

6. THE FINDS

6.1 Pottery

Jeremy Evans with Kay F Hartley, David F Williams, Steven H Willis & Gwladys Monteil

Some 284 sherds weighing 11,074g were recovered from the 1999 excavation, 271 from stratified contexts. The quantity of pottery is small but is just about adequate to give some broad outlines to the use of ceramics on the site. A further 29 sherds weighing 263g were recovered from the 2008 excavation, 24 from stratified contexts. The pottery from the 2010 excavation produced 513 sherds, which were assessed, but a full report was never commissioned. See Illus 13 and the catalogue in Appendix 2 ‘Catalogue of illustrated coarse pottery vessels’.

In summary, the pottery types identified in the collection include amphorae, samian ware, mortaria and Black Burnished Wares. The other sherds are mostly coarse vessels of sandy, red, cream and grey fabrics, although there are some finer redware examples. The fabric proportions from the 1999 and 2008 assemblages are combined in Table 1.

Sherds of amphora are by far the most common, at 155 sherds, with varying curvatures suggesting a range of shapes. Black Burnished Ware is the second most common type recovered, numbering 86 sherds. These vessels tend to have a light grey fabric with characteristic black surfaces and feature sherds including small flat bases and everted rims.

There is very little samian ware and few mortaria in the collection. The samian ware numbers only 18 sherds. They are mostly small bodysherds but there is a foot-ring base sherd and three decorated sherds. There are four sherds of mortaria, one of which is a large rim sherd stamped ‘MAVIVE’.

Only the 1999 and 2008 assemblages are reported in detail below. The catalogue of samian ware is in Appendix 1, a catalogue of illustrated coarse pottery vessels is in Appendix 2 and a table of fabric descriptions (Table 5) is in Appendix 3.

6.1.1 Date

All the material appears to be of Flavian date, with the exception of the heirloom, Claudio-Neronian mortarium (Illus 13:6), a number of which seem to appear in Flavian contexts in northern England and Scotland, and the Neronian Dr 29 (samian

Table 1 Doune fabric proportions (1999 and 2008 assemblages combined)

Fabric	% no. of sherds	% weight
A01	51.4	82.0
F01	0.3	0.2
F02	0.6	0.0
M01	0.3	0.5
M02	3.2	8.1
M03	1.6	3.4
M04	0.3	0.5
O01	8.6	1.2
O02	0.3	0.0
O03	1.6	0.2
O04	1.0	0.1
O05	0.6	0.4
O06	2.2	0.1
Q01	2.6	0.4
R01	2.6	0.3
R02	0.6	0.1
R03	2.6	0.2
R04	1.3	0.6
R05	0.3	0.2
S10	6.1	0.5
W01	9.0	0.5
W02	1.9	0.3
W03	1.0	0.3
Total	313	11,337g

catalogue, no. 4). There is also a sherd, probably of Cologne colour-coated ware, which perhaps post-dates AD 80. The samian ware (see Appendix 1 ‘Catalogue of samian ware’ below) gives the closest dating evidence, although none of the material is very closely datable, and the best range is AD 65–90, although the historical context of the fort suggests that like Inchtuthil it should be dated *c* AD 83–86/7.

6.1.2 Fabric supply

The 1999 excavation assemblage is dominated by amphora sherds, unusually so even for a military site, with 56% by sherd count, 83% by weight, and even 14% by minimum numbers of rims. Although there is a concentration of amphorae in the ‘destruction pit’ (C060), even without this amphorae would comprise 47% by count and 71% by weight. Levels of amphorae from other military assemblages by count is normally in the 5–10% range, with weight figures in the range 30–45%, as can be seen at Binchester, Birdoswald, Catterick, Carlisle and Walton-le-Dale (Hird 1997; Ferris 2011). Notably higher figures by weight come from Flavian Brithdir (Evans 1997) at 64%. At Brithdir, in north Wales, the assemblage is associated with the rampart back, as is the assemblage here and the group with the higher amphora figure from Birdoswald (Hird 1997; Wilmott 1997). The consistent presence of high amphora levels in rampart back locations may partly explain the high amphora level in this assemblage.

The assemblage is completely dominated by Baetican Dressel 20 oil amphora sherds with no fish sauce amphorae present and no wine amphorae. Two fineware fabrics are present, making up only 1.1% of the assemblage; one is probably Central Gaulish Pompeian redware 3 and the other is probably from Cologne.

Mortaria are well represented in the assemblage, four sources being present: Noyon in north-east Gaul; a source perhaps in Central Gaul; Verulamium; and a local source, probably Doune itself. The commonest fabric is that of Noyon, followed by Verulamium region ware, with the local and possibly Central Gaulish sources represented by single pieces.

Some 13.3% of the assemblage is composed of oxidised wares. The commonest is fabric O01, which seems likely to be of local origin as may be fabrics O02 and O05, which with O01 may form a continuum. White-slipped oxidised flagon fabrics occur in only a single fabric Q01, at around 3%.

Greywares make up 7.1% of the group by count, a rather lower level than the oxidised wares, as might be expected in a northern military assemblage of this date. Forms represented are globular jars with short everted rims which can be paralleled at other Flavian forts in the region.

Whitewares apparently make up 9.9% of the assemblage by count, but most of these are accounted for by a large number of sherds from a single vessel in W01. Much of the oxidised ware, greyware and whiteware contain varying quantities of fine gold mica, like the sling shots, and all these fabrics are probably of very local origin.

Samian ware is surprisingly poorly represented in the group. Military assemblages usually contain 10% or more of samian ware (Evans 1993; Willis 1998).

