The Magna Project
2023 Excavations

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FOREWORD

BY THE DIRECTOR OF EXCAVATIONS

The Magna project includes a five-year research excavation at the fort of Magna on Hadrian's Wall, started in 2023, which is funded by the National Lottery Heritage Fund and the Vindolanda Trust. The project's aim is to thoroughly understand how the Roman fort, settlement and landscape of Magna was formed and to what extent the rapidly changing climate is affecting the buried archaeological remains. This report is the first of a series of five archaeological reports which will be produced at the end of each season of work chronicling the progress of the project from the remains of milecastle 46 in the north through to the commanding officer's house in the southwestern corner of the fort.

Magna Roman fort and landscape has been under the care of the Vindolanda Trust since 1972. The Trust purchased the land to protect the archaeological deposits from further agricultural damage. The site was an important Stanegate road and pre-Hadrianic fort, Hadrian's Wall fort, and had the remains of milecastle 46, the vallum and extramural settlements and cemeteries in a tightly packed landscape. It is also known to have large areas of organic anaerobic preservation, which contain materials such as Roman leather, textiles, writing tablets and wood. Those precious artefacts are increasingly rare and do so much to illuminate the life and history of their users. They are also amongst the most vulnerable archaeological remains and are the first to disappear when the buried archaeological deposits are no longer protected or rapidly respond to climate changes above the ground. A significant element to this project is a long-term monitoring system which constantly and diligently observes the health of the soil buried deeply below the surface of the site. Over the past two years this system of probes and weather stations has recorded and highlighted the strong relationships between climatic events, such as drought and torrential rainfall, with significant changes to the preservation landscape below the surface.

The Vindolanda Trust is deeply grateful to the insight and support of its funding partner, the National Lottery Heritage Fund, and to the thousands of volunteers who are taking part in this important work. Through their efforts we will be able to record things which may otherwise be forever lost and prepare a strategy to secure Magna's future.

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The Vindolanda Trust

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THE MAGNA PROJECT

1. INTRODUCTION

The Magna Project is a five-year research excavation at the fort of Magna on Hadrian's Wall. It commenced on the 3rd of July in 2023 with fieldwork investigating the remains of milecastle 46 and its immediate extramural area. The excavations uncovered the eastern half of the milecastle, confirming the position of its walls and its north and south portals. In addition, 10m of the milecastle's extramural landscape to the east and 12m of the extramural landscape to the south of the milecastle was explored. This uncovered evidence for Roman occupation at the site dating from the Hadrianic period to the 4th century, along with evidence for more recent activity from medieval to modern times.

During the course of the excavations a total of 8 roads or paths (sections 2.1, 2.2, 2.3), 6 pits (sections 2.2, 2.3, 2.4), 4 cobbled surfaces (sections 2.2, 2.3), 3 walls (section 2.3), 16 silt deposits (sections 2.1, 2.2, 2.3), 5 drains (sections 2.1, 2.2, 2.3), a cist grave (section 2.2, 11), a well (section 2.3), and a gully (section 2.4) were recorded.

2. EXCAVATION RESULTS

2.1 MEDIEVAL, POST-MEDIEVAL AND MODERN ACTIVITY

It is unclear when the milecastle fell into total disuse, whether in the later 4th century, or after the official withdrawal of the Roman army. There is no surviving evidence of occupation at the site in the immediate sub or post-Roman period and the abandonment of the occupation of the milecastle appears to be marked by extensive bands of silt that had built up across large areas of the site, most notably along the faces of walls. This suggests that some structural elements of the milecastle remained upstanding for a period, even at a low level, forming a barrier against which the silt could form. It is likely that the most systematic demolition and removal of material from the site took place during the medieval and post-medieval periods. This is a period when historic reclamation of Hadrian's Wall stones, most notably for the construction of the nearby Thirlwall Castle, built in the 14th century, took place (Collins et al., 2023: 89-91). A new trackway appears to have been laid over the central milecastle road around this time and is dated by a sherd of green-glazed pottery within its fabric. The trackway would have provided a useful link between the neighboring estates of Blenkinsopp, which owned the land containing Magna fort, and Thirlwall, which owned the land containing milecastle 46 and Hadrian's Wall (Birley, 1998: 48).

Activity in the post-medieval and modern period can be primarily linked to the cultivation of the land as part of Carvoran farm (Birley, 1998: 43-47). Three ceramic field drains running north-south were cut through the excavation area. Records from the first half of the 19th century show that these field drains were installed as part of wider efforts to improve the land by the Carrick family (Birley, 1998: 56-59). Additionally, three small cuts through the milecastle wall at the south-east corner may also relate to attempts to improve the land for agriculture. An alternative explanation is that these small trenches may represent explorations dug to locate the milecastle as the westernmost of the three crosses the full width of the wall and contains modern pottery and glass.

2.2 3RD AND 4TH CENTURY ACTIVITY

Evidence of intensive activity in the central and eastern range of the milecastle decreased during the 3rd and 4th centuries, perhaps indicating more sporadic occupation or a reduction in traffic crossing the Wall in those periods (Fig. 1). However, refurbishments and improvements were made to the central road during its later Roman occupation, with resurfacing and a new stone-lined drain installed beside the roadway. A surviving section of the drain crossed through the road surface from the direction of the unexcavated western half of the milecastle

before exiting through the southern gate. This drain may have connected to a building in the unexcavated part of the milecastle where a permanent garrison could have been billeted. However, this cannot be proven without further excavation. The drain and remodelling could have dated from the early part of the 3rd century, in the Severan period, coinciding with the refortification of other frontier posts and installations during the Severan wars (Breeze and Dobson, 2000: 140). However, as there were no further modifications until this feature was filled by the medieval trackway's cobbled surface, it is plausible that the drain had a later date.

After the drain had been laid two short E-W oriented trenches were cut through the road. Between them lay a small area of cobbling which may have represented the insertion of a temporary structure within the milecastle, overlying the previously broader roadway. In addition, two short paths were built within the milecastle: a curving, cobbled path to the north and a flagstone path to the south. The purpose of these paths remains uncertain. Unfortunately, no evidence was found of structures that the paths may have led to from the central road and it could be that they were laid to access the ramparts of the milecastle rather than an internal building or feature.

In the final phases of the Roman occupation of the milecastle, likely to be dated towards the end of the 4th century based on the ceramic assemblage (see section 6.1), the internal yard surface was left to silt up. This suggested a less intensive use of the internal yard space or that regular maintenance was no longer being prioritized. Before the open yard appears to have been abandoned, the remains of an earlier well (Fig. 4), dug through the primary cobbled surface near the east wall of the milecastle, had been deliberately backfilled. The lower fill of the well included laminated material more often associated with occupation material from sites like Vindolanda. This deposit was capped with large whinstone boulders and stone blocks to seal the structure from further use. The maximisation of the open interior yard space appears to have been more of a requirement than the use of a well in this space in the final years of Roman occupation.

Figure 1: *Aerial image of the excavations in September 2023 with 3rd century features highlighted in pink and 4th century features highlighted in blue.*

In the 3rd and 4th centuries, the extramural areas surrounding the milecastle to the east and south appear to have been lightly used. Earlier 2nd century features, such as pits, were deliberately filled or allowed to fill with silt. Light silt deposits also formed over the open areas of cobbling as well as along the faces of the walls or at the edge of the road. One of the most enigmatic features uncovered during the excavations was a large stone foundation or plinth (Fig. 2). This was constructed with facing blocks of sandstone arranged neatly across the top of the infill of a large pit to the east of the milecastle and did not extend beyond the limits of the earlier pit. The facing stones were reused Roman masonry blocks which were laid to form a clear faced eastern edge on the structure, with a smaller buttress of stone blocks built onto the northern section. The exact date of this feature and its purpose remain unknown due to the lack of dating material below or in the construction. The other pits in the area (see section 2.3) did not feature the same capping structure. However, the re-use of what were likely to have been stones from Hadrian's Wall or the milecastle would suggest that the pit was capped after one of the extensive remodeling phases had taken place, making this more likely to be Severan or post-Severan in date.

Figure 2: *Aerial view of the stone foundation or plinth in the eastern extramural area. Image captured from a 3D model.*

The most significant find from the later Roman period was a cist burial to the east of the milecastle. The grave had been positioned in the corner formed by the junction of the east milecastle wall and Hadrian's Wall, a location which would also have formed a secluded corner protected from the prevailing south westerly weather. The sides of the burial had been carefully lined with large flat stones to form a cist (Fig. 3), though there was no stone lining in the base of the grave. The top of the grave was filled with carefully placed rubble or wall stones to create a small cairn. The grave was oriented E-W, parallel with Hadrian's Wall, and this, combined with the lack of grave goods accompanying the remains may suggest this was an early Christian burial. A single inhumation was present within the grave though the remains were poorly preserved, having lost most of the cortical bone. The position of several bones, recorded before the skeleton was exhumed, suggests that the body had decomposed in a confined space and had likely been wrapped in a shroud before burial (see section 15). This is most visible with the position of the legs, which are closer together than they would usually be, and in the chest cavity. Here the ribs were displaced to lie parallel with the spine rather than perpendicular to it and the first rib was compressed onto the cervical vertebrae, a position in which it would not otherwise be found. Full osteological analysis of the skeletal remains is provided by Dr Trudi Buck (see section 11).

Stratigraphically, the burial can be dated to the Roman period, between c AD370-410 due to the spread of Roman material, including Huntcliff ware pottery, in a context which partially covered the top of the burial, as well as a single sherd found within the burial context. Inhumation is more typical from the late 3rd century onwards and the norm in the 4th century for many communities in Roman Britain (Toynbee, 1996: 40). The cist burial at Sewingshields (MC35) is one of only a few comparable examples of burials at Hadrian's Wall, with others known from Chapel House (MC9) and Turret 39a (Crow and Jackson, 1997: 65).

Figure 3: *Partially excavated grave, showing in-situ cist stones and tibia.*

2.3 2ND CENTURY ACTIVITY

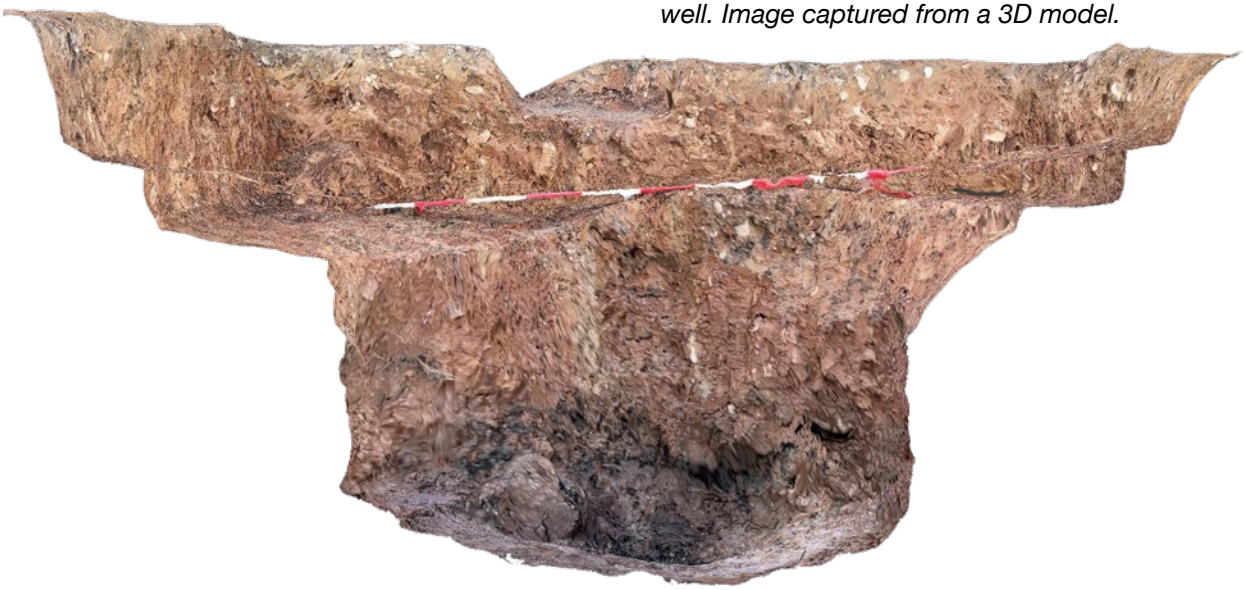
No traces of pre-Hadrianic or pre-Roman activity (such as evidence for ploughing or other land use) were visible on the site of the milecastle. The earliest archaeological deposits dated to the Hadrianic period and related to the construction of the milecastle and curtain wall. Despite extensive later stone robbing, both the southern and eastern walls of the milecastle were uncovered, along with the stretch of Hadrian's Wall running from the north gate to the junction with the milecastle's east wall (Fig. 5). Only a small number of facing stones survived in-situ, primarily at the southeast corner of the milecastle and where Hadrian's Wall met the east wall. However, where the stones had been removed, the construction cut remained clearly visible outlining the position of the original walls. As with the facing stones, the rubble core was largely absent in the milecastle's eastern wall, however it did survive in the southern wall and in the southeast corner. Most of the surviving core was formed of large limestone and whinstone boulders packed tightly between the inner and outer faces. The exception to this was the end of the south wall as it formed the south gate. Here the core was found to have been made of smaller limestone cobbles, although no obvious reason for this change can be offered.

The excavations revealed no evidence of any buildings within the eastern half of the milecastle in this period. Instead, a cobbled yard was laid throughout the interior, abutting the edge of the road, and set into a white clay foundation. This surface was well preserved in the northern half of the excavated area but more disturbed in the southern half of the milecastle interior. Cut through the surface were the foundations for two buttresses, packed with local boulder clay and built onto the interior face of the southern wall. These were positioned just inside the south gate, and no evidence of buttressing was observed elsewhere on the milecastle walls. One interpretation is that these may have been foundations for a timber stairwell providing access from the street level to the battlements, comparable to the stone steps found at milecastle 48 in both position and function (Breeze and Dobson, 2000: 31).

The original Hadrianic surface of the central road through the milecastle was uncovered in several sections along its length. The most substantial section ran through the north gate, where a tightly packed surface of small, uniform cobbles was uncovered between the two sides of the gateway and extending north beyond the trench edge. This surface was then covered by the first major resurfacing during the Antonine period. A new layer of tightly packed cobbles was laid, and a stone box drain was built along the eastern edge of the road. Pottery recovered from the surfaces of both roads has confirmed their respective dates (see section 6.1).

As well as road resurfacing, several other alterations to the internal spaces could be dated to the latter half of the 2nd century. This may link into the wider changes taking place along Hadrian's Wall in this period to refurbish the frontier before the withdrawal from southern Scotland in the latter half of the 2nd century, as observed at Housesteads and milecastle 10 and the surrounding area (Symonds, 2022: 96). A row of four postholes were recorded along the inside face of the milecastle's east wall, some of which retained their packing stones. Although no matching row was present along the road edge, the postholes may have supported a frame for an awning or roof covering this half of the internal area. This would have provided shelter for people and animals within the milecastle and protected the well whilst it was in use.

Figure 4: *East facing profile of the fully excavated well. Image captured from a 3D model.*



The most substantial later 2nd century addition was the insertion of a well into the milecastle. This was situated under the covered area of the yard adjacent to the eastern wall. This is at present the only known well to have been discovered inside a milecastle. It had a diameter of 1.79m and a depth of 2.5m (Fig. 4). The well was deliberately backfilled during the third century using whinstone boulders and dressed stone blocks (see section 2.2). The backfilling provided the conditions for the lower deposits to remain sealed, waterlogged, and semi-anaerobic, preserving organic material such as fragments of wood, leather, and rope.

One other feature dug through the milecastle's floor is also likely to date to the 2nd century. This was a relatively shallow, sub-oval pit that was filled with a very large stone block, located close to the south wall. The block bore no inscription or tool marks and the purpose of the pit was not clear, and the area was covered by a flagstone path by the 4th century.

Figure 5: *Aerial image of the excavations in September 2023 with later 2nd century features highlighted in green and Hadrianic features highlighted in orange.*

Most of the activity in the extramural areas to the south and east of the site can be dated to the latter half of the 2nd century. However, a few features can be linked to the initial construction of the Hadrianic defenses. A tightly packed cobbled road, linking back to the main fort at Magna, ran from the south gate towards the vallum. An extensive later cobbled surface to the south of the milecastle, abutting the road, likely functioned as a waiting or holding area for traffic crossing the Wall.

A loose spread of cobbling to the east of the milecastle, defined on its southern edge by an E-W ditch, may have performed a similar function. This latter cobbled area was later cut by several large pits and the defining ditch allowed to silt up (Fig. 5). Three of these pits are of comparable diameter and depth, suggesting they were all for the same purpose and likely in use at the same time or immediately after one another. A fourth pit was excavated to the north of this cluster: it differs from the others in both shape and fill, suggesting it was not part of the main group. This area was accessed from the southern cobbled yard via a short section of road made of tightly packed cobbles which wrapped around the outer face of the southeast corner of the milecastle.

The eastern area is perhaps best interpreted as an industrial zone, although the specific functions of the pits are not yet clear beyond the extraction of materials such as clay and stones. One potential use is that they were dug as quarry pits for agger to use in the construction of the Military Way or other nearby roads. Another possible interpretation is that they were used for the processing of raw materials, which may have been brought through the Wall and refined onsite before transported to markets in the Empire. This is being investigated through the analysis of both bulk and low volume environmental samples with the aim of recovering ecofactual or chemical trace evidence which can then be linked to industrial processes (see sections 16.1, 16.2, 17).

2.4 UNCERTAIN FEATURES AND FURTHER WORK

Although most of the features uncovered during the 2023 excavation season have been identified, the function of a couple remains more difficult to ascertain. Both are likely to date to the later Roman occupation of the site based on stratigraphic evidence. To the east of the milecastle a shallow gully, oriented N-S, was excavated to the south of Hadrian's Wall (Fig. 1). The southern terminus of the gully was cut across the upper fill of a substantial pit. It may have been dug to channel water away from Hadrian's Wall; however, its overall function remains unclear. Within the milecastle, a sub-rectangular pit, aligned N-S, was cut through the cobbled surface at the north end. This feature has no obvious purpose although its shape in plan is reminiscent of the cist grave found outside the milecastle wall (see section 2.2). While no evidence of human remains was found within this pit, the poor preservation of bones from the area does not completely rule out the possibility of it once being used as a grave.

3. A PRIORITY MILECASTLE

The excavation of the north, south and east walls of the milecastle allowed the dimensions of the eastern half of the milecastle to be calculated. The south and east walls were found to be on average 3.2m wide; the width of the north wall (Hadrian's Wall) could not be calculated as it extended beyond the northern edge of the trench. The internal dimensions were 20m N-S by 9.4m E-W, providing a total potential width of 18.8m E-W and 376m^2 internal area. This proves that milecastle 46 was a long-axis, broad-walled milecastle and of a comparable size to milecastles 47 and 48 to the west, making it one of the largest on the Wall. The thickness of the walls indicates that milecastle 46 was constructed in the early phases of work on the Wall. Along with the broad wall dimensions, the southeast corner was rounded on both its inner and outer faces, further confirming an early construction date (Symonds, 2005: 72).

The similarity to milecastles 47 and 48 would suggest it was part of a set of 'priority milecastles' built to control the Tipalt-Irthing Gap. Three distinct groups of milecastles have been identified as protecting areas of strategic concern, based on the whole or partial use of broad wall dimensions in their construction (Symonds, 2005: 72). In the western cluster the River Irthing and Tipalt Burn are focal points, as they provide a natural route through the landscape (Fig. 6). The topographic location of milecastle 46 on a ridge above the Tipalt Burn, with clear views over much of the land to the west, further explains its inclusion in the priority group.

One notable difference between milecastle 46 and its western neighbours is the lack of internal buildings located by the excavations. Although it remains possible that a barrack block exists in the unexcavated western half, both Poltross Burn (MC48) and Chapel House (MC47) were found to contain large buildings on either side of the central road (Simpson et al., 1936: 272). The absence of accommodation may be explained at milecastle 46 due to its proximity to the main fort of Magna, a few hundred metres to the south. This location meant it would have been possible for soldiers to man the milecastle directly from their barracks within the main fort, rather than being deployed outside of it for extended periods of time. The hypothesis of soldiers stationed at Magna manning milecastle 46 may also explain the absence of an oven within the milecastle's excavated features. If soldiers were not living in the milecastle, they would have less need to prepare and cook food at the site, instead of bringing supplies with them for the day (see section 8.1 for further discussion). It is important to note that at both milecastle 47 and 48 the ovens were in the northwest corner, an area not excavated as part of this project.

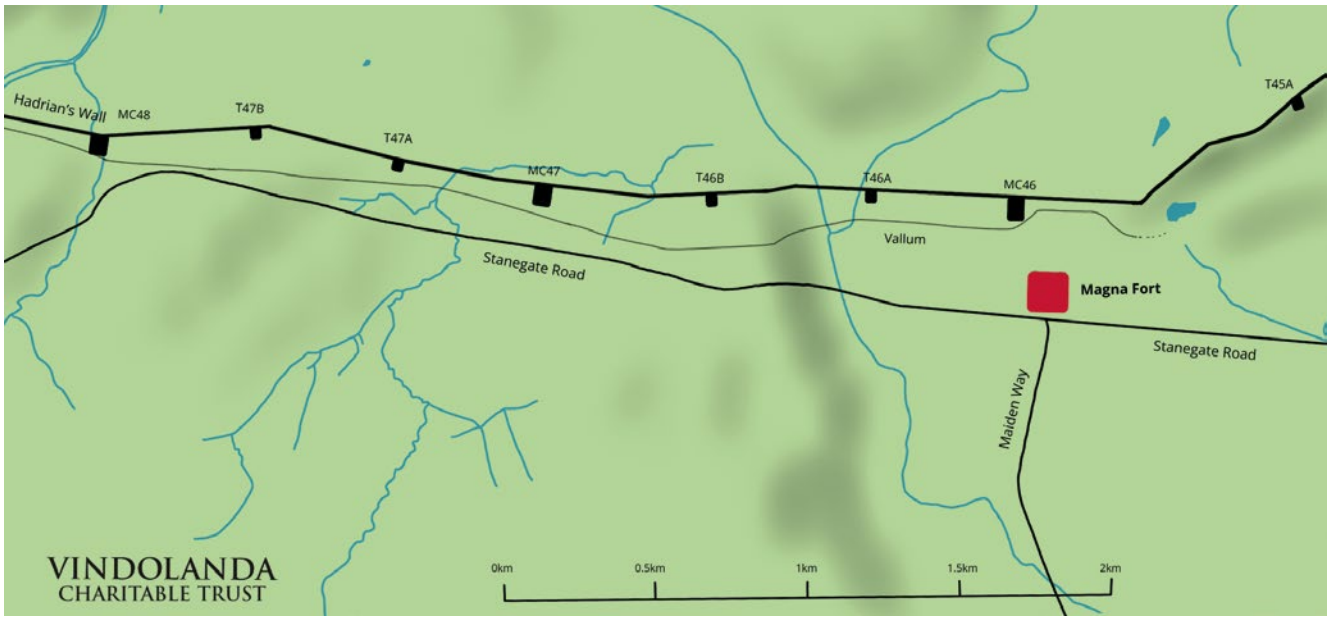


***Figure 6**: Map showing the locations of milecastles 46-48 and the road network at Magna fort.*

3.1 A TRADING HUB

Although originally constructed as a defensive structure, milecastle 46 may not have exclusively functioned as a military outpost. Its location, close to the fort of Magna, the Stanegate and Maiden Way (Fig. 6), lent itself to becoming a key crossing point for the Wall and potential trading hub (Birley, 1998: 10). The creation of extensive cobbled yards both inside and outside the milecastle attested to the potential volume of traffic passing through the Wall. These areas could also be interpreted as a place for informal roadside trading. As well as structural evidence, several of the artefacts found during the 2023 excavations can be associated with trade and the movement of goods and people through the site. Amphora recovered by the excavation included a high number of sherds, likely from a single vessel, smashed on the surface of the Antonine period roadway (see section 7.1). Whilst this might have been used to transport rations to the milecastle for the soldiers it could also represent an unfortunate loss of goods in transit passing through the Wall.

The discovery of a dual balance (MSF7, see section 10.1) at milecastle 46 may indicate that trade or taxation of high value goods also took place at the site. The dual balance could have been used by officials of the Roman army for taxation or it may have belonged to a craftsperson travelling through the region to reach new markets. The high-quality manufacture of this artefact and its association with high value goods contribute to our understanding of milecastle 46 as a significant crossing point through Hadrian's Wall.

4. BULK FINDS

Overall, the excavations were characterised by a low density of find types across all contexts, with many contexts producing no artefactual remains. Poor preservation conditions are likely to have been a contributing factor, with the rare preservation of bone characteristic of the excavation. In total there were 52 iron objects (mostly nails), 46 glass shards, 23 bone and teeth fragments and 17 pieces of CBM. This material will be assessed after the 2024 excavations as a complete assemblage from area A. In addition to this, 2.579 kilograms of post-Roman pottery, primarily post-medieval, and 496g of white clay pipe fragments were also recovered but will not be subject to further analysis.

5. POTTERY REPORT

BY DR CRISTINA CRIZBASAN

5.1 INTRODUCTION

The pottery assemblage from Magna 2023 (M23) excavation season consisted of 489 sherds which amounted to 8.218 kilograms. Out of these, 52 sherds represented the minimum number of rims (MNR), with an average estimated number of vessels (ENVavg) – obtained as an average between a minimum and a maximum ENV – of 266 and an estimated vessel equivalent (EVE) of 5.615.

Overall, the assemblage revealed that milecastle 46, near the fort at Magna, received diverse pottery regarding fabrics and forms, being well connected to the main supply routes. The constantly renewed roads would have allowed for a flow of goods to the site, visible in the range of vessels. Moreover, these patterns tended to highly resemble the ones from other milecastles on Hadrian's Wall (Richmond and Gillam, 1952; Harbottle et al., 1988; Gibson et al., 1911), arguing that a mutual supply may have reached all these military installations.

The structure of the report covers the following key information. Firstly, an in-depth analysis of the overall quantities is given, based on two different criteria: period (early 2nd century; late 2nd century; 3rd century; 4th century) and area (interior and exterior of milecastle 46). The former assesses the quantities of pottery per period as a way of understanding the flux of supply at milecastle 46 and its link to occupation over time. The latter looks at the pottery quantity distribution outside and inside the milecastle, to differentiate between consumption surrounding the milecastle in terms of both quantities and functional categories.

The next section of the report is focused on fabric supply, discussed by fabric class. The approach highlights the relationship between fabric quantities and chronology, the functional analysis of forms within each fabric, as well as any association of specific fabric classes, such as amphora, with specific contexts. Lastly, all these trends and patterns are dissected, zoomed in and discussed in their regional context by comparison with other assemblages from nearby milecastles for alternative perspectives on pottery consumption on Hadrian's Wall.

5.2 METHODOLOGY

The fabric recording followed a common northern typology series previously employed at sites such Catterick (Evans, 2002), Binchester (Evans, 2002) and Vindolanda (Alberti et al., forthcoming 2024; Vindolanda North Field report forthcoming). Essentially, the approach relies on nine broad fabric classes as listed below.

Fabric Class Code	Fabric Class
A	Amphorae
B	Black-burnished and its imitations
F	Finewares
G	Gritted wares
M	Mortaria
O	Oxidised wares
Q	White-slipped flagon fabrics
R	Reduced wares
S	Samian
W	Whitewares

Table 1: *Fabric Class codes used to classify the pottery fabrics at Magna.*

As additional layers of fabric analysis and interpretation, two more levels of assessment have been employed: form classes and form types within each fabric class. This allows the exploration of the range of vessels within each fabric category, enabling an understanding of the functional role of each fabric, by displaying the predominant vessels that were produced for each one. For example, cooking jars would be made mostly in reduced (R) greyware, while tablewares and flagons would be made in oxidised (O) fabrics.

