
222	Deposit	Compact floor horizon at the interface between contexts 205 and 206. Midden-rich firm sediment, dark brown to black, with mixed shells, bone and small stones throughout, some beach pebbles. Outside and east of wall entrance the deposit slopes down	223, 205, 253	224, 229, 248			Upper floor horizon, post-medieval, 19th century?; predates infill (205) event and could have been a surface during a time that the walls were in use; post-dates construction of

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		into the entrance but does not continue beyond.					the walls
243	Deposit	Light to mid brown fine silt with virtually no stone forming a compact wedge of material up to 80mm deep at threshold of entrance.	222	242			Trampled soil layer
242	Fill	Homogenous mid to dark brown gritty sediment containing angular and rounded stone fragments and small bones.	243, 222	241	241		Fill of cut [241]
241	Cut	U-shaped, steep sided cut for a pit with a U-shaped base; below surface (222); cuts through all layers below (222), possibly related to post-medieval occupation for a structure?	222	248			Post-medieval structural slot?
229	Deposit	Coarse sand containing beach cobbles, some angular stones, charcoal, fish bone, animal bone and shellfish under context 222.	222	232			Levelling deposit in the cave
224	Deposit	Light to mid brown sandy silt under 222. Possibly windblown and appears to peter out towards the S wall.	222	246			Wind-blown layer
507	Deposit	Pale grey-white silty ash with small charcoal flecks	222, 238	227, 509			Hearth, fire deposit, post-medieval
508	Structure	Semi-circular setting of stone surrounding with hard grey silt compacted surface	222, 238	227, 509			Stone hearth setting
509	Deposit	Pale grey-cream silty ash underlying 508 forming lower hearth; contains small charcoal flecks and fragments; not confined by any stone setting	508	510			Fire deposit - spot fire, post-medieval
510	Deposit	Mid dark brown sandy silt, loosely compact, to west side of 511; contains some bone, metal, glass, post-medieval ceramic	509	511			Post-medieval occupation material

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
514	Deposit	Large, flat slab to E of [511]	509, 510				Hearth slab?
248	Deposit	Thin occupation /trampled lens comprising mid brown silty matrix containing stone chips and fine roots. Sits over 247 and under 222 and 224.	222, 224	247			Post-medieval layer
227	Deposit	Mid brown silty sediment containing numerous stones (beach cobbles and angular stones)	222	232, 239			Post-medieval layer, predates floor (222), post-dates (239)
247	Deposit	Thin dark brown trampled surface containing some shell and small stone fragments. Sits above 246.	205	246			Post-medieval layer
206	Deposit	Dark brown loose layer containing gravel, charcoal, shells and bone. Context layer 40 cm in depth and contains lens of ash and charcoal	205	212, 210			Probably several thin layers not distinguishable in the test pit, consisting of at least (244) and (246)
246	Deposit	Wedge of deposit containing numerous angular and rounded stones, some shell and bone. Mid brown silty matrix with lots of roots. Thin lens of silt which could be ash within 246	247	244			Same as (206) from Test Pit 2; post-medieval layer
213	Structure	Double-faced mortared stone wall on south side of cave, forms part of a wall related to [204]; measures 1.25-1.5m long on the outside and 1m long on the inside by 1m wide, and stands up to 1m high as built against cave wall; constructed with large stones infilled with small stones and lime mortar ; the outside face is slightly curving outward; it opposes wall [204] at a distance of 1.35m, where it forms an entrance into cave;	202, 205	244			South wall in cave entrance, part of structure with [204]

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
		the end face opposing [204] steps in and has a linear vertical slot that formed a door slot, although some stonework has collapsed out					
204	Structure	Well-built, mortared stone wall aligned N-S, measures 1.2m long on the outside and 0.9m long on the inside by 1m wide, and stands up to 1.4m high at N end against cave wall and 1.05m high at S end; the outside face curves slightly outward; it opposes wall [213] at a distance of 1.35m, where it forms an entrance into cave; the end face opposing [213] steps in and has a linear vertical slot that formed a door slot	209	244, 245			North wall in cave entrance, part of structure with [213]
Phase 4		Medieval/Late Medieval Activity					
239	Deposit	Dark brown soil under 238 containing shells and bone	227, 238	235			Midden layer, post-medieval c.16th/17th/18th c
244	Deposit	Mid to dark brown gritty sediment containing small stone chips, some shell and fine roots.	204, 213	245			Equates to lower part of (206) from Test Pit 2; layer through which walls [204] and [213] were constructed; same as (14) midden from 2006 excavation
212	Deposit	Lens of silty ash and charcoal within 206	206	210			Lens of material below wall [204] in Test Pit 2
245	Deposit	Thin black occupation lens located under 244, possibly trampled. Contains fine shell fragments and some ash. Above 232 and the same as 212.	244	231			Occupation surface, predates construction of walls, medieval?