The 2008 excavation pottery changes the overall site figures very little because the assemblage size is much smaller. As just discussed, the 1999 excavation group is heavily amphora-dominated, but this is not the case with the 2008 excavation group. Here amphorae levels are probably a little lower than those that might be found on a typical fort (cf Evans 2001: fig 11). Oxidised wares are well represented and outnumber greywares, as might be expected on a military site of this date, and whitewares are well represented. Mortaria sherds are absent. Samian ware is very strongly represented, both by count and weight, in contrast to the assemblage from the 1999 excavation (cf Willis 2006).

The basic differences between these two groups are probably not the result of sample size or happenstance. It has been becoming evident for some time that rampart back locations in forts seem to produce more amphorae. As Doune itself shows, these are the locations for bread ovens and seem likely to have been used for various elements of food preparation. That mortaria are also well represented here brings to mind the mortarium from Usk (Wright et al 1976: 391, no. 66 *Pejlveis Contubernio Messoris*), showing they could be owned communally by the *contubernium*, presumably for their communal food preparation. That more samian comes from Trench 5, well in the interior of the fort, equally follows established patterns. Samian tends to be scarcer on rampart back locations, where it is not needed in food preparation, but commoner where status display and food consumption are located.

6.1.3 Samian ware from the 2008 excavation

Gwladys Monteil

Eight pieces of samian ware were recovered from three contexts at Doune Primary School in 2008.

Three decorated sherds, four plain sherds and a scrap, all South Gaulish in origin, make up this small assemblage. The samian group is quite fragmented and consists of fairly small sherds. No evidence of repair was recorded.

A single foot-ring fragment from a dish Dr 18, recovered from C010, is unfortunately too fragmentary to display a stamp. C018 yielded a slightly larger and more varied group. Two decorated fragments from a dish Dr 29 in the style of the T-1 decorative group are particularly interesting. They are pre-Flavian in date (see Appendix 1 ‘Catalogue of samian ware’). They do not display particularly distinctive signs of wear or use compared to the other samian sherds but could possibly be part of an heirloom. The rest of the samian group is more difficult to date as precisely. The presence of a Dr 37, unfortunately too small to provide a close date range, does suggest a Flavian date for the deposition.

6.1.4 Discussion

As noted above, amphorae levels are high, even for a military assemblage, and samian ware levels are low in the 1999 assemblage primarily associated with the rampart back. The small 2008 group from the fort interior shows neither of these features and, indeed, samian is very well represented.

The functional composition of the group (Table 2), although with a low number of vessels overall, also appears rather unusual (cf Evans 1993), with high levels of amphorae and mortaria, although the low jar level relative to tablewares is usual for early military assemblages. As noted above, there is some suggestion of higher amphora levels in forts from rampart back locations, and it might be that these and the mortaria reflect food preparation here (the rampart back ovens providing clear evidence for this taking place here). Although surfaces are often

Table 2 Functional analysis of vessels from Doune

Vessel type	No.	Percentage
Flagons / constricted-necked jars	2	11.1
Jars	4	22.2
Bowls	2	11.1
Lids	1	5.6
Beakers and cups	2	11.1
Mortaria	5	27.8
Amphorae	2	11.1
No. of rims	18	

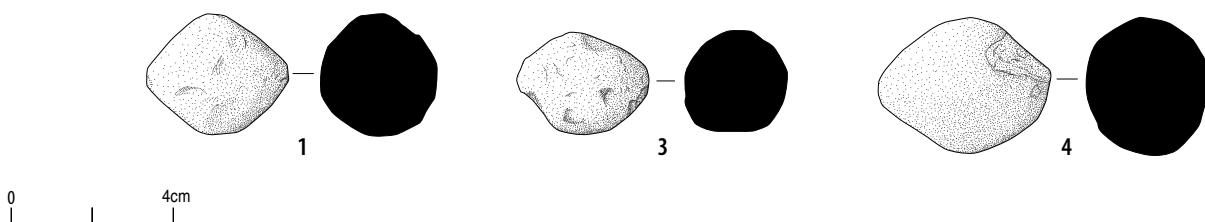
eroded, there is little evidence of sooting on vessels; a comparatively low level of sooting seems to be the case quite often on early military assemblages.

The limited evidence for supply here would suggest that only specialist vessels, such as amphorae, mortaria and finewares, were being brought in over large distances with any frequency. This picture appears to be typical for military installations of the mid-Flavian campaign period in Scotland. The coarsewares, including a minority of the mortaria, would seem likely to have been of fairly local manufacture (cf Darling 1985).

6.2 Fired clay sling shots

Jeremy Evans

Eight sling shots were recovered from the 1999 excavation, and an additional two from the 2008 excavation (Illus 9). A total of 135 were found in the 2010 excavation, mainly within the pits cutting the floor of Building 123. The report below only details the 1999 and 2008 finds. The catalogue for the sling shots is in Appendix 4.



Illus 9 Sling shots from 1999 and 2008. © Headland Archaeology (UK) Ltd

Nos 1–8 were all recovered from monitoring of a service trench adjacent to the north entrance to the school, rather than the main trenches. The weights of the reasonably complete sling shots vary from 15 to 39g, although their sizes are generally rather more consistent. A close set of parallels to these sling shots comes from Strageath (Frere & Wilkes 1989: 177), the second closest fort north from Doune, although the 91 Strageath examples all come from Antonine contexts. Many of the Strageath sling shots also share the double-cone form generally employed here.

Greep (1987) has reviewed the distribution of sling shots in Britain. Most clay sling shots from military sites have been recovered from Wales and Scotland, with shots of the double-cone form coming from sites north of the Antonine Wall and round shots coming from Antonine Wall sites. The Doune examples add to this pattern and would seem to suggest that the Strageath examples might be residual Flavian pieces rather than Antonine ones.