The current analysis has considered all pottery from the stratified, Roman-dated contexts. Table 3 below is the only one to display each context and its dating (both Roman and non-Roman) for an overview of quantities and the way they are divided across contexts. However, the rest of the in-depth analysis focuses only on the Roman periods, that is early 2nd century, late 2nd century, 3rd century and 4th century. When residual fragments have been identified, they have been left in the assemblage due to their potential to reveal pottery consumption trends over time. They provide the peak period of their use, as well as a perspective on the gradual dying down of fashions as they become residual and are replaced by other fabrics and form types.

6. BASIC QUANTITIES

The excavations from Magna produced in 2023 a total number of 118 contexts and one watching brief (OASIS thevindo1-519695, Magna Archaeological Evaluation, September 2023) with two additional contexts, that is MWB 307 and MWB unstratified general area. Out of these, 80 contexts lacked any Roman pottery while 40 contexts contained at least one Roman sherd. Additionally, from those containing Roman pottery, two contexts were from the watching brief, while 13 contexts dated to either medieval or post-medieval period. Therefore, out of 120 contexts overall (including the watching brief), 87 were dated as Roman and 27 of them contained at least one Roman pottery sherd (Table 2). Table 3 offers insights into the exact quantities of pottery resulting from each of the 120 contexts.

Context	Nos of contexts with Roman pottery	Nos of contexts without Roman pottery	Total no of contexts
Roman	27	60	87
Non-Roman	13	20	33
Total	**40**	**80**	**120**

Table 2: *A breakdown of the number of number of Roman/non-Roman contexts which contained/did not contain Roman pottery.*

Context no	Date	NoSh	Weight (g)	MNR	EVE	ENV
1	Post-Medieval	73	1199	10	0.785	61
2	Medieval	6	121	3	0.31	6
3	Post-Medieval	1	5	0	0	1
4	Medieval	5	24	0	0	4
5	Medieval	5	16	1	0.05	3
6	Medieval	5	83	1	0.27	4
7	Hadrianic	9	137	3	0.205	9
8	Hadrianic	1	3	0	0	1
9	Late 2nd Century	1	157	1	0.08	1
10	Medieval	0	0	0	0	0
11	Post-Medieval	0	0	0	0	0
12	3rd Century	2	8	0	0	2
13	4th Century	0	0	0	0	0
14	Medieval	6	39	0	0	6
15	Post-Medieval	0	0	0	0	0
16	4th Century	3	9	0	0	2
17	3rd Century	0	0	0	0	0
18	Post-Medieval	0	0	0	0	0
19	Post-Medieval	0	0	0	0	0
20	Post-Medieval	31	191	2	0.495	7.5
21	Post-Medieval	5	141	0	0	3.5
22	3rd Century	56	526	8	1.035	47.5
23	4th Century	0	0	0	0	0
24	Medieval	0	0	0	0	0
25	Medieval	0	0	0	0	0
26	4th Century	0	0	0	0	0
27	4th Century	0	0	0	0	0
28	4th century	0	0	0	0	0
29	Hadrianic	0	0	0	0	0
30	Hadrianic	0	0	0	0	0
31	Post-Medieval	0	0	0	0	0
32	Medieval	8	332	0	0	6

Context no	Date	NoSh	Weight (g)	MNR	EVE	ENV
33	Medieval	0	0	0	0	0
34	Hadrianic	1	2	0	0	1
35	Post-Medieval	0	0	0	0	0
36	Medieval	0	0	0	0	0
37	4th Century	1	4	0	0	1
38	4th Century	0	0	0	0	0
39	Late 2nd Century	0	0	0	0	0
40	Post-Medieval	0	0	0	0	0
41	Post-Medieval	0	0	0	0	0
42	Post-Medieval	0	0	0	0	0
43	Post-Medieval	0	0	0	0	0
44	Post-Medieval	0	0	0	0	0
45	Post-Medieval	5	194	1	0	3
46	Late 2nd Century	4	100	1	0.09	4
47	3rd Century	0	0	0	0	0
48	Late 2nd Century	6	24	0	0	6
49	Hadrianic	1	10	0	0	1
50	Hadrianic	1	3	0	0	1
51	3rd Century	20	89	3	0.29	18
52	3rd Century	10	76	5	0.315	10
53	4th Century	0	0	0	0	0
54	Hadrianic	3	18	0	0	2.5
55	4th Century	13	49	0	0	5
56	Late 2nd Century	1	3	0	0	1
57	Late 2nd Century	0	0	0	0	0
58	4th Century	66	905	2	0.12	10
59	Late 2nd Century	0	0	0	0	0
60	Late 2nd Century	0	0	0	0	0
61	3rd Century	11	988	1	0.25	0
62	4th Century	0	0	0	0	0
63	4th Century	0	0	0	0	0
64	3rd Century	0	0	0	0	0

Context no	Date	NoSh	Weight (g)	MNR	EVE	ENV
65	3rd Century	0	0	0	0	0
66	Late 2nd Century	0	0	0	0	0
67	Late 2nd Century	2	51	2	0.125	2
68	3rd Century	0	0	0	0	0
69	3rd Century	5	36	3	0.12	4
70	Late 2nd Century	0	0	0	0	0
71	4th Century	4	26	0	0	4
72	3rd Century	0	0	0	0	0
73	3rd Century	2	44	1	0.12	2
74	Post-Medieval	0	0	0	0	0
75	Post-Medieval	0	0	0	0	0
76	Post-Medieval	0	0	0	0	0
77	Post-Medieval	0	0	0	0	0
78	Late 2nd Century	0	0	0	0	0
79	Late 2nd Century	0	0	0	0	0
80	4th Century	0	0	0	0	0
81	Hadrianic	0	0	0	0	0
82	Hadrianic	0	0	0	0	0
83	3rd Century	0	0	0	0	0
84	3rd Century	0	0	0	0	0
85	4th Century	0	0	0	0	0
86	4th Century	0	0	0	0	0
87	4th Century	0	0	0	0	0
88	3rd Century	0	0	0	0	0
89	4th Century	0	0	0	0	0
90	4th Century	54	1049	0	0	4
91	Late 2nd Century	0	0	0	0	0
92	Late 2nd Century	0	0	0	0	0
93	3rd Century	0	0	0	0	0
94	3rd Century	0	0	0	0	0
95	Late 2nd Century	47	398	0	0	2
96	Late 2nd Century	4	209	1	0.15	4

Context no	Date	NoSh	Weight (g)	MNR	EVE	ENV
97	Late 2nd Century	0	0	0	0	0
98	3rd Century	0	0	0	0	0
99	3rd Century	0	0	0	0	0
100	3rd Century	0	0	0	0	0
101	Hadrianic	0	0	0	0	0
102	Late 2nd Century	1	18	0	0	1
103	3rd Century	0	0	0	0	0
104	Late 2nd Century	0	0	0	0	0
105	Hadrianic	0	0	0	0	0
106	Hadrianic	0	0	0	0	0
107	Hadrianic	0	0	0	0	0
108	Hadrianic	0	0	0	0	0
109	Hadrianic	0	0	0	0	0
110	Hadrianic	0	0	0	0	0
111	Late 2nd Century	0	0	0	0	0
112	Late 2nd Century	0	0	0	0	0
113	Late 2nd Century	0	0	0	0	0
114	Late 2nd Century	0	0	0	0	0
115	Late 2nd Century	0	0	0	0	0
116	Late 2nd Century	0	0	0	0	0
117	Late 2nd Century	0	0	0	0	0
118	Late 2nd Century	0	0	0	0	0
MWB307	N/A	7	770	2	0.525	6
MWB gen unstrat area	N/A	3	161	1	0.28	3
Total		**489**	**8218**	**52**	**5.615**	**266**

Table 3: *Breakdown of each (Roman/non-Roman) context, its dating and the quantification of present pottery by NoSh, weight, MNR, EVE and ENV.*

6.1 QUANTITIES BY PERIOD

The 2023 Magna excavations revealed four Roman periods (early 2nd Century, late 2nd Century, 3rd Century and 4th Century), and two non-Roman periods (Medieval and Post-Medieval). The two contexts from the watching brief could not be dated. Only the four Roman periods have been considered for further analysis. Tables 5-8 present pottery quantities by period and context at the milecastle.

Table 4 below shows the way Roman pottery quantities are distributed across these periods based on five quantification methods. While the number of sherds (NoSh) and weight indicate that almost half of the total pottery quantity lies in 4th century contexts, the MNR, EVE and ENVavg designate the 3rd century as the most abundant in pottery. This essentially reveals that the fragmentation of pottery is higher in the 4th century. The contexts from the 4th century also contain heavier vessel types (such as amphorae and mortaria), which lead to high NoSh and Weight, but lower quantities of actual individual vessels. For example, from the 4th century, context 58 contains 66 sherds from ten vessels on average. Approximately 56 of these sherds originate from an almost complete black-burnished jar. Additionally, in context 90, out of 54 sherds, 50 belong to a friable amphora which weigh altogether 1009g. Therefore, these patterns led to the results seen in Table 4 regarding the 3rd and the 4th centuries AD.

Period	NoSh%	Weight%	MNR%	EVE%	ENVavg%
Hadrianic	4.86	3.50	9.68	7.07	10.20
Late 2nd century	20.06	19.43	16.13	15.34	13.82
3rd century	32.22	35.75	67.74	73.45	58.88
4th century	42.86	41.32	6.45	4.14	17.11
Total	**329**	**4942**	**31**	**2.9**	**152**

Table 4: *The distribution of pottery quantities (%) across the four periods at milecastle 46.*

Each of the four Roman periods identified at milecastle 46 has been further analysed in terms of pottery quantities and originating contexts, to understand the fluctuation of pottery flow at milecastle 46. The pottery in each period has been quantified based on the number of sherds (NoSh), weight, minimum number of rims (MNR), estimated vessel equivalent (EVE), and an average estimated number of vessels (ENVavg). Both raw numbers and percentages have been provided. While the former provides a clear understanding of the objective quantities of Roman pottery in each context and each period respectively, the latter allows for a better perspective on which contexts contained the highest ratios of pottery within each period. This method allows one to compare and isolate contexts of outstanding abundance for an in-depth analysis.

EARLY 2ND CENTURY

The Hadrianic period rendered in total 16 sherds of Roman pottery, from contexts 7/49, 8, 34, 50 and 54. Just over half of these fragments originated from context 7/49, amounting to ten sherds, that is 62.50% of the total quantity in this period. The rest of the sherds were scattered across the other four contexts and in minimal quantities. Thus, the Hadrianic period at milecastle 46 is rather scarce in terms of pottery consumption. This could be because the milecastle was freshly built and just started operating at the time, hence supply was yet to fully reach it. It is also possible that the goods may have been the minimal personal possessions of the soldiers who would be stationed there, enough to cover their needs for a short time.

Excavations seem to suggest that the milecastle – at least the excavated eastern side – may not have been intensively occupied as a permanent or long-term residence but acted instead as a customs checking point manned and supplied by soldiers stationed at Magna. It is generally accepted that one of the milecastles' functions was to control and permit otherwise undesirable civilian traffic through forts (Breeze and Dobson, 1972: 191). Additionally, the first half of the 2nd century is also marked by

the building of the Antonine Wall and the decision in AD138 to move the troops north. This decision would have left some of the milecastles abandoned until about the mid-160s (Breeze and Dobson, 2000: 116). Thus, the pottery results seen in the early 2nd century AD appear to reflect the novelty of the milecastle's construction, as well as its possible short-term, ephemeral style of occupation at the time and the possible impact of the new Antonine frontier.

EARLY 2ND CENTURY										
Context	**NoSh**	**NoSh%**	**Weight**	**Weight%**	**MNR**	**MNR%**	**EVE**	**EVE%**	**ENVavg**	**ENVavg%**
7/49	10	62.50	147	84.97	3	100.00	0.205	100.00	10	64.51
8	1	6.25	3	1.73	0	0.00	0	0.00	1	6.45
29	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
30	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
34	1	6.25	2	1.16	0	0.00	0	0.00	1	6.45
50	1	6.25	3	1.73	0	0.00	0	0.00	1	6.45
54	3	18.75	18	10.40	0	0.00	0	0.00	2.5	16.13
81	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
82	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
101	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
105	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
106	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
107	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
108	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
109	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
110	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**16**	**100.00**	**173**	**100.00**	**3**	**0.00**	**0.205**	**100.00**	**15.5**	**100.00**

Table 5: *Breakdown of each Roman-dated context from the early 2nd century and the pottery quantities (raw and percentages) each one contained.*

LATE 2ND CENTURY

The late 2nd century at Magna produced overall 66 sherds, from contexts 9, 47, 48, 56, 67, 95, 96 and 102. They weighed 960g and contained a minimum number of rims (MNR) of 5 and 0.445 estimated vessel equivalent (EVE). When switching the quantitative perspective from NoSh/weight to ENVavg, context 48 contained six possible vessels, followed by 46 and 96 with four vessels each. It appears that the most abundant context regarding number of sherds and weight is 95, associated with two friable amphorae broken onto the Antonine road crossing the interior of the milecastle. Archaeological evidence suggests that the road had been resurfaced, with the laying of new cobbles and insertion of a drain, indicating therefore a continuous use of the road leading to milecastle

46 and the incoming of goods to and through the site such as the transport of amphorae and their associated contents.

The archaeological and ceramic evidence seem to suggest that the milecastle was kept as a crossing point in the late 2nd century and some of these goods may have continued their journey beyond the Wall. Civilian traffic at the Wall would have been directed in preference through the milecastles rather than forts, controlling the movements of merchants, local farmers or settlers visiting relatives on the other side of the Wall (Breeze and Dobson, 2000: 40). Additionally, in the light of the Antonine move, the milecastle gateways could have stayed opened, allowing the access to traffic, both military and civilian, before regaining their full functions after AD160s (Breeze and Dobson, 2000: 90). At milecastle 46, the resurfacing of the road, as well as the traces of a pivot hole next to the gate, seem to suggest that the late 2nd century brought some refurbishment work at the site, which is also reflected in the pottery assemblage. The pottery quantities, regardless of the quantitative measures employed, increased in the late 2nd century compared to the previous period, showing continued milecastle use, as well as a more stable flow of goods at and through the site towards the end of the 2nd century.

LATE 2ND CENTURY										
Context	**NoSh**	**NoSh%**	**Weight**	**Weight%**	**MNR**	**MNR%**	**EVE**	**EVE%**	**ENVavg**	**ENVavg%**
9	1	1.52	157	16.35	1	20.00	0.08	17.98	1	4.76
39	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
46	4	6.06	100	10.42	1	20.00	0.09	20.22	4	19.05
48	6	9.09	24	2.50	0	0.00	0	0.00	6	28.57
56	1	1.52	3	0.31	0	0.00	0	0.00	1	4.76
57	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
59	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
60	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
66	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
67	2	3.03	51	5.31	2	40.00	0.125	28.09	2	9.52
70	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
78	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
79	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
91	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
92	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
95	47	71.21	398	41.46	0	0.00	0	0.00	2	9.52
96	4	6.06	209	21.77	1	20.00	0.15	33.71	4	19.05
97	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
102	1	1.52	18	1.88	0	0.00	0	0.00	1	4.76
104	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

LATE 2ND CENTURY										
Context	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
111	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
112	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
113	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
114	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
115	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
116	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
117	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
118	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**66**	**100.00**	**960**	**100.00**	**5**	**100.00**	**0.445**	**100.00**	**21**	**100.00**

Table 6: *Breakdown of each Roman dated context from the late 2nd century and the pottery quantities (raw and percentages) each one contained.*

3RD CENTURY

In the 3rd century the number of sherds increased from the previous period, from 66 to 106. They weighed 1852g, with a total of 21 MNR and 2.1 EVE. In fact, this period offered the most abundant quantities of pottery throughout the 2023 excavation season at Magna. However, most pottery came from context 22 which contained 56 sherds: that is just over half of the total quantity of this period. This is further supported by the other quantitative methods which show a MNR of 8, EVE 1.035 and ENVavg 47.5 thus, accounting for almost half the quantity of pottery from this period. The nature of this context however seems to be a rubbish buildup, which would have started likely in the 3rd century and continued into the 4th. This is evidenced by the presence of two fragments of Huntcliff-type ware which date to AD340s at least, based on evidence from the Womersley hoard (Pirie, 1971: 127-9). This ware appears to have been in direct competition with BB1 which ceased to be delivered to northern Britain as a result of the emergence of the cheaper to produce and distribute Huntcliff type ware (Gillam, 1976: 58). Due to the presence of black-burnished types along with the gritted Huntcliff type fabric, context 22 appears to exhibit a picture of gradual rubbish buildup over time, possibly starting in the 3rd century AD and continuing into the 4th.

Other relatively rich contexts in pottery from the 3rd century were 51 and 52 which together contained eight minimum number of rims, that is 38.1% of the total pottery from the 3rd century; and 28 ENVavg that equals to 31.28%. However, these were the fills of two industrial pits from the late 2nd century discontinued in use by the 3rd century were likely to have been silted up due to the lack of use. Overall, it seems that throughout the 3rd century the amount of pottery arriving to the milecastle at Magna has increased from the previous phase, but from a restrained number of contexts which seem to be related to rubbish buildup or older features silting up. These characteristics keep suggesting that the milecastle served as a post station where soldiers would have camped short-term and therefore used the bare minimum in terms of pottery.

3RD CENTURY										
Context	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
12	2	1.89	8	0.45	0	0.00	0	0.00	2	2.23
17	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
22	56	52.83	526	29.77	8	38.10	1.035	48.59	47.5	53.07
47	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
51	20	18.87	89	5.04	3	14.29	0.29	13.62	18	20.11
52	10	9.43	76	4.30	5	23.81	0.315	14.79	10	11.17
61	11	10.38	988	55.91	1	4.76	0.25	11.74	6	6.70
64	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
65	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
68	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
69	5	4.72	36	2.04	3	14.29	0.12	5.63	4	4.47
72	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
73	2	1.89	44	2.49	1	4.76	0.12	5.63	2	2.23
83	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
84	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
88	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
93	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
94	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
98	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
99	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
100	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
103	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**106**	**100.00**	**1767**	**100.00**	**21**	**100.00**	**2.13**	**100.00**	**89.5**	**100.00**

Table 7: *Breakdown of each Roman dated context from the 3rd century and the pottery quantities (raw and percentages) each one contained.*

4TH CENTURY

The 4th century assemblage from Magna 2023 season consisted of 141 sherds which weighed 2042g. In terms of estimating the vessels number, this period unveiled a MNR 2, EVE 0.12, and ENVavg 26. Context 58 stood out in this period as containing almost half of the total pottery. The two preserved rim sherds originated in this context, while the ENVavg was 10, taking up 38.46% of the total pottery in the 4th century. The other three contexts to contain pottery were 55, 71 and 90, which together amounted to an ENVavg 13. The assemblage from the 4th century contained the highest number of sherds (NoSh), but the actual estimations of vessel count (ENVavg) was 26, taking up approximately 17% of the total estimated number of vessels from milecastle 46. This essentially shows that the fragmentation rate of vessels in this period was high and that the high number of sherds reflects levels of pottery integrity preservation rather than the actual number of vessels. This is supported by the presence of an almost complete jar from context 58 which ended up in 56 separate sherds, driving up the number of sherds (NoSh), but not the number of vessels.

The low quantities of pottery dating to this period seem to indicate that the occupation of the milecastle must have ended at some point in the 4th century AD. A similar pattern has been observed at other milecastles on Hadrian's Wall. For example, at milecastle 54, pottery indicated ongoing occupation until sometime in the 4th century AD. This has been particularly supported by the presence of the Huntcliff jars, which peaked in this period (Allason-Jones et al., 1984: 234). A similar pattern has been observed at milecastle 46, where Huntcliff ware type jars came from at least context 22, a rubbish buildup starting in the 3rd century and continuing into the 4th. Additionally, the almost complete jar from context 58 is a type Gillam 147, which has been identified on Hadrian's Wall at Housesteads to date to AD290-370 (Gillam, 1957: 195). While the dating range is wide, it covers predominantly the first three quarters of the 4th century. Therefore, the decreasing quantities of pottery indicate that the milecastle must have been abandoned at some point during the 4th century, whilst the pottery types indicate that for at least some part of this period activity continued at the site.

4TH CENTURY										
Context	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
13	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
16	3	2.13	9	0.44	0	0.00	0	0.00	2	7.69
23	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
26	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
27	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
28	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
37	1	0.71	4	0.20	0	0.00	0	0.00	1	3.85
38	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
53	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
55	13	9.22	49	2.40	0	0.00	0	0.00	5	19.23
58	66	46.81	905	44.32	2	100.00	0.12	100.00	10	38.46
62	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
63	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
71	4	2.84	26	1.27	0	0.00	0	0.00	4	15.38
80	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
85	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
86	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
87	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
89	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
90	54	38.30	1049	51.37	0	0.00	0	0.00	4	15.38
Total	**141**	**100.00**	**2042**	**100.00**	**2**	**100.00**	**0.12**	**100.00**	**26**	**100.00**

Table 8: *Breakdown of each Roman dated context from the 4th century and the pottery quantities (raw and percentages) each one contained.*

6.2 QUANTITIES BY AREA

A further analysis has been undertaken regarding the link between quantities of pottery and their originating area. Throughout the milecastle excavations, the pottery was assigned to either the interior or the exterior of the milecastle. An overall quantitative perspective is offered in Table 9 across the four Roman periods. Depending on the quantification methods employed, results may differ. According to the number of sherds more pottery came from outside the milecastle (59.52% to 40.48%). However, the weight seems to indicate only 42.80% of pottery came from the exterior and 57.20% originated in the interior. This is the case when employing weight and number of sherds as quantification methods. They tend to measure the different amounts of material in different pots, thus, pots broken in more pieces will be highly represented, while the more complete

ones will appear as less; similarly, if a pot (especially amphorae and mortaria) weighs more, it will be better represented than the lighter counterparts. It is for these reasons that weight and NoSh seem to tell slightly different stories at Magna.

EVEs, MNRs and ENVs have been employed to get a grasp on the individual numbers of vessels, rather than the material of the pot. When looking at these quantitative values from the exterior of the milecastle, percentages indicate clearly that most of the pottery came from contexts located outside the milecastle. This trend however is a bulk perspective based on the total quantities of pottery from early 2nd century until the 4th century. Thus, Table 10 further scrutinises the change of pottery quantity ratios inside and outside the milecastle in each period.

Area	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Exterior	200	59.52	2169	42.80	28	82.35	2.41	75.08	124	77.99
Interior	136	40.48	2899	57.20	6	17.65	0.8	24.92	35	22.01
Total	**336**	**100.00**	**5068**	**100.00**	**34**	**100.00**	**3.21**	**100.00**	**159**	**100.00**

Table 9: *The total quantities of Roman pottery as distributed in the interior and exterior of milecastle 46.*

EARLY 2ND CENTURY

The overall pottery quantities in the early 2nd century at milecastle 46 are rather low, hence they may not represent an exact image of consumption at the site. Nonetheless, it is essential to understand the interior-exterior distribution as this may shed light on some tendencies in the context of consumption practices at the time. A focus on this period shows that most pottery came predominantly from the exterior of the milecastle, with an ENVavg of 12.5 to 3, that is 80.65% to 19.35%. From the interior, the key fragments came from the Hadrianic road and a cobble spread. They both seem to have been deposited accidentally, either as losses or discards, based on the nature of the contexts, as well as the extremely low quantities. From the exterior, 10.5 vessels came from a cobbled area, while the remaining two vessels came from the road leading to the milecastle. This may show incipient activity around the milecastle next to Magna, with vessels circulating and arriving at the site immediately after its construction.

LATE 2ND CENTURY

In the late 2nd century, the data suggests that the ratios of pottery quantities inside and outside the milecastle are more balanced. In terms of individual vessels, all quantitative measures (MNR, EVE and ENVavg) show an almost equal balance between the two with no definite answer on which area is more pottery abundant. From the interior, out of the ten individual vessels, six were associated with the Antonine road and its features, while the remaining four vessels came from a deliberate pit which over time accumulated these sherds from different occupants, guests or visitors at the milecastle. It is important to acknowledge that compared to the previous period, the pottery consumption in the interior of the milecastle slightly increased in the late 2nd century.

However, the increase in pottery is not particularly striking and it is likely that this may have happened towards the later part of the late 2nd century AD. The move to the Antonine Wall may have left the milecastle abandoned and therefore affected the quantities of pottery. Conversely, around mid-160s during the return to Hadrian's Wall, it is likely that the milecastle was occupied again. Archaeological evidence shows signs of refurbishment: the resurfacing of the road inside the milecastle and the change/replacement of the south gate. Later on, at the end of the 2nd century and the beginning of the 3rd, the organisation of the Severan campaigns in Scotland may have started to attract more goods to the site. During the reign of the Severan dynasty, coin loss peaked particularly on Hadrian's Wall, suggesting a period of prolonged activity and a clear policy regarding the Wall as a permanent and continued frontier (Roach, 2013: 111). Further refurbishments may have also taken place on the Wall, with clear evidence from Birdoswald (Wilmott,

1997: 103), while South Shields became an important transit port for the supplies needed in the Severan campaigns (Elliot, 2014: 38). Therefore, these effects may have encompassed milecastle 46 by enhancing the movement of soldiers and supplies which eventually led to increased quantities of pottery. Therefore, the reoccupation of Hadrian's Wall and the later Severan campaigns are likely to have contributed to the observed increase in pottery.

3RD CENTURY

Moving to the 3rd century, the discrepancy between pottery consumption inside and outside the milecastle becomes particularly stark. In terms of MNR, 20 rims came from the exterior, while one originated from the interior. This translates into 95.24% exterior versus 4.76% interior. EVE is equally striking with 88.26% to 11.74%. Lastly, when all sherds were taken into consideration to measure the average estimated number of vessels, the percentages were 91.06% exterior and 8.94% interior. These results may be a consequence of rubbish dumping and buildup over time. The most abundant context from the 3rd century, 22, was associated with a dumping area over the walls of the milecastle from the interior. It is therefore expected that the pottery quantities from outside the milecastle grew higher over time as new goods arrived at the site, while the older ones were discarded over the walls.

4TH CENTURY

Reaching the 4th century, the contrast between the interior and exterior remains obvious, but less strong than that seen in the 3rd century. For example, the average estimated number of vessel (ENVavg) ratios are 73.08% exterior to 26.92% interior. From the exterior, out of 19 ENVavg, 10 came from a spread buildup, five from a stone foundation, and four from the lower fill of grave 62. The first two contexts are either silted up deposits or construction layers. Of notable importance is one vessel from the spread, which was likely deposited intact but recovered broken into 56 sherds due to taphonomic processes. The vessel was repaired, as suggested by the presence of a lead plug. The pottery from the grave's lower fill is not abundant and only four sherds have been recovered representing four different vessels. It is likely that they ended up there as redeposited fill rather than intentional placements, since they were not found as complete vessels in the actual grave next to the body. The pottery from the interior consisted of seven ENV. Four came from a possible deposit buildup, two from a possible path and one from the fill of a pit. It appears that the pottery distribution at milecastle 46 in the 4th century continued to incline more towards the exterior rather than the interior. However, they come from a more restrained number of contexts, of which some seem to suggest possible unintentional redeposition of these fragments.

