Torksey Excavation 2016

Report on an excavation near Torksey, Lincolnshire
7-14 November 2016

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The University Of Sheffield.

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Contents

Department of Archaeology
University of York
2018

1 INTRODUCTION

1.1 Project Background

From 7-14 November 2016 Wessex Archaeology (North) undertook an archaeological excavation of a rectangular area c.15m x 40m, within the site of the Viking winter camp, Torksey (NGR 483500, 380580, hereafter the Site) on behalf of the Universities of Sheffield and York.

1.2 Location, topography and geology

1.2.1 The Site (Figure 1) is located to the west of the A156 between Torksey to the south and Marton to the north. It is situated on a raised parcel of arable land between the A156 to the east and the River Trent to the west at an elevation of approximately 13 m above Ordnance Datum (aOD). The land slopes gently downhill to the north, east and south but falls more sharply away towards the River Trent to the west.

1.2.2 The underlying solid geology consists of Triassic sedimentary mudstone of the Mercia Mudstone Group overlaid by superficial deposits of Quaternary sand and gravel of the Holme Pierrepont Sand and Gravel Member (BGS 2016). The local soils are described as 'freely draining, slightly acid, sandy soils' (LandIS 2016).

1.3 Archaeological and historical background

1.3.1 The Site is located within the core of the Torksey Viking Winter Camp, the extent and character of which has recently been defined (Hadley and Richards 2016; Richards and Hadley 2016). The Site was initially identified through the analysis of artefacts recovered by metal detectorists over the last twenty years. The analysis identified 'a period of exceptional activity at Torksey' (Blackburn 2011), indicated by a concentration of 9th-century coins, and other finds including Arabic dirhams, hack-metal, ingots and copper-alloy weights.

1.3.2 Hadley and Richards (2016) have undertaken a programme of archaeological works to set the metal-detected assemblage in context. These investigations comprised:

- Geophysical survey;
- Fieldwalking;
- Metal-detector survey;
- Geomorphological analysis;
- Small-scale excavation.

1.3.3 The geophysical survey (Brown 2012) revealed a complex of rectilinear enclosures close to the highpoint of the Site (Figure 2). The anomalies are characteristic of Romano-British settlement and the fieldwalking survey also confirmed activity of this date. A post-medieval rabbit warren was also identified during the course of the geophysical survey.