6.3 The metalwork

Nicholas M McQ Holmes, Fraser Hunter & Julie Lochrie

6.3.1 Coins

Five coins have been identified in total, one prior to the 2008 excavation by the school janitor (location shown on Illus 1) and four during the 2010 excavation.

6.3.1.1 The 2008 coin

Nicholas M McQ Holmes

This was a stray find, retrieved by the school janitor, Mr Robert Kinnaid, while laying lighting cables some time previously and handed in to the excavation team in 2008 for identification (Illus 10:1).

► Domitian copper as

28.5 × 27.5mm, 8.20g, die axis 180°; AD 86–7

Obv: [IMP C]AE[S] DOMIT AVG GERM COS XII[I?]; head laureate right

Rev: MONETA AVG[VST(I)]; Moneta standing left, holding scales and cornucopiae; S to left and C to right in field.

Surfaces oxidised, with some pitting and accretion; apparently unworn.

It is particularly unfortunate that an area of corrosion on the obverse of this coin coincides with the latter part of the obverse legend, commencing at the very point where the consular numeral potentially becomes extremely important for dating purposes. If the inscription reads COS XII, the coin falls into the long-recognised group of virtually unworn bronze coins minted in AD 86 which represent the latest found on a number of Flavian military sites in Scotland, including Inchtuthil, Stracathro, Dalginross, Strageath, Camelon and Crawford (Robertson 1983: 419) and Elginhaugh (Bateson 1989: 167). These coins have been quoted as evidence for the evacuation of these sites in AD 87 or very shortly after. It is impossible to be certain whether the consular numeral on this coin is XII or XIII, although the symbol following XII does look rather more like a vertical upright than the C of CENS. Were the coin to have been minted in AD 87, it would appear to be the most northerly find of a coin of this date on a Flavian site (Hobley 1989).

6.3.1.2 The 2010 coins

Fraser Hunter

The 2010 coins were two of silver denarii (SF137, SF972) and two of copper alloy (SF008, SF747). The silver coins were around 20mm in diameter and the copper alloy examples were larger at 27mm and 28mm respectively. SF008 is an as or dupondius but is unidentifiable. SF747 is a Flavian dupondius. The 2010 coins are in a terrible condition and no details can be discerned on their surface. No conservation has been undertaken and none have been X-rayed.