HADRIANIC										
	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Exterior	13	81.25	165	95.38	3	100.00	0.205	100.00	12.5	80.65
Interior	3	18.75	8	4.62	0	0.00	0	0.00	3	19.35
Total	**16**	**100.00**	**173**	**100.00**	**3**	**100.00**	**0.205**	**100.00**	**15.5**	**100.00**

LATE 2ND CENTURY										
	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Exterior	11	16.67	253	26.35	3	60.00	0.205	46.07	11	52.38
Interior	55	83.33	707	73.65	2	40.00	0.24	53.93	10	47.62
Total	**66**	**100.00**	**960**	**100.00**	**5**	**100.00**	**0.445**	**100.00**	**21**	**100.00**

3RD CENTURY										
	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Exterior	97	87.74	771	43.63	20	95.24	1.88	88.26	81.5	91.06
Interior	13	12.26	996	56.37	1	4.76	0.25	11.74	8	8.94
Total	**106**	**100.00**	**1767**	**100.00**	**21**	**100.00**	**2.13**	**100.00**	**89.5**	**100.00**

4TH CENTURY										
	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Exterior	83	58.87	980	47.99	2	100.00	0.12	100.00	22	73.08
Interior	58	41.13	1062	52.01	0	0.00	0.00	0.00	13	26.92
Total	**141**	**100.00**	**2042**	**100.00**	**2**	**100.00**	**0.12**	**100.00**	**35**	**100.00**

Table 10: *Breakdown of pottery quantity ratios from interior/exterior of milecastle 46.*

EARLY 2ND CENTURY							
	Context number	Context type	Pottery				
			NoSh	Weight	MNR	EVE	ENVavg
Interior	8	Milecastle south wall core	1	3	0	0	1
	29	Floor N of internal S wall	0	0	0	0	0
	30	Southern wall buttress	0	0	0	0	0
	34	Hadrianic Roman road	1	2	0	0	1
	50	Spread cobbled surface north end of MC	1	3	0	0	1
	81	Hadrian's Wall	0	0	0	0	0
	82	Outer face of east MC wall	0	0	0	0	0
	106	Inside face of east MC wall	0	0	0	0	0
	107	Inside face of east MC wall	0	0	0	0	0
	108	Core of east MC wall	0	0	0	0	0
	109	West side of north gate	0	0	0	0	0
	110	Sandy clay/loose cobbles in MC-floor/surface	0	0	0	0	0
Exterior	49/7	Cobbled area outside E of MC	10	147	3	0.205	10
	54	Road to Milecastle gate	3	18	0	0	2.5
	101	Ditch	0	0	0	0	0
	105	Sandy clay S of cobbles 59	0	0	0	0	0

Table 11: *Breakdown of early 2nd century contexts, their type, and the quantities of containing pottery.*

LATE 2ND CENTURY							
	Context number	Context type	Pottery				
			NoSh	Weight	MNR	EVE	ENVavg
Interior	46	Fill of 79	4	100	1	0.09	4
	60	Cut of a well	0	0	0	0	0
	79	Cut of a deliberate pit	0	0	0	0	0
	91	Fill of a well	0	0	0	0	0
	95	Antonine road	47	398	0	0	2
	96	Drain associated w Antonine road	4	209	1	0.15	4
	111	Cut of a posthole	0	0	0	0	0
	112	Fill of a poshole	0	0	0	0	0
	113	Cut of a posthole	0	0	0	0	0
	114	Fill of a posthole	0	0	0	0	0
	115	Cut of a posthole	0	0	0	0	0
	116	Fill of a posthole	0	0	0	0	0
	117	Cut of a posthole	0	0	0	0	0
	118	Fill of a posthole	0	0	0	0	0
Exterior	9	Cut of a pit	1	157	1	0.08	1
	39	Cut of a pit	0	0	0	0	0
	48	Road	6	24	0	0	6
	56	Fill of a pit 57	1	3	0	0	1
	57	Cut of a pit industrial area	0	0	0	0	0
	59	Loose cobbled surface S of MC	0	0	0	0	0
	66	Cut of a pit	0	0	0	0	0
	67	Fill of a pit 66	2	51	2	0.125	2
	70	Cut of a pit industrial area	0	0	0	0	0
	78	Fill of 92	0	0	0	0	0
	92	Cut of a pit industrial	0	0	0	0	0
	97	Fill of a pit 66	0	0	0	0	0
	102	Fill of a ditch 101	1	18	0	0	1
	104	Fill of a pit 70	0	0	0	0	0

Table 12: *Breakdown of late 2nd century contexts, their type, and the quantities of containing pottery.*

3RD CENTURY							
	Context number	Context type	Pottery				
			NoSh	Weight	MNR	EVE	ENVavg
Interior	12	Burnt clay deposit	2	8	0	0	2
	17	Drain	0	0	0	0	0
	47	Rubble deposit patch	0	0	0	0	0
	61	Fill of a well 60	11	988	1	0.25	6
	68	(Possible) oven	0	0	0	0	0
	72	Deposit buildup	0	0	0	0	0
	88	Fill of a well 60	0	0	0	0	0
	93	Cut of a pit	0	0	0	0	0
	94	Fill of a pit 93	0	0	0	0	0
	98	Cut of a pit	0	0	0	0	0
	99	Fill of a pit 98	0	0	0	0	0
	100	Deposit buildup	0	0	0	0	0
	103	Severan road	0	0	0	0	0
Exterior	22	Possible rubbish buildup	56	526	8	1.035	47.5
	51	(Upper) Fill of a pit 57	20	89	3	0.29	18
	52	Fill of a pit 92	10	76	5	0.315	10
	64	Cut of a pit	0	0	0	0	0
	65	Fill of a pit 64	0	0	0	0	0
	69	Fill of a pit 70	5	36	3	0.12	4
	73	Deposit buildup-part of 22	2	44	1	0.12	2
	83	Cut of a gully	0	0	0	0	0
	84	Fill of a gully 83	0	0	0	0	0

Table 13: *Breakdown of 3rd century contexts, their type, and the quantities of containing pottery.*

4TH CENTURY							
	Context number	Context type	Pottery				
			NoSh	Weight	MNR	EVE	ENVavg
Interior	13	(Possible) path	0	0	0	0	0
	16	(Possible) path	3	9	0	0	2
	23	Silt deposit against S wall	0	0	0	0	0
	26	Deposit buildup	0	0	0	0	0
	27	Deposit buildup	0	0	0	0	0
	28	Spread	0	0	0	0	0
	37	Fill of a pit 38	1	4	0	0	1
	38	Cut of a pit	0	0	0	0	0
	80	Layer buildup	0	0	0	0	0
	85	Infill of road truncation 87	0	0	0	0	0
	86	Road truncation	0	0	0	0	0
	87	Road truncation	0	0	0	0	0
	89	Infill of road truncation 86	0	0	0	0	0
	90	(Possible) Deposit buildup	54	1049	0	0	4
Exterior	53	Path-related to 16?	0	0	0	0	0
	55	stone foundation	13	49	0	0	5
	58	Spread buildup	66	905	2	0.12	10
	62	Cut of a cist grave	0	0	0	0	0
	63	Upper fill of grave 62	0	0	0	0	0
	71	Lower fill of grave 62	4	26	0	0	4

Table 14: *Breakdown of 4th century contexts, their type, and the quantities of containing pottery.*

7. FABRIC SUPPLY

The following section analyses the fabric supply at the milecastle over time. Table 15 below shows the overall quantities from the early 2nd century until the 4th century, expressed in NoSh, weight, MNR, EVE and ENVavg. When employing the first two methods, amphorae appear to be the most consumed fabric class at the site over the Roman period. This is due to the nature of these quantifications, which tend to measure brokenness and generally the amounts of materials (fabrics) in different pots. When employing MNR, EVE and ENVavg, the reduced fabrics appear to become more prominent. In short, based on the numbers below, reduced and black-burnished style vessels seem to have predominated at milecastle 46 overall. These percentages are further divided by periods within each fabric section, to understand how fabric consumption changed at the site over time.

Fabric Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
A	100	30.40	2020	40.87	0	0.00	0	0.00	5	3.29
B	89	27.05	1045	21.15	8	25.81	0.83	28.62	31.5	20.72
F	8	2.43	43	0.87	2	6.45	0.05	1.72	8	5.26
M	5	1.52	440	8.90	2	6.45	0.15	5.17	5	3.29
O	37	11.25	209	4.23	2	6.45	0.19	6.55	34	22.37
R	77	23.40	1091	22.08	15	48.39	1.5	51.72	55.5	36.51
S	12	3.65	79	1.60	2	6.45	0.18	6.21	12	7.89
W	1	0.30	15	0.30	0	0.00	0	0.00	1	0.66

Table 15: Fabric class quantities at milecastle 46 in the Roman periods.

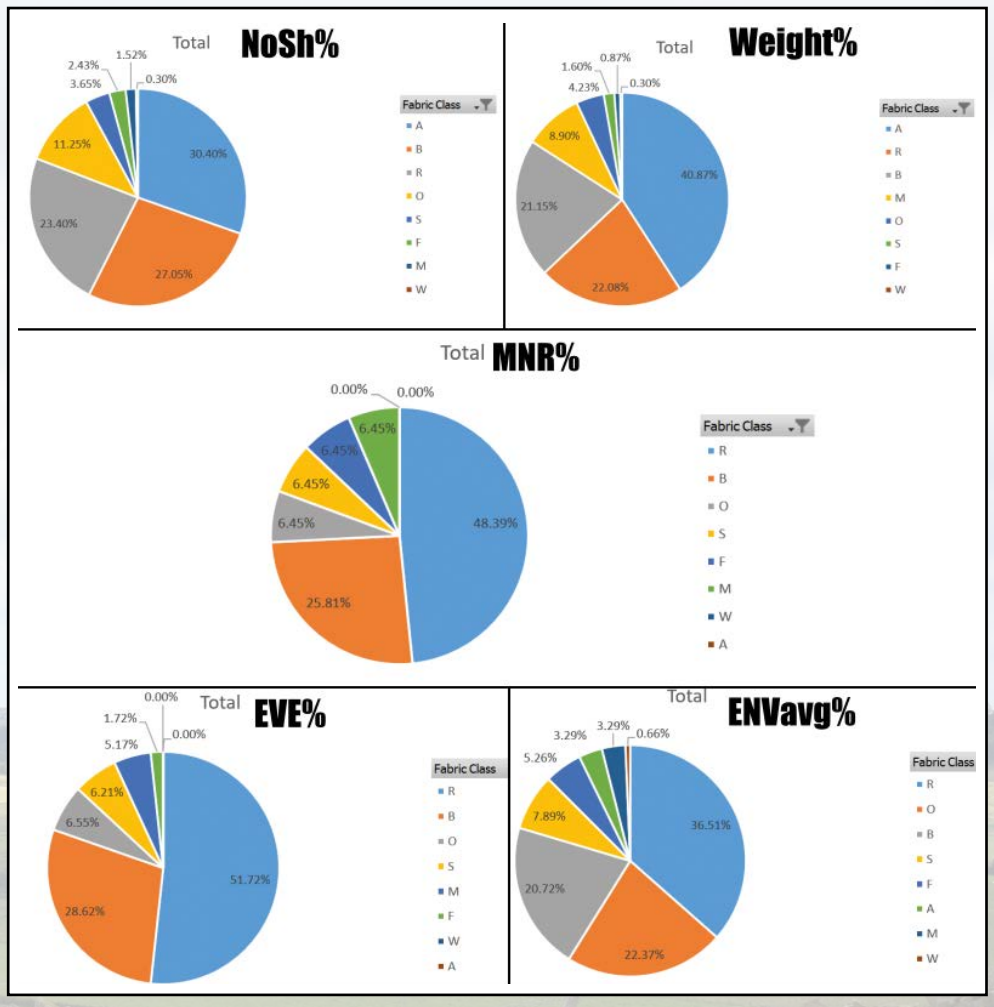


***Figure 7:** The total percentages of pottery fabric classes at Magna 2023 based on the five quantitative methods employed (NoSh, weight, MNR, EVE and ENVavg).*

7.1 CLASS A- AMPHORAE

The first fabric class to be analysed is amphora. Table 16 shows the way quantities of amphora consumption changed from the 2nd century until the 4th. No sherds have been identified from the earlier 2nd century. The rest of the three periods contained at least one estimated amphora. In the late 2nd century, three amphorae have been recovered, all from contexts associated with the Antonine road structure in the interior of the milecastle. In the 3rd century, the two amphora sherds came from the upper fill of a well. Lastly, in the 4th century, the fragments were associated with a late Roman cobbled surface. The association of the amphorae particularly with road contexts suggest activity at the milecastle in each period, with goods flowing through the milecastle. This further strengthens its prominent role as a crossing point on Hadrian's Wall.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Late 2nd Century	48	48.00	586	29.01	0	0.00	0	0.00	3	60.00
3rd Century	2	2.00	425	21.04	0	0.00	0	0.00	1	20.00
4th Century	50	50.00	1009	49.95	0	0.00	0	0.00	1	20.00

Table 16: *The consumption of amphora quantities across the Roman periods at milecastle 46.*

Sum of ENVavg Period/Context	Fabric A	A%
Late 2nd Century	3	60.00
95	2	40.00
96	1	20.00
3rd Century	1	20.00
61	1	20.00
4th Century	1	20.00
90	1	20.00
Grand Total	**5**	**100.00**

Table 17: *The distribution of amphora across periods and contexts.*

7.2 CLASS B- BLACK-BURNISHED WARE

The black-burnished ware class includes both the original fabrics from south England as well as the imitations made in black-burnished style. As Table 18 indicates, their consumption starts from 3.17% in the early 2nd century and rises to a maximum of 71.43% (ENVavg) in the 3rd century, going down to 12.70% in the 4th century. These trends seem to indicate the way general supply of black-burnished ware worked throughout time in the North. After AD120s the organised supply and consumption of these products began to increase on the Wall (Gillam, 1976: 57). Consequently, their supply raised over time, peaking throughout the 3rd century, and declined again beginning with the 4th century.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Early 2nd Century	1	1.12	3	0.29	0	0.00	0	0.00	1	3.17
Late 2nd Century	4	4.49	32	3.06	1	12.50	0.05	6.02	4	12.70
3rd Century	24	26.97	190	18.18	6	75.00	0.74	89.16	22.5	71.43
4th Century	60	67.42	820	78.47	1	12.50	0.04	4.82	4	12.70

Table 18: The consumption of black-burnished quantities across the Roman periods at milecastle 46.

Sum of ENVavg Period/Context	Fabric B	B%
Early 2nd Century	1	3.17
8	1	3.17
Late 2nd Century	4	12.70
48	2	6.35
67	1	3.17
102	1	3.17
3rd Century	22.5	71.43
22	17	53.97
51	2.5	7.94
52	1	3.17
69	1	3.17
73	1	3.17
4th Century	4	12.70
55	1	3.17
58	3	9.52
Grand Total		**100.00**

Table 19: The distribution of black-burnished ware across periods and contexts.

Table 20 looks at the form classes made in black-burnished fabrics between the 2nd and 4th centuries. Out of the total ENVavg percentage, 71.43% were unidentified sherds, 22.22% were jars and 6.35% were bowls. Overall, cooking pots were predominant, while tablewares appear to have been consumed in smaller quantities. This could be connected to the role of the milecastle and the length of soldiers' stay at the site. If indeed this was more of a crossing point on the Wall, then the occupancy would have been short-term and the bulk goods would have served towards cooking and eating sufficient food for the length of the soldiers' posting shift. It would be particularly useful to compare the patterns of use at milecastle 46 with the data from the fort at Magna as it becomes available during the course of this project. This will shed light on the link between pottery form consumption and the length of occupancy in different military installations, clarifying whether the two sites in close proximity could develop drastically different consumption styles.

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Bowl	2	2.25	54	5.17	2	25.00	0.17	20.48	2	6.35
Jar	12	13.48	153	14.64	6	75.00	0.66	79.52	7	22.22
Unident	75	84.27	838	80.19	0	0.00	0	0.00	22.5	71.43

Table 20: *Black-burnished form class analysis across the Roman periods.*

Catalogue Nos:

- **M23-22: 5, 8, 9, 10**
- **M23-58: no illustration 2F.5**
- **M23-67: 23**
- **M23-69: 24**
- **M23-73: 25**

7.3 CLASS F- COLOUR-COATED AND FINEWARES

Eight sherds of fineware have been identified at milecastle 46, which represented an ENVavg of 8. Half of the quantity came from the 3rd century, with four sherds originating from four different contexts, mostly associated with silted up pits. Their presence at the site shows the diversity of supply, which brought to milecastle 46 finewares from outside Britain too. For example, the fragment from context 69 represented Moselkeramik, a ware imported from present Trier in Germany.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Hadrianic	2	25.00	30	69.77	0	0.00	0	0.00	2	25.00
Late 2nd Century	1	12.50	3	6.98	0	0.00	0	0.00	1	12.50
3rd Century	4	50.00	8	18.60	2	100.00	0.05	100.00	4	50.00
4th Century	1	12.50	2	4.65	0	0.00	0	0.00	1	12.50

Table 21: *The consumption of finewares quantities across the Roman periods at milecastle 46.*

Sum of ENVavg Period/Context	F	F%
Early 2nd Century	2	25.00
7	2	25.00
Late 2nd Century	1	12.50
56	1	12.50
3rd Century	4	50.00
22	1	12.50
51	1	12.50
52	1	12.50
69	1	12.50
4th Century	1	12.50
55	1	12.50
Grand Total	**8**	**100.00**

Table 22: *The distribution of finewares across periods and contexts.*

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Beaker	3	37.50	8	18.60	2	100.00	0.05	100.00	3	37.50
Unident	5	62.50	35	81.40	0	0.00	0	0.00	5	62.50

***Table 23:** Finewares form class analysis across the Roman periods.*

Catalogue Nos:

- **M23-52: 20**

7.4 CLASS M- MORTARIA

Five sherds of mortaria have been recovered in total from Magna in 2023. They come from five different contexts spread across all four periods (Table 24). The later 2nd century period produced two sherds, that is 40% of the total, while the other three periods have exhibited one sherd each. The five total fragments are the equivalent of five vessels. They tend to come from the exterior of the milecastle, with only one sherd – out of the total five – found within the walls. The contexts vary from pits to spreads, however no other specific patterns of deposition seem to exist.

The location of 80% of the mortaria outside the milecastle walls and is of potential significance towards interpreting food consumption at the site. The traditional understanding of mortaria use is associated with grinding and mixing as an initial food preparation (Tyers, 1996: 116). However, it is likely that the uses and functions of these vessels were highly dependent on the social context and its associated community (Cool, 2004: 32). In this case, the milecastle environment seems to support mortaria use in the traditional Roman way due to its association with a military environment. Cramp et al. (2011: 1347) in pursuit of understanding mortaria function through residue analysis, have discovered that these vessels frequently contained processed commodities of plant and animal carcass origin. Thus, the presence of mortarium fragments at milecastle 46 outside its walls may reflect some extramural food preparation. Whether full cooking actually took place at the milecastle is difficult to establish, as no ovens or hearths have been identified yet.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Hadrianic	1	20.00	34	7.73	1	50.00	0.07	46.67	1	20.00
Late 2nd Century	2	40.00	226	51.36	1	50.00	0.08	53.33	2	40.00
3rd Century	1	20.00	120	27.27	0	0.00	0	0.00	1	20.00
4th Century	1	20.00	60	13.64	0	0.00	0	0.00	1	20.00

***Table 24:** The consumption of mortaria quantities across the Roman periods at milecastle 46.*

Sum of ENVavg Period/Context	M	M%
Early 2nd Century	1	20.00
7	1	20.00
Late 2nd Century	2	40.00
9	1	20.00
46	1	20.00
3rd Century	1	20.00
22	1	20.00
4th Century	1	20.00
58	1	20.00
Grand Total	**5**	**100.00**

Table 25: *The distribution of mortaria across periods and contexts.*

Catalogue Nos:

- **M23-7: 1**
- **M23-9: 4**

7.5 CLASS O- OXIDISED WARES

The oxidised wares amounted to 22.37% ENVavg; however, only two vessels have managed to be identified in terms of form class, out of 37, that is a flagon and a jar (Table 27). The oxidised fabrics were rather friable, resulting in very fragmented and abraded sherds. Nonetheless, the identified flagon adds another layer to the consumption at milecastle 46, that is alcohol use. Flagons seem to be more orientated towards the consumption of wine as opposed to beer (Pitts, 2005: 58). It has been previously asserted that the accommodation in milecastles would be sufficient should it be used only by the soldiers off their Wall patrolling duty (Breeze and Dobson, 1972: 189). In this context, the consumption routine of the soldiers at milecastle 46 may have included food accompanied by a drink, likely wine. Therefore, the evidence gathered from the identified oxidised vessels indicates that while the occupation may have been short-term, the soldiers posted there placed equal importance on food as well as alcohol consumption, as this is further supported by the fineware beakers recovered from the site.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Hadrianic	5	13.51	31	14.83	0	0.00	0	0.00	4.5	13.24
Late 2nd Century	4	10.81	19	9.09	0	0.00	0	0.00	4	11.76
3rd Century	21	56.76	137	65.55	2	100.00	0.19	100.00	19.5	57.35
4th Century	7	18.92	22	10.53	0	0.00	0	0.00	6	17.65

Table 26: *The consumption of oxidised wares quantities across the Roman periods at milecastle 46.*

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Flagon	1	2.70	12	5.74	1	50.00	0.11	57.89	1	2.94
Jar	1	2.70	11	5.26	1	50.00	0.08	42.11	1	2.94
Unident	35	94.59	186	89.00	0	0.00	0	0.00	32	94.12

Table 27: *Oxidised wares form class analysis across the Roman periods.*

Catalogue Nos:

- **M23-51: 14, 17**

7.6 CLASS R- REDUCED WARES

Reduced wares represented the highest quantities of pottery at the site over time. This class includes all the greywares and reduced gritted wares recovered from milecastle 46. The bulk of greywares came from 3rd century contexts. However, it is important to note that at least two fragments from context 22 were in fact part of the 4th century as examples of Huntcliff ware. Due to the nature of this context as a rubbish buildup, it likely started in the 3rd century and continued, perhaps in a more limited fashion, into the 4th, leading to a mix of vessels and fabrics. This context does show a change in pottery consumption over time, highlighting the popularity of the black-burnished wares initially, then slowly disappearing and being replaced by the gritted wares such as Huntcliff types.

The form classes to be made in reduced wares were mostly jars as displayed in Table 29. This could be a consequence of the role of the milecastle at the time, as similarly discussed with the black-burnished ware types. Consumption here may have been limited to everyday practices of cooking and eating, therefore, the vessels to arrive here were predominantly reduced ware jars and less tablewares. In fact, upon analysing form consumption in the North, Evans (1993: 99) observed that in the 2nd century, the ratio between jars and tablewares in milecastles and turrets especially inclines towards jar consumption with particularly low percentages of dishes or bowls. In the 3rd and 4th century, figures are similar, in the sense that that jar levels are high and in fact, continue to increase into the later 4th century AD. For example, the milecastle at Poltross Burn (MC48) displays over 70% jars, but less than 20% tablewares, as well as no beakers and flagons (Evans, 1993: Fig.12). Conversely, the forts tend to consume between 40% and 55% jars and over 30% dishes, along with consistent use of beakers and flagons too (Evans, 1993: 103). In short, it appears that consumption at milecastle 46 seems to resemble that from other milecastles, focusing particularly on jars and communal cooking.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Hadrianic	6	7.79	73	6.69	2	13.33	0.135	9.00	6	10.81
Late 2nd Century	6	7.79	88	8.07	3	20.00	0.315	21.00	6	10.81
3rd Century	47	61.04	825	75.62	10	66.67	1.05	70.00	34.5	62.16
4th Century	18	23.38	105	9.62	0	0.00	0	0.00	9	16.22

Table 28: *The consumption of reduced wares quantities across the Roman periods at milecastle 46.*

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Bowl	1	1.30	4	0.37	1	6.67	0	0.00	1	1.80
Jar	14	18.18	219	20.07	13	86.67	1.44	96.00	13	23.42
Unident	62	80.52	868	79.56	1	6.67	0.06	4.00	41.5	74.77

Table 29: *Reduced wares form class analysis across the Roman periods.*

Catalogue Nos:

- **M23-7: 2, 3**
- **M23-22: 6, 7, 11, 12**
- **M23-46: 13**
- **M23-52: 16, 17, 18, 19**
- **M23-61: 21**
- **M23-67: 22**
- **M23-69: 24**
- **M23-96: 26**

7.7 CLASS S- SAMIAN

Twelve sherds of Samian were recovered from Magna across the four periods, equivalent of 12 vessels (ENVavg) (Table 30). Only three sherds have been identified in terms of form, while the rest of nine fragments have been difficult to assess. Table 31 exhibits those sherds that have been identified and, as observed, one fragment comes from a Dr37 bowl, while two sherds represent two Dr33 cups. Dr33 tends to be a diagnostic form chronologically, especially when occurring on its own as opposed to when occurring in parallel with Dr27 cups. While the assessed assemblage is rather small to make definite statements, and the remaining sherds are likely residual, the presence of two identified Dr33 cups in the 3rd and 4th century contexts support the general chronological trends of their consumption. During the mid and late 1st century Dr27 cups would have been more frequently consumed than the Dr33; in the 2nd century, particularly by AD160, the latter would have grown to predominate the consumption patterns (Willis, 2005). Therefore, the sole presence of Dr33 and the lack of Dr27 may suggest that the 2nd and 3rd century supply offered access to the trending Samian products on the markets at Magna and milecastle 46.

These patterns are to be expected especially at a military site, as the Roman military received fresh supplies of Samian regularly, resulting in 'up-to-date' assemblages (Willis, 1998: 104). The sherd of the Dr33 cup, located in a 4th century context, is certainly residual, representing the vestiges of a historic supply chain.

The Samian assemblage from milecastle 46 consists of small fragments, often abraded, resulting therefore in a high number of unidentified forms which amount to 75% ENVavg. Due to these factors, it is difficult to explore more in-depth functional analysis and chronology.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Early 2nd Century	1	8.33	2	2.53	0	0.00	0	0.00	1	8.33
Late 2nd Century	1	8.33	6	7.59	0	0.00	0	0.00	1	8.33
3rd Century	7	58.33	62	78.48	1	50.00	0.1	55.56	7	58.33
4th Century	3	25.00	9	11.39	1	50.00	0.08	44.44	3	25.00

***Table 30:** The consumption of Samian quantities across the Roman periods at milecastle 46.*

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Bowl (Dr 37)	1	8.33	35	44.30	0	0.00	0	0.00	1	8.33
Cup (Dr 33)	2	16.67	16	20.25	2	100.00	0.18	100.00	2	16.67
Unident	9	75.00	28	35.44	0	0.00	0	0.00	9	75.00

Table 31: *Samian form class analysis across the Roman periods.*

7.8 CLASS W- WHITEWARES

Only one fragment has been recovered from a 4th century context and it is likely to be residual.

Period	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
4th Century	1	100.00	15	100.00	0	0.00	0	0.00	1	100.00

Table 32: *The consumption of whiteware quantities across the Roman periods at milecastle 46.*

Form Class	NoSh	NoSh%	Weight	Weight%	MNR	MNR%	EVE	EVE%	ENVavg	ENVavg%
Flagon	1	100.00	15	100.00	0	0.00	0	0.00	1	100.00

Table 33: *Whiteware form class analysis across the Roman periods.*

8. TRENDS AND PATTERNS IN THE ASSEMBLAGE:

FUNCTION, DISTRIBUTION AND PROVENANCE

The following section explores pottery from milecastle 46 in comparison to other milecastles on Hadrian's Wall. This approach helps to contextualise consumption regionally, as well as to identify the extent to which pottery supply overlapped at these sites. Understanding the background supply helps to identify unusual consumption patterns at milecastle 46 and further explore the factors behind different repertoires.

8.1 FORM CLASS CONSUMPTION

The form class consumption explores the ratios of different vessel types (such as dishes, bowls, jars etc.) at milecastle 46, as well as other milecastles where such data has become available. The aim is not only to understand the overall vessel ratios at these sites, but also the way they changed throughout time, from the 2nd century until the 4th century AD.

The first pattern to stand out at milecastle 46 has been the jar consumption, which appeared to be particularly high. Previous research (see Evans, 1993) has already identified a significantly higher jar consumption associated with milecastles and turrets on Hadrian's Wall. However, it appears that this study has included in the analysis only one milecastle at Poltross Burn (MC48). For a wider and more accurate contextualisation of jar consumption at milecastle 46, it is necessary to understand the way consumption and supply looked at multiple milecastles on Hadrian's Wall.