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
240	Deposit	Mid brown loose sandy gravel with small angular stones, lots of shells (limpet and winkle) and some animal bone. Also contained 1 boar tusk and 1 piece of flint. Contemporary with/part of 231.	222	232			Medieval occupation?
231	Deposit	Coarse to fine sand with shell and some bone and small rounded pebbles, under 222 and over 232 and up to 7cm thick.	222, 239, 245	232			Same as (229) and (210) from Test Pit 2; medieval occupation?
210	Deposit	Very loose, gritty sand. Dark grey, like 206. Charcoal, bone and antler found. Cow(?) femur found in NW corner at depth of 70cm	206, 212	211			Probably several thin layers not distinguishable in the test pit, probably consisting of (231) and (232)
Phase 3		Early Medieval Activity					
232	Deposit	Compact thin occupation horizon comprising a dark brown-black silt with charcoal-rich lenses and buff-grey ash patches; under 231 and over 233 and up to 2cm thick.	227, 231, 239	233			Occupation horizon, probably same as the base of (107) from Test Pit 1 and probably upper part of (210) from Test Pit 2; floor horizon that pre-dates post-medieval period . early medieval layer?
233	Deposit	Pale yellow-brown coarse sand containing animal bone, shell and bones. Under 232 and over 234 and up to 5cm thick.	232	234			(210) from Test Pit 2 roughly equates to this; occupation layer that pre-dates floor (232) and contains some spread of slag - could be upper part of sandy occupation horizon, so contemporary with (234)
211	Deposit	Coarse sand with no finds. Bedrock at base, 125 cm depth	210	235			Basal layer in Test Pit 2, probably (235) or natural sand

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
234	Deposit	Mid brown gritty sand with charcoal rich lenses and shellfish. Under 233 and over 235 and up to 5cm thick.	233	235			Sandy occupation layer, upper deposit of (235); (108) from Test Pit 1 - circa 8th/7th c AD - roughly equates to this
Phase 2		Early Medieval Metalworking Activity and Structures					
252	Fill	Charred wood and charcoal-rich soil within cut 251	232	251	251		Fill of stake hole 251
251	Cut	Possible stake and hole within midden below and outside E face of wall.	232	235b		252	Possible stake hole for screen at entrance
250	Fill	Fill of pit 249, a mid to dark brown silty sediment containing small rounded stone fragments, charcoal pieces and thin lenses of ash.	232	249	249		Fill of pit 249
249	Cut	Cut of circular pit with angled sides cut into sand 235b and filled by 250. 0.38m NW-SE by 0.28m and 0.18m deep. Under 232.	232	234, 235b		250	Pit - hearth pit?
259	Cut	Small post hole cut through 235b, 0.15m diameter and 0.14m deep. Filled by 234.	234	235b		234	Stake/post hole
260	Cut	Three small stakeholes cut through 235b, 0.05m to 0.07m diameter. Filled by 234	234	235b		234	Stake holes
254	Cut	Post hole cut through 235b with upright packing stones, 0.3m diameter and 0.23m deep. Under and filled by 234.	234	235b		234	Post hole
255	Cut	Post hole cut through 235b with post pad stone in base, 0.22m diameter and 0.24m deep. Filled by 234.	234	235b		234	Post hole
256	Cut	Post/stake hole cut through 235b with 2 small packing stones, 0.22m diameter and 0.24m deep. Filled by 234.	234	235b		234	Post hole

Context No.	Type	Description	Under	Over	Fill of	Filled by	Interpretation
266	Fill	Fill of post-hole 265, comprises a mid-brown gritty sediment with small stones, shells and charcoal.	234	265	265		Fill of post hole 265
265	Cut	Cut of post hole, steep sided with a rounded bottom, 0.3m diameter and 0.18m deep.	234	235b		266	Post hole
262	Fill	Dark brown soily sand with charcoal and shell	234	263	263		Fill of 263
263	Cut	Sub-oval pit cut into 235, 0.35m deep.	234	235b		262	Pit
257	Fill	Mid brown gritty sand with charcoal rich lenses and shellfish	233, 234	258	258		Fill of pit 258
258	Cut	Sub-oval pit cut through 235, 0.7m E-W by 0.6m.	257	235b		257	Pit . possibly associated with smithing hearth
261	Deposit	Area of cobbling below 234 inside of S wall. Comprises small to medium cobbles, 0.8m N-S by 0.9m.	234	235b			Cobbled surface against inside of S wall, contemporary with metal-working activity
268	Fill	Fill of hearth 267 containing charcoal and ashy rich sediment with some charcoal pieces.	234	267	267		Fill of hearth 267
267	Structure	Square shaped hearth 0.4m across at the base of 234 comprising beach pebbles.	268	235b		268	Forge hearth/re-heating hearth
237	Fill	Fill of pit 236, a mid-brown to buff sandy sediment containing numerous charcoal fragments and pieces of shell.	233	236	236		Charcoal rich fill of pit 236
236	Cut	Amorphous shaped feature against N wall of cave and under wall 204. It cuts through 235.	237	235b		237	Pit - hearth pit, or charcoal store?
235a	Deposit	Pale orange-yellow-brown coarse sand containing beach cobbles/pebbles, bone fragments, limpet and periwinkle shells and fish bone.	234	235b			Natural sand layer with occupation material, particularly a spread of ferrous residues associated with metal-working

Context No.	Type		Description	Under	Over	Fill of	Filled by	Interpretation
Phase 1			Early Medieval Burial and Associated Deposits					
511	Structure		Roughly rectangular setting of stone aligned N-S. Measures 1.4m x 0.6-0.8m externally; stone is sub-angular, all talus material, averaging 0.25-0.35m long and 0.2-0.3m wide; stones to the E side are almost set on edge	509, 510, 513				Primary stonework forming stone setting around calf burial
512	Structure		Largest stone of the setting at the centre of the group of 511 - "capstone"	509, 510, 513				Possible capstones to the possible cist
513	Deposit		Mid dark brown sandy silt, contains some ash and friable brown silty deposits, large charcoal/burnt wood and calf skeleton; similar to (510)	509	511, 512			Matrix between 511/512
264	Deposit		Mostly clean sand same as 235 but damper and slightly darker. Contains some animal deposits (feasting residues) and contains the human inhumation.	239	235			Deposit covering inhumation
Natural								
235b	Deposit		Pale orange-yellow coarse sand containing beach cobbles and pebbles	235a	-			Natural sand and bedrock in base of cave
221	Deposit		Coarse beach sand under 220 in the NW corner alcove.	220				Natural sand over bedrock
Learnie 2C								
Phase 1b			Post-Medieval Activity – Tinkers/Travellers and Recent Use					
101	T1	Deposit	Mid brown silty loam with 19/20th c. glass, ceramics, metal, animal bone					Topsoil
201	T2	Deposit	Mid brown silty loam with 19/20th c. glass, ceramics, metal, animal bone		202			Topsoil
210	T2	Deposit	Reddish brown sandy silt, very soft like an organic layer, visible in E facing section	201	202			Remnants of a bracken mat deposit?