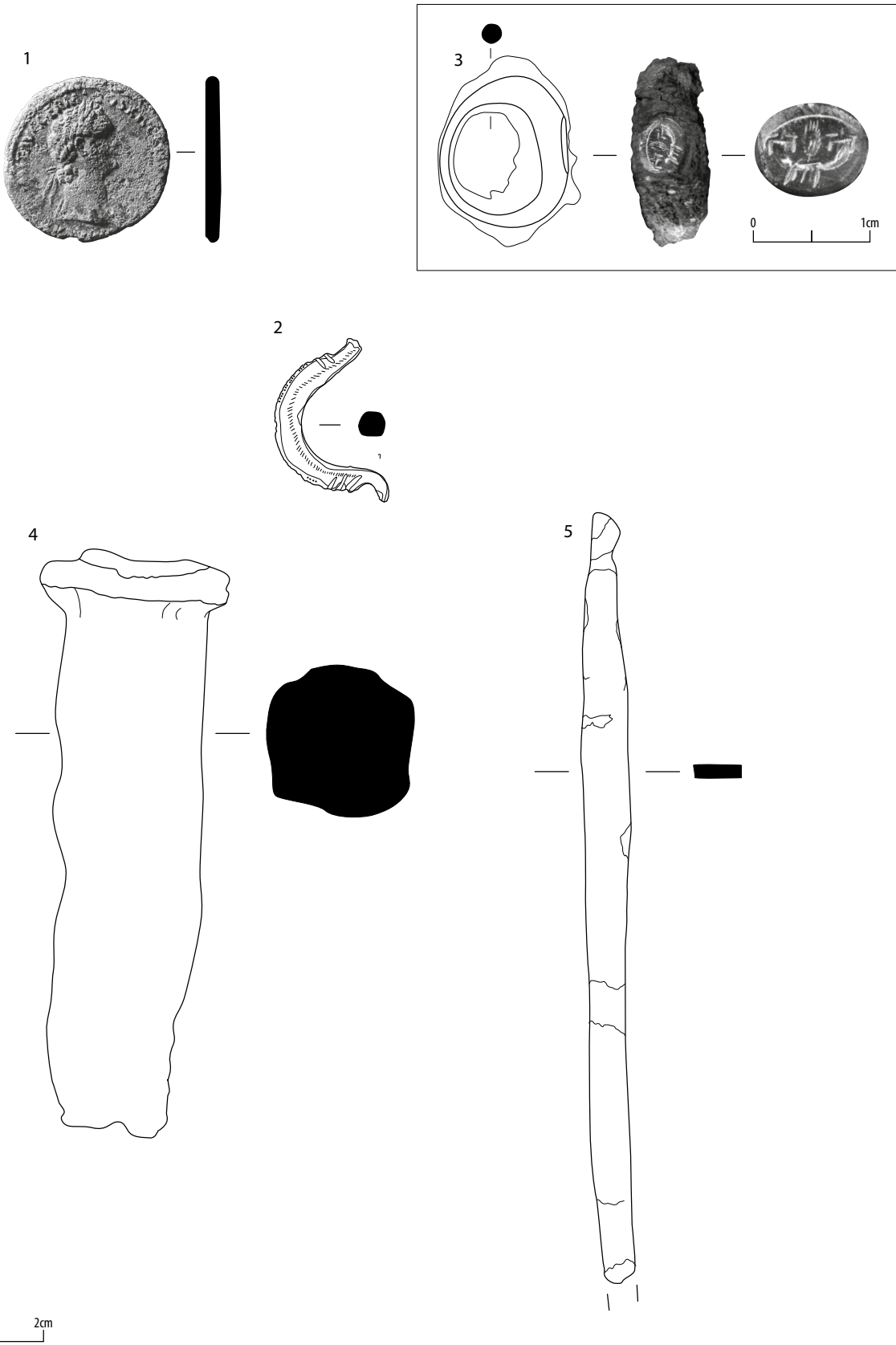
6.3.2 Copper alloy finds

Fraser Hunter

6.3.2.1 2008 finds

The only copper alloy find from the 1999/2008 excavations (aside from the coin described above) is a fine decorated handle, probably from a casket or an item of furniture.

► **Fine U-shaped decorated handle**, the terminals narrowed and out-turned, one broken. The faceted section bears punched decoration on the central and lateral spines, with chevron decoration on the latter and sinuous diagonals on the former. The concave



Illus 10 Copper alloy and iron finds: 1 coin; 2 handle; 3 intaglio ring; 4 punch; 5 file. © Headland Archaeology (UK) Ltd

Table 3 Copper alloy finds from 2010 excavation (excluding coins)

Small Find no.	Identification
804	Belt or strap mount
189	Enamelled circular harness mount with four-way distributor fixing
823	Unknown
829	Pin shank
876	Bent rivet
438	Headstud brooch
868/905	Two joining fragments of an enamelled headstud brooch

moulding where the loop narrows to the terminals is defined by two or three incised transverse grooves. A fine carrying loop, perhaps from a casket. L: 28.5mm; W: 17mm; Th: 4.3mm. DPSE07, SF001, C005 (Illus 10:2).

6.3.2.2 2010 finds

Aside from the two copper alloy coins, there were eight copper alloy finds in the 2010 excavation (Table 3). As with the entire 2010 assemblage these have been only briefly assessed and only the harness fitting (SF189) is commented on below.

The harness fitting (SF189) from C005/009 is undoubtedly the highlight of the assemblage (Illus 11). It is a strap junction decorated in the Mirror-style of southern England, typically early 1st century AD, so an heirloom by the time it came north, perhaps from a soldier recruited from the south. There are two fastenings on the rear for the strap. It was originally four-armed but one arm has been broken off. It has a very nicely done decoration of a three-arm whirligig, engraved with parts highlighted with engraved basketry hatching and red enamel, around a central trefoil design. The arms have engraved scrolling designs, again with red enamel. This fits into a wider pattern of troops bringing material from previous postings, and also (by implication) of troops recruited in the south serving in the northern conquest. In this specific case of southern 'Celtic metalwork' on Scottish Roman sites, you can find parallels in 'lipped terrets' (a southern form) from Cargill and Newstead (former unpublished; from David Woolliscroft/Brigitta Hoffmann's work there; latter Macgregor 1976: no. 63).

6.3.3 Other non-ferrous finds

Julie Lochrie

The 2010 excavation identified 13 lead alloy finds and one possible silver find (SF968). The lead alloy finds all appear to be waste fragments, although SF806 is plano-convex in shape and may be an ingot.

6.4 Iron, glass and stone finds

Martin Goldberg, Fraser Hunter & Julie Lochrie

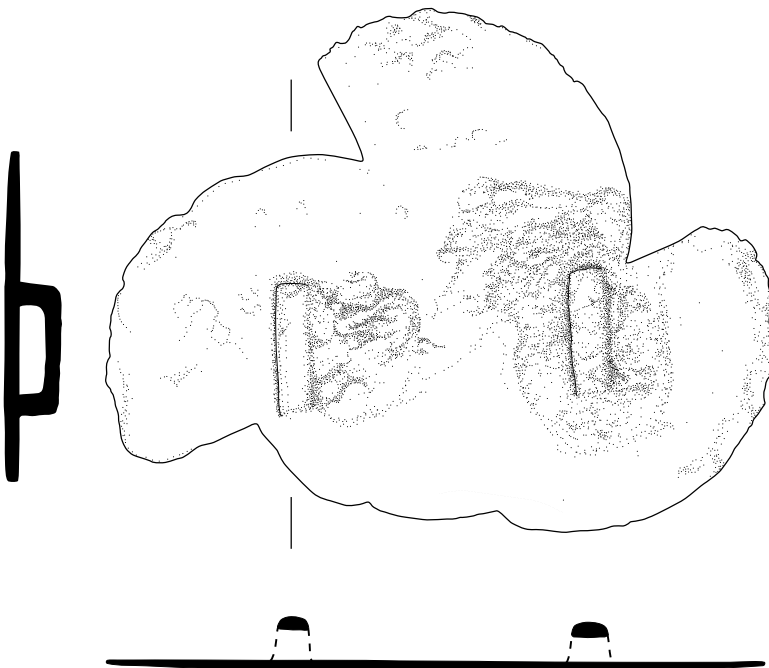
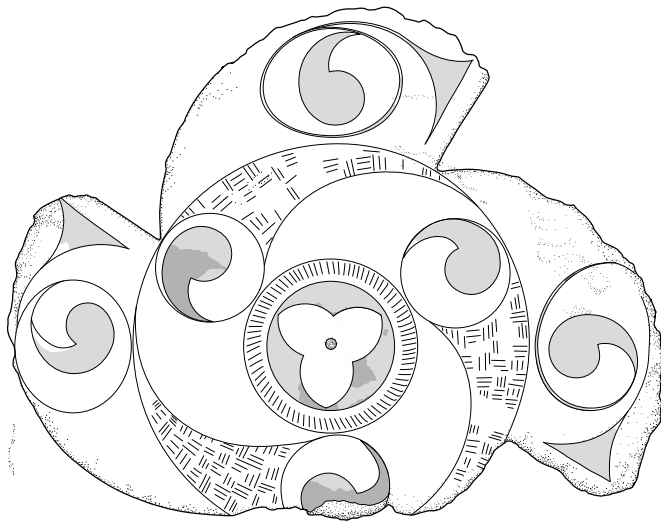
6.4.1 Iron