In the future, an alternative perspective could also be provided from both forts and civilian sites, in order to understand whether pottery consumption was indeed tailored to its social context; that is rural or urban, military or civilian. This will be particularly illuminating when the project unveils the pottery data from the nearby fort at Magna. A comparative study may reveal the way consumption looked at the fort compared to the milecastle and the extent to which their occupation type (long-term/short-term) influenced pottery selection at the two sites.

Table 34 exhibits the jar consumption in comparison with other form classes, at a series of milecastles on Hadrian's Wall. The quantification is based on a minimum number of rims (MNR) as this allows the inclusion of identifiable form classes. Pottery quantities from milecastles generally appear to be at the lower end of the spectrum, in accordance with their size and shorter term of occupation, as opposed to forts. When focusing on the specific form classes, it appears that vessels associated with cooking or storage, namely jars, are the most abundant class at all sites under analysis across the 2nd until the 4th century AD. Most milecastles show jar consumption ranging between 70 and 90% throughout the Roman occupation. This could be due to the function of these milecastles, which unlike forts, were less likely to be inhabited by a community for a longer period of time but would rather be used strategically short-term by alternating groups of soldiers.

The size of the milecastles may have also played a decisive role in the pottery form ratios and overall quantities. For example, milecastles 4 and 48 both had a jar consumption of 44-45%. While in the case of milecastle 4, this could be simply a bias resulting from the small MNR of 12, the quantities and ratios from milecastle 48 at Poltross Burn may be linked to its size as well as the number of barracks. Milecastle 48's interior plan revealed two barrack buildings, which would have allowed it to accommodate more people, as opposed to other milecastles such as 9, 37, 50 or 54, which all contained one barrack block only (Breeze and Dobson, 1972: 189). More barrack spaces meant the possibility to accommodate more soldiers, allowing longer stationing and thus a higher diversity in vessel consumption.

Conversely, while milecastle 46 was a similar size to milecastle 48, its internal organisation has not revealed a barrack on the eastern side, meaning that likely it had only one block, located on the unexcavated western side if at all present. Additionally, milecastle 46 was in very close proximity to the Magna fort, so the accommodation needs may have been less pressing. Instead, shorter shifts would have been associated with this milecastle, resulting in lower percentages of pottery and a jar-orientated consumption.

The high presence of jars at milecastle 46 represents a consequence of the lifestyle at the site at the time of its occupation. Their consumption could be part of a special arrangement to accommodate the lifestyle in short-term living quarters. The quantity of jars predominates the environment, while tablewares

such as dishes and bowls appear in starkly lower quantities. At milecastle 46 between the 2nd and the 4th century, out of those vessels whose form has been identified, more than half are jars, 12% are amphorae and mortaria each, followed by only 7% bowls and no dishes. One could argue that tablewares would have been covered by the Samian supply. However, terra sigillata represents only 6% out of total pottery rims recovered in 2023 season, which is not sufficient to explain the low quantities of tablewares.

This seems to suggest two scenarios: either pre-prepared meals were consumed on site, or cooking took place either in the western portion or outside the milecastle, with everyone bringing their own plate or bowl. The occupation of milecastles suggests short tours of duty (Breeze and Dobson, 1972: 190). Should this be the case of milecastle 46, the goods there would serve towards cooking and eating sufficient food for that specific posting. This theory is supported by the high percentage of jars, in particular black-burnished style cooking pots with the typical flange in which pre-cooked food would have been brought to the site or some cooking may have been done at the milecastle.

Conversely, no hearths or ovens have been identified so far either inside or outside the milecastle. If no oven was present in the western area either, this could mean that the working shift may have brought a pre-cooked meal with them to the milecastle, along with the necessary serving ware. Evans (1993: 107) explained that these patterns could be due to the greater use of metal vessels for tablewares. Thus, while some of the jars would have remained at the site, it is likely that the tablewares, especially if metalware, would have been taken back upon the soldiers' end of duty tour.

Site	Assemblage	Date	MNR	Jars	Dishes	Bowls	Flagons	Beakers	Mortaria
Magna23	Milecastle46	2nd c.	8	62.50	-	12.50	-	-	25.00
Magna23	Milecastle46	3rd c.	20	75.00	-	10.00	5.00	10.00	-
Magna23	Milecastle46	4th c.	1	100.00	-	-	-	-	-
Westgate Road	Milecastle4	2nd c.	12	45.45	-	36.36	-	-	9.09
Poltross Burn	Milecastle48	2nd c.	61	44.26	9.84	19.67	13.11	-	13.11
Poltross Burn	Milecastle48	3rd c.	30	73.33	3.33	6.67	-	-	6.67
Poltross Burn	Milecastle48	4th c.	44	81.82	-	4.55	-	-	13.64
Solway	Milecastle79	2nd c.	67	83.58	4.48	2.99	-	2.99	5.97
High House	Milecastle50	2nd c.	64	90.63	1.56	3.13	1.56	1.56	1.56

***Table 34:** The pottery form class consumption at milecastle 46 at Magna along with a series of other milecastles on Hadrian's Wall (excluding Samian).*

8.2 FABRIC CONSUMPTION

The fabric consumption at milecastles on Hadrian's Wall tends to follow similar patterns to those observed in the form class analysis overall. These are exhibited in Table 35, based on a minimum number of rims. The predominant fabric class continues to be the reduced one (R), followed by the black-burnished ware (B). The latter is expected to appear in significant quantities since a formal and more intense supply to the north commenced from the Hadrianic period onwards. In fact, focusing on the black-burnished consumption over the three centuries at milecastle 46, a familiar pattern emerges: in the 2nd century the consumption reaches 12.50% while in the 3rd century it doubles reaching almost 30%. The results from the 4th century are less reliable due to the particularly low quantity of only 2 MNR. Therefore, it appears to be a clear trend of black-burnished consumption at milecastle 46 over time.

This pattern seems to align with the well-known chronological supply of black-burnished ware in the north on Hadrian's Wall. In about AD120, their supply captured the markets in the western and northern military zone of Britain (Gillam, 1976: 57). In the light of this newly established supply, it is expected that the quantities would have increased over time, until the 4th century AD, when their supply slowed down and eventually ceased by the third quarter of the 4th century (Gillam, 1976: 58). Therefore, the pottery patterns from milecastle 46 are part of wider trends which appear at several sites throughout time, including Poltross Burn (MC48) (see Table 35).

Samian appears to be consumed in particularly low quantities at milecastle 46, a pattern reflected by the quantification method employed. Essentially, limited Samian rims were preserved, hence when applying MNR, the ware appears to be particularly scarce. Table 36 focuses on fabric consumption only at milecastle 46 within each period, quantifying the pottery by an average estimated number of vessels (ENVavg). This allows non-diagnostic sherds to become visible, hence showing the quantities of Samian at the milecastle. Amphora and mortaria also show in these results. The low Samian quantities at Magna could be due to their recovery contexts which are part of only one excavated half of the milecastle, along with the adjacent eastern and southern areas outside its walls. Therefore, these results are rather indicative than definite.

Table 37 focuses on the specific form types identified within the Samian ware between the 2nd and 4th century AD. It appears that two types were particularly popular at the site, the Dr37 bowls and the Dr33 cups. The latter is particularly meaningful, as they tend to slowly take over the Dr27 consumption over time (Willis, 2005). This means that the milecastles would have been regularly supplied with the 'newest' Samian forms, to keep the repertoire up to date, a pattern typical of military sites which would have regularly received fresh supplies of Samian (Willis, 1998: 104).

Therefore, the fabric consumption at milecastle 46 appears to fit well within the wider trends seen in Northern Britain. Other milecastles seem to also consume reduced and black-burnished fabrics as their staple products. This is likely a reflection of jars being the main forms employed at the sites. These patterns tie in with the earlier discussion on the form consumption at the milecastle, further supporting the short-term occupation of the milecastle and the possibility of cooked meals in packed containers brought from the fort, and sufficient to support the soldiers on their short tour of duty.

Site	Assemblage	Date	MNR	R	B	O	A	M	F	W	S
Magna23	Milecastle46	2nd c.	8	62.50	12.50	-	-	25.00	-	-	-
Magna23	Milecastle46	3rd c.	21	47.62	28.57	9.52	-	-	10.00	-	4.76
Magna23	Milecastle46	4th c.	2	-	50.00	-	-	-	-	-	50.00
Westgate Road	Milecastle4	2nd c.	15	40.00	20.00	-	6.67	6.67	-	-	26.67
Poltross Burn	Milecastle48	2nd c.	64	50.00	-	26.56	-	12.50	-	6.25	4.69
Poltross Burn	Milecastle48	3rd c.	30	56.67	-	6.67	-	6.67	-	3.33	-
Poltross Burn	Milecastle48	4th c.	53	69.81	-	1.89	-	11.32	-	-	16.98
Solway	Milecastle79	2nd c.	70	61.43	-	1.43	-	5.71	-	-	4.29
High House	Milecastle50	2nd c.	64	76.56	17.19	3.13	-	1.56	1.56	-	N/A

Table 35: *The pottery fabric consumption at milecastle 46 at Magna along with a series of other milecastles on Hadrian's Wall.*

Site	Assemblage	Date	ENVavg	R	B	O	A	M	F	W	S
Magna23	Milecastle46	2nd c.	90	32.88	13.70	23.29	8.22	8.22	8.22	-	5.48
Magna23	Milecastle46	3rd c.	37	38.55	25.14	21.79	1.12	1.12	4.47	-	7.82
Magna23	Milecastle46	4th c.	26	34.62	15.38	23.08	3.85	3.85	3.85	3.85	11.54

Table 36: *The pottery fabric consumption at milecastle 46 at Magna, quantified by ENVavg.*

Site	Assemblage	Date	Dr37	Dr31	Dr33	Dr45	Dr27	Cu11
Magna23	Milecastle46	2nd -4th c.	33.33	-	66.67	11.11	-	-
Westgate Road	Milecastle4	2nd c.	25.00	-	25.00	-	-	50.00
Poltross Burn	Milecastle48	2nd -4th c.	25.00	50.00	8.33	-	16.67	-
Solway	Milecastle79	2nd c.	100.00	-	-	-	-	-

Table 37: *The identified Samian form types at the analysed sites.*

9. CONCLUSIONS AND FURTHER WORK

The pottery assemblage from Magna reveals key aspects of both consumption and supply between the 2nd and 4th century AD on Hadrian's Wall. The diversity of fabrics shows that many goods travelled to and through the site: mortaria, amphorae, and Samian ware, along with the more ordinary coarsewares, appear to have been consumed at milecastle 46. This would have been particularly achievable thanks to the several roads that continued to be repaired throughout occupation on the site, enhancing connectivity with the supply routes and bringing current and diverse vessels in the area.

Finewares also seem to occur at the site in slightly lower quantities. One fragment of Moselkeramik, imported from Trier, made its way to Magna. This shows that not only was pottery supplied from workshops across Britain or locally, but it also originated from outside the province, travelling from Gaul all the way to Hadrian's Wall. Conversely, it is necessary to understand that these fragments were not represented in high quantities, which could be due to at least two factors: firstly, the milecastle is only partly excavated, meaning that more could be revealed in future excavations; secondly the small fragments could be personal possessions of soldiers rather than formally supplied vessels at the site. Nonetheless, despite the size of the assemblage, the pottery from milecastle 46 indicates a diverse source of imports, both local and foreign.

Reduced and black-burnished wares tend to monopolise the assemblage: a pattern typical of milecastles and turrets due to their predominant jar consumption. The prominence of this practice could be due to the nature of the military structure. Unlike forts, milecastles do not normally host a unit for an extended period but are rather associated with short-term occupation. Therefore, the pottery supply would have to cater for different needs in milecastles, which would be daily cooking and eating. This aspect of the assemblage from milecastle 46 is expected and blends in with the general situation of milecastles on the Wall. However, due to the lack of ovens or hearths in the excavated area, the arrival of pre-cooked meals transported in jars could also be suggested.

These preliminary results offer scope for further research when it comes to pottery consumption not only at Magna, but at milecastles more widely on Hadrian's Wall. The discussion section has introduced a series of other milecastles as a means of contextualising milecastle 46. This approach however would benefit from the addition of other sites of different character. Thus, the inclusion of pottery assemblages from Hadrian's Wall and the Stanegate forts, as well as civilian sites, may provide a contrasting view to the pottery consumption at milecastles. This discussion could be particularly developed once the rest of excavations associated with milecastle 46 and Magna are completed, as they will provide a more accurate perspective not only on the milecastle, but also on its associated fort.

Additionally, the understanding of pottery consumption will benefit from lipid analysis which will be undertaken after the 2024 excavations. The residues associated with the ceramic containers could provide answers to questions regarding diet, food storage, trade, and use. While use and function of a vessel can only be assumed based on the broad form class, individual communities may have given secondary uses to their pots. Additionally, it is impossible to know which foods would have been cooked or consumed in these vessels without further scientific analysis, including lipid analysis. This would be particularly useful, as most pottery at the milecastle is made of cooking or storage vessels and hence knowing what soldiers would consume in a milecastle versus in a fort could reveal significant differences in diets or cooking habits.

10. SMALL FINDS

A total of 36 small finds were recorded during the 2023 excavation, including those categorised under the separate headings of coins, leather, wood, and human remains. A full list of the small finds is provided below.

Object Number	Context	Description
MSF1	M23-001	Camera film
MSF2	M23-001	Cu alloy square
MSF3	M23-006	Quern stone
MSF4	M23-012	Fe Tang
MSF5	M23-010	Cu alloy fragment
MSF6	M23-016	Needle
MSF7	M23-002	Cu alloy balance beam
MSF8	M23-002	Glass bead
MSF9	M23-002	Fe brooch
MSF10	M23-020	Cu buckle
MSF11	M23-035	Fe object
MSF12	M23-001	Lead weight
MSF13	M23-001	Fe rod
MSF14	M23-037	Cu alloy buckle
MSF15	M23-051	Fe object
MSF16	M23-054	Horseshoe
MSF17	M23-007	Fe hook
MSF18	M23-022	Fe nail
MSF19	M23-004	Quern stone
MSF20	M23-022	Fe handle (?)
MSF21	M23-022	Altar focus (?)
MSF22	M23-058	In-situ black-burnished pot
MSF23	M23-059	Glass bead
MSF24	M23-069	Fe rod
MSF25	M23-052	Fe bracket
MSF26	M23-069	Quern stone
MSF27	M23-052	Fe object
MSF28	M23-024	Fe nail
MSF30	M23-026	Quern stone
MSF31	M23-054	Glass bead
MSF32	M23-050	Blade - three parts
MSF33	M23-051	Stone with possible chisel marks
MC1	M23-050	Cu alloy radiate coin
ML2023-1	M23-091	Leather scraps
MW2023-1	M23-091	Three strand rope
MSK1	M23-062	Inhumation

10.1 DUAL BALANCE

Further research into a dual balance beam (MSF7) has been carried out (Frame, 2024 – forthcoming). MSF7 was discovered immediately outside the line of the east wall of the milecastle, in a deposit which dates to one of the final phases of activity on the site. Context M23-002, where MSF7 was uncovered, likely represents demolition and stone robbing of the milecastle remains during the medieval period, which disturbed other Roman deposits and material. Despite the disturbed nature of this context, the presence of the dual balance onsite still provides valuable evidence for trade and potential taxation at the milecastle.

The dual balance measures 220mm in length and is primarily made from copper alloy. It is in an excellent state of preservation and an example of high-quality manufacturing. It has a decorated central fulcrum featuring two crescentic extensions on each side of the suspension hole and a triangular point above it, while the end of each arm is finished with a triple bevel design and a loop. One arm is marked with eleven circular silver or niello insets, evenly spaced 100mm apart, while the other arm is plain. It is complete, bar the hook or loop from the end of the graduated arm, though no parts of the suspension chain or hanging pans survive (Fig. 8). Although the date of the dual balance cannot be established from its context, other comparable examples from Britain have been dated typologically to the late 1st to late 2nd centuries AD (Smither, 2017b: 49; Eckardt and Walton, 2021: 126). Given the lack of evidence for pre-Hadrianic activity on the site, a 2nd century AD date could be suggested for this object.

Figure 8: *Dual balance beam MSF7 with (inset) graduated scale arm marked by silver or niello circular insets.*

To date, only thirteen other examples of dual balances have been found in the United Kingdom, of which the most direct comparison for this artefact is a fragmentary scale arm that was recovered from the River Tees at Piercebridge (BM-0A38FC) (Eckardt and Walton, 2021: 126). Also made from copper alloy, this features a very similar triple bevel decoration and loop at the terminal and four evenly spaced silver or niello insets forming part of the scale (Walton, 2015). A second more complete example from Piercebridge (NCL-E18835) provides a comparison for the crescent shaped decoration on the central fulcrum (Walton, 2004).

The discovery of this dual balance at a milecastle on Hadrian's Wall is unique so far and represents the northernmost discovery of a dual balance to date in Roman Britain. Its discovery within such an overtly military setting also raises wider questions surrounding the distribution and use of these weighing instruments within Roman Britain. Although weighing equipment is frequently found on military sites, the most common finds are steelyards which would have been used in weighing out food rations (Smither, 2017a: 7). Due to the size and delicacy of this artefact, it would have been best suited for weighing small quantities of high value materials, such as precious metals and stones or medicines, and could have been used in jewellery making or other crafts. Dual balances were the most versatile weighing instruments, as they combined elements of both an equal balance and a steelyard. Weights could be placed in the hanging pan or moved along the graduated arm, or both. This meant that a dual balance could weigh more accurate quantities than an equal balance or steelyard (Roman Finds Group, 2021).

11. SKELETAL ANALYSIS

DR TRUDI BUCK

11.1 INTRODUCTION

This report presents the results of morphological analyses of an articulated adult skeleton, MSK1, excavated outside of milecastle 46 on Hadrian's Wall, Northumberland in September 2023. The purpose of this study was to determine a biological profile of the individual who was found within a cist burial just outside of the remains of the previously unexcavated milecastle.

11.2 ARCHAEOLOGICAL BACKGROUND

In 2023 a human skeleton was excavated from the area surrounding milecastle 46 on Hadrian's Wall. The individual was buried in a supine position within a stone lined cist orientated in an E-W direction (Fig. 9). The head of the individual was situated towards the east. The arms were laid out across the lower torso and the tibiae were positioned close to one another. The grave was positioned almost parallel with the line of Hadrian's Wall and alongside the east wall of the milecastle. No grave goods or evidence of personal possessions were found with the skeleton. Careful excavation of the surrounding area did not locate any further burials.

Figure 9: *MSK1 following excavation in the grave.*

12. MORPHOLOGICAL ANALYSIS

The skeleton was analysed according to the standards provided in the Guidelines to the Standards for Recording Human Remains IFA Paper No. 7 (Brickley and McKinley, 2004) and the CIFA Updated Guidelines to the Standards for Recording Human Remains (Mitchell and Brickley, 2017).

12.1 PRESERVATION AND COMPLETENESS OF THE SKELETON

The preservation of the skeletal elements was assessed macroscopically and graded following the guidelines in McKinley (2004). Overall the bone surfaces were in poor condition, with extensive post-mortem erosion of the cortical surfaces and many articular surfaces of the long bones were missing (Fig.10, also cfr Appendix 3). The condition of the bones varied greatly between the right and left sides of the body, with the right-hand side showing greater preservation than the left. The bones from the right side of the body were graded a 4 and those present from the left side a 5 (McKinley, 2004). On the left side of the body the outline of some skeletal elements were present whilst the skeleton was being excavated but the very poor condition of the bone, with only a lens of cortical bone remaining in many cases, meant that these did not survive the lifting process (Appendix 3). The skeleton was less than 50% complete and many of the bones, due to their very poor condition, did not survive excavation and cleaning. Whilst the outline of the cranium was visible in the soil the cranial bones were in very poor condition and were not complete in the ground. The foot bones were missing and the tibia were truncated just above the distal epiphyses, however it was not possible to say whether this is taphonomic or due to human activity.

***Figure 10:** Distal end of the femur, showing degraded condition of the cortical bone.*

12.2 CRANIUM

Prior to excavation the outline of the cranium was visible only as a lens of bone in the soil. This area was lifted as a whole to preserve any complete bones however the surviving cranial bones, including parts of the parietals, were too fragmented for analysis.

12.3 MANDIBLE & DENTITION

A small fragment of the left mandibular corpus remained with the two premolars in-situ (Fig. 11). The section of mandible was not fully cleaned on initial analysis to preserve the worn enamel of the surviving teeth for peptide analysis. There was also a loose left maxillary second molar crown which had separated post-mortem.

***Figure 11:** Mandibular fragment containing surviving dentition.*

12.4 POSTCRANIAL SKELETON

The postcranial skeleton was differentially preserved, with the axial skeleton and the right side of the body better preserved (Fig. 9). This may be due to the right side being more protected as this part of the body was laid deeper than the left. During the decomposition process the ribs from the left side of the body had fallen medially, resting in a more vertical position out of normal anatomical alignment.

12.5 RIGHT SIDE OF THE SKELETON

Part of the scapula survived, including the scapular spine. Approximately two vertebral bodies were

fused to the anterior side of the scapular fragment. Similarly, two more fragments of vertebral bodies were fused to the first rib. This is presumably due to taphonomic activity and decay, possibly within a small space. There were approximately four fragmentary ribs present from the right side of the body, but these broke into smaller fragments following excavation and cleaning. A small fragment of the sacrum was also present and the os coxa was fragmentary.

The right humerus was present, but only very thin sections of the cortical bone of the diaphysis remained and as such the bone was in many fragments following lifting. The distal epiphysis was present but missing the articular surface and the proximal epiphysis was also present but not complete and was detached from the diaphysis in-situ. The right radius and ulna could be identified in the grave and were attached to one another by the soil. When cleaned these elements broke into several fragments. The radial head survived as a separate fragment with a maximum diameter measurement of 25mm. Whilst in the grave the right femur survived intact and measured 420mm in length. The distal epiphysis was present and the biepicondylar width measured 74mm. The femoral head, neck and greater trochanter were complete and broke from the diaphysis on excavation. The femoral head diameter measured 50mm. The right tibia was articulated with the femur prior to lifting and most of the diaphysis was present. The distal epiphysis was missing and no foot bones were found. Approximately 75% of the diaphysis of the fibula was present and the distal epiphysis was preserved.

12.6 LEFT SIDE OF THE SKELETON

The left side of the body was less well preserved with fewer bones present. Four ribs were visible in the grave but broke during lifting and cleaning. The femur and tibia were visible in the grave, the former missing the distal epiphysis and the latter both the distal and proximal epiphyses. These bones were largely held together by very thin lenses of cortical bone and broke into small fragments when lifted and cleaned. As with the right leg, the distal end of the tibia was missing in-situ. The proximal end of the fibula was attached by soil to the tibia but again fragmented during the cleaning process. No foot bones were found.

13. BIOLOGICAL PROFILE

To establish a biological profile for the individual, age-at-death, sex and stature were estimated.

13.1 AGE AT DEATH

Methods for estimating age-at-death for adults rely almost solely on observations of degenerative change within the skeleton and dentition which will vary at different rates within and between populations and assemblages (Buckberry, 2015; O'Connell, 2017). The patterns of dental wear on the three surviving teeth are the only features of the skeleton available on which to base an estimation of age-at-death. Dental attrition is the gradual wearing down of the tooth, predominantly the occlusal surface, due to natural mastication and increases with age. Mays (2015) has demonstrated that dental wear for non-modern populations produces a higher correlation with age than other adult bony age indicators, though the rate of wear will vary among and between populations due to variables such as the hardness of diet and the nature of food production. As the rate of wear is most regular on molars, most scoring systems (e.g. Brothwell, 1963) focus on these teeth though Lovejoy (1985) presents a scoring system of occlusal attrition that includes premolars and is therefore employed in this study.

The two premolars present in the mandibular fragment were scored in Phase I for mandibular dentition, with the crown worn flat and the loss of all cuspal topography (Lovejoy, 1985). Phase I is given the age range of 45-55 by Lovejoy (1985), however as this is the latest phase available in the system it is possible that the individual was much older than this. The loose upper second molar was scored in Phase H for maxillary dentition, with an age range of 40-50. Again this is the oldest range given by Lovejoy and the individual should be considered older than 50 years. A comparison was made with a sample of Roman individuals curated at the Biological Anthropology Research Centre, University of Bradford, who are recorded as having high levels of dental wear. MSK1 demonstrates higher wear on average in the premolars and molar than these individuals (Pilling, pers. comm.).

13.2 SEX ESTIMATION

Estimation of sex of the skeleton is only possible from metric analysis of the femoral and radius heads as no diagnostic portion of the os coxae or cranium survived. Metric analysis involves taking maximum or minimum dimensions to quantitively analyse size differences between males and females (Christensen and Passalacqua, 2018) and is because males are, on average, larger than females, particularly in more weight-bearing articular surfaces such as the femoral head.

The maximum diameter of the femoral head measured 50mm and the bi-epicondylar breadth approximately 76mm. The maximum diameter of the radial head measured 25mm. Table 38 provides a comparison of mean measurements and standard deviations from populations as comparison for sex estimation of MSK1. On the basis of the metric analysis the measurements of the radial and femoral heads situate the individual within the male range. The bi-epicondylar measurement of the femur however is much lower and within the female range for this metric. The results of the metric analysis are therefore inconclusive however the enamel peptide analysis will provide confirmation of biological sex (Gowland et al., 2021).

	MSK1	Male Mean	S.D.	Female Mean	S.D.
Radius: Maximum Head Diameter* (mm)	25	23.2	1.5	20.6	1.6
Femur: Maximum Head Diameter (mm)**	50	48.4	2.6	42.1	2.1
Femur: Bi-epicondylar breadth (mm)**	76	85.3	4.4	74.5	3.8

Table 38: *Mean, standard deviations for comparison with MSK1.*

**From Pretoria Bone Collection & Raymond Dart Collection, South Africa (Barrier and L'Abbé , 2008)*

***From the Forensic Data Bank, US, (Spradley and Jantz, 2011)*

13.3 STATURE

When the whole skeleton is not present, stature can be estimated using regression methods which are based on the correlation between living height and skeletal elements such as the femur.

The femur was measured in-situ before lifting and subsequent fragmentation. The length of the femur was approximately 420mm, giving a living stature of between 158.1 – 164.4cm if male and between 154.1 – 161.6cm if female (Trotter and Gleser, 1958). Goldewijk and Jacobs (2013) suggest that long bone lengths provide a preferable comparison between populations than stature calculated from regression equations. The femur length of 420mm lies within the range of the male femoral lengths recorded from Romano-British cemeteries in Southern and Eastern England (Gowland and Walther, 2018). The mean male femoral length provided by Gowland and Walther (2018) is 443.8mm, S.D. 28.2, and the female mean 411.8mm, S.D. 21.9.

Image captured from a 3D model.

14. PATHOLOGY

Due to the very poor condition of the bone overall it was not possible to identify pathology.

15. SUMMARY AND DISCUSSION

The biological profile of the individual MSK1 is that of an adult over the age of at least 50 years, but could be much older based on the dental wear observable. The individual is possibly male, though the metric analysis was inconclusive and the results of the enamel peptide analysis should provide confirmation of biological sex. The length of the femur is below the recorded mean for male Romano-British individuals but above the mean for females of the same population, giving an estimated stature of between 157.8 - 161.4cm or approximately 5ft 2 inches.

The very poor preservation of the bone is likely due to the acidic nature of the soil and resulted in the skeleton becoming highly fragmented following lifting and cleaning. This poor condition also meant that pathological analysis was not possible. The position of the body in the ground and analysis of the bones however did reveal some interesting features relating to the nature of the burial of the individual. It was noted that in the grave the body was better preserved on the right side than the left, and the left ribs were positioned almost vertically rather than in their standard anatomical position. The tibia were positioned very closely together and the right arm was noted to be positioned across the body, with where the hands would have been resting on the pelvis. Analysis of the fragmentary bones of the spine and upper torso revealed that the two first ribs had moved from their anatomical position in a medial fashion, and they were fused to approximately two vertebral bodies. Similarly the portion of surviving scapula had also moved medially and two more vertebral bodies were fused to it. These features are possibly the result of transversal compression around the shoulder region due to the body having been tightly wrapped in a shroud (Duday et al., 2009). This would also account for the very close positioning of the tibia.