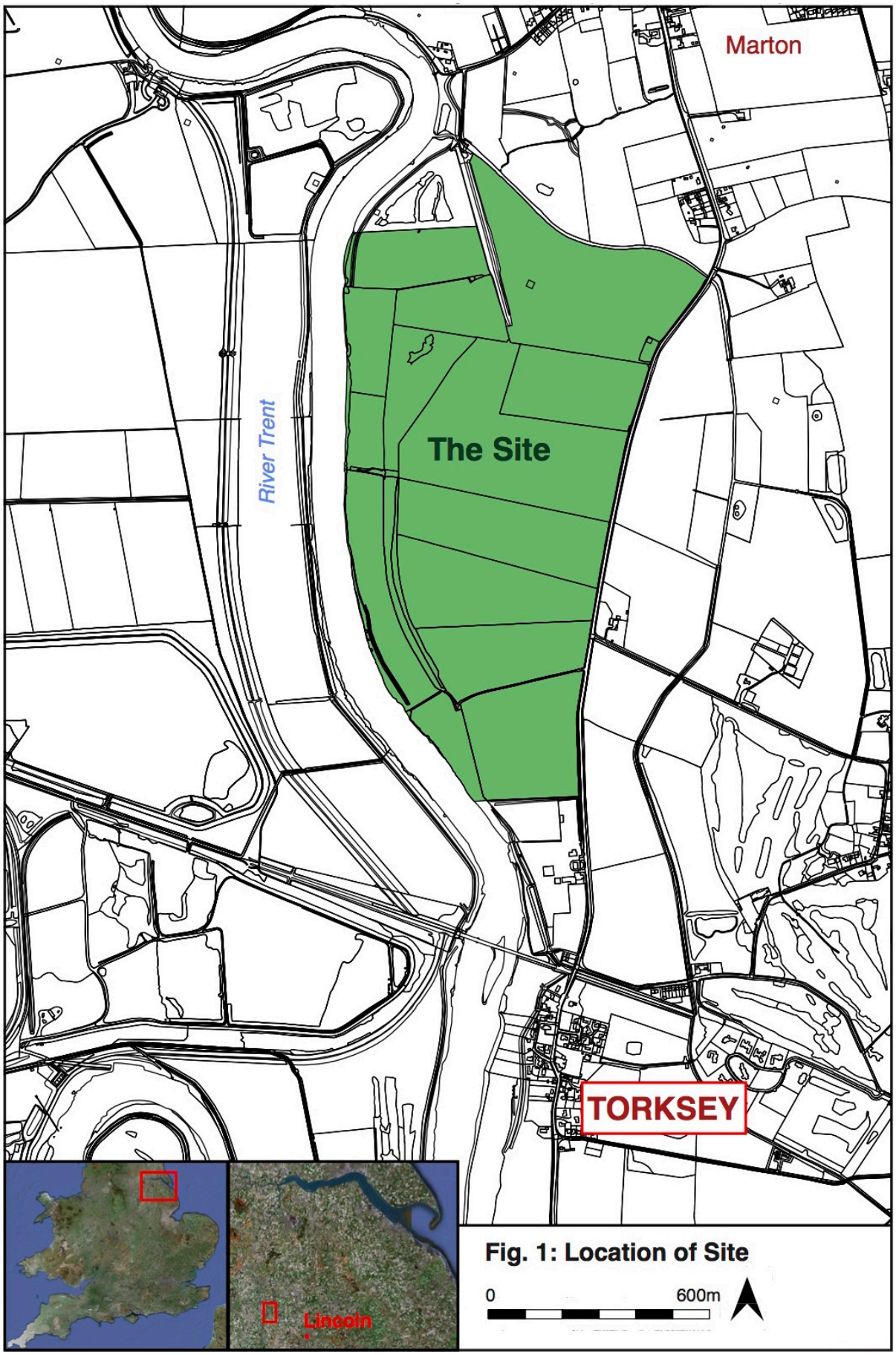

Fig. 1: Location of Site

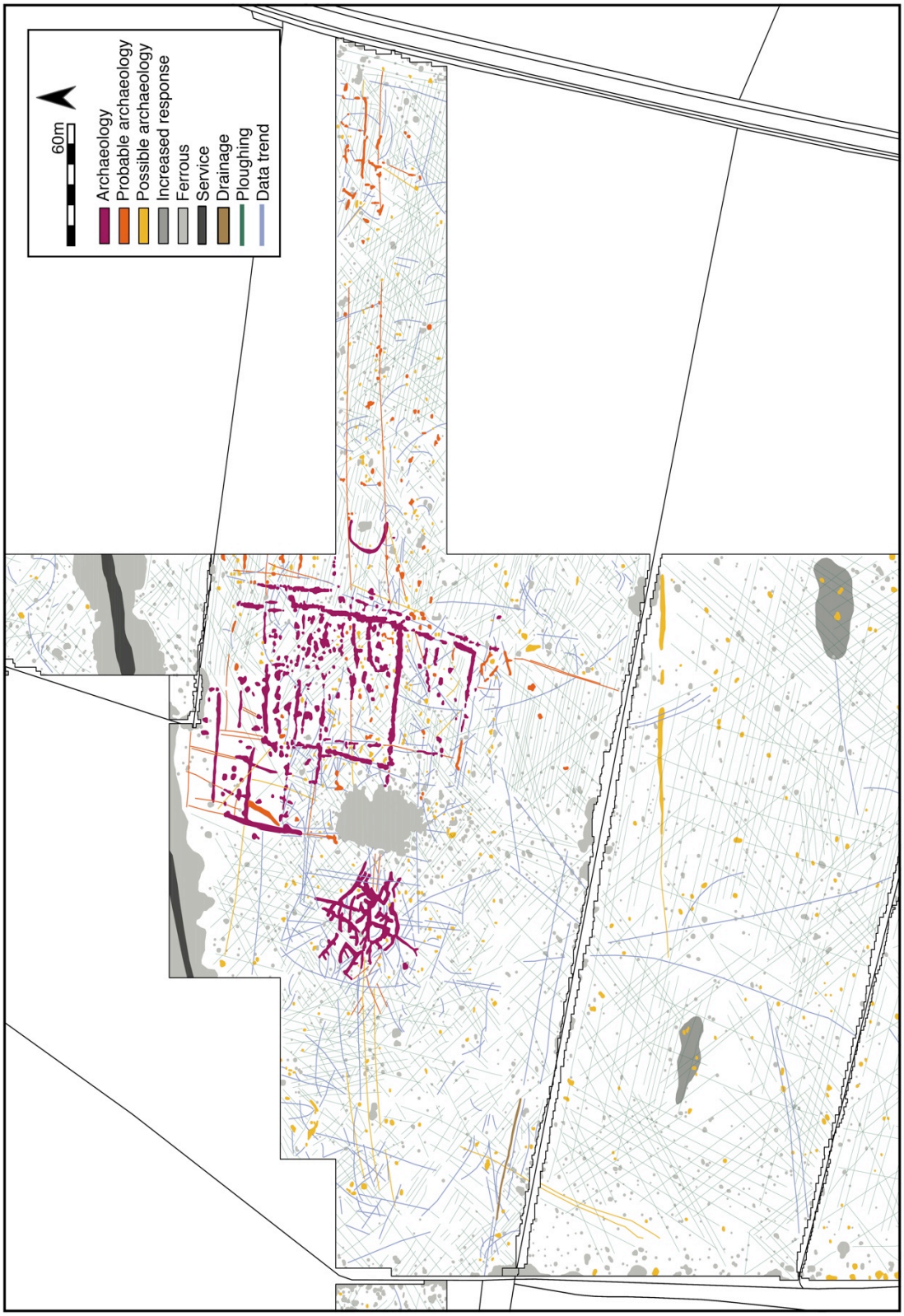

Fig 2: Interpretation of magnetometer survey in central part of the Site (Brown 2012; Figure 21) with Romano-British farmstead left centre, and post-medieval rabbit warren below.

2 AIMS OF THE EXCAVATION

It was decided to excavate an area of 600m^2, within the area highlighted by the geophysical survey. The geomorphological survey (Stein 2011; 2012) had revealed that elsewhere within the site of the winter camp any archaeological features were often masked by a significant depth of Aeolian sand, and a test pit to the south (Mahoney-Swales and Perry 2014) had indicated that this could be at least 1.5m deep. It was anticipated that excavation of known archaeological features would at least give an indication of the condition of such features. An area was chosen on the periphery of the Romano-British farmstead to avoid the risk of recovery of large quantities of Roman finds, whilst still confirming its nature. The specific area 15m x 40m was chosen so as to include at least two clear linear features (and their intersection) probably of Roman date, plus three sub-circular geophysics anomalies. These latter could be of any date, but there was a possibility they might be pits or hearths relating to the Viking camp. It was also envisaged that this area of higher ground within the centre of the camp, and in an area from which many Viking period artefacts had been recovered, was likely to have been a focus of Viking activity.

The aims of the excavation were:

- to assess the condition, character and depth of archaeological features visible in the geophysical survey;
- to undertake sample excavation of any non-Viking phase deposits encountered;
- to identify any Viking phase deposits in order to determine a research strategy to understand further the Winter Camp.