Martin Goldberg & Fraser Hunter

Below is a summary of the 1999 and 2008 assemblage. The 2010 excavation produced 641 iron finds, of which 453 are nails and 87 are hobnails. Much of the iron is currently unidentifiable due to corrosion but there may be knives, mail fragments and tools present. No further assessment has been undertaken of this assemblage.

The 1999/2008 excavations produced a small but diverse assemblage of ironwork. Notable finds include a ring complete with intaglio, a range of militaria and various tools. The assemblage (17 objects; 16 pieces of chain mail; 123 nails and 52 hobnails) is summarised in Table 4.

The most striking item of personal ornament is an iron finger ring which still retains its chalcedony intaglio (Illus 10:3). The design of two interlocked cornucopiae symbolises prosperity and fertility. Militaria are represented by loose chain mail links, javelins and catapult bolts. The type of light throwing spears found at Doune is typical of auxiliary equipment; they fall within Manning's



KEY
enamel
damaged enamel

Illus 11 The harness fitting. © Headland Archaeology (UK) Ltd

Table 4 Summary of ironwork in the Doune assemblage divided by season of excavation

Season	Jewellery	Military equipment	Tools	Fixtures and fittings	Hobnails	Miscellaneous
1999	Intaglio	2 javelin heads; catapult bolt		Nails; clamp; chain link; spiked loop	1	Bar fragment; fragment
2008		Chain mail	Blacksmith's punch; file; ?file; knife	Nails; T-clamp; washer	51	Bar fragment; decorative mount

Group 1A (Manning 1985: 162–5), a common type with parallels *inter alia* from Newstead (Curle 1911: 188–9). More unusual is the evidence for artillery, in the form of the catapult bolt head; post-excavation fragmentation renders identification awkward, but it has all the characteristics of such a bolt head. This need occasion no surprise, as the discovery of catapult parts from Elginhaugh illustrates that artillery was not the sole preserve of the legionary (Allason-Jones 2007: 405–7; Hanson 2007: 658–9).

The range of tools indicates the variety of activities taking place within the fort. Metalworking is represented by the blacksmith's punch. There are one or two files; the identification of one is uncertain, but the fineness of the other suggests a role in metalworking. Carpentry is represented by nails and other structural fittings such as various clamps. The only knife fragment has a notably thin blade, suggesting it is not from a robust multi-purpose tool but a finer, more specialist implement.

Remarkably, only a single hobnail was recovered from the 1999 excavation, compared to 51 from the 2008 excavation; possible reasons are discussed below. The hobnails (Manning 1985: 135, type 10), have short shanks and small domed heads, suitable for sandals and boots. Those from DPSE07 C010 are smaller than the majority, suggesting a smaller or finer shoe than the normal military type. Notable concentrations came from DPSE07 C018, 036 and 010, the latter clearly representing deposition of an intact shoe, as several are fused together.

Structural fittings and fixtures are represented by a common range of types, including a double-spiked loop, a C-clamp and a T-clamp with anchor head (Manning 1985: 130–2). The fixtures and fittings are dominated by nails, as is normal. Most

frequent are Manning's type 1B (below 15cm in length), square-sectioned with tapering shanks and a sub-rectangular flat head. The 1999 excavation had a fairly homogeneous nail assemblage of Manning type 1B, with C004, 010, 046 and 056 producing the highest numbers. Many were straight, indicating that they were deposited still in the wood. Two of these contexts (C004 and 056) come from features interpreted as rubbish/destruction pits; the nails presumably relate to the discard of wooden structural elements with intact nails. By contrast, DPSE07 C015 has several nails with bent shanks, suggesting removal from the wood and discard within the secondary deposit of Pit C014. DPSE07 C036 had high numbers of both nails and hobnails from the lowest levels of foundation slot 034; the nails may be structural, but the hobnails may represent the loss or deposition of a shoe during construction.

Most intriguing among the miscellaneous items is a fine broken diamond-shaped decorative mount with an ornamental terminal. No parallels have yet been noted, but it is likely to be a decorative mount from an organic item.

6.4.2 The 1999 and 2008 iron finds in context

While fixtures and fittings (especially the ubiquitous nail) are the most common finds from both excavation phases, there are notable differences between the two assemblages, as summarised in Table 4. Most obvious is that the 1999 excavation produced weapons but no tools, whereas the 2008 excavation produced tools but no weapons. However, these differences are more apparent than real; both assemblages are largely the product of just two pits, DPS99 Pit C005 and DPSE07 Pit

C029, interpreted as rubbish deposits. The relatively small scale of the assemblages should caution against drawing any radical conclusions.

Foundation trenches such as DPSE07 C034 (Building 5) occasionally contained nails and other items (eg fragmentary knife blade, SF103), but the majority of finds came from pits interpreted as discard or destruction deposits. The key significant difference between the finds from the two excavation phases is that significantly more hobnails and chain mail fragments were found in 2008. As sampling strategies were consistent, the patterns are likely to be meaningful, and probably indicate rather more intense activity in the barracks area, with the movement and everyday activities of the troops leading to the incidental loss of individual hobnails and loose chain mail links. The rear of the rampart either saw less activity, or the users were rarely armoured and booted.