Context No.	Type		Description	Under	Over	Fill of	Filled by	Interpretation
202	T2	Deposit	Mid-dark brown sandy loam with Victorian ceramic, glass and clay pipe	201	203, 204, 205, 208			Soil build-up with occupation material
301	T3	Deposit	Mid brown silty loam with 19/20th c. glass, ceramics, metal, animal bone		302			Topsoil
302	T3	Deposit	Mid-dark brown compact soil with some cobbles (1cm-1.5cm)	301	303-4			
Phase 1a			Initial Post-Medieval Activity – Tinkers/Travellers					
203	T2	Deposit	Ash layer overlying stone on North wall of cave; extends approximately 50 cm x 40cm	202	204			Fire deposit
204	T2	Deposit	Alignment of stones (up to 30cm x 30 cm) across cave in line N-S	203, 202	205			Small rubble wall inside cave, Victorian
209	T2	Deposit	Winkle/limpet shell deposit at E end of T2, same as 208	202				Same as 208, shell midden
208	T2	Deposit	Winkle/limpet shell deposit at E end of T2	202	205			Shell midden
205	T2	Deposit	Compacted dark soil layer interspersed with cobbles; extends under ash layer (206), and contains no finds	202, 204	206			Occupation deposit - unknown period
206	T2	Deposit	Dark brown silty ash with some charcoal fragments	205				Burning layer, spread of hearth material
207	T2	Deposit	Roughly laid cobbles in natural sand	204, 206				Cobbled surface
303	T3	Deposit	Patches of sand, with gravel and sea washed rounded cobbles, bed rock showing through; sondage excavated to bedrock	302	304			Sand layer
304	T3	Deposit	Black-pale yellow ash layer in NE corner T3	302	305			Burning layer, fire deposit?
305	T3	Deposit	Mid-dark brown compact soil in NE side of T3	302, 304	306			
Natural								
306	T3	Deposit	Pale brown yellow gritty sand in SW side of T3	305				Natural sand

Appendix 2 Small Finds Register

Find No.	Context No.	Description
138	338	slag, from base of furnace [351]
139	352	stone, slab from smithing hearth/furnace [351]
140	142	Fe iron
141	334	from base of furnace [351]
142	350	furnace lining
143	354	slag
144	303	Fe + Cu bullet cases plus tin lid
145	316	Cu metal coin
146	303	ceramic
147	303	glass
148	303	Stone, ceramics- separated
149	323	ceramic Scottish-White-gritty-ware
150	152	clay pipe fragment or shell
151	164	slag 1 piece
152	142	?ceramic possible burnt ceramic , maybe furnace wall
153	320	quartz, possibly worked
154	316	clay pipe fragment
155	316	Fe
156	316	ceramic, including white gritty ware
157	106/7	(possible) pumice
158	323	Ceramic and glass, ? including pumice, to be separated
159	106/7	Fe
160	106/7	? Possible burnt flint
161	335	glass 1 piece
162	153	? Leather, from centre of hearth
163	137	leather, cut pieces
164	181	slag/hearth 3 hearth base fragments/slag
165	177	Fe, hammerscale
166	181	Fe, hammerscale
167	180	Fe, hammerscale
168	179	Fe, hammerscale
180	146	possible worked stones
181	177	Fe
182	312	Cu alloy bullet casing
183	342	Fe, hammerscale + slag
184	342	hammerscale
185	177	hammerscale
187	140	Stone, iron stone, hearth base/burnt stone
188	177	hammerscale (from 29)
189	137	glass
194	103	Fe, mixed ferrous items

Find No.	Context No.	Description
195	103	Ce, clay pipe
196	103	Ce, pottery
197	102	glass, assorted glass (bottles)
198	102	Ce, mixed C18/19 pottery
199	102	Ce, clay pipe fragment
200	102	leather pieces
201	300	Glass - mixed
202	300	Ce, mixed C18/19 ceramic
203	300	Fe, mixed metal
204	102	Metal - assorted
205	118	metal - mixed metal/ferrous material retrieved from spot-fire 118
206	103	leather offcut
207	103	glass
208	141	horn, worked/cut horn core
209	141	Leather offcuts + net (leather?)
210	141	glass
211	141	Ce, C18/19 pottery
212	141	Ce, clay pip stem
213	137	glass
214	137	Ce, C18/19 pottery
215	137	metal
216	104	pottery
217	104	leather
218	104	metal
219	top of 307	Ce medieval ceramic
220	137	stone, blade sharpener
221	137	bone button
222	137	Ce, pipe stem, 2 pieces
223	137	leather
224	137	stone, lemonade stopper
225	137	metal
226	137	Metal hook?
227	102	Cu, metal items, copper alloy, pins + bullet
228	102	metal, iron nails / iron
229	102	glass
230	102	Ce
231	102	wood
232	102	metal
233	102	glass
234	102	ceramic
235	102	clay pipe stem
236	102	wood
237	300	glass