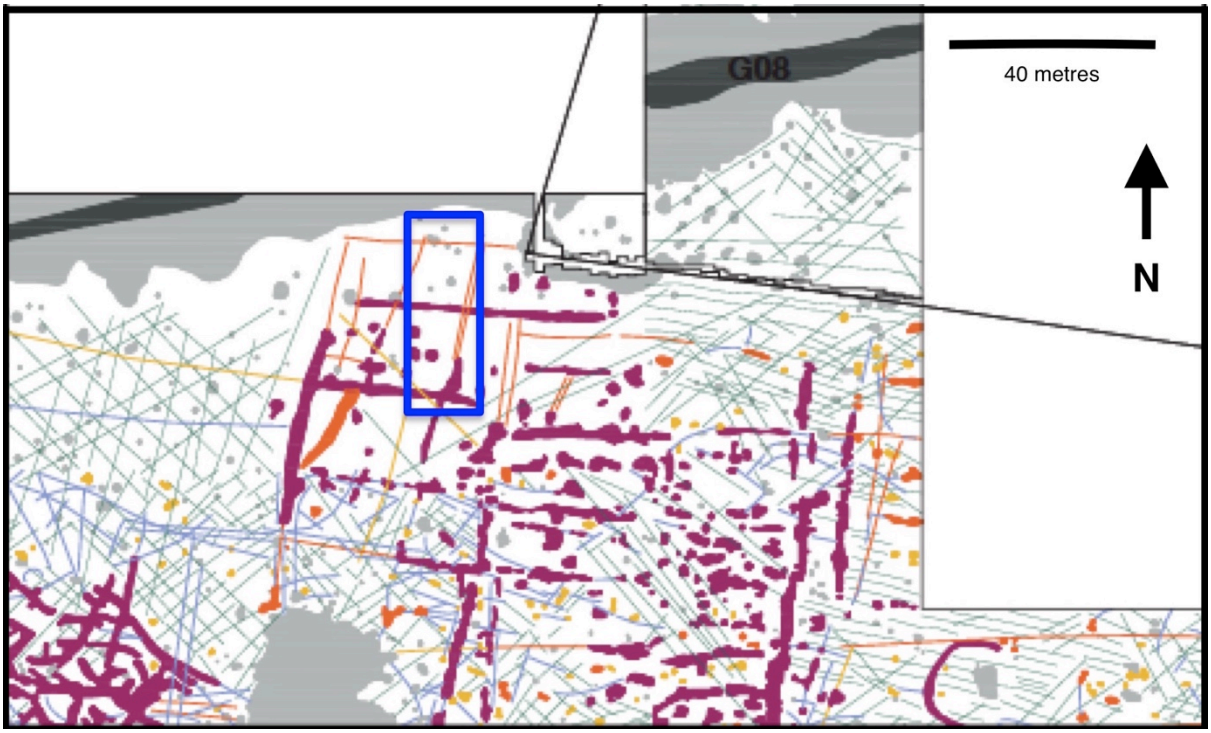

Fig.3: Area of excavation, highlighted in blue, superimposed upon geophysical survey interpretation.

3 METHODOLOGY

3.1 Introduction

3.1.1 All works were undertaken in accordance with the methodology set out within the Project Design (Wessex Archaeology 2016).

3.2 The Site

3.2.1 The Site was set out by Wessex Archaeology by means of a GPS system, and tied into the OS grid.

3.2.2 The Site was scanned with a CAT to check for uncharted services and mechanical excavation took place by means of a 13 ton tracked excavator fitted with a toothless ditching bucket, and under continuous archaeological supervision. Excavation took place in *c*. 200 mm spits.

3.2.3 Metal detecting survey was undertaken prior to excavation and repeated at regular intervals during machining. All green waste was discarded but all other metal finds were collected, with handheld GPS used to log the co-ordinates of all significant finds.