6.4.3 Conclusion

While small, the Doune iron assemblage is an interesting one, with a wide range of ironwork. Little of it is surprising in itself, but it includes some striking finds (notably the intaglio and the militaria) which add colour to our picture of life on the frontier, while different loss patterns among the smallest of artefacts, the hobnails and chain mail links, suggest varying activity patterns in different areas of the fort. With the rest of the finds, it is only as larger samples of the site are dug, or more work is done on comparing assemblages from different sites, that any wider patterns will emerge.

6.4.4 Catalogue of iron

6.4.4.1 Jewellery

Fraser Hunter

► **Iron intaglio-set finger ring**, the circular-sectioned hoop swelling to the bezel (Henig 1978: fig 1, type III) in which is set an oval flat semi-translucent dark grey chalcedony intaglio with bevelled upper edges (10 × 12mm). The intaglio bears a pair of interlocked cornucopiae flanking an ear of corn. Both are standard symbols of fertility and prosperity, which are common on gemstones; for parallels to their use in combination (although with the corn set in a vessel), see Henig (1978: no. 401 and app 54). Unrelated traces of wood adhere

to corrosion on one side. Max Diam: 27mm; inner Diam max: 19mm; band Diam 4mm; bezel W: 8mm. DPS99, SF1, C060, upper fill of Pit 061 (Illus 10:3).

6.4.4.2 Tools

Fraser Hunter

► **Blacksmith's punch**, rounded tip, tapering cylindrical shank, expanded head cracked in half. A common type (Manning 1985: 9–11), with parallels from the Blackburn Mill and Carlingwark Loch hoards (Piggott 1953: 38 & 48, cat C.64–7 & B.45–7). L: 96mm; Diam at tip: 21mm; Diam at top of shank: 30mm; head Diam: 34mm. DPSE07, SF101, C028, lower fill of Pit 029 (Illus 10:4).

► **Fine file**. No traces of teeth due to corrosion, as is often the case, but the form is typical of a file; parallel-sided rectangular-sectioned bar tapering towards tip and narrowing at one end to a broken tang. L: 132mm; 8 × 3mm, narrowing to 3 × 3mm at tang. DPSE07, SF102, C028, lower fill of Pit 029 (Illus 10:5).

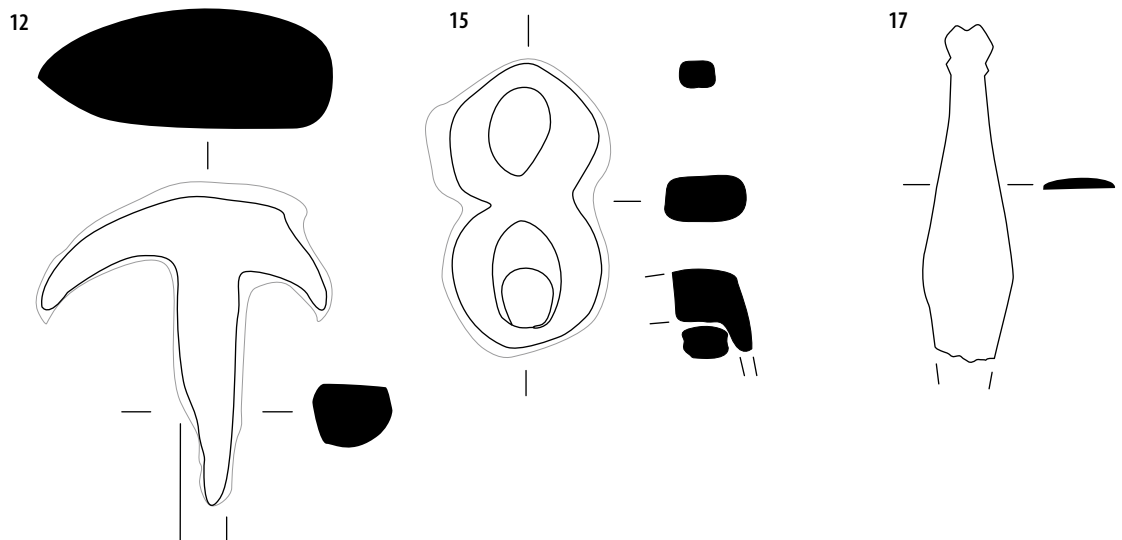
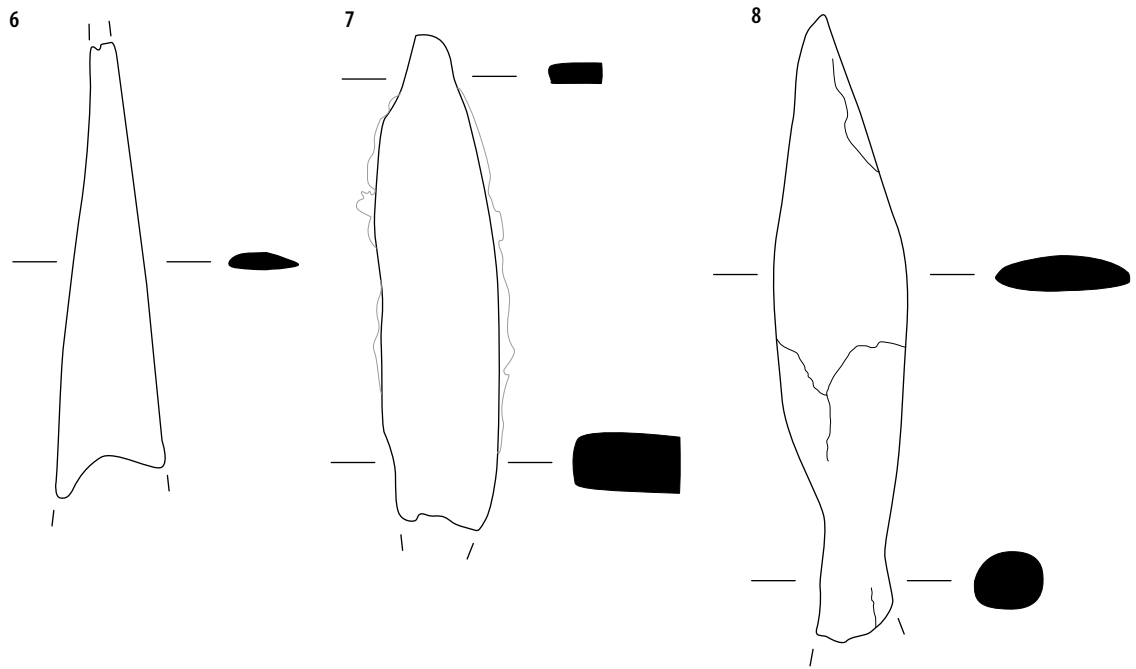
► **Fine knife blade tip**. Both edges of tip sharpened; fine blade, form unclear due to corrosion. L: 60mm; max H: 15mm tapering to 3.2mm at broken tip; Th: c 1mm. DPSE07, SF103, C036, lower (backfill) deposit in foundation trench 034 (Illus 12:6).