Find No.	Context No.	Description
238	300	leather
239	300	metal
240	300	cork, bottle cork fragment
241	300	Ce clay pipe stem
242	300	Ceramic
243	312	Cu, metal spoon
244	312	Glass
245	312	metal, Primus burner
246	312	Ceramic
247	312	Ce, clay pipe bowl
248	308	glass
249	308	metal
250	308	ceramic
251	308	metal, ?oil-lamp wick holder
252	323	glass
253	323	metal
254	116	leather strap
255	116	ceramic
256	116	glass
257	104	ceramic, almost appears to be bone but most likely to be ceramic
258	307	ceramic, medieval pot
259	307	metal
260	307	Ce, clay pipe bowl fragment
261	103	Ceramic including fragment of pipe bowl
262	103	leather ?Shoe
263	103	glass
2264	103	metal, nail, Fe
265	304	Ce, with inscription "Merry Christmas"
266	304	Metal, Fe + Cu, including cartridge
267	304	Ce pipe stem
268	304	glass
269	145	leather, ?shoe with eyelet holes
270	145	metal, including Cu, ?eyelets
271	145	Ce, with gold coloured decoration
272	145	glass
273	147	Ce, 2 decorated, pipe bowls, one with inscription
274	147	metal, Fe + Cu, including cartridge head
275	147	Mother of pearl button with 2 holes
276	147	glass
277	147	Ce
278	311	ceramic , large piece of jar
279	311	metal, assorted
280	311	glass
281	146	Mother of pearl, decorated knife/penknife handle with perforations (or bone?)

Find No.	Context No.	Description
282	146	Ce, mixed ceramic
283	146	glass
284	146	metal, Cu + Fe
285	102	stone, possible worked beach cobble, ?stone tool
286	102	Assorted ceramic
287	147	leather
288	102	leather, sole of shoe, very narrow instep and toe section missing
289	102	glass
290	102	metal
291	103	ceramic
292	103	wood, worked
293	303	metal cartridges
294	303	Ce, ceramic pipe bowl + stem, lettering "MS"
295	303	glass, assorted
296	303	Ce, worked ?stoneware bowl edge
297	102	stone, ?flint, ?worked shale
298	102	Ce, pipe stem with foot
299	102	leather, worked
300	102	wood, worked and burned
301	102	Wood or cork? Bung or bottle cork?
302	102	Ce, assorted
303	102	glass
304	102	metal, Fe + Cu
305	102	stone, slightly pecked beach cobble, ?hammerstone
306	102	metal, Cu copper fitting
307	102	shell, button ?mother of pearl
308	300	Ce, 3 pieces of clay pipe bowl + 3 pieces of clay pipe stem
309	300	mineral, 1 piece slate pencil
310	300	metal, 1 Victorian penny (1890 - 1901)
311	300	Ce, pottery sherds
312	300	Fe, iron bits
313	300	metal, fragments of copper and brass
314	300	glass
315	300	leather: 1 shoe sole fragment, 1 other fragment
316	329	metal, 1 fragment
317	108	metal, 1 piece
318	137	Leather fragments, from mouse hole?
319	137	glass
320	137	Ce 1 pottery sherd
321	137	wood; fragments of worked wood
322	137	bone, fragments of worked bone, ?drilled
323	146	Fe, iron door hinge
324	137	Ce, 1 pottery sherd

Find No.	Context No.	Description
325	137	stone, with hole ?worked
326	106/7	stone fragments, worked/used as tools?
327	300	glass
328	300	leather
329	300	mother of pearl button
330	312	Cu, metal coin
331	312	Fe (Trench 2)
332	312	glass
333	312	Ce (trench 2)
334	316	Fe
335	-	Possible coarse pebble tool, unstrat.
336	316	Ce, small fragments, ceramics
337	156	antler, worked antler piece, possible gaming piece/stopper
338	137	bone, ?worked
339	177	flint, blade or flake
340	300	Fe, iron object
341	145	wood fragment
342	102	Ce, composite clay pipe fragment
343	145	Fe + Cu, mixed metal finds
344	145	Ceramics
345	145	glass
346	145	leather offcuts
347	145	bone + metal, decorated bone knife cheek piece & blade fragment
348	102	leather, shoe fragments
349	145	wood, fragment from box with lettering (cocoa box)
350	145	cut bone
351	[351]	Mixed slag, stone, vitrified ceramic. Recovered section of smithing hearth incl. stone slab fragment (see find 139 also), vitrified ceramic furnace [unreadable!] base and hearth base fragment
		The following finds were found inside sample bags when the bones were being cleaned
352	300	2 metal nails, in sample 52
353	300	bone knife handle and some blade, in sample 52
354	312	clay pipe stem, found in sample 102
355	300	?clay pipe, found in sample 52

Appendix 3 Samples Register

Sample No.	Cave	Context No.	Description	No. of Bags
1	L1B	104	fish scale	1
2	L1A	300	shell	1
3	L1A	300	animal bone	1
4	L1B	102	animal bone	1
5	L1B	141	shell	1
6	L1B	141	animal bone	1
7	L1B	137	animal bone	1
8	L1B	104	shell	1
9	L1B	104	animal & fish bone	1
10	L1A	323	shellfish	1
11	L1B	137	bone	1
12	L1B	106/7	animal bone	1
13	L1A	308	fish scales/skin?	1
14	L1A	316	sediment sample	1
15	L1B	137	whelk shells	1
16	L1B	102	fishbone, crab + shell	1
17	L1B	102	bone	1
18	L1B	102	bone	1
19	L1B	102	shell	1
20	L1A	300	bone	1
21	L1A	300	shell	1
22	L1A	312	bone	1
23	L1A	312	fishbone	1
24	L1A	312	shell	1
25	L1A	308	bone	1
26	L1A	308	shell	1
27	L1A	323	bone	1
28	L1B	104	bone	1
29	L1B	116	bone	1
30	L1A	304	bone	1
31	L1A	304	shell	1
32	L1B	106	bone	1
33	L1B	104	bone	1
34	L1A	307	bone	1
35	L1B	103	bone	1
36	L1B	147	bone including 2 tusks, ?boar	1
37	L1A	311	bone	1
38	L1B	146	bone	1
39	L1B	103	mixed bone	1
40	L1B	146	fish bone, ?skate or ray wings	1
41	L1A	303	Assorted bone including pigeon	1
42	L1B	137	assorted bone	1
43	L1B	102	bone & horn core	1
44	L1B	103	fish scales, large & abundant	1