3.2.4 Mechanical excavation continued until the upper archaeological horizon was encountered.

3.3 Sample excavation and recording

3.3.1 Where archaeological features and deposits were encountered, excavation was carried out by hand, sufficient to characterise and date the remains.

3.3.2 Written and drawn records were made of the stratigraphy within the area investigated. Full written and drawn records of all excavated contexts were made in accordance with best archaeological practice. Unexcavated archaeological deposits were recorded to the maximum extent possible.

3.3.3 Records included overall Site plans. All archaeological features were related to the Ordnance Survey Datum and to the National Grid. Survey was undertaken using a GPS system to a three dimensional accuracy of 0.05m or better.

3.3.4 All archaeological deposits were recorded using Wessex Archaeology's *pro forma* recording system. This written record is hierarchically based and centred on the context record. Each context record fully describes the location, extent, composition and relationship of the subject and is cross-referenced to all other assigned records.

3.3.5 Each excavated context appears on at least one detailed plan at 1:50 or 1:20 scale and one section at 1:10 and coordinated onto the overall Site plan.

3.3.6 A full photographic record was maintained comprising digital images taken with a suitable camera. The photographic record illustrates both the detail and the general context of the principal features.

3.4 Finds

3.4.1 All artefacts from excavated contexts were retained, except those of obviously modern date.

3.4.2 The majority of finds were metal-detected from the ploughsoil and GPS coordinates were logged for all significant finds. These have also been given a Torksey project database number (in the form e.g. DB2279), by which they are referred to in this report, and a full list is included in Appendix C, with iron work also catalogued in Appendix E.

3.4.3 Pottery sherds and animal bone were recorded by context and are catalogued below and listed in Appendices D and F.

3.5 Environmental samples

3.5.1 Bulk environmental soil samples for plant macro-fossils, small animal and fish bones and other small artefacts were taken from appropriate well-sealed and dated/datable archaeological deposits. Their analysis is described below in Section 7.

Plate 1: General working shot

4 SUMMARY OF RESULTS

4.1 Natural

The superficial natural geology across the Site comprised mid to light yellowish brown sand (101) with a little silt.

4.2 Prehistoric

No features of prehistoric date were identified but a fragment of a Neolithic Langdale polished axe (DB2319) was recovered from the ploughsoil (100), confirming prehistoric activity, probably including tree-felling, in the vicinity.

4.3 Romano-British

The only dateable features recovered were probably of Romano-British date, and fall into two categories.

4.3.1 Romano-British farmstead

An E-W ditch (124) (Plate 3) with a cut (102/118) some 1.25-1.4 m wide at the top and 0.4-0.46m deep extended across the full width of the northern end of the site. This was filled with a light brown loose sand (103/119) with <3% sub-rounded pebbles and c.5% charcoal flecks. Five sherds of Romano-British pottery (including the base of a pedestal bowl) and a slag concretion (DB2325) were also recovered from the fill.

A second parallel ditch (104) (Plate 4) some 0.6m wide and less than 0.12m deep was visible for c.5m across the southern end of the site. This was filled with a mid brown loose sand (105). Although no finds were recovered from the shallow fill its orientation suggests it is of the same date as the larger ditch to the north.

Both features were visible on the geophysical survey, where they were interpreted as part of the boundaries of the Romano-British farmstead, although excavation revealed that they had been heavily truncated by later ploughing, particularly (104) of which only the base survived. According to the geophysical survey a short section of N-S ditch appeared to intersect with the southern E-W ditch (104). Ephemeral traces of this feature were visible wen the site was first machine stripped but the feature was extremely shallow and it proved impossible to define it, or establish any relationship with the E-W feature.

4.3.2 Romano-British rubbish pits

Three sub-circular or circular pits (121, 122, 123) were defined in the south-western part of the Site. These had also been visible in the geophysical survey as sub-circular anomalies.