16. ENVIRONMENTAL SAMPLES AND MONITORING

BY FRANKI GILLIS

16.1 BULK ENVIRONMENTAL SAMPLES

The 2023 excavation season yielded a total of 628L of environmental samples from across 22 contexts (see Appendix 4). At least 40L were taken from each context of large (over a metre in diameter) pit features, and 50% of each context was sampled from five smaller pits or otherwise cut features. The bulk environmental samples were primarily being processed through wet sieving. All of the samples have been processed but not yet analysed. For tender purposes, the recovered seeds, insects, and pollen will be fully analysed when the excavation of Area A has concluded. However, select analysis from a few samples has been undertaken. Dr Eva Panagiotakopulu of Edinburgh University has identified carabids and staphylinids within the primary and secondary fills from the well (Fig. 12), although limited imaging capabilities mean that further details on their subfamilies are not yet available. Nevertheless, this is a promising first step in the analysis of the bulk environmental samples at Magna. In addition to wet sieving, some bulk samples will undergo additional processing through portable X-ray fluorescence (pXRF) analysis and/or paraffin flotation, the latter for the potential recovery of insect remains. As a precaution, 5L environmental samples of select features have been kept for future analysis.

Figure 12: *A carabid head found within sample MES2023-026 from the primary fill of the well.*

Many of the bulk environmental samples came from extramural pits. The usage of these pits is not yet confirmed, but it is likely that they had an industrial purpose – analysis of the recovered ecofacts should help shed light upon their purpose. No ovens, fire pits, or latrine pits were located in the excavated portions of Area A excavated in 2023. Pottery analysis suggests that soldiers stationed at milecastle 46 would bring a "packed lunch" in coarseware jars (See section 8.1 for further details), thus nullifying the need for an oven at the milecastle. The lack of extramural structures, buildings, refuse, or latrine pits and fireplaces also means that an intramural versus extramural occupation analysis of the environmental material is less impactful than it may have otherwise been. As such, these bulk environmental samples will help answer questions about the historical environment, living conditions at the milecastle, and diet.

16.2 LOW VOLUME ENVIRONMENTAL SAMPLES

Around 160 low volume samples (<.5L) were taken for pXRF, textile, and plant species analysis. Prior to removing the turf, a grid of low volume samples was taken for pXRF analysis - these will act as comparative points. This grid methodology was later utilised in lower layers of Roman occupation. Analysis of the results is still ongoing, but preliminary heatmaps of the site have been produced. Within the topsoil, there is a clear relationship between the frequency of common soil elements and the topography of the site. As such, many elements have a higher concentration in the western area of excavation, closer to the modern drystone wall, because that has a lower elevation. In the subsoil, this relationship is absent (Fig. 13). However, there is an interesting occurrence within the subsoil where Al, Ca, Fe, K, P, Pb, S, Ti, Zn, and Bal (Bal is short for balance, and refers to elements that the pXRF is unable to detect; these are usually light elements) all have concentrations in a similar pattern (Fig. 14). Namely, higher density points to the west of the well, in the northeast inner corner of the milecastle, in the southern gate, and near the extramural ditch to the east of the milecastle. At this moment in time, it is unclear why this pattern has occurred and so further research into this phenomenon is necessary.

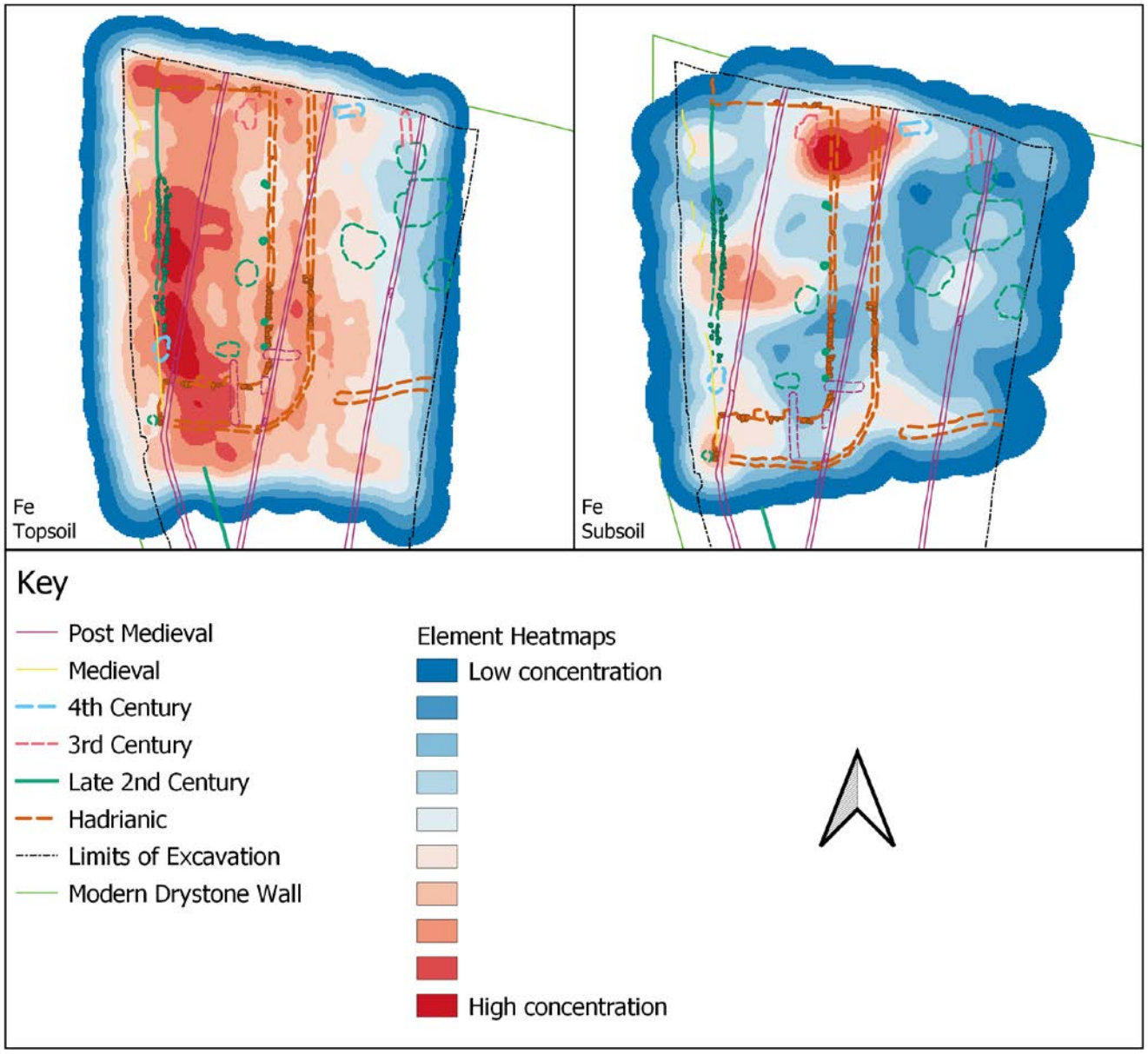


***Figure 13**: Heatmaps comparing the concentration of Fe in the topsoil (left) vs subsoil (right).*

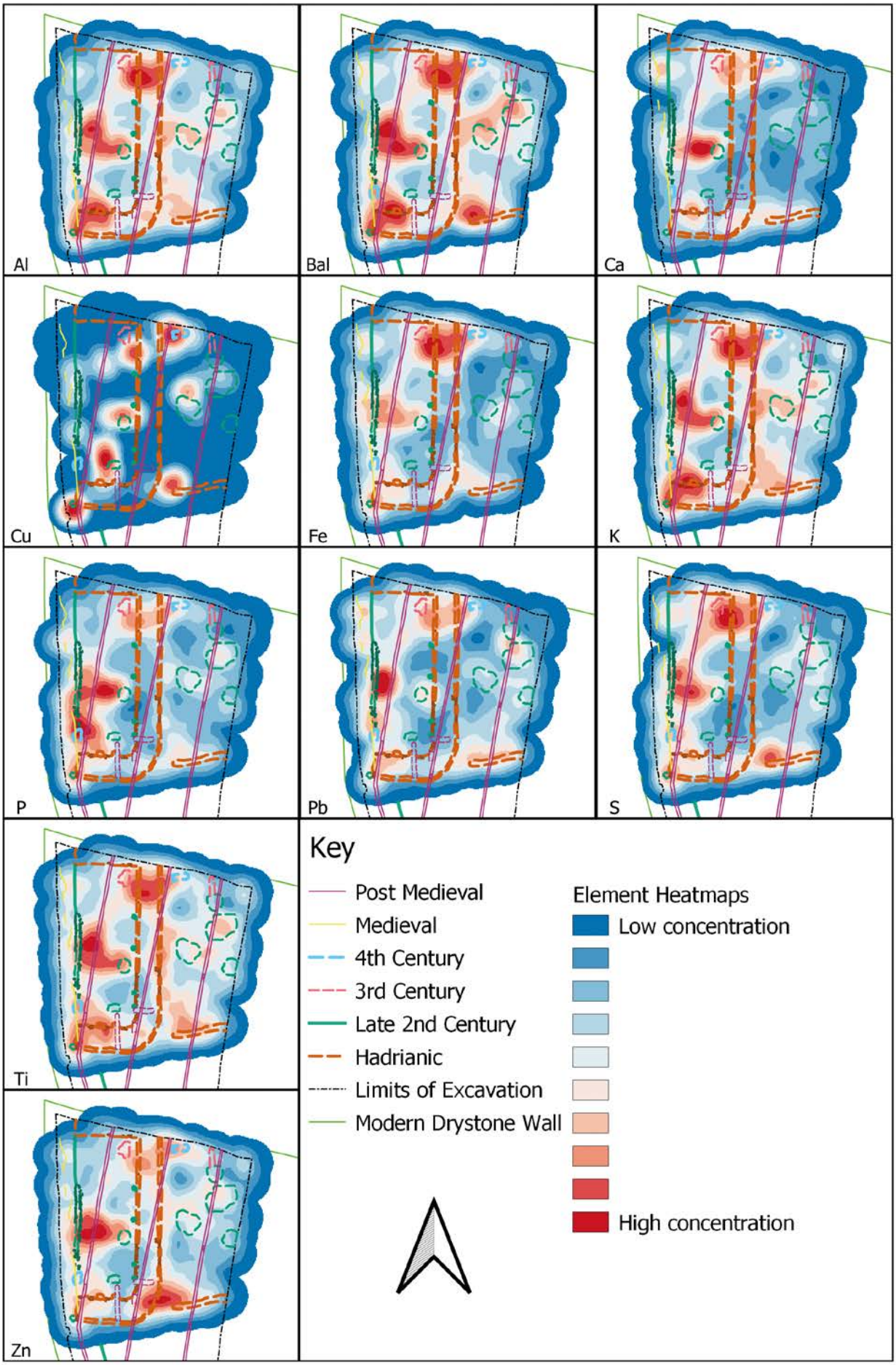


Figure 14: *These heatmaps all share similar concentrations of the listed elements. The reason for this pattern is not yet known, so further analysis is necessary.*

Additionally, seven low volume samples were taken from the cist grave for textile analysis. The position of the bones suggested that this was a shrouded burial (see sections 2.2, 15), but the analysis did not locate any residual amounts of textile fragments within the soil. Samples of wood and bracken have also been taken from the well feature – these plant species will be examined by external specialists at the same time as our bulk environmental samples. Identification of these plant species will provide further insight into the raw building material used at the milecastle and nearby Magna Fort. Preliminary on-site examination of the bracken shows it was compacted with straw which suggests it was used as a building material, like bracken deposits found at Vindolanda.

16.3 ENVIRONMENTAL MONITORING

The weather station and probe array (Wall-E) at Magna has continued to monitor the local environment, taking over ten types of data points every fifteen minutes. In mid-April, the probes will have been in the ground for two years and will have given us well over 500,000 data points to analyse. It is still too early to have definitive trends about climate, soil, and climate's impact on soil health; however, there seems to be an intriguing annual trend regarding the oxygen reduction potential (ORP) and pH at Magna. This trend shows a steep incline in the ORP levels starting mid-December which is evident in Figure 15 below. In 2023, the soil returned to normal anaerobic levels (between -400 and -600 mV) at the beginning of May – we shall have to wait and see if this part of the trend continues this year. Current data shows that this trend is more extreme this year than last, which could have potentially devastating effects on the archaeology if it continues in this aerobic environment for an additional three months. Similarly, this trend shows a steady decline of pH levels which then spike in mid-November before becoming more acidic once again (Fig. 16). Unfortunately, the spike in November 2023 was not extreme and therefore the current pH levels at Magna are unusually low. If the pH continues to decline, we could see a change in the overall average pH of the soil at Magna. Once again, this has potentially devastating effects on the archaeology. These trends in the pH and ORP levels at Magna, while observed, have yet to be studied for their possible causes and impending effects on the archaeology. Nevertheless, this demonstrates the importance of continual environmental monitoring of the peatland at Magna.

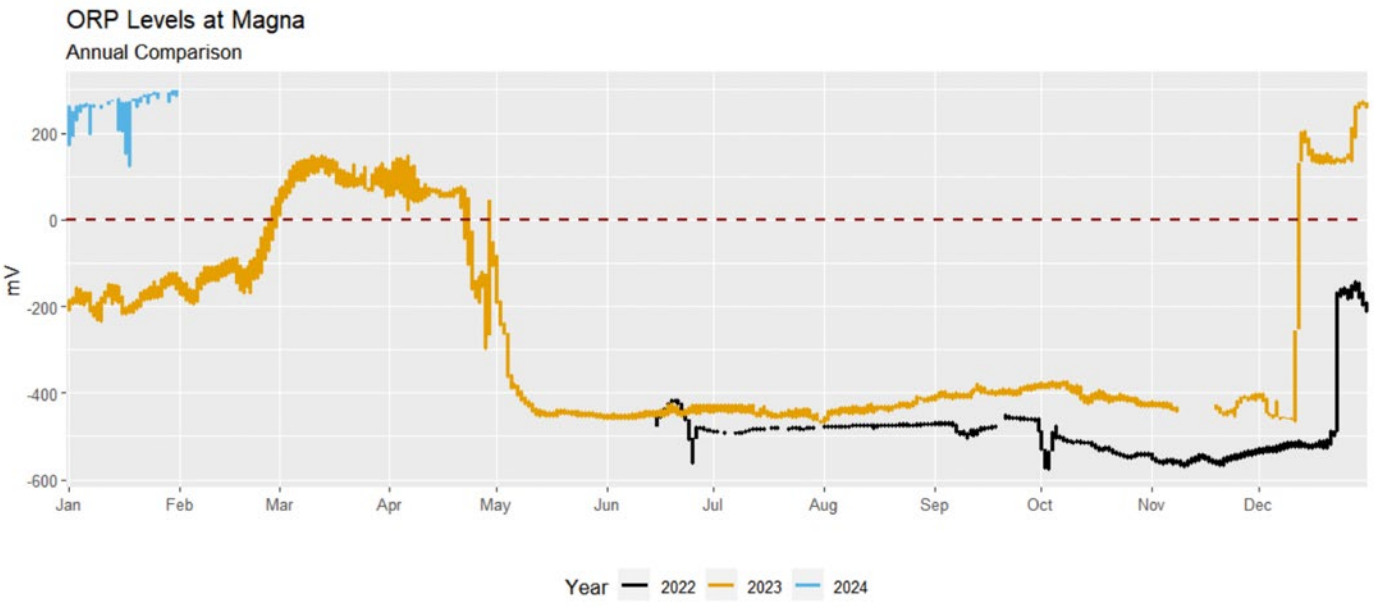


Figure 15: *Graph demonstrating the ORP levels at Magna since June 15, 2022, until January 31, 2024. Unfortunately, about two weeks of data from mid-November 2023 was corrupted, hence the gap in the 2023 graph line.*

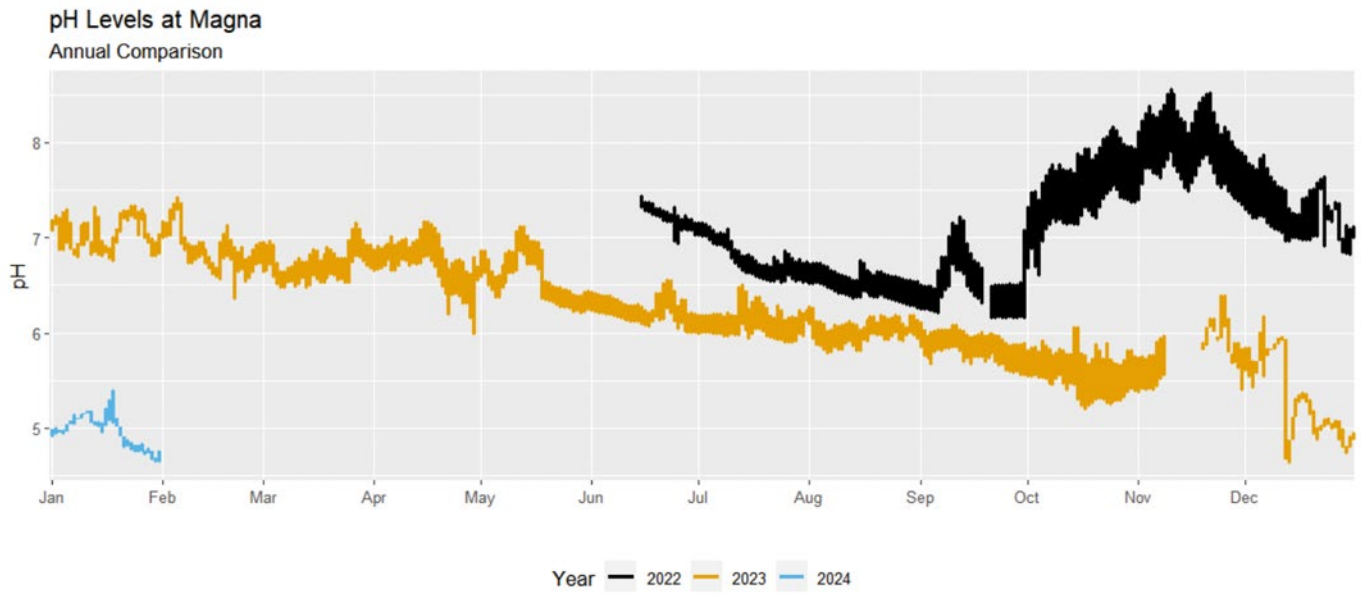


Figure 16: *Graph demonstrating the pH levels at Magna since June 15, 2022, until January 31, 2024. Unfortunately, about two weeks of data from mid-November 2023 was corrupted, hence the gap in the 2023 graph line.*

17. FUTURE RESEARCH

The Magna project is part of several collaborative research projects with colleagues from across the UK, with further research opportunities arising from the results of the excavation. Many of these are already underway with more beginning during the 2024 season.

Skeletal analysis and wider scientific study of the human remains is ongoing with Dr Trudi Buck of Durham University. Samples of the bone and teeth have been sent to Professor Janet Montgomery and Dr Joanna Moore at Durham University for isotopic and peptide analysis with the aim of determining the sex, diet, and geographical origins of the individual along with radiocarbon dating to establish the date of the remains. Analysis of the organic material recovered from the bulk environmental samples will be undertaken by Dr Hannah Russ at Archaeology. biz with consultation from Dr Jacqui Huntly (former Science Advisor North East for Historic England). This will aim to identify and quantify (if present): charred plant remains, waterlogged plant remains, mineralised plant remains, wood charcoal and terrestrial molluscs. Commencing in 2024, further specialist processing and study of bulk environmental samples will also be carried out with the University of Edinburgh by Dr Eva Panagiotakopulu to investigate the preservation of ancient insect remains and by Dr Bob McCulloch to identify pollen remains. Additional samples of coal from secure Roman contexts will also be taken from 2024 onwards as part of geological research by Ian Jackson into the sources and supply of coal to Roman forts on the frontier. The geoarchaeological turf study, in collaboration with Dr Tanja Romankiewicz and Dr Ben Russell at the University of Edinburgh, will focus on any surviving sections of the vallum's north and south mounds and include the collection and analysis of specialist samples. Broader geoarchaeological studies, including pXRF of low volume samples, are already underway. These samples have been processed at Teesside University under the guidance of Dr Gillian Taylor and Dr Rhys Williams. Further work with Dr Taylor includes the analysis of cores taken from across the site in 2021 and continued monitoring of the effects of climate change on the archaeological landscape and site preservation.

18. BIBLIOGRAPHY

Alberti, M. 2024. 4th century report on the south-east quadrant. forthcoming.

Allason-Jones, L., Bennett, J. and Welsby, D. A. 1984. 'The finds from Milecastle 54, Randylands'. Archaeologia Aeliana (5) 12, 228-235. DOI: https://doi.org/10.5284/1060775.

Barrier, I.L.O. and L'abbé, E.N. 2008. 'Sex determination from the radius and ulna in a modern South African sample'. Forensic Science International, 179(1), 85-e1.

Birley, A.R. 2022. Scheduled Area Monument Consent Application for excavation at the Roman Fort of Magna 2023-2027. Bardon Mill: Vindolanda Trust.

Birley, A.R.; Taylor, G.; Orr, C.; Rollason, E.; Williams, R.; Shillito, L.M. 2021. Carvoran/Magna Preliminary Report. Bardon Mill: Vindolanda Trust.

Birley, A.R. and O'Meara, D.P., 2022. 'The challenges of managing and monitoring the archaeological deposits of the Wall, with case studies from Vindolanda and Carvoran (Magna).' In Hadrian's Wall: Exploring its Past to Protect its Future. Alberti and Mountain eds, 7-14. Oxford: Archaeopress.

Birley, R.E. 1998. The Fort at the Rock: Magna and Carvoran on Hadrian's Wall. Greenhead: Roman Army Museum Publications.

Bishop, M C. 1996. Finds from Roman Aldborough, a Catalogue of Small Finds from the Romano-British Town of Isurium Brigantum, Oxford.

Breeze, D.J. and Dobson, B. 1972. 'Hadrian's Wall: Some Problems'. Britannia, 3, 182-208.

Breeze D.J. & Dobson B. 2000. Hadrian's Wall. 4th ed., London: Penguin History.

Brickley, M. and McKinley, J. I. 2004. Guidelines to the Standards for Recording Human Remains IFA Paper No. 7 BABAO

Brothwell, D.R. 1963. 'The macroscopic dental pathology of some earlier human populations'. Dental Anthropology, 271-288.

Buckberry, J. 2015. 'The (mis) use of adult age estimates in osteology'. Annals of Human Biology, 42(4), 323-331.

Christensen, A.M. and Passalacqua, N.V. 2018. A Laboratory Manual for Forensic Anthropology. Academic Press.

Collins, R., Kille, I. and O'Donnell, K. 2023. Fabric of the Frontier: Prospection, Use, and Re-Use of Stone from Hadrian's Wall. London: Oxbow Books

Cool, H. 2004. 'Some Notes on Spoons and Mortaria'. Theoretical Roman Archaeology Journal 2003, 28-35. DOI: https://doi.org/10.16995/TRAC2003_28_35.

Cramp, L.J.E., Evershed, R.P. and Eckardt, H. 2011. 'What was a mortarium used for? Organic residues and cultural change in Iron Age and Roman Britain'. Antiquity, 85(330), 1339–1352.

Crow, J. and Jackson, M. 1997. 'The Excavation of Hadrian's Wall at Sewingshields and the Discovery of a Long Cist Burial.' Archaeologia Aeliana, (5) 25, 61-69.

Crummy, N. 1983. Colchester Archaeological Report 2: The Roman small finds from excavations in Colchester 1971-9, Colchester.

Dore, J.N. 2014. 'The coarseware', in A. Rushworth, Housesteads Roman Fort-the Grandest Station: Excavation and survey at Housesteads, 1954-95. Swindon: English Heritage Publishing.

Duday, H., Cipriani, A.M. and Pearce, J. 2009. The Archaeology of the Dead: Lectures in archaeothanatology (Vol. 3). Oxbow books.

Eckardt, H. and Walton, P. 2021. Bridge over troubled water: the Roman finds from the River Tees at Piercebridge in context, London.

Elliott, P. 2014. Legions in crisis. Stroud: Fonthill Media Limited.

Evans, J. 1985. Aspects of later Roman pottery assemblages in Northern England. Investigation of Roman pottery assemblages and supply with emphasis on East Yorkshire industries, and of the potential of neutron activation analysis for fabric characterisation. PhD Thesis, unpublished.

Evans, J. 1993. 'Pottery Function and Finewares in the Roman North'. Journal of Roman Pottery Studies, 6, 95-118.

Evans, J. 1997. 'Pottery from Catterick Bypass and Catterick 1972 (Sites 433 and 434)' in P.R. Wilson, Cataractonium: Roman Catterick and its hinterland. Excavations and research, 1958-1997, York: English Heritage Publishing.

Evans, J. and Ratkai, L. 2010. 'Roman coarse pottery', in I. Ferris, The Beautiful Rooms are Empty: Excavations at Binchester Roman Fort, County Durham 1976-1981 and 1986-1991, Durham: Durham City Council.

Frame, R. 2024. A dual balance from milecastle 46, Hadrian's Wall. Forthcoming

Gibson, J. P., Bosanquet, R. Carr., Craster, H. H E. and Simpson, F. Gerald. 1911. 'The Milecastle on the Wall of Hadrian at the Poltross Burn'. Transactions of the Cumberland & Westmorland Antiquarian & Archaeological Society (2), 11, 390-461. DOI: https://doi.org/10.5284/1064034.

Gillam, J.P. 1957. 'Types of Roman Coarse Pottery Vessels in Northern Britain'. Archaeologia Aeliana, 35, 180-251.

Gillam, J.P. 1976. 'Coarse Fumed Ware in North Britain and Beyond'. Glasgow Archaeological Journal, 4, 57-80.

Goldewijk, G.K. and Jacobs, J. 2013. The relation between stature and long bone length in the Roman Empire. Groningen: University of Groningen, SOM research school.

Gowland, R. and Walther, L. 2018. 'Human growth and stature', in Scheidel. W (ed), The Science of Roman History: Biology, climate, and the future of the past, 174-204.

Gowland R., Stewart N.A., Crowder K.D., Hodson C., Shaw H., Gron K.J., Montgomery J. 2021. 'Sex estimation of teeth at different developmental stages using dimorphic enamel peptide analysis'. American Journal of Physical Anthropology, 174(4), 859-69.

Harbottle, B., Fraser, R., Burton, F.C., Dore, J.N., Casey, P.J. and Huntley, J.P. 1988. 'The Westgate Road Milecastle, Newcastle upon Tyne'. Britannia, 19, 153-162.

Lovejoy, C.O. 1985. 'Dental wear in the Libben population: its functional pattern and role in the determination of adult skeletal age at death'. American Journal of Physical Anthropology, 68(1), 47-56.

McKinley, J.I. 2004. 'Compiling a skeletal inventory: disarticulated and co-mingled remains', in Brickley, M. and McKinley, J. I. (eds) Guidelines to the Standards for Recording Human Remains IFA Paper No. 7 BABAO

Mays, S. 2015. 'The effect of factors other than age upon skeletal age indicators in the adult'. Annals of Human Biology, 42(4), 332-341.

Merrington, A. 2023. 'Roman road network spanning the South West identified in new research.' https://news.exeter.ac.uk/faculty-of-humanities-arts-and-social-sciences/roman-road-network-spanning-the-south-west-identified-in-new-research/ Exeter University. Accessed on 16/11/2023.