Sample No.	Cave	Context No.	Description	No. of Bags
45	L1B	103 (base)	fish scales, large & abundant	1
46	L1B	137	animal droppings for ID	1
47	L1A	329	sediment sample	1
48	L1A	329	sediment sample	1
49	L1B	137	animal bone (cow/horse deposit including cranium & vertebra)	1 box
50	L1A	T2	coal	1
51	L1A	T2/300	shell	1
52	L1A	T2/300	bone	1
53	L1A	T2/300	bark	1
54	L1A	307	bone	1
55	L1A	307	charcoal	1
56	L1A	307	shell	1
57	L1A	T1/329	bone	1
58	L1A	T1/329	charcoal	1
59	L1A	T1/326	shell	1
60	L1A	T1/326	bone	1
61	L1A	T1/326	charcoal	1
62	L1A	T2/319	ash from floor surface	1
63	L1B	108	bone fragment	1
64	L1B	T7/108	rich wood ash deposit	1
65	L1B	106/107	bone	1
66	L1B	137	bone	1
67	L1B	137	shell	1
68	L1A	T1/331	ash from hearth	1
69	L1A	T1/332	mixed floor deposit	1
70	L1B	137	bone	2
71	L1A	340	periwinkle midden	1
72	L1B	142	bone	1
73	L1B	grid17/142	soil sample	1
74	L1B	grid16/142	soil sample	1
75	L1B	grid18/142	soil sample	1
76	L1B	grid5/142	soil sample	1
77	L1B	grid4/142	sediment sample	1
78	L1B	grid6/140	soil sample	1
79	L1B	grid7/108	soil sample	1
80	L1B	grid11/140	soil sample	1
81	L1B	grid12/140	soil sample	1
82	L1B	106/7	soil sample	1
83	L1B	106/7	soil/organic sample	1
84	L1A	T1/342	mag. SOS	1
85	L1A	T1/342	mag. SOS	1
86	L1A	T1/342	mag. SOS	1
87	L1A	T1/342	mag. SOS	1
88	L1A	T1/342	mag. SOS	1

Sample No.	Cave	Context No.	Description	No. of Bags
89	L1A	T1/342	mag. SOS	1
90	L1A	T1/342	mag. SOS	1
91	L1A	T1/342	mag. SOS	1
92	L1A	T1/334	deposit overlying possible furnace	3
no 93				
94	L1A	T1/331	bone	1
95	L1B	T8/108	ash	1
96	L1B	154	sediment sample	1
97	L1B	T10/142	sediment sample	1
98	L1B	152	sediment sample	1
99	L1A	T2/300	bone	1
100	L1A	T2/300	shell	1
no 101				
102	L1A	T2/312	bone	1
103	L1A	T2/312	shell	1
104	L1B	T3 106/7	context sample	1
105	L1B	155	context sample	1
106	L1A	T2/316	bone	1
107	L1A	T2/316	?coal	1
108	L1A	T2/319	ash deposit	1
109	L1B	137	bone	1
no 110				
111	L1B	2/154	context sample	1
112	L1A	T1/334	hearth furnace	1
113	L1B	9/ 106/7	sediment sample	1
114	L1B	137	bone	1
115	L1B	154, below hearth stone	1 piece charcoal	1
116	L1B	156	animal tooth	1
117	L1B	158	fish bone	1
118	L1B	5/ 142	charcoal	1
119	L1B	4/142	1 piece charcoal	1
120	L1B	3/106/7	1 piece charcoal	1
121	L1B	10/142	3 pieces bone, 1 showing burning	1
122	L1B	8/108	charcoal	1
123	L1B	6/153	bone	1
124	L1B	6/153	charcoal	1
125	L1B	7/108	1 piece charcoal	1
126	L1B	108	charcoal	1
127	L1B	108	bone	1
128	L1B	106/7	bone	1
129	L1B	106/7	charcoal	1
130	L1A	351	lower fill of furnace	1
131	L1B	154	charcoal	1
132	L1B	154	bone	1

Sample No.	Cave	Context No.	Description	No. of Bags
133	L1B	142	bone	1
134	L1B	151	context sample	1
135	L1A	332	bone	1
136	L1A	303	bone	1
137	L1B	164	silty layer	1
138	L1B	165	black ash	1
139	L1B	163	ash/burnt stone	1
140	L1B	167	hearth ash	1
141	L1B	152	bone	1
142	L1B	165	bone	1
143	L1B	151	bone	1
144	L1B	151	charcoal	1
145	L1B	106/7	bone	1
146	L1B	106/7 area19	context sample	1
147	L1B	106/7 area20	context sample	1
148	L1B	106/7 area24	context sample	1
149	L1B	106/7 area13	context sample	1
150	L1B	106 area15	"interface"	1
151	L1B	106 area21	"interface"	1
152	L1B	106 area21	ash	1
no 153				
no 154				
155	L1B	142 area14	context sample	1
156	L1B	142 area16	context sample	1
157	L1B	162	bone	1
158	L1B	106/7 area 18	context sample	1
159	L1B	142 area 17	context sample	1
160	L1B	106/7 area 9	context sample	1
161	L1A	320	bone	1
162	L1A	307	bone	1
163	L1A	307	charcoal	1
164	L1A	316	bone	1
165	L1A	323	bone	1
166	L1B	106/7 area 24	bone	1
167	L1B	106/7 area 24	charcoal	1
168	L1B	106/7 area 18	charcoal	1
169	L1B	106/7 area18	bone	1
170	L1B	146 area 23	context sample	1
171	L1A	319	context sample - ash	1