► **Tool?** Function unclear; form suggests tang and broken blade, possibly from a file. Rectangular-sectioned bar tapering and narrowing to a rounded end; other end broken, with a large corrosion blister. L: 64mm; 2.5 × 5mm at tip; 9 × 16mm at widest point. DPSE07, SF104, C042, upper (destruction) deposit in foundation trench 037 (Illus 12:7).

6.4.4.3 Military equipment

Fraser Hunter

► **Javelin head with damaged socket**. Approximately symmetrical diamond-shaped blade; socket fragmentary, with remains of wooden shaft. Manning group 1A; close parallel in a diamond-shaped blade from the Durden collection (Manning 1985: 164, no. V53). Overall L: 82mm; head L: 67mm; W: 22mm; Th: 3mm; socket surviving L: 15mm, outer Diam: 10mm; inner Diam: 5mm. DPS99, SF004, C004, fill of Pit 005 (Illus 12:8).



Illus 12 Iron finds: 6 knife blade; 7 tool; 8 javelin head; 12 T-clamp; 15 chain link; 17 decorative mount. © Headland Archaeology (UK) Ltd

► **Damaged javelin head.** Leaf-shaped blade with broken tip; a second non-joining fragment from the same context is probably from the same object. The lentoid-sectioned tip is blunted and bent from use. The blade has a low belly at *c* 10% of blade length (70mm from tip); no mid-rib; heavily laminated, making thickness difficult to determine. The tapering closed socket has no apparent rivet (Diam: 13mm at neck, flaring to 15mm); wooden shaft fragments in the socket. The leaf-shaped blade is more typical of Manning's Group 1A (Manning 1985: 162–5). Fragment 1, L: 127mm; spear head surviving L: 82mm; W: 26mm; socket L: 45mm; outer Diam: 15mm; inner Diam: 9mm. Fragment 2, L: 46mm; W: 20mm. DPS99, SF006, C004, fill of Pit 005.

► **Fragmentary remains of catapult bolt head.** Heavily corroded tapering socket with wooden shaft remains. Other fragments appear to form the neck of spear head, its original form uncertain, but the square section and short length suggest a tapering pyramidal point typical of artillery bolt heads (Manning 1985: pls 82–3). Post-excavation corrosion makes it too fragmentary to illustrate. Min L: 92mm; head L: min 34mm; D: min 14mm; socket outer Diam: 14mm; inner Diam: 9mm. DPS99, SF060, C010, upper fill of Pit 011.

► **Lorica hamata – chain mail links.** Two complete small punched rings (SF106, SF109); three riveted rings (SF108); fragments of 11 others (SF105). Diameters vary between 4.5 and 7mm but thickness of wire is consistently 1.5mm. These fragments were all from sample residues, generally from the upper levels of features (DPSE07 C010, 035, 046) or later deposits (C005). Pit C029 contained chain mail fragments from both its lower and upper fills (Sample 21 from the lower deposit C028, Sample 22 in its later fill C046). DPSE07, SF105, 106, 108, 109, C005, 010, 028, 035, 046.

6.4.4.4 Fixtures and fittings

Fraser Hunter

► **T-clamp with anchor-shaped head;** broken square-sectioned shank with perpendicular tapering down-curved arms. Intact, no wood traces and thus not in situ when buried. For parallels see

Curle (1911: 289); Manning (1985: 132). Shank L: 42mm; W: 5mm. Head L: 40mm; W: 8mm. DPSE07, SF110, C042, foundation trench (Illus 12:12).

► **C-shaped timber clamp.** Formed from a rectangular-sectioned bar, the broad end turned through 90° and the tip a further 90°; bent 90° at other tapered end. Bar bowed from use. L: 134mm; W: 52mm; bar section 13 × 10mm; flattened end 24mm wide × 9mm thick; clamped round timber Th: 31mm. DPS99, SF201, C010, upper fill of Pit 011.

► **Spiked loop.** Heavily fragmented. A common type of fitting for timber architecture; compare Curle (1911: 289); Manning (1985: 130). L: 57mm; spike L: 38mm; head W: 27mm; loop Diam: 10mm. DPS99, SF202, C003, hollow containing iron-smelting debris.