Mitchell, P.D. and Brickley, M. (eds.) 2017. Updated guidelines to the standards for recording human remains. Chartered Institute for Archaeologists.

O'Connell, L. 2017. 'Guidance on recording age at death in adult human skeletal remains'. Updated Guidelines to the Standards for Recording Human Remains, 25.

Pilling, J. 2023. Personal Communication.

Pirie, E. 1971. 'A Constantinian coin hoard from Womersley, WR', Yorks Archaeol J, 42, 127–9.

Pitts, M. 2005. 'Regional Identities and the Social Use of Ceramics'. Theoretical Roman Archaeology Journal 2004, 50-64. DOI: https://doi.org/10.16995/TRAC2004_50_64.

Richmond, I. A. and Gillam, J. Pearson. 1952. 'Milecastle 79 (Solway)'. Transactions of the Cumberland & Westmorland Antiquarian & Archaeological Society 52 (series 2), 52, 17-40. DOI: https://doi.org/10.5284/1062709.

Roach, L. 2013. 'From the Severans to Constantius Chlorus: the lost century', in R. Collins and M. Symonds (eds), Breaking down boundaries: Hadrian's Wall in the 21st century. Portsmouth (RI): Journal of Roman Archaeology, 105-122.

Roman Finds Group. 2021. Roman Weighing - presented by Philip Smither, available at https://www.youtube.com/watch?v=0vAhHDMYvA4 (Accessed: 13 December 2023).

Simpson, F. Gerard., Richmond, I. A., Birley, E. B., Keeney, G. S. and Steer, K. A. 1936. 'Milecastles on Hadrian's Wall explored in 1935-36'. Archaeologia Aeliana (4) 13, 258-273.

Smither, P. 2017a. 'Weighing Instruments', Datasheet 8, Roman Finds Group, Hertfordshire.

Smither, P. 2017b. 'Weighing up the Economy of Roman London'. London and Middlesex Archaeological Society Transactions, 68, 41-57.

Spradley, M.K. and Jantz, R.L. 2011. 'Sex estimation in forensic anthropology: Skull versus postcranial elements'. Journal of Forensic Sciences, 56(2), 289-296.

Symonds, M. 2005. 'The construction order of the milecastles on Hadrian's Wall.' Archaeologia Aeliana, (5), 34, 67-81.

Symonds, M. 2022. Hadrian's Wall: Creating Division. London: Bloomsbury Academic.

Toynbee, J.M.C. 1996. Death and Burial in the Roman Word. Baltimore: JHU Press.

Trotter, M. and Gleser, G.C. 1958. 'A re-evaluation of estimation of stature based on measurements of stature taken during life and of long bones after death'. American Journal of Physical Anthropology, 16(1), 79-123.

Tyers, P. 1996. Roman Pottery in Britain. London: Batsford.

Walton, P. 2004. NCL-E18835: A ROMAN BALANCE, available at: https://finds.org.uk/database/artefacts/record/id/60927 (Accessed: 13 December 2023)

Walton, P. 2015. BM-0A38FC: A ROMAN BALANCE, available at: https://finds.org.uk/database/artefacts/record/id/733456 (Accessed: 12 December 2023)

Willis, S. 1998. 'Samian Pottery in Britain: Exploring its Distribution and Archaeological Potential'. Archaeological Journal, 155, 1, 82-133. DOI: 10.1080/00665983.1998.11078847.

Willis, S. 2005. 'Samian Pottery, a Resource for the Study of Roman Britain and Beyond: the results of the English Heritage funded Samian Project. An e-monograph'. Internet Archaeology, 17.

Wilmott, T. 1997. Birdoswald: Excavations of a Roman fort on Hadrian's Wall and its successor settlements: 1987-92. London: English Heritage.

York Archaeology. 2023. 'Well, well, well what do we have here?' https://m.facebook.com/story.php?story_fbid=pfbid0zMMm1gpR4G-wpv8RvAGiqVasbms3K9x4LyVqDkiZhm44wbXk-mYL4uhGLpMTQMTQVcl&id=100055238632521 Facebook. Accessed on 16/11/2023.

APPENDIX 1: CONTEXTS

Context no.	Description and Interpretation	Provisional periods
M23-001	**Colour:** light brownish grey. **Composition:** sandy silt. **Compaction:** dry, very loose. Turf and topsoil overlying whole excavation area. Gets consistently deeper towards south of excavation area. Very dry and loose, with very high density of roots from grass, reeds and weeds throughout. Frequent finds of post medieval pottery, glass and clay pipes throughout with occasional pieces of animal bone and Roman pottery.	**Post-Medieval**
M23-002	**Colour:** light orangey brown. **Composition:** medium clayey sand. **Compaction:** dry, cemented. Inclusions: 1) frequent small to medium angular to sub-angular spheroidal sandstone, evenly distributed 2) frequent medium to large well-rounded spheroidal clay, concentrated towards northeast edge. Uppermost orange silt and clay infill of northern edge of the trench, overlying the eastern wall and extending downslope to the west towards road edge. Steelyard, glass bead and iron brooch all found in this deposit, at eastern extent. Partially overlain by silt 032 on south and west sides. Cut by modern drain 018 on west side and drain 076 on east edge. Possibly a deliberate dump of material after the demolition of the milecastle as different from all the other silty deposits that have built up in other parts of the site after the area went out of use. May also be related to the demolition/robbing of Hadrian's Wall.	**Medieval**
M23-003	**Colour:** light brownish grey. **Composition:** sandy silt. **Compaction:** dry, loose. **Inclusions:** occasional small to medium sub-angular spheroidal stone cobbles, evenly distributed. Light grey more silty soil built up along the eastern edge of road 005. Possibly overlying earlier Roman road surfaces. Lighter in some areas and borders 002 at north end of trench. Mainly concentrated in northern half of the trench at natural hollow, most likely built up through material washing into this over time.	**Post-Medieval**
M23-004	**Colour:** dark blackish grey. **Composition:** clayey silt. **Compaction:** moist, malleable. **Inclusions:** frequent flecks of sub-angular platy charcoal, evenly distributed. Area of dark silty material outside milecastle east wall. Lies immediately to the west of road (007) and covers most of the extramural space. Cut by a N-S field drain, probably from the early 19th century. Does not seem to extend all the way to the edge of the milecastle wall. Two possibly Roman nails were found in cleaning the surface of the deposit as well as occasional pottery shreds. Overlies 3 large pits in the northern half of the area as well as a disturbed cobble surface 049. Most likely a silt buildup that occurred after the abandonment of the milecastle, similar to 045 within the milecastle.	**Medieval**
M23-005	**Colour:** mid brownish grey. **Composition:** poorly sorted pebbly cobble. **Compaction:** dry, firm. A loosely packed cobbled road surface running in a north/south direction immediately below the turf/topsoil both without and within the boundary of milecastle 46, heading to the location of the milecastle's north gate. Medieval green glazed ware pottery, clay pipes and farming wares are amongst the finds in the surface and stuck within the fabric of the road. This feature is likely associated with the land management of the field in the medieval period up to the 19th century. Very little Roman material is present amongst the debris. Directly overlies the earlier Severan road.	**Medieval**

Context no.	Description and Interpretation	Provisional periods
M23-006	**Colour:** mid orangey brown. **Composition:** very poorly sorted clayey cobble. **Compaction:** dry, cemented. Small area of rubble at north edge of the trench, just outside the east wall of the milecastle. Remains of the rubble core of Hadrian's Wall left behind by robbers removing stone in the medieval period. Matches with other discard mounds visible on the north side of the wall cut. Partial upper queen stone recovered from within rubble. Sitting on top of silty buildup of material that's very finds poor.	**Medieval**
M23-007	**Colour:** mid orangey brown. **Composition:** sandy silt. **Compaction:** moist, loose. **Inclusions:** frequent medium to large sub-rounded to rounded spheroidal river stones, evenly distributed. Spread of cobbles along the east trench edge. Likely Roman in date due to the import of river stones but the cobbling is not as compact as one might usually find. Runs at a diagonal along the trench edge so widens as it heads south through the trench. Has some lime in patches that might suggest repairs were completed at some point in time on this surface. E-W ditch separating these cobbles from southern cobbles 059. Further pits cut into the road surface towards north end. West edge may be slightly truncated by the cut for large pit 052. Associated with looser cobbled spread 049 around the large pits.	**Late 2nd Century**
M23-008	**Form:** foundation of E-W regular, curvi-linear wall. Direction of face(s): N, S. Materials: 1) stone/other 2) light grey river cobbles. **Bonding:** dry friable light whitish orange medium clay. Extruded pointing. Clay only seen as a lining material on edge of stones rather than in between them. **Finish and coursing:** stones featuring random uncoursed coursing with rough face finish. Rubble core of mile castle south wall. West end nearest road is made of smaller rounded cobbles instead of large stone blocks. Three small later cuts through the wall in the SE corner, possibly evidence for 20th century trenches looking for the milecastle. Based on depth of these only the very base of the core has survived. cut by modern drain 018 at west edge of South Gate. No facing stones survive on the south edge, some survive on inside face and at the South Gate. Abutted on the north edge by clay buttresses 030. No clear reason visible for the change in core material at the south gate.	**Hadrianic**
M23-009	**Colour:** dark blackish brown. **Composition:** silty loam. Compaction: moist, friable. **Inclusions:** moderate medium to large sub-rounded spheroidal river cobbles, evenly distributed. A small sub-circular pit cut through the Roman road surfaces, full of dark grey/black earth and has charcoal deposits within its boundary. Large chunk of mortarium recovered from upper fill. Moderately frequent large rocks throughout fill and in the base of the pit.	**Late 2nd Century**
M23-010	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, firm. Deposit of silty material between the medieval road and modern drain. Seems contemporary with 005 as seems to underlie/intermingle with the cobbles. Overlying the facing stones of the end of the south milecastle wall, small square scrap of Cu alloy recovered from this area. Extends north for several meters along the road edge covering a possible pit. Truncated by field drain 018 on east side.	**Medieval**

Context no.	Description and Interpretation	Provisional periods
M23-011	**Colour:** mid brownish grey. **Composition:** poorly sorted silty cobble. **Compaction:** very dry, cemented. Later large stone rubble sitting on top of the medieval road surface along western trench edge. Doesn't form an even layer, possibly related to the construction of the field boundary walls or stone clearance from the rest of the milecastle area. Doesn't include any facing or worked stones and sat in a matrix of topsoil and subsoil. Only a few finds that are all post medieval or modern in date.	**Post-Medieval**
M23-012	**Colour:** light whitish orange. **Composition:** sandy clay. **Compaction:** dry, cemented. Small sub-circular deposit of burnt clay material in South of the milecastle, near the South Gate and the road through the fort. Just to the west of flagstones 013. Sub-oval in shape and made of hard heat affected orange and white clay with frequent charcoal inclusions. No structural features were seen so it's most likely a redeposited dump of oven material instead of the original oven. Iron tang found towards the base of the burnt material. Directly overlying white clay floor surface 029.	**3rd Century**
M23-013	**Colour:** mid brownish grey. **Composition:** flagstone. **Compaction:** dry, cemented. Linear stretch of large flagstones, possibly acting as a path to the SE corner of the milecastle but no clear structure in this area. Does not extend all the way to the road at the west and may relate to later reuse of the mile castle. Tightly packed to form a nice surface, flags on average 30-70cm long and wide. Some incidental rubble and large stones overlying the surface, probably from the milecastle demolition. Overlies a sub-oval pit 079 with a very dark and charcoal rich fill at the west end.	**4th Century**
M23-014	**Colour:** mid blackish brown. **Composition:** sandy silt. **Compaction:** dry, firm. Inclusions: frequent large to very large angular to sub-angular spheroidal stone rubble, evenly distributed. Layer of silt and rubble buildup overlying flagstones 013. Frequent angular whinstone fragments and rubble, possibly from the core of the milecastle south wall and related to its demolition/collapse. Also overlying part of the south wall of the mile castle.	**Medieval**
M23-015	**Colour:** light brownish orange. **Composition:** sandy silt. **Compaction:** dry, firm. Inclusions: moderate medium to large sub-angular to sub-rounded spheroidal cobbles, evenly distributed. Orange sandy silt material partially overlying the south wall of the milecastle to the south of (014) and infilling space where facing stones have been robbed in later periods. Moderately frequent small-medium cobbles and stone fragments throughout the material. Similar to other later deposit overlying parts of the interior of the milecastle.	**Post-Medieval**
M23-016	**Colour:** mid greyish brown. **Composition:** medium moderately sorted silty pebble. **Compaction:** dry, firm. Linear spread of cobbles extending east from the roadside in the central northern area. Possibly a side path leading from the road to a later Roman building inside the milecastle, but no clear signs for structures in this area. Curves to the south as it extends east. Relatively well sorted river-rounded cobbles set in a silty grey matrix. Not as well surviving closest to roadside. Overlies earlier cobbled yard space inside the milecastle. Cut by later field drain 018. Roman needle found on northwest edge.	**4th Century**

Context no.	Description and Interpretation	Provisional periods
M23-017	**Form:** NW-SE regular, linear drain. **Materials:** whitish yellow sandstone. **Bonding:** none. **Finish and coursing:** stones featuring rough face finish. Stone square drain running NW-SE through central milecastle road. Infilled by later cobbles associated with medieval road 005. Only partially surviving, full length has been lost along with west side and part of the base. Unclear if it was originally capped. Runs on a different line to the road as if heading from the western half of the milecastle out through the gate. Side is made of flat sandstone blocks set on their edge with more blocks laid flat to form the base. Part of the Severan road.	**3rd Century**
M23-018	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. Cut for a 19th century N-S field drain at western edge of site. Vertical sides and a flat base with a circular ceramic pipe laid within the cut.	**Post-Medieval**
M23-019	**Colour:** mid brownish orange. **Composition:** silty clay. **Compaction:** dry, firm. **Inclusions:** moderate small to medium angular to sub-angular spheroidal sandstone, evenly distributed. Fill of the 19th century field drain. 2 pipes at slightly different heights, only 1 is continuous through excavated section of drain.	**Post-Medieval**
M23-020	**Colour:** dark greyish black. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** 1) occasional flecks of angular platy charcoal, evenly distributed 2) moderate medium to large angular spheroidal whinstone frags, evenly distributed. Very dark spread in central western part of trench. Cut by field drain 018 on west side. Part of Cu alloy buckle found near drain. Still partially disturbed by rooting. Also, later post medieval pottery and clay pipe throughout so likely a later dump of material infilling the milecastle interior. Overlay a well filled with wall stones at east edge and remnants of a cobbled surface.	**Post-Medieval**
M23-021	**Colour:** light brownish grey. **Composition:** sandy silt. **Compaction:** moist, loose. **Inclusions:** frequent medium to large sub-rounded spheroidal river cobbles, evenly distributed. Spread of loose silty soil with frequent cobbles throughout. Cobbles do not form any cohesive surface and are just mixed through the deposit. Likely to have been formed after the milecastle fell out of use and cobbles have just become mixed in from demolition or clearing of the site. Partially overlay cobbled path (016) which runs to north of this spread.	**Post-Medieval**
M23-022	**Colour:** dark brownish black. **Composition:** clayey silt. **Compaction:** moist, malleable. **Inclusions:** moderately large to very large sub-angular to subrounded spheroidal sandstone, concentrated towards west edge. Sub-rectangular deposit outside the east wall of the milecastle. Very soft material and very dark, with a concentration of stones at the north and west edge. partially underlies Hadrian's Wall rubble 006 at north end. Does not fill any deliberate cut but seems to have built up in a shallow depression immediately outside the east wall of the milecastle. Frequent finds of pottery, predominantly black-burnished ware, along with other artefacts so may be a result of dumping rubbish over the walls of the milecastle from the interior.	**3rd Century**

Context no.	Description and Interpretation	Provisional periods
M23-023	**Colour:** mid orangey brown. **Composition:** sandy silt. **Compaction:** moist, firm. Inclusions: occasional large sub-rounded spheroidal cobbles, evenly distributed. Mounded deposit of orangey brown sandy silt butting up against the south wall of the milecastle. Overlying a white sandy clay and cobbled surface, similar to surfaces seen in other parts of the site. Also partially overlying inner face of milecastle south wall and clay buttresses along its edge. No finds recovered from this deposit.	4th Century
M23-024	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, malleable. Fill of the cut of the east mile castle wall towards the north end. No facing stones or rubble core surviving in this area. Only infills the area where the facing stones of the outer east wall foundation would have been, distinct from the fill of the core of the milecastle but similar to the equivalent deposit on the inside face. Is not present at the SE corner or along the south wall. Silty infill that was deposited after the robbing of the facing stones, likely during the medieval period.	Medieval
M23-025	**Colour:** mid orangey grey. **Composition:** pebbly silt. **Compaction:** moist, loose. **Inclusions:** frequent medium sub-angular spheroidal ironstone, evenly distributed. Area of deeper silt deposit in the northwest corner of the trench, on east edge of the road and north of path (016). Very frequent ironstone and iron ore patches present. Overlies the east edge of the earliest Roman road and line of Hadrian's Wall as it forms the east side of the north gate and in places the natural red clay. Likely the same as 032 but truncated on east side by field drain 018. No finds but likely medieval as it covered the remains of the foundations for Hadrian's Wall.	Medieval
M23-026	**Colour:** light brownish grey. **Composition:** clayey silt. **Compaction:** moist, malleable. **Inclusions:** moderate small to medium sub-angular platy limestone, evenly distributed. Small spread of grey silty material immediately east of the central road through the milecastle. Defined/truncated by the modern drain 018 on east side. Most likely built up after the milecastle had fallen out of use, no finds or evidence of deliberate deposition. Recorded separately for PXRF sampling.	4th Century
M23-027	**Colour:** light brownish orange. **Composition:** clayey silt. **Compaction:** moist, malleable. **Inclusions:** moderate small to medium sub-angular platy limestone, evenly distributed. Deposit of silty orange material along the east edge of the central road through the milecastle. Defined/truncated by land drain 018 on the east, and abuts 026 to the north, 028 to the south. Likely built up after the milecastle was abandoned, no sign of deliberate deposition and no finds. Recorded separately for PXRF analysis.	4th Century

Context no.	Description and Interpretation	Provisional periods
M23-028	**Colour:** dark blackish grey. **Composition:** loamy silt. **Compaction:** moist, loose. **Inclusions:** 1) frequent small to large sub-angular platy limestone, evenly distributed 2) frequent small to medium rounded spheroidal cobbles, evenly distributed. Spread of dark rubbly material along the east edge of the central road through the milecastle. Truncated by field drain 018 on east side. Seems contemporary with the later Roman road resurfacing. Overlay intermittent kerb stones from the south end of the drain 096 defining the east side of the road. Large amount of rubble and cobbles loose in this spread but doesn't not form a coherent surface.	**4th Century**
M23-029	**Colour:** very light greyish white. **Composition:** sandy clay. **Compaction:** moist, firm. Spread of white sandy clay running along the inside face of the south milecastle wall. Most likely formed part of the original floor surface in this part of the milecastle and is very similar to the clay bedding for the cobbled surfaces present elsewhere on site. Similar to bands of natural clay known to exist at Magna. Clay buttresses 030 cut into this context.	**Hadrianic**
M23-030	**Colour:** light pinkish orange. **Composition:** sandy clay. **Compaction:** dry, cemented. Linear clay feature running along and between the inside foundation facing stones of the south milecastle wall. Two square patches of clay extend into the surface 030. Possible buttressing for a timber staircase leading to the wall walk of the MC and giving access to the top of Hadrian's Wall. No other signs of buttresses elsewhere on the inside face of the walls. East buttress partially truncated by later trench 040.	**Hadrianic**
M23-031	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** wet, loose. Fill of small cut, possibly for later land improvements or archaeological trenching. Cut through the SE corner of the wall of the milecastle. Cut is entirely inside the main milecastle wall and is probably associated with the 2 other small cuts in this area. No finds were recovered during excavation.	**Post-Medieval**
M23-032	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** 1) occasional medium to large sub-angular to subrounded stone cobbles, evenly distributed 2) moderate medium subrounded platy clay, evenly distributed. Silty spread partially overlying (002) and the east wall of the mile castle. Moderately frequent patches of orange and white clay mixed through but not intentionally deposited. Occasional sub rounded cobbles mixed in but likely just part of natural stony build up. most likely built up over time after the occupation of the mile castle ended. Also partially overlying cobbled surface 050 and very similar to 003/025 in NW corner. Finds were of a mixed date supporting long term build-up of the deposit.	**Medieval**
M23-033	**Colour:** mid brownish orange. **Composition:** clayey silt. **Compaction:** dry, firm. Orange clayey silt layer overlying the core and foundation facing stones of the east wall of the milecastle and continuing over the inner face. More rubble within this deposit on the inner side of the wall and glass from this area as well. Abuts the grey silty infill of the milecastle to west and 032 to north. Likely related to the demolition of the milecastle because of the rubble within this deposit.	**Medieval**

Context no.	Description and Interpretation	Provisional periods
M23-034	**Colour:** light greyish yellow. **Composition:** well-sorted clayey cobble. **Compaction:** dry, cemented. Original road running north-south through the milecastle. Made of small river rounded cobbles tightly packed together in a grey silt clay matrix. Cut by a small pit (009) at the south end. Later covered by Antonine resurfacing and repairs. Not 100% exposed and no slots dug through the surface. Clearest in the NW corner where it passes through the north gate of the milecastle.	**Hadrianic**
M23-035	**Colour:** dark brownish black. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** frequent flecks to small angular platy charcoal & coal, evenly distributed. Dark lens with very frequent charcoal and coal inclusions. Likely related to (020) just to the west but this layer is significantly thinner and more linear. Large amounts of coal directly on the surface of this layer. Found an unknown iron object (possibly hammer head?) in this layer along with clay pipe and post-med pottery. Likely related to dumping of waste on the site, possibly from Carvoran farm.	**Post-Medieval**
M23-036	**Colour:** dark blackish grey. **Composition:** clayey silt. **Compaction:** moist, malleable. **Inclusions:** frequent flecks of sub-angular platy charcoal, evenly distributed. Spread of grey silty material along the outside face of the eastern milecastle wall. Fundamentally the same as 004 that was overlying the eastern area of cobbles and large pits. No finds and is most likely silt building up against the milecastle wall over time, particularly after the abandonment of the area.	**Medieval**
M23-037	**Colour:** dark greyish brown. **Composition:** clayey silt. **Compaction:** dry, firm. **Inclusions:** moderate medium angular spheroidal sandstone, concentrated towards surface. Fill of a sub-oval pit cut into the east edge of the central road through the milecastle. Dark silty fill with occasional rubble at the surface but overall, very shallow. Similar to overlying silty material built up along the road edge. 2 fragments of a cu alloy buckle recovered from the northern half of the fill. Underlies later medieval road surface.	**4th Century**
M23-038	**Shape in plan:** sub-oval. Break at top: sharp. **Sides:** vertical. Break at base: sharp. **Base:** flat. Cut for a sub-oval pit towards southern end of the central milecastle road. Underlies later medieval road surface. Filled by single fill 037. Very shallow feature with vertical sides and a flat base. Cut through east edge of the later Roman road surface, no obvious sign of earlier road surface in base of the pit so likely disturbed this too. Unclear purpose but located just within the South Gate and close to another smaller pit dug through the early Roman road surface.	**4th Century**
M23-039	**Shape in plan:** irregular, sub-circular. **Break at top:** sharp. **Sides:** steep, straight. **Break at base:** gradual. **Base:** uneven. Cut of a small sub circular pit cut through Roman road in the South Gate of the milecastle. Filled by a single dark charcoal rich fill 009. Sides and base somewhat irregular due to medium river cobbles present from the cobbled road surface the pit has been cut through. Immediately beside the facing stones of the South Gate foundation.	**Late 2nd Century**

Context no.	Description and Interpretation	Provisional periods
M23-040	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** gradual. **Base:** uneven. N-S cut through the south milecastle wall, near the SE corner. Narrow, shallow cut which doesn't extend into the clay and cobble packing material below the rubble wall core. Possibly the cut for earlier trench looking for the wall. Fill material is very similar to the wall core but obviously displaced. Also cuts clay buttress 030.	**Post-Medieval**
M23-041	**Colour:** dark blackish brown. **Composition:** silty clay. **Compaction:** wet, cemented. **Inclusions:** frequent very large sub-angular to sub-rounded spheroidal stone rubble, evenly distributed. Rubble packed infill of later post medieval cut through the south milecastle wall. Possibly earlier trench dug to find the milecastle, rubble within the cut is visually indistinguishable from the rubble core of the wall around it, but post-med finds were recovered from below the stones. Generally a darker silty fill, similar to the topsoil covering the rest of the site.	**Post-Medieval**
M23-042	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. Small later feature running N-S and cut through the core of the milecastle wall in the SE corner. Parallel with trench 040, the cut is entirely inside the main milecastle wall, and is probably associated with the 2 other small trenches in this area. No finds were recovered during excavation. Deeper towards the south end but does not seem to continue under the remaining rubble core. Most likely represents later interventions in the landscape either for land improvements or attempts to locate the milecastle.	**Post-Medieval**
M23-043	**Shape in plan:** regular, linear. **Base:** flat. Later E-W cut through the east wall of the milecastle at the SE corner. May be related to other later cuts in this area. Shape in profile of the cut was not seen, only the rubble fill remained upstanding above the east wall of the milecastle. Cut was briefly seen in plan through the later material overlying the milecastle wall, suggesting this may be a much later feature or previous trench trying to identify the remains of the milecastle. Breaks through the facing stones on the inside face of the wall.	**Post-Medieval**
M23-044	**Colour:** mid blackish brown. **Composition:** clayey silt. **Compaction:** wet, firm. **Inclusions:** frequent very large sub-angular to sub-rounded spheroidal stone rubble, evenly distributed. Rubble core fill of later cut through the east wall of the milecastle at the corner. Partially overlay post hole 111 on west side. Only the rubble fill remained of this feature, visually very similar to the core of the south wall of the milecastle. May represent redeposited wall core in a later trench investigating the milecastle. No dating evidence found but possibly relates to other later cuts in this area.	**Post-Medieval**
M23-045	**Colour:** mid brownish grey. **Composition:** pebbly silt. **Compaction:** moist, loose. **Inclusions:** moderate flecks of sub-rounded platy charcoal, evenly distributed. Build-up of grey silty material in south part of milecastle interior. Abuts flagstones 013 to the south and black deposit 020 to north, cut by modern drain 018 on west edge. Overlay 2 potential post holes along inside face of milecastle east wall, white clay and cobbled floor surface and charcoal filled pit 046. Likely the same as 021 to the north of black deposit 020. Most likely formed during a period of disuse within the milecastle structure after the demolition of the outer walls.	**Post-Medieval**