Sample No.	Cave	Context No.	Description	No. of Bags
172	L1A	336	soil sample from west side of floor	1
173	L1B	153	hearth	1
174	L1A	335	context sample - ash	1
175	L1B	153	burnt bone	1
176	L1B	153	charcoal	1
177	L1B	140	bone & 1 crab claw fragment	1
178	L1A	307B	bone	1
179	L1A	335	bone	1
180	L1B	137	bones - horse & pig	1
181	L1A	335	bone	1
182	L1B	169	black ash deposit	1
183	L1B	170	orange-black ash	1
184	L1B	176	hearth	1
185	L1B	177	context sample	1
186	L1B	137	bone	1
187	L1B	137	bone	1
188	L1A	338	soil sample	1
189	L1A	337	charcoal	1
190	L1A	337	bone	1
191	L1A	336	charcoal	1
192	L1A	337	bone	1
193	L1A	336	crab	1
194	L1A	331	bone	1
195	L1A	331	crab	1
196	L1A	338	bone ? for dating	1
197	L1B	154?	fish & mammal bone	1
198	L1B	158	bone	1
199	L1B	158	stone ?metallic	1
200	L1B	182 trench ext.	sediment sample	1
201	L1B	177 area 29	context sample	1
202	L1B	177 area 31	sediment sample	1
203	L1B	177 area 26	sediment sample	1
204	L1B	177 area 27	sediment sample	1
205	L1B	177 area 30	sediment sample	1
206	L1B	177 area 25	sediment sample	1
207	L1B	177	fish bones	1
208	L1B	177	bone	1
209	L1B	177	charcoal	1
210	L1B	181	charcoal	1
211	L1B	181	bone	1
212	L1B	180	bone	1
213	L1B	180	charcoal	1
214	L1B	177	bone	1
215	L1B	177	charcoal	1

Sample No.	Cave	Context No.	Description	No. of Bags
216	L1B	172	bone	1
217	L1B	172	charcoal	1
218	L1B	172	charcoal	1
218	L1B	146	bone	1
219	L1B	188	charcoal	1
220	L1B	177 area 26	charcoal	1
221	L1B	169	upper fill of post pipe, cut 169	1
222	L1B	177 area 15 main trench	context sample	1
223	L1B	155, overlying 177	ash deposit, in block	1
224	L1B	177 area 8	soil sample	1
225	L1B	177 area 8	? bone	1
226	L1A	304	butchered bone	1
227	L1B	199 area 30	shell midden	1
228	L1A	353, basal area under smithing hearth	sediment sample	1
229	L1B	177 area 27	charcoal	1
230	L1B	177	animal bone	1
231	L1B	142 area 30	animal & fish bone	1
232	L1B	196	soil sample	1
233	L1B	160	bone	1
234	L1B	140	charcoal	1
235	L1B	140	fish bone	1
236	L1B	140	animal bone	1
237	L1A	338	charcoal	1
238	L1B	173 main trench	charcoal rich deposit from back of cave	1
239	L1B	145	bone fragments	1



Plate 46: Revealing the Early Medieval deposits in Learnie 1B

Appendix 4 Drawing Register

Drawing No.	Cave	Description	Scale	Date
15	L1B	Mid-ex plan showing wall feature (146/147) and post-medieval deposits	1:20	Jun-18
16	L1A	Mid-ex plan showing spot-fire and shell midden surface (308). See #17 for back of cave detail	1:20	Jun-18
17	L1A	Mid-ex plan showing wall features (313) and (314) and surface (312/316)	1:20	Jun-18
18	L1A	Mid-ex plan showing surface of (320) and ash deposit (319)	1:20	Jun-18
19	L1A	E-facing section A-B in cave	1:10	Jun-18
20	L1B	Mid-ex plan showing articulated horse remains in stone deposit (137)	1:20	Jun-18
21	L1A	Mid-ex plan showing smithing hearth location (330) within midden (329)	1:20	Jun-18
24	L1B	Mid-ex plan showing contexts (108), (106/107), (142), (140) and (153)	1:20	Jun-18
23	L1A	Mid-ex plan showing hearth (319) and (335), wall (341) and (343)	1:20	Jun-18
26	L1B	Mid-ex plan showing Early Medieval basal deposits and features in cave	1:20	Jun-18
25	L1A	ENE-facing section in trench extension	1:20	Jun-18
26	L1A	Pre-ex plan of smithing hearth and associated deposits	1:20	Jun-18
27	L1A	NE-facing section C-D in cave	1:20	Jun-18
28	L1A	SW-facing section G-H in cave	1:20	Jun-18
29	L1A	SE-facing section E-F in cave	1:20	Jun-18
30	L1B	E-facing section through post-hole (187)	1:10	Jun-18
31	L1B	S-facing section through post-hole (195)	1:10	Jun-18
32	L1A	NNE-facing section I-J in cave	1:20	Jun-18
33	L1B	Mid-ex plan showing Early Medieval basal deposits and features in cave	1:20	Jun-18
34	L1B	S-facing section through post-hole (190)	1:10	Jun-18
35	L1B	ESE-facing section through post-hole (186)	1:10	Jun-18
36	L1A	NW-facing section through smithing hearth showing (350), (352) and (334)	1:10	Jun-18
37	L1B	NNW-facing section through post-hole (182)	1:10	Jun-18
38	L1B	Post-ex plan showing basal deposits and features (Early Medieval) in cave	1:20	Jun-18
39	L1B	E-facing section at back of cave	1:20	Jun-18
40	L1B	W-facing section at front of cave	1:20	Jun-18