► **Chain link.** Complete figure-of-eight link with a small fragment of a second link attached. For parallels see Manning (1985: 139). L: 39mm; W: 21.5mm; Diam: 6mm. DPS99, SF002, C004, fill of Pit 005 (Illus 12:15).

► **Nails.** There were 77 iron nails recovered in the 1999 excavation and 46 nails from the 2008 excavation, all of Manning type 1B (Manning 1985: 134): < 150mm in length with flat, sub-rectangular or slightly rounded heads. The 52 hobnails were all of Manning type 10. Only one came from DPS99; those from DPSE07 were found in concentrations (> 2) in C010, 018, 036 and 045. In a number of these, corroded organics indicate the deposition of complete or fragmentary shoes.

6.4.4.5 Miscellaneous

Fraser Hunter

► **Fine decorative mount.** Diamond-shaped fitting, broken at one end, with a decorative terminal which expands in angular bifurcated form; small triangular mouldings flank it. Flat or slightly plano-convex section, with no rivet holes surviving; probably a fine decorative clamp or mount for an organic object. L: 44mm; W: 4.5–12mm; Th: 1–2mm. DPSE07, SF113, C018, lower fill of Pit 014 (Illus 12:17).

6.4.5 Glass

Julie Lochrie

There were 32 glass finds recovered in the 2010 excavation, including three turquoise faience melon beads. Melon beads are a common type very popular during the Roman period.

The other glass sherds in the collection are very similar thin curving fragments of green or blue colour. It is unclear if they belong to bottles or vessels but a few of the sherds have raised ribs which may be decorative. A collection of larger sherds are likely to be from the same vessel and their retrieval from the primary fill of a pit located between the intervallum road and the edge of the rampart provides a Roman date. Similarly, three sherds were retrieved from the primary fill of a pit inside one of the buildings and are also certainly Roman in date.

6.4.6 Stone

Julie Lochrie & Fraser Hunter

There are 16 pieces of one or more Niedermendig lava stone querns, imported from the Rhineland, Germany identified in the 2010 excavation. Similar querns have been discovered before in Scotland. One complete example was found at Newstead, Roxburghshire (NMS Cat no. 000-100-037-477-C).

Other stone finds include two possible tool fragments, two whetstones, a weight, a pivot stone, a prehistoric flint tool and a worked shale fragment. The fragment was originally thought to be part of a large D-sectioned bangle but has been re-identified as a rim of a vessel (Hunter 2014: 158).

6.5 The industrial remains

Effie Photos-Jones

Significant quantities of industrial waste were recovered from only four contexts, all from the 1999 excavation. The majority (7.1kg) came from a shallow scoop (C003) cut into the surface of the intervallum road. Smaller quantities (less than 1.0kg each) were recovered nearby from the spreads of burnt material in front of the ovens (C008 and 029) and the fill of a large demolition pit (Pit C055, fill C056). Slag, likely to be derived from ironworking, was found in various contexts across the 2010 excavation. The levels are not large, 1,799g, but enough to suggest ironworking in the area. Three

examples of likely furnace lining and three crucibles certainly seem to confirm this. All the crucibles were recovered from C029, strongly suggesting metalworking nearby, although surprisingly there was no associated industrial waste from this context. Only the 1999 industrial waste is reported on below.

The industrial waste was initially classified as slag from hand specimens. On sectioning the slag it became obvious that the majority was highly fired metallurgical ceramic rather than metallurgical slag proper. Metallurgical slag was peculiarly absent in any form other than small prills adhering to the surface of the metallurgical ceramic. SEM-EDX analysis showed that the metallurgical ceramic had been involved in an iron-making/smelting process due to the presence of metallic iron adhering to the surface of the ceramic. The molten metal had been deposited rather than reacted with the clay matrix; no reaction is obvious between matrix and metallic area other than iron-rich 'penetration' into the clay matrix.

A number of fragments of the ceramic showed a pronounced gradient from a black and glassy inner surface to a low-fired, red external one with a grey and vitrified area in between. This suggests that the original container or structure to which these fragments belonged was free-standing with its outer surface exposed to an oxygen-rich atmosphere and the source of heat contained within. The thickness of the fragments indicates that this was a furnace rather than a crucible. They could not have been part of a smithing hearth since these rarely tend to be vitrified apart from the area around the tuyère, the rest consisting simply of heated clay.

Thus the evidence points to the vitrified clay fragments being part of a small iron bloomery furnace. It could have been free-standing or embanked like those shown by Tylecote (1986) for the Roman period in England. However, no in situ remains of the furnace were found within the excavated area at Doune and it is not possible to base a detailed reconstruction on the recovered fragments of furnace wall. The only distinctive fragment was one piece resembling a tuyère (an identification based on its narrow inner diameter and the extent of vitrification). Alternatively, it may have served as an air inlet as part of the furnace construction.

The location of the majority of the furnace debris in C003, close to the back of the rampart, suggests that the furnace itself may have been built into the

rampart. This location was also used for the ovens, and for both furnace and oven this may reflect the need to keep processes involving fire away from the highly flammable timber buildings of the fort.

This is the first example of a shaft furnace from the Roman period in Scotland. The design is seen widely in England at this time but the local tradition in

Scotland is simple bowl furnaces like that excavated at Tarras Farm, Forres (Will 1998; Photos-Jones 1999) and indicated at the Roman fort at Rough Castle on the Antonine Wall (MacIvor et al 1980). The evidence from Doune therefore indicates the presence of a smith in the fort using local materials to manufacture iron in a Roman-style furnace.