Context no.	Description and Interpretation	Provisional periods
M23-046	**Colour:** dark brownish black. **Composition:** clayey silt. **Compaction:** dry, firm. **Inclusions:** occasional medium rounded spheroidal rounded stone, evenly distributed. Fill of shallow oval pit. Large oblong stone suggests an intentional backfill, but no clear sign of any working of the stone block. Very dark fill with frequent charcoal flecks throughout. Overlain by flagstone path 013 and silty deposit 045. Original purpose unclear but was intentionally backfilled before later use of the milecastle.	**Late 2nd Century**
M23-047	**Colour:** light orangey brown. **Composition:** clayey silt. **Compaction:** dry, cemented. **Inclusions:** frequent large angular to sub-angular spheroidal sandstone, evenly distributed. Small area of compacted rubble inside the milecastle. Lies just to the south of the well and overlies the earlier clay and cobble surface. Likely just a dump of material related to the demolition of the milecastle and internal features.	**3rd Century**
M23-048	**Colour:** mid orangey grey. **Composition:** poorly sorted sandy cobble. **Compaction:** dry, cemented. **Inclusions:** moderate medium to large subangular platy iron pan, evenly distributed. Tightly cobbled path or road running round the outside of the SE milecastle corner. Large patches of iron pan across the surface, seems to be bonding the cobbled together. Poorly sorted stone used in the construction, similar to the Severan road inside the milecastle but this contains no iron pan. Respects the line of the milecastle wall and does not seem to overlie the potential boundary ditch 101. May have been access into the processing area east of the milecastle.	**Late 2nd Century**
M23-049	**Colour:** mid whitish grey. **Composition:** poorly sorted clayey cobble. **Compaction:** moist, firm. **Inclusions:** occasional flecks of platy charcoal, evenly distributed. Large spread of loose cobbling set into whitish grey clay east of the milecastle. A series of large irregular pits are cut through this surface as well as a cist grave. Cobbling is not consistent and is heavily damaged/lost in the central areas around the pits but is better preserved along the edge of the milecastle wall. Most likely the same as or contemporary with 007 along the east edge of the trench.	**Hadrianic**
M23-050	**Colour:** mid brownish grey. **Composition:** moderately sorted pebbly cobble. **Compaction:** dry, cemented. **Inclusions:** rare medium wellrounded platy charcoal, concentrated towards north. Large spread of cobbles at north end of the milecastle interior. Made of moderately well sorted small-medium cobbles packed into a grey silty matrix. Underlies cobbled path 016 so most likely is the original surface creating a cobbled yard inside the north gate of the milecastle. Abuts Hadrianic road through the milecastle on the west. Cut by a shallow broadly rectangular pit in the northeast corner near the junction of Hadrian's Wall and the east milecastle wall. 110 in the southern half of the milecastle is likely the same surface, just more heavily damaged in later periods. Coin and blade recovered from the surface.	**Hadrianic**

Context no.	Description and Interpretation	Provisional periods
M23-051	**Colour:** mid brownish grey. **Composition:** silt. **Compaction:** wet, loose. **Inclusions:** 1) occasional flecks of platy charcoal, evenly distributed 2) occasional very large sub-rounded spheroidal whinstone, evenly distributed. Upper fill of an irregularly shaped circular pit dug through the packed clay and white cobbles of a Roman surface to the east of the east wall of the milecastle. Filled with a moist clay and grey silt fill which is wet and retains water and a few sherds of Roman pottery. Unknown metal object recovered from the fill as well as a piece of Roman glass but no obvious indication of the purpose of the pit. This fill was likely just silting up of the pit once it was no longer used, no obvious deliberate infilling or secondary use as a midden. Several very large whinstone boulders throughout fill but none seem intentionally placed.	**3rd Century**
M23-052	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** 1) occasional very large sub-rounded spheroidal whinstone, evenly distributed 2) moderate flecks of platy charcoal, evenly distributed. Upper fill of a large pit west of the mettled surface and to the east of milecastle 46. Silty fill with frequent small cobbles stones which have washed off the adjacent surface. A few nails and sherds of ceramics are within this context. The side of the road to the east slopes up at an angle of approximately 45 degrees. The silt fill is a mid-grey and retains water. Most likely formed after the pit fell out of use and it silted up, little evidence of deliberate infilling or use as a midden. No obvious indication of the purpose or date of the pit from this fill. Several large whinstone boulders throughout the fill but none seem intentionally placed. Capped with very large, faced stones forming a platform of some sort. Cut by 19th century field drain.	**3rd Century**
M23-053	**Colour:** mid brownish grey. **Composition:** fine moderately sorted silty pebble. **Compaction:** moist, cemented. Small area of cobbled path set into silt 004 outside the milecastle. Immediately to the southeast of large pit 057 but likely unrelated as set into the silt which overlay this feature. May relate to path 016 recorded within the milecastle as both laid into higher silty deposits overlying the earlier archaeology, possibly originally all one path running e-w across the trench after the demolition of the milecastle.	**4th Century**
M23-054	**Colour:** mid brownish grey. **Composition:** moderately sorted silty cobble. **Compaction:** moist, friable. Just below the topsoil. Top level of cobbled Roman street leading to the South Gate of the milecastle. Post Roman pottery recovered from above the tightly packed surface which is well made from well sorted cobble stones. Likely equivalent to the Hadrianic road within the milecastle. Abuts cobbled surface 059 covering the area south of the milecastle.	**Hadrianic**

Context no.	Description and Interpretation	Provisional periods
M23-055	**Form:** foundation of N-S regular, linear wall. **Direction of face(s):** E. **Materials:** light yellowish grey sandstone. **Bonding:** moist loose mid grey fine clay. Flush pointing. **Finish and coursing:** stones featuring fair face finish. A low foundation made of stone preserved at the same height as the surrounding road cobbles to the east. Sits entirely within the cut for pit 092, running over the top of its upper fill 052 to form a capping deposit. The structure/feature lies in a north/south orientation and has on its eastern edge a secondary foundation attached made from a two-sided wall, one course deep and four facing stones long. Purpose and date of this feature are unclear. Possibly disturbed on its western side by later field drain.	4th Century
M23-056	**Colour:** mid blackish grey. **Composition:** sandy clay. **Compaction:** wet, malleable. **Inclusions:** 1) frequent small to medium well-rounded platy charcoal, evenly distributed 2) occasional very large sub-rounded spheroidal whinstone, evenly distributed. Primary fill of pit 057. Has pockets of dark black organic rich material - likely organic material that formed when the pit was left open probably with standing water in it for a period of time. Very waterlogged. No clear evidence for the date or use of the pit from this layer. Very similar to the primary fill in the other pits in this area. Several large whinstone boulders throughout the fill and against the sides of the pit but none seem intentionally placed.	Late 2nd Century
M23-057	**Shape in plan:** irregular, sub-oval. **Break at top:** sharp. Sides: vertical, concave, undercut. **Break at base:** gradual. **Base:** uneven. Large irregular sub-oval pit cut through cobbled surface 049 to the east of the milecastle. Forms part of a series of pits with pits 092 and 070. Uneven base and undercut sides, cut into natural clay at base. 2 fills, lower fill is waterlogged and fibrous and suggests pit stood open for a short while before getting infilled. Occasional Roman artefacts in upper fill, but no clear suggestion of date or purpose. Some sort of industrial activity, possibly clay extraction or processing raw materials.	Late 2nd Century
M23-058	**Colour:** dark greyish black. **Composition:** silty clay. **Compaction:** dry, firm. **Inclusions:** 1) frequent flecks of angular platy charcoal, evenly distributed 2) moderate flecks of rounded platy orangey red clay, evenly distributed. Spread of soft dark silt material at the north end of the trench, east of the milecastle. Overlies cobbled surface 049 and pit/gully feature 066/083. Extends beyond LOE to north, most likely running up to the south face of Hadrian's Wall, cut by modern drain on east edge. No cut for deposit, similar to other spreads of dark silty material that seem to build up near walls across the site. Complete pot buried within this fill, near to gully and pit relationship.	4th Century

Context no.	Description and Interpretation	Provisional periods
M23-059	**Colour:** mid yellowish brown. **Composition:** moderately sorted sandy cobble. **Compaction:** dry, loose. **Inclusions:** frequent flecks of platy charcoal, evenly distributed. Area of loose cobbling south of the milecastle, partially disturbed by modern field drains. Small glass bead found on its surface. Not as compacted as the cobbled road 048 to the north or road to the milecastle 054 to the west. Possible pits cut through the surface, but not investigated this year. Partially overlies and is collapsed into ditch 101, possibly linking onto surface 049. Butts up against road 054 to the milecastle and road 048 at the SE corner of the milecastle. Probably a cobbled yard space for holding traffic outside the milecastle before crossing the border.	Late 2nd Century
M23-060	**Shape in plan:** regular, circular. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** gradual. **Base:** rounded. Clay lined well just inside the milecastle wall. The well was purposefully backfilled during the later Roman period based on the pottery found within (088) and the large masonry stones (061) packed into the top. The well was tightly backfilled with large stones and contained wood, possibly floors or wooden well lining, thrown inside in the lower layers. Circular with vertical sides but clay is unstable and collapsed/undercut. Unable to fully excavate with original shape in plan, boxed at the top for safety.	Late 2nd Century
M23-061	**Colour:** dark blackish brown. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** frequent very large very angular elongate roman masonry, concentrated towards surface. Upper fill of the well in the interior of the milecastle, close to the line of the east wall. Upper part of the fill is dominated by large well-shaped Roman stonework, likely from the walls of the milecastle. Heavily packed nature of stones in this layer and those below suggest that the backfill of this well was quite intentional.	3rd Century
M23-062	**Shape in plan:** regular, rectangular. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. Cut for a cist grave in the corner between the outside face of the east wall of the milecastle and Hadrian's Wall. Partially stone lined, no stone base or capping stones but stones lining the sides of the cut. Flat base with the remains laid directly in the base. Very regular shape in plan, intentionally cut and lined with stone. Cut through 072 silt deposit against the milecastle walls, probably buried while the walls were still standing to provide a protected corner for the grave. Grave is aligned E-W, parallel with the line of Hadrian's Wall.	4th Century
M23-063	**Colour:** mid yellowish brown. **Composition:** clayey silt. **Compaction:** moist, firm. **Inclusions:** moderate very large angular elongate roman masonry, concentrated towards surface. Upper fill of cist grave 062. Covering and partially contains the stone lining forming the walls of the cist as well as many large blocks of Roman masonry in the upper surface sealing the grave. This rubble was not neatly placed to form a cap but was just packed into the upper fill. No finds in this layer and no human remains, they are entirely contained within the lower fill of the grave.	4th Century

Context no.	Description and Interpretation	Provisional periods
M23-064	**Shape in plan:** regular, oval. **Break at top:** 1) NE: gradual 2) SW: imperceptible. **Sides:** shallow, concave. **Break at base:** imperceptible. **Base:** flat. Cut for a shallow oval pit, just outside the east wall of the milecastle. Sits immediately south of grave 062. Cut through partially cobbled surface 049. Forms one of a series of pits of varied sizes throughout the north eastern extramural area. Cut mostly lost on the south and west side of the pit, but profile is better surviving on NE edge. Very shallow overall, may be partially truncated. Underlay black silty deposit 022.	**3rd Century**
M23-065	**Colour:** dark orangey brown. **Composition:** sandy silt. **Compaction:** dry, loose. **Inclusions:** moderate heat affected sand, concentrated towards edges, particularly e end. Fill of a small shallow pit just outside the east wall of the milecastle. Fill is a dark brown sandy silt with areas of possibly heat affected orange sand, primarily concentrated around the edges of the feature and particularly in the base of the east edge. No finds or other dating evidence were recovered so date is unclear, but it underlies deposit 022 which produced significant amounts of Roman pottery so the pit is Roman.	**3rd Century**
M23-066	**Shape in plan:** regular, sub-circular. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** gradual. **Base:** rounded. Deep circular pit outside the east wall of the milecastle. Immediately to the north of pit 092 but probably not part of the series of big pits, much smaller and not on the same spacing as the others. Cut by a later gully/short linear feature aligned N-S after the pit had been backfilled. Original date and purpose of these features unclear. Intact pot was found just to the west.	**Late 2nd Century**
M23-067	**Colour:** mid orangey pink. **Composition:** sandy clay. **Compaction:** wet,malleable. **Inclusions:** occasional small to large sub-rounded spheroidal whin sill stone, concentrated towards western edge. Upper fill of pit 066, cut by later gully/short linear that runs from the north over the top of the pit. Composed of redeposited natural clay with several large whinstone boulders throughout the fill, especially on the west edge. None of the stones seem to be intentionally placed to form a lining. No indication of the date or use of the pit. Cut on east side by later field drain.	**Late 2nd Century**
M23-068	**Colour:** mid blackish orange. **Composition:** sandy clay. **Compaction:** dry, firm. **Inclusions:** moderate small to medium rounded spheroidal cobbles, evenly distributed. Small deposit of burnt material against the inside face of the milecastle east wall. Originally interpreted as an oven due to semi-circle of cobbles within the context defining an area of burning but no real depth or structure found upon excavation. Immediately northeast of well 060.	**3rd Century**
M23-069	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** wet, malleable. **Inclusions:** moderate small to large sub-rounded platy limestone, evenly distributed. Upper fill of pit [070] outside the east wall of the milecastle. Grey silty clay material, most likely formed by the gradual silting up of the pit after it was out of use. No obvious signs of deliberate infilling or use as a midden, but several large stones through the fill. Area of slumped cobbles also in the upper fill on the west edge of the pit, likely part of the surrounding surface collapsing into the pit. No clear indication of the use of the pit. Extends beyond the eastern LOE.	**3rd Century**

Context no.	Description and Interpretation	Provisional periods
M23-070	**Shape in plan:** irregular, semi-circular. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** sharp. **Base:** uneven. Cut for a large pit which forms part of a series of pits with 092 and 057 to the east of the milecastle, cut through cobbled surface 049/007. Not entirely excavated as the eastern part goes under the LOE. Irregular shape in plan and profile, with undercut sides and an uneven base. Original date or purpose is unclear but was possibly for clay extraction or some other industrial activities. The pit has 2 fills, with the lower indicating that it remained open for some time after excavation.	**Late 2nd Century**
M23-071	**Colour:** dark brownish black. **Composition:** clayey silt. **Compaction:** moist, firm. Lower fill of cist grave 062. Silty clay containing the skeleton. Very dark in colour most likely from organic decay of the remains. Skeleton was probably shrouded as bones are very tightly together with ribs displaced. Very high percentage of bone fragments in the fill due to poor bone preservation. Extensively sampled as part of the removal/sampling of the human remains.	**4th Century**
M23-072	**Colour:** dark brownish black. **Composition:** silt. **Compaction:** moist, firm. L-shaped area of silt that has built up against the outside of the milecastle east wall and Hadrian's Wall at the junction where they meet. No evidence of it being a deliberate build up, the landscape forms a natural hollow here in the corner of the two walls for material to be washed into. Cist grave is cut through this material. Not a very deep deposit so probably formed gradually over time or may have been periodically cleaned out while the milecastle was occupied.	**3rd Century**
M23-073	**Colour:** dark greyish black. **Composition:** clayey silt. **Compaction:** dry, loose. **Inclusions:** frequent large to very large angular spheroidal sandstone, evenly distributed. Small deposit primarily consisting of large rectangular stones just outside the milecastle east wall. Originally thought to be a base of a structure, this seems to be an unintentional concentrated deposit of stone rubble most likely from the demolition or collapse of the milecastle and Hadrian's Wall. Probably part of 022 a dark spread of material with several pieces of Roman pottery and other occupational waste.	**3rd Century**
M23-074	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. 19th century field drain cut. Runs N-S through the area east of the milecastle, cutting two of the pits and potential boundary ditch as well as the cobbled surfaces.	**Post-Medieval**
M23-075	**Colour:** mid pinkish orange. **Composition:** sandy clay. **Compaction:** dry, loose. **Inclusions:** moderate small to medium well-rounded spheroidal river stone, evenly distributed. Intentional backfill of field drain cut. Likely dates to the mid-1800s. Circular ceramic field drainpipe laid in the base with occasional broken sections of pipe disposed of in the backfill. Mixed deposit of topsoil and natural clay that was dug out to lay the pipe.	**Post-Medieval**

Context no.	Description and Interpretation	Provisional periods
M23-076	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. Cut for 19th century field drain insertion. Runs N-S through the east wall of the milecastle and cobbled surface south of the milecastle.	Post-Medieval
M23-077	**Colour:** mid pinkish orange. **Composition:** sandy clay. **Compaction:** dry, loose. **Inclusions:** moderate small to medium well-rounded spheroidal river stones, evenly distributed. Intentional backfill of cut for field drain, dates to mid-1800s. Includes redeposited rubble core of the milecastle wall where it cuts through the SE corner.	Post-Medieval
M23-078	**Colour:** dark greyish black. **Composition:** clayey loam. **Compaction:** waterlogged, spongey. **Inclusions:** 1) moderate organic material, evenly distributed 2) occasional medium to very large sub-rounded spheroidal whin sill stones, concentrated towards base. Primary fill of pit 092. Very waterlogged with black organic, fibrous material throughout. This likely formed when the pit was left open with standing water in the base of the pit. No clear evidence for the date or use of the pit within this fill. Several large whinstone boulders throughout the fill but none seem intentionally placed. Very similar to the primary fills in the other pits in this area.	Late 2nd Century
M23-079	**Shape in plan:** regular, sub-oval. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** gradual. **Base:** rounded. Cut for a shallow oval pit near the southeast corner of the milecastle. Overlain by later flagstone path 013 and silt deposit 045. Very large oblong stone was deposited within the pit as it was backfilled, no sign of markings on the stone but likely intentionally buried in the pit. Cut through remains of the original cobbled surface of the milecastle interior.	Late 2nd Century
M23-080	**Colour:** dark blackish grey. **Composition:** fine clayey sand. **Compaction:** dry, firm. Thin spread of darker silty material built up along the south face of Hadrian's Wall within the milecastle. Not filling any visible cut and just seems to have built up over time. Overlies the cobbled floor surface 050 where it meets Hadrian's Wall and the north end of a rectangular pit filled with large wall stone rubble. No finds.	4th Century
M23-081	**Colour:** mid orangey red. **Composition:** sandy clay. **Compaction:** dry, friable. Remnants of the robbed out foundation of Hadrian's Wall. Handful of foundation facing stones survive in situ, and junction with the inside face of the east wall is visible. Extends beyond the LOE to the north, full width of the wall not seen but expected to be broad wall to match with the milecastle walls. Foundation cut primarily filled with redeposited clay most likely dumped in during the medieval stone robbing. Runs down the northwest corner of the trench to form the north gate but no clear evidence for the east side of it.	Hadrianic
M23-082	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** steep, straight. **Break at base:** sharp. **Base:** uneven. Foundation cut for the outer face of the east milecastle wall. Filled by 024 in central and northern section, some original facing stones are surviving in situ towards the SE corner. Shallow and fairly irregular cut, in some areas not much distinction from the rubble core of the wall.	Hadrianic

Context no.	Description and Interpretation	Provisional periods
M23-083	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** gradual. **Base:** uneven. Cut of gully of unknown purpose. Possibly used to drain water off Hadrian's Wall. Cut over the top of circular pit 066 after it had been backfilled. No clear purpose, short N-S linear feature which is shallow with an uneven base. Complete pot was found just to the west of the gully.	3rd Century
M23-084	**Colour:** dark blackish brown. **Composition:** silty clay. **Compaction:** dry, friable. **Inclusions:** rare small sub-rounded platy stone, evenly distributed. Fill of small N-S gully that cuts through an earlier pit. Dark silty material clearly distinct from the upper fill of pit 066. No finds or indication of the use of the feature. Underlay 058 which contained a whole Roman pot buried to the west of the gully.	3rd Century
M23-085	**Colour:** mid orangey brown. **Composition:** sandy silt. **Compaction:** very dry, friable. **Inclusions:** moderate small to medium sub-rounded platy limestone, evenly distributed. Infill of small truncation through the Severan Roman road surface. Possibly deliberate infilling but not clear from the composition of the fill. Underlies medieval trackway 005 and is likely related to truncation 086 and possibly surface 090.	4th Century
M23-086	**Shape in plan:** regular, semi-linear. **Break at top:** sharp. **Sides:** steep, straight. **Break at base:** sharp. **Base:** uneven. Truncation in Severan road (103) of unknown purpose. Likely related to nearby truncation [087] and surface (090). Linear shape suggests this was an intentional truncation. May possibly be related to the construction of a small temporary structure if the road was not in use as a route through the wall.	4th Century
M23-087	**Shape in plan:** regular, semi-linear. **Break at top:** gradual. **Sides:** steep, straight. **Break at base:** imperceptible. **Base:** uneven. Truncation in road (103) of unknown purpose. Likely related to nearby truncation [086] and surface (090). Linear shape suggests this was an intentional truncation. Might possibly be the insertion of small temporary structure over the road while it was not in use as a route through the wall.	4th Century
M23-088	**Colour:** very dark greyish black. **Composition:** clayey silt. **Compaction:** waterlogged, spongey. **Inclusions:** frequent medium to very large subrounded spheroidal whin sill stones, concentrated towards southwest corner. Waterlogged secondary deposit within well. Differentiated from (091) by layer of strewn timber and its aerobic nature. primarily composed of material (both organic and geological) used to backfill the well after its discontinued usage. Intentionally deposited to prevent reuse of the well.	3rd Century
M23-089	**Colour:** mid orangey brown. **Composition:** sandy silt. **Compaction:** very dry, friable. Possibly intentional backfill of small cut through the Severan road surface. Underlies the medieval trackway and may have been a levelling deposit prior to its construction. Likely related to second truncation 085 and cobbled surface 090, may be remains of a small temporary structure built over the road once it had fallen out of use.	4th Century

Context no.	Description and Interpretation	Provisional periods
M23-090	**Colour:** dark orangey brown. **Composition:** well sorted cobble. **Compaction:** dry, loose. Late Roman cobbled surface. Only present between two small truncations through the Severan road, 086 and 087. Possibly built up as the earlier roads called for repair. May also relate to the insertion of some small structure once the road is no longer in use as a route through the milecastle.	4th Century
M23-091	**Colour:** very dark greyish black. **Composition:** peat. **Compaction:** waterlogged, spongey. **Inclusions:** 1) moderate large to very large subrounded spheroidal whin sill stones, concentrated towards base and southwest side 2) frequent timber and various wood, evenly distributed. Primary deposit of the well (060). Separated from (088) by a layer of timber planks. Heavily waterlogged; lowest ~30cm is anaerobic. Timbers from the sides of the well or nearby structures were likely deposited in the well during its final backfill as this layer contained many pieces of timber and twigs as well as preserved bracken. This likely represents general silting up of the base of the well while it was in use, due to the waterlogged and organic nature of the deposit. Leather and rope may represent a bucket system for drawing water.	Late 2nd Century
M23-092	**Shape in plan:** irregular, sub-circular. **Break at top:** gradual. **Sides:** steep, concave. **Break at base:** sharp. **Base:** uneven. Cut for a large irregular sub-circular pit to the east of the milecastle cut through cobbled spread 049. Forms part of a series with pits 057 and 070. Irregular shape in plan and in profile, cut down into the natural clay. Sides are undercut and potentially have secondary features or further extensions visible in places. 2 fills with the lower fill suggesting it remained open with standing water for some time before backfilling. Capped with large stone base 055 across the top of the upper fill. Original purpose of the pit is unclear but it's possibly for clay extraction or industrial processing.	Late 2nd Century
M23-093	**Shape in plan:** regular, sub-rectangular. **Break at top:** sharp. **Sides:** vertical, concave. **Break at base:** gradual. **Base:** uneven. Cut for a sub-rectangular pit in the northeast corner of the milecastle. Semi-circular extension on the west side of the pit but no sign of an intercutting secondary pit feature. Otherwise very regular rectangular shape and similar in cut and fill to cist grave 062, but no evidence remaining for any interment of remains. Cut through cobbled surface 050 in the north end of the milecastle but underlying thin silt buildup 080 against the north wall so likely dates to the end of the milecastle's use.	3rd Century
M23-094	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, firm. **Inclusions:** 1) moderate small to medium rounded spheroidal cobbles, evenly distributed 2) occasional very large angular elongate masonry blocks, concentrated towards upper layers. Fill of sub-rectangular pit in the NE corner of the milecastle. Occasional large, dressed masonry blocks in the upper part of the fill, likely from the milecastle or Hadrian's Wall. Very similar pre-excavation to the fill of cist grave 062 but no evidence for human remains within the fill. No difference observed between the fill of the main pit and semi-circular extension on the west edge to suggest this is 2 intercutting features.	3rd Century

Context no.	Description and Interpretation	Provisional periods
M23-095	**Colour:** mid yellowish grey. **Composition:** moderately sorted pebbly cobble. **Compaction:** dry, cemented. First resurfacing of the central road through the milecastle, most likely dating to the Antonine period based on the construction technique. Directly overlies the Hadrianic road surface and has an associated stone drain 096 running down the east edge. Full width of the road not excavated as extends beyond the western trench edge. Constructed of moderately well sorted small-medium cobbles which are generally slightly larger than those of the Hadrianic surface. Some areas in pretty poor condition which explains the need for resurfacing in the Severan period. Small pit 098 cut through the edge of the road surface/drain.	Late 2nd Century
M23-096	**Form:** superstructure of N-S regular, linear drain. **Materials:** light grey sandstone. **Bonding:** none. **Finish and coursing:** stones featuring random coursed coursing with fair face finish and unstressed corners. Stone drain alongside central road of milecastle. Part of the Antonine road structure, sits partially atop the Hadrianic road. Runs along the eastern edge of the road. No base stones present within the drain and no evidence of there having been capping stones over the top, though these may have been removed to be used elsewhere. Drain was covered/infilled by the construction of the Severan road layer. Sides of the drain do not survive in situ for the full length of the road through the milecastle, south end of the drain has been disturbed by small pit 098 and potentially other later cuts through the road.	Late 2nd Century
M23-097	**Colour:** very dark greyish black. **Composition:** clayey silt. **Compaction:** waterlogged, loose. **Inclusions:** frequent decomposed organic material, evenly distributed. Waterlogged deposit at bottom of pit [066]. Condition of soil suggests that this pit was open for a considerable amount of time which allowed water to collect and organic material to decompose before being backfilled. No finds or indication of the date or use of the pit.	Late 2nd Century
M23-098	**Shape in plan:** regular, sub-circular. **Break at top:** sharp. **Sides:** vertical, straight. **Break at base:** sharp. **Base:** flat. Cut for a small shallow pit through the east edge of the Antonine road and drain. Unclear purpose but defined by small cobbles in the edge of the pit. Very shallow and mainly filled with later loose cobbling.	3rd Century
M23-099	**Colour:** mid brownish grey. **Composition:** pebbly silt. **Compaction:** moist, loose. Fill of small shallow pit cut through the Antonine road and drain. No clear purpose and the fill is mainly small cobbles and pebbles from later changes to the road surfaces.	3rd Century
M23-100	**Colour:** mid orangey grey. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** frequent small to medium sub-angular to sub-rounded spheroidal cobbles, evenly distributed. Build-up of silt and rubble along the east edge of stone drain 096 within the milecastle. Defined/truncated by modern drain 018 on its east side. No clear signs of this material being intentionally dumped, instead seems to be a gradual buildup over time of material along the road edge, possibly linked to a period of inactivity in the milecastle or the final abandonment of the structure.	3rd Century