Appendix 5 List of Photographs

Photo No.	Cave	Context	Description	Direction Facing	Date
8762	L1B	[118]	E-facing section of spot fire	W	16/06/2018
8763	L1B	[118]	E-facing section of spot fire, close-up	W	16/06/2018
8764	L1B	[118]	spot-fire in plan	W	16/06/2018
8765	L1B	104	fish scale in situ, sample 1, broad location view	WSW	17/06/2018
8766	L1B	104	fish scale in situ, sample 1, plan location view	?	17/06/2018
8767	L1B	104	fish scale in situ, sample 1, general view	WSW	17/06/2018
8768	L1B	104	fish scale in situ, sample 1, close-up	WSW	17/06/2018
8769	L1B		possible stone setting near N cave wall & fish scale sample4	NNW	17/06/2018
8770	L1B		possible stone setting [], plan view		17/06/2018
8771	L1B		general view of cobbles [145] & wall [146]	WSW	17/06/2018
8772	L1B		ENE-face of wall [146] & cobbles [145]	WSW	17/06/2018
8773	L1B		ENE face of wall [146] & cobbles [145]	WSW	17/06/2018
8774	L1B		ENE face of wall [146] & cobbles [145] with flash	WSW	17/06/2018
8775	L1B		ENE wall face [146], cobbles [145], oblique	S	17/06/2018
8776	L1B		wall [146] & cobbles [145] in plan	SW	17/06/2018
void	L1B		wall [146] in plan	SW	18/06/2018
void	L1B		E-face of wall [146] after removal of cobbles	W	18/06/2018
8777	L1B		ENE face of wall [146]		18/06/2018
8778	L1B		ENE face of wall [146]		18/06/2018
8779	L1B		plan view of wall [146]		18/06/2018
8780	L1A		T1 looking W showing [325], [324] & midden	W	18/06/2018
8781	L1A		T1 plan view of spot fire [325]	NNW	18/06/2018
8782	L1B		wall [146] after removal of fill (147) to section line - in plan	SW	18/06/2018
8783	L1A		surface of (312)/(316) & wall [313]	NE	18/06/2018
8784	L1A		surface of (312)/(316) & wall [313]	NE	18/06/2018
8785	L1A		same image in plan	N	18/06/2018
8786	L1A		wall [314] in alcove & stone pile (311)	W	18/06/2018
8787	L1A		wall [313] and floor (316)	N	18/06/2018
8788	L1A		wall [313] and stone pile from S. floor (316)	N	18/06/2018
8789	L1A		mid-ex. (308) and (323) midden in T1	W	18/06/2018
8790	L1B		plan of [146] after section excavation	E	19/06/2018
8791	L1B		feature [146] showing section through walls	S	19/06/2018
8792	L1B		plan of surface of (104) in trench extension showing fish scales & charcoal patches	W	19/06/2018
8793	L1B		view onto surface as above (oblique)	SW	19/06/2018

Photo No.	Cave	Context	Description	Direction Facing	Date
8794	L1B		close view of fish bones in surface of (104)	SW	19/06/2018
8795	L1B		close view of fish scales in surface of (104)	S	19/06/2018
8796	L1B		mid-ex. Photo showing section through (103) fish scales with (137) below (stone layer)	SE	20/06/2018
8797	L1B		mid-ex. Photo showing section through (103) fish scales with (137) below (stone layer), closer view	SE	20/06/2018
8798	L1B		mid-ex. Photo showing section through (103) fish scales with (137) below (stone layer), closer view	SE	20/06/2018
8799	L1A		looking west showing black, ?burned, beach cobbles in general view	SW	20/06/2018
8800	L1A		looking west showing black, ?burned, beach cobbles in general view	SW	20/06/2018
8801	L1A		looking west showing black, ?burned, beach cobbles in general view	SW	20/06/2018
8802	L1A		facing North, hearth setting	N	20/06/2018
8803	L1B		general view of (317)	W	20/06/2018
8804	L1B		general view of (317) from higher up, panorama	W	20/06/2018
8805	L1B		close-up of skull and spinal column	W	20/06/2018
8806	L1B		close-up of skull from above	W	20/06/2018
8807	L1B		close-up of skull, oblique	W	20/06/2018
8808	L1B		close-up of vertebrae from above	S	20/06/2018
8809	L1B		close-up of vertebrae oblique	S	20/06/2018
8810	L1B		close-up of vertebrae, "capstone" removed	S	20/06/2018
8811	L1B		close-up of vertebrae, "capstone" removed		20/06/2018
8812			photo of page 1 of photograph register		
8813			photo of page 2 of photograph register		
8814	L1B		articulated cow bones	SW	21/06/2018
8815	L1B		articulated cow bones, overhead shot	S	21/06/2018
8816	L1B		skull of articulated cow	S	21/06/2018
8817	L1B		spinal column of articulated cow, overhead	S	21/06/2018
8818	L1B		articulated cow bones	NE	21/06/2018
8819 to 8859	L1B		photogrammetry photos of articulated cow		21/06/2018
8860	L1A		overhead shot of (316)	S	21/06/2018
8861	L1A		section shot of SW (316)	W	21/06/2018
8862	L1A		overhead shot of ash deposit (316)	S	21/06/2018
8863	L1A		wall & section beneath	N	21/06/2018
8864	L1A		closer shot of wall and section beneath	N	21/06/2018
8865	L1B		overhead shot of articulated cow with grid		21/06/2018

Photo No.	Cave	Context	Description	Direction Facing	Date
8866-8868	L1B		working party		21/06/2018
8869	L1B		cow skull (excavated)		21/06/2018
8870-2	void				
8873	L1B		cow skull showing pole-axe impact		21/06/2018
8874	L1B		cow spinal column, excavated		21/06/2018
8875	L1B		general view main trench old test pit, bottom left	W	21/06/2018
8876	L1B		general view main trench old test pit, bottom left	W	21/06/2018
8877	L1B		general view main trench old test pit, bottom left	W	21/06/2018
8878	L1B		view into cave old test pit right hand side	SW	21/06/2018
			Steve's Camera		
1 to 6	L1A		plan of trench 1 showing hearth (331) and floor surface (332) looking W	W	22/06/2018
7 and 8	L1A		mid-ex images showing section through hearth (331) T1	W	22/06/2018
9 and 10	L1A		mid-ex images showing shell midden (34) and ephemeral rubble wall [152]	W	22/06/2018
11 and 12	L1A		T1 after initial clean of surface (333)	W	22/06/2018
13 and 14	L1A		T1 after initial clean of surface (333)	W	22/06/2018
			Bob's Camera		
8879	L1B		oblique view of hearth [153]	SW	23/06/2018
8880	L1B		plan view of hearth [153]	NW	23/06/2018
8881	L1A		T1. mid-ex image showing sand horizon (342) & location of smithing hearth (334)	W	23/06/2018
8882	L1A		T1. mid-ex image showing sand horizon (342) & location of smithing hearth (334) in plan	N	23/06/2018
8883	L1A		T1 In plan showing smithing hearth (334)	NNW	23/06/2018
			No numbers 8884 to 8891		
8892	L1A		In plan, smithing hearth [334]	N	23/06/2018
8893	L1A		Smithing hearth [334]	W	23/06/2018
8894	L1A		close-up of smithing hearth [334]	W	23/06/2018
8895	L1A		Close-up of orange (ash?) (334) ? (351)	W	23/06/2018
			No numbers 8896 to 8899		
8900	L1A		plan view of smithing hearth (334)	S	23/06/2018
8901	L1A		detail view of smithing hearth (334)	SW	23/06/2018
8902 - 8910	L1B		various photos of gaming piece		24/06/2018

Photo No.	Cave	Context	Description	Direction Facing	Date
8911	L1A		mid-ex trench 1 (351) showing smithing hearth	SE	24/06/2018
8912	L1A		mid-ex trench 1 (351) showing smithing hearth	SE	24/06/2018
8913	L1A		detail of smithing hearth (351) in section	SE	24/06/2018
8914	L1A		detail of furnace wall [351]	SE	24/06/2018
8915	L1A		detail of furnace wall [351] showing slag run	SE	24/06/2018
8916	L1A		close-up of slag run	SE	24/06/2018
8917	L1A		overall view to SE of [351]	SE	24/06/2018
8918	L1A		plan of smithing furnace	NE	24/06/2018
8919	L1A		plan of smithing furnace, closer	NE	24/06/2018
8920	L1A		view of furnace [351]	NE	24/06/2018
8921	L1A		closer view of furnace [351]	NE	24/06/2018
8922	L1A		even closer view of furnace [351]	NE	24/06/2018
8923	L1B		SW trench extension mid-ex	W	24/06/2018
8924	L1B		hearth 168	NW	24/06/2018
8925	L1B		hearth 168	NE	24/06/2018
8926	L1B		overhead hearth 168		24/06/2018
8927	L1B		stone setting (159)	SE	24/06/2018
8928	L1B		stone setting (159)	SW	24/06/2018
8929	L1B		stone setting (160)	NE	24/06/2018
8930	L1B		stone setting (161)	N	24/06/2018
8931	L1B		possible hearth remains (162)	N	24/06/2018
8932	L1B		general	SW	24/06/2018
8933	L1B		general (no poles)	N	24/06/2018
8934	L1B		marketing shot		24/06/2018
8935	L1B		marketing shot		24/06/2018
8936	L1A		stone wall [313]	N	24/06/2018
8937	L1A		stone wall [313] view from above	N	24/06/2018
8938	L1A		stone wall [313]	NW	24/06/2018
8939	L1B		mid-ex of hearth [167]	NE	24/06/2018
8940	L1B		mid-ex of hearth plan view 168	NW	24/06/2018
8941	L1B		WNW-facing section of hearth 168 (left & 166 (right)	ESE	24/06/2018
8942	L1B		SSE facing section of hearth 166	WNW	24/06/2018
8943	L1B		location shot of hearths 166 (left) & 167 (far right)	SW	24/06/2018
8944	L1B		location shot of hearths 166 (left) & 167 (far right) with light	SW	24/06/2018
8945-8947	void				
8948	L1B		general view (same extent as 8932)	SW	27/06/2018
8949	L1B		general view (same extent as 8932)	SW	27/06/2018
8950, 8951			people		27/06/2018
8952	L1A		ash (319)	SW	27/06/2018

Photo No.	Cave	Context	Description	Direction Facing	Date
8953	L1A		ash (319)	SW	27/06/2018
8954	L1A		view of rough wall [343] retaining shell midden (323)	NE	27/06/2018
8955	L1A		overhead view of ash hearth (319) & retaining wall [343] for shell midden (323)	N	27/06/2018
8956	L1A		View of ash layer (335)	NW	27/06/2018
8957	L1B		Steve and beer	SW	28/06/2018



Plate 47: Leather boot overlying floor surface(103) in Learnie 1B