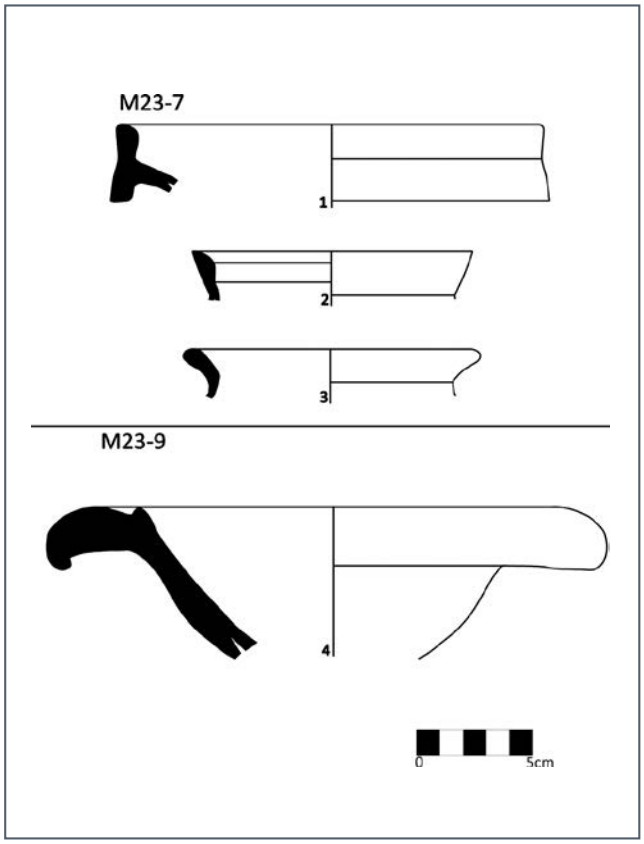
Context no.	Description and Interpretation	Provisional periods
M23-101	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** steep, straight. Cut for an E-W ditch to the south of the large pits outside the milecastle. Not fully excavated this season. Doesn't extend all the way to the SE corner of the milecastle but does continue beyond the east trench edge. Runs broadly parallel with the line of Hadrian's Wall. Possibly acted as a boundary dividing the industrial work area to the north and cobbled holding area to the south.	**Hadrianic**
M23-102	**Colour:** dark greyish brown. **Composition:** clayey silt. **Compaction:** wet, firm. **Inclusions:** moderate medium to large rounded spheroidal cobbles, concentrated towards south edge. Backfill of ditch 101 to the south of the large pits. Not fully excavated this season. Possibly intentional backfilling of the ditch to allow the laying/ expansion of cobbled surface 059, part of which has slumped down the southern side of the ditch. Extends beyond the eastern trench edge.	**Late 2nd Century**
M23-103	**Colour:** mid brownish grey. **Composition:** poorly sorted clayey cobble. **Compaction:** moist, cemented. Severan surface of the central road through the milecastle. Overlies the Antonine road surface, most likely laid to repair the road ahead of campaigns north of the Wall/ as part of the wider repairing of the frontier. Infills the Antonine drain 096. Has a smaller section of stone drain 017 running across the road at an angle near the South Gate, draining from the western half of the milecastle to outside the South Gate. Cut by small pit 038 near the South Gate and two linear cuts E-W across the road surface of unknown purpose. Constructed of a mix of small tightly packed cobbles and large flagstones.	**3rd Century**
M23-104	**Colour:** dark greyish black. **Composition:** silty clay. **Compaction:** wet, malleable. **Inclusions:** occasional very large angular spheroidal whinstone, evenly distributed. Primary fill of large pit 070. Very waterlogged and dark organic deposit, with fibrous material throughout. Probably formed while the pit was left open with standing water in the base. Not fully excavated as it extends beyond the trench edge. No evidence for the date or use of the pit from this material.	**Late 2nd Century**
M23-105	**Colour:** light orangey yellow. **Composition:** sandy clay. **Compaction:** dry, friable. **Inclusions:** occasional small to medium angular to sub-angular spheroidal sandstone, evenly distributed. Spread of light sandy clay running along the southern edge of cobbled surface 059. Does not seem to be filling a cut feature and simply defines the end of the cobbled area. Full extent not seen and not excavated this season.	**Hadrianic**
M23-106	**Shape in plan:** regular, linear. **Break at top:** sharp. **Sides:** steep. **Break at base:** sharp. **Base:** flat. Foundation cut for the inside face of the milecastle's east wall. Filled by 107 at northern end, facing stones survive in situ towards the SE corner, in central section line of the inside face is only visible through the change from interior cobbled yard 050 to wall core material, no sign of the foundation cut survives. Cut is fairly regular where it survives.	**Hadrianic**

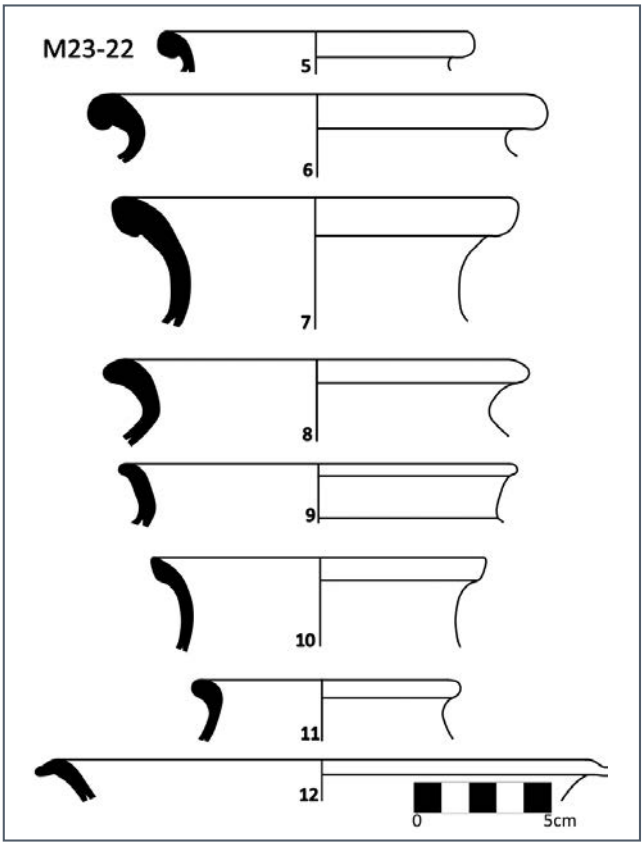
Context no.	Description and Interpretation	Provisional periods
M23-107	**Colour:** mid greyish brown. **Composition:** silty clay. **Compaction:** dry, friable. Fill of foundation cut for the inside face of the milecastles east wall. Only present at the north end of the wall, filling the line where the foundation facing stones have been robbed out. Similar to 024 filling the cut in the outer face, but distinct from the main core of the wall. Visible where it wraps round to join onto Hadrian's Wall in the northeast.	**Hadrianic**
M23-108	**Colour:** mid whitish grey. **Composition:** cobbly clay. **Compaction:** dry, cemented. Clay and cobble core filling the east wall of the milecastle. Only occasional fragments of larger rubble core material are surviving in the east wall but the majority has been lost. Surviving material is most likely the foundational deposits for the main rubble core, consisting of clay and cobbles packed into the foundations between the two cuts for the facing stones.	**Hadrianic**
M23-109	**Colour:** light brownish grey. **Composition:** poorly sorted clayey cobble. **Compaction:** moist, firm. Very edge of the west side of the north gate through Hadrian's Wall. Only really visible in section in the northwest corner of the trench, made of poorly sorted cobble and rubble. Matches with the line of Hadrian's Wall and respects the Hadrianic road running through the gate. Not excavated as cannot extend the trench in this corner.	**Hadrianic**
M23-110	**Colour:** light greyish yellow. **Composition:** sandy clay. **Compaction:** moist, loose. **Inclusions:** moderate medium to large rounded spheroidal cobbles, evenly distributed. Large spread of sandy clay with frequent loose cobbles throughout. Covers the southern half of the milecastle interior and probably represents the remains of a floor or surface within this area. Not as clearly cobbled as the northern end but enough remnants of cobbling to suggest area was originally cobbled but this was later removed. Cut by the well and pit 079 and by the modern drain 018 but runs up to the edge of the road and Antonine drain.	**Hadrianic**
M23-111	**Shape in plan:** regular, sub-circular. **Break at top:** gradual. **Sides:** steep, concave. **Break at base:** gradual. **Base:** rounded. Cut for a small post hole up against the inside face of the milecastle's east wall. Most southerly in a set of four running up the east wall. Was partially overlain by flagstone path 013 and rubble wall 043. No packing stones were visible in this post hole. No equivalent row of post holes was found to the west but may have been for supporting an awning or wooden roof over the space within the milecastle.	**Late 2nd Century**
M23-112	**Colour:** mid brownish grey. **Composition:** clayey silt. **Compaction:** moist, loose. Fill of the most southerly in a row of four post holes along the inside face of the milecastle's east wall. No packing stones were surviving in this fill but may have been removed during later phases of occupation. No finds or signs of preserved timber in the fill. No equivalent posthole seen on the west side of the area.	**Late 2nd Century**

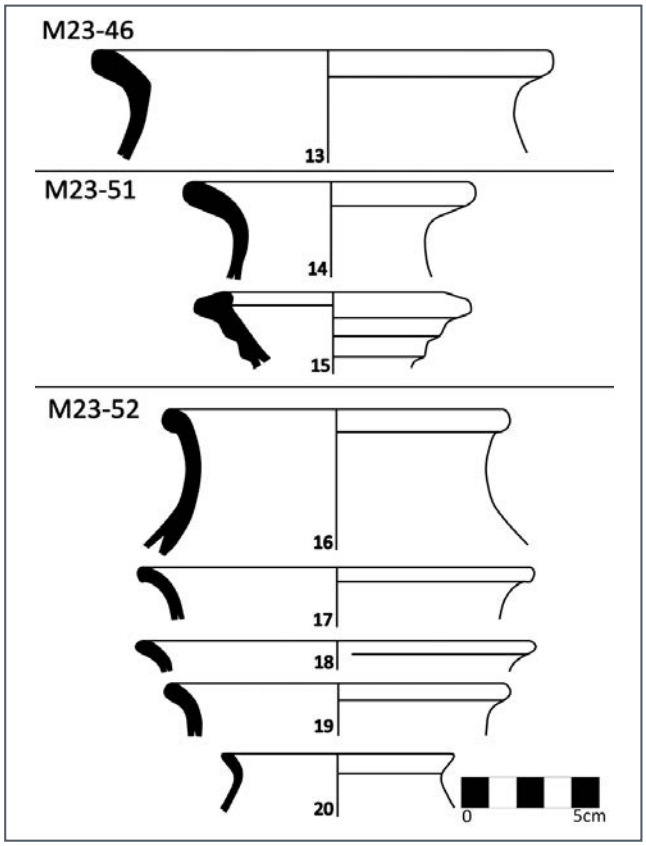
Context no.	Description and Interpretation	Provisional periods
M23-113	**Shape in plan:** regular, sub-circular. **Break at top:** sharp. **Sides:** steep, concave. **Break at base:** gradual. **Base:** rounded. Cut for a small posthole along the inside face of the milecastles east wall. Second most southerly in a row of four post holes. East side of the posthole and it's packing stones is formed by the foundation stones of the milecastle east wall. No equivalent posthole on the other side of the open area but may have been used to support a covering or roof over the open area. Covered by rubble and clay 033 most likely from the collapse of the milecastle wall.	Late 2nd Century
M23-114	**Colour:** mid greyish brown. **Composition:** clayey silt. **Compaction:** moist, loose. **Inclusions:** moderate very large sub-angular elongate packing stones, evenly distributed. Fill of second most southerly posthole along the inside face of the milecastle's east wall. Two large packing stones were placed in the western edge with a third formed by a vertical facing stone in the foundation of the milecastle wall. No sign of any timber within the fill and no finds.	Late 2nd Century
M23-115	**Shape in plan:** regular, sub-circular. **Break at top:** gradual. **Sides:** shallow. **Base:** flat. Cut for a posthole along the inside face of the milecastles east wall. Second most northerly in a row of four post holes. No equivalent posthole was found on the west side of the area. This posthole was not excavated and only seen in plan. Three large packing stones in the fill are the primary evidence for the location of the posthole. May have helped support a covering or roof over the internal yard of the milecastle.	Late 2nd Century
M23-116	**Colour:** light brownish grey. **Composition:** clayey silt. **Compaction:** dry, firm. **Inclusions:** moderate very large angular to sub-angular spheroidal packing stones, evenly distributed. Fill of second most northerly posthole in a row of four along the inside face of the milecastles east wall. Three large packing stones are present round the edges of the cut, placed on an angle or vertically. Fill is very similar to surrounding contexts, no finds or signs of timber surviving. Not excavated so depth is not known.	Late 2nd Century
M23-117	**Shape in plan:** regular, sub-circular. **Break at top:** gradual. **Sides:** shallow, concave. **Break at base:** imperceptible. **Base:** flat. Shallow remains of a cut for a posthole along the inside face of the milecastle's east wall. Most northerly of a row of four post holes. No equivalent posthole seen on the western side of the area. Badly truncated, only the shallow remains of the base are visible, with no packing stones left. East side of the cut visible going into the line of the milecastle foundation. May have been used to support a covering or roof over the internal area of the milecastle.	Late 2nd Century
M23-118	**Colour:** light orangey brown. **Composition:** clayey silt. **Compaction:** dry, loose. Fill of most northerly posthole in a row of four along the inside face of the milecastle's east wall. Very shallow and not clearly distinct from the overlying silty build up, posthole is heavily truncated and only the base of the cut is surviving. No evidence for packing stones or timber in the fill.	Late 2nd Century

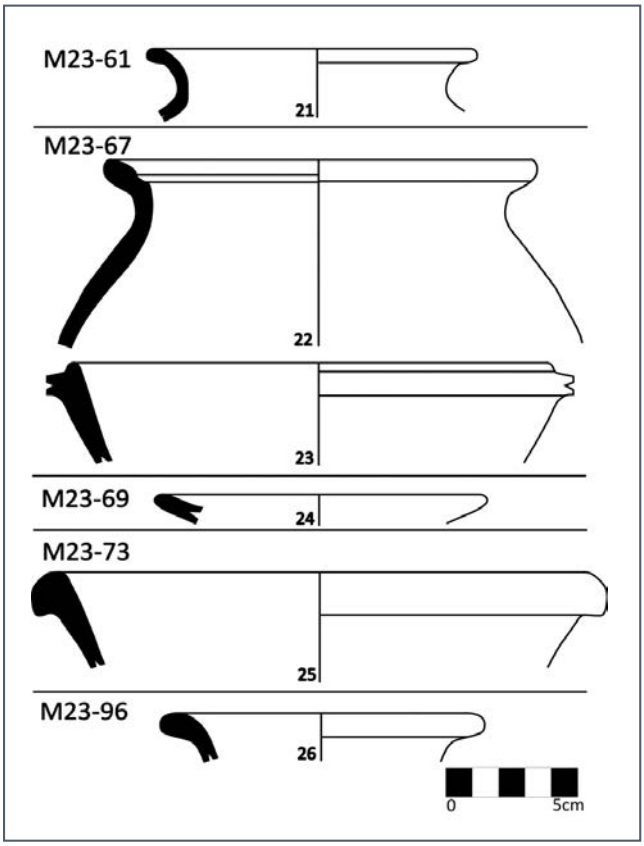
APPENDIX 2A: FORM CATALOGUE

The form types from milecastle 46 have been drawn and sorted based on context, in order to enhance the understanding on the pottery consumption in each stratigraphic layer. This approach is contextual and aims to provide a more complete picture on the pottery consumption combinations.









APPENDIX 2B: FORM CATALOGUE

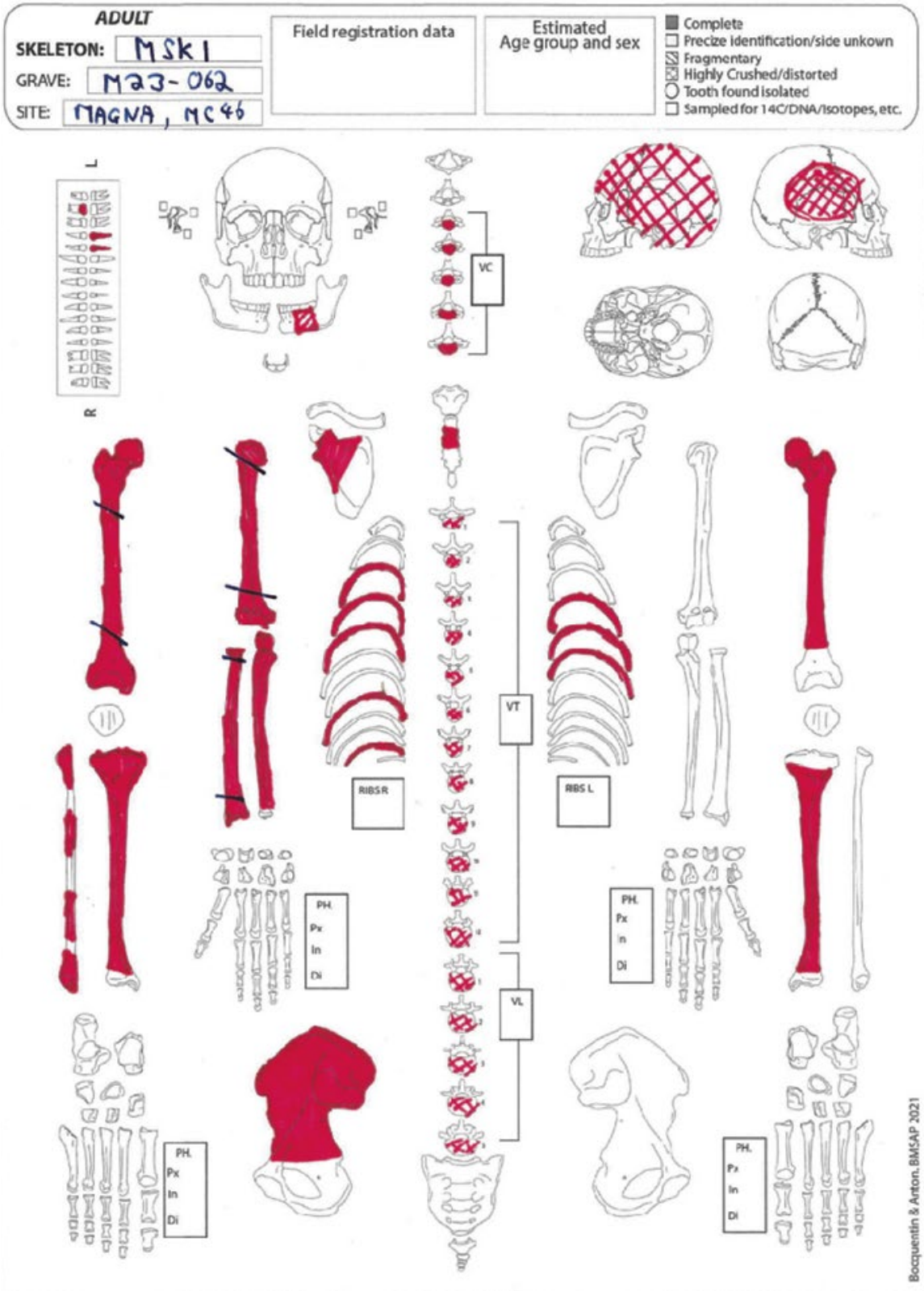
The second part of Appendix 2 presents the rims exhibited in Appendix 2A. The first column represents the catalogue number, the second column indicates the form class and form type based on MOLA Roman pottery codes (available at London Roman pottery codes). This is particularly helpful in the case of those forms/fabrics supplied and consumed widely across Britain, such as the mortaria or black-burnished types. In other cases, some analogies with similar types from other sites in Northern Britain have been provided for a refined chronology.

Finally, the last column provides a brief description of the rim, which includes a form class, morphological features and a provisional date range.

1	7HAM	Rim sherd from a hammerhead mortaria, c.AD200-300
2	2F	Rim of a black-burnished-type everted-rimmed jar made in a reduced fabric, c.AD120-250
3	2F	Rim of a black-burnished-type everted-rimmed jar made in a reduced coarse gritted fabric, c.AD120-250
4	7HOF	Rim of a hoof-flanged mortaria c.AD43-140, likely to go into AD180 based on analogy with M5 from Housesteads (Dore in Rushworth, 2009: Fig 16.19)
5	2W	Rim of a hooked-rimmed jar, made in black-burnished fabric with dark surface, c.AD300-400
6	2W	Rim of hooked-rimmed jar, made in a reduced fabric, c.AD300-400
7	2W	Rim of a hooked-rimmed jar, made in gritted Huntcliff type ware, c.AD300-400
8	2F	Rim sherd of a black-burnished-type, slightly outturned everted-rimmed jar, c.AD120- 250
9	2F	Rim sherd of black-burnished-type long everted-rimmed jar, c.AD120-250
10	2R	Narrow-necked jar, black-burnished, c.AD60-160
11	2F	Everted-rimmed jar with upright rim, made in reduced light grey fabric, c.AD120-250
12	4H	Black-burnished-type round-rimmed style bowl made in a reduced gritted fabric, likely Huntcliff ware, c.AD340-400
13	4	Everted-rimmed jar, made in a reduced fabric
14	4	Rim of an everted, necked jar, made in an oxidised fabric, c.AD120/130-140
15	1B	Rim of a ring-necked flagon, c.AD43-200
16	2T	Rim of a long-necked-jar with a round rim and narrow mouth, c.AD43-400 but the date could be narrowed to 2nd to 3rd century based on analogy with (Dore in Rushworth, Fig16.17)
17	2F	Rim of an everted-rimmed, black-burnished-type jar, made in a reduced fabric, c.AD120-250
18	2F	Rim of an everted-rimmed, black-burnished-type jar, made in a reduced fabric, c.AD120-250
19	2F	Rim of an everted-rimmed, black-burnished-type jar, made in a reduced fabric, c.AD120-250
20	3M	Rim of a funnel-necked beaker, made in Nene Valley colour coated fabric, c.AD225-300. Analogy at Carlisle (Gillam, 1957: Fig. 7, 56)
21	2F	Rim of an everted-rimmed, black-burnished-type jar, made in a reduced fabric, c.AD120-250
22	4	Rim of an everted-rimmed jar, possibly made in Dales ware c.AD200-375
23	4M	Rim of a black-burnished type flanged bowl, with a bead rim and a truncated conical form, c.AD250-400

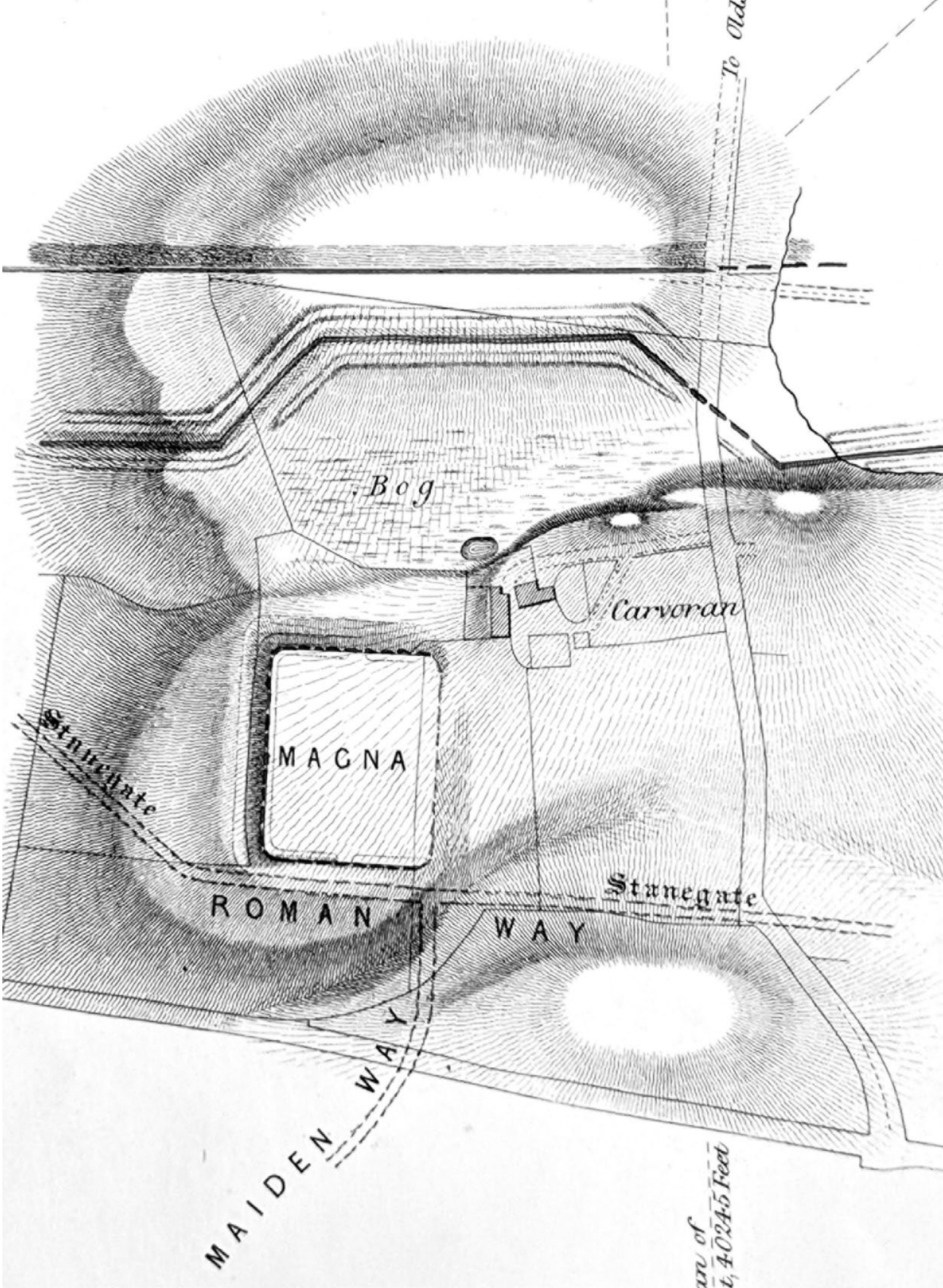
24	2F	Flange of black-burnished-type jar, c.AD120-250
25	4H	Rim of a black-burnished-type round-rimmed bowl, c.AD120-300. Based on analogy with Gillam 223 from Corbridge, date could be narrowed to AD180-200 (Gillam, 1957, FIG.23).
26	2T	Rim of an everted, necked jar with a narrow mouth, c.AD43-400 - 2F.5 Rim of an everted-rimmed jar with slightly curved everted rim from context 58, c.AD290-370.

APPENDIX 3: MSK1 SKELETAL INVENTORY



APPENDIX 4: ENVIRONMENTAL SAMPLES

Sample No.	Context	Feature Type	Preliminary Dating	Total volume (L)
MES2023-001	M23-001	Topsoil	Unknown	0.5
MES2023-002	M23-035	Coal and charcoal spread	Post-medieval	10
MES2023-003	M23-009	Pit – primary fill	Late 2nd century	20
MES2023-004	M23-037	Pit – primary fill	4th century	20
MES2023-005	M23-051	Pit – secondary fill	3rd century	25
MES2023-006	M23-056	Pit – secondary fill	Late 2nd century	1
MES2023-007	M23-058	Dark silty deposit	4th century	1
MES2023-008	M23-063/M23-071	Cist grave – primary and secondary fills	4th century	20
MES2023-009	M23-063	Cist grave – secondary fill	4th century	40
MES2023-010	M23-065	Pit – primary fill	3rd century	15
MES2023-011	M23-072	Dark silty deposit	3rd century	30
MES2023-012	M23-031	Wall cut – primary fill	Post-medieval	1
MES2023-013	M23-041	Wall cut – primary fill	Post-medieval	10
MES2023-014	M23-052	Pit – secondary fill	3rd century	50
MES2023-015	M23-078	Pit – primary fill	Late 2nd century	45
MES2023-016	M23-061	Well – tertiary fill	3rd century	25
MES2023-017	M23-046	Pit – primary fill	Late 2nd century	50
MES2023-018	M23-071	Cist grave – primary fill	4th century	30
MES2023-019	M23-063/M23-071	Cist grave – primary and secondary fills	4th century	30
MES2023-020	M23-071 PELVIS	Cist grave – primary fill from around pelvis/hands area	4th century	20
MES2023-021	M23-071 CHEST	Cist grave – primary fill from around chest area	4th century	20
MES2023-022	M23-069	Pit – secondary fill	3rd century	35
MES2023-023	M23-085	Cut – primary fill	4th century	5
MES2023-024	M23-071 UNDER	Cist grave – primary fill from underneath skeleton	4th century	20
MES2023-025	M23-084	Gully related to pit – primary fill	3rd century	20
MES2023-026	M23-091	Well – primary fill	Late 2nd century	15
MES2023-027	M23-088	Well – secondary fill	3rd century	15
MES2023-028	M23-067	Pit – secondary fill	Unknown	20
MES2023-029	M23-097	Pit – primary fill	Late 2nd century	10
MES2023-030	M23-097	Pit – primary fill	Late 2nd century	10
MES2023-031	M23-094	Pit – primary fill	3rd century	5
MES2023-032	M23-072	Dark silty deposit	3rd century	10
MES2023-033	M23-072	Dark silty deposit	3rd century	10


To Old
Bog
Carvoran
MAGNA
Stanegate
ROMAN
WAY
Stanegate
MAIDEN
WAY


STAFF

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