Pit 121 (Plate 5) comprised a circular cut (108/112) some 2.2-2.35m in diameter and 0.95m deep, with steep sides and a concave base. It was filled with mid reddish-orange brown silt sand (109/113) with occasional stones and c.10-15% charcoal showing as a tip line. Ten sherds of Iron Age pottery and Romano-British grey ware (including a rim from a bowl and one sherd with a relief horizontal line) were found within the fill. A small Romano-British animal bone assemblage was recovered from hand-sieving of the fill and a total of 22 specimens were identified, comprising only cattle and sheep/goat (although roe deer cannot be excluded) (Salvagno 2017). Several slag concretions (DB2322; DB2323; DB2324) were also recovered from this fill. The fact that a similar concretion was recovered from ditch fill (119) may suggest that the fills of the ditch and pits are relate and that both groups of features were levelled at the same time. Analysis of a 20 litre sample of context 113

revealed a range of charred cereal grains and crop weeds which appeared to have been incidentally incorporated in the pit fill. The charcoal incorporated in the sample showed a high proportion of oak, possibly reflecting its use for fuel in metalworking.

Pit 122 (Plate 6) comprised a sub-circular cut (106/114) some 2.2m in diameter and 0.75m deep, with steep sides and a concave base. It was filled with a mid orange-brownish sand (107/115) with c.10% charcoal flecks appearing as tipping layers.

Pit 123 (Plate 7) comprised an oval cut (110/116) some 2.1m x 1.42m across and 0.3m deep, with steep sides and a concave base. The upper fill consisted of very dark grey/ black sand (111/117) comprising c.60% charcoal, which appeared to have been dumped in the pit as there was no evidence of in-situ burning. A single sherd of a Romano-British bowl was also recovered from this fill. Analysis of a 20 litre sample of context 111 revealed that this incorporated what appeared to be a deliberate dump of domestic hearth waste which included both cereal grains and crop weeds, as well as a high concentration of sedge grasses, and charcoal from general hearth waste. The basal fill of the feature (125/126) consisted of a mid to dark reddish brown silty sand some 0.16m deep.

4.4 Post-Roman

A number of artefacts were recovered by metal-detecting of the plough soil (100) which, on the basis from finds elsewhere on the site, are likely to have been deposited during the Viking over-wintering of AD 872-3. These included one certain and one possible iron sword pommels (DB2312; DB2313) and a possible sword hilt (DB2296), a lead gaming piece (DB2285) and two Northumbrian stycas: one of Wigmund (DB2291), and the other of Æthelred II (DB2299). A large number of fragments of iron were also recovered. These are not usually retained by the metal detectorists, but the quantity recovered during the excavation indicates the considerable quantity of undiagnostic iron work from the site, much of which must date to the over-wintering. In addition to those given individual database numbers (and listed in Appendix C) there were also 34 indefinable nail fragments of indeterminate date. Some 84 droplets or fragments of lead were also recovered from the plough soil and were not given individual database numbers. Similar quantities of small lead fragments have been found across the site of the winter camp and are thought to be associated with metal-working (Hadley and Richards 2016, 51-3). The ploughsoil also contained many sherds of Iron Age and Roman-British pottery, a single abraded sherd of Torksey ware, and a few pieces of medieval and post-medieval pottery.

The only features which could be dated to the post-Roman period were several episodes of ploughing. The V-shaped scars, generally 0.1m wide at the top by 0.1m deep, into the fills of the Romano-British ditches and pits. They were also on a slightly different alignment to the Romano-British and the modern field boundaries. The most prominent set were around 1m apart and ran NNE-SSW across the excavated area. A second set ran perpendicular to the first, WNW-ESE, and a third NE-SW. The nature of these scars suggested that they might relate to medieval ploughing. Finally, it was possible to discern traces of medieval ridge and furrow which did appear to be aligned with the present-day field boundaries, and may indicate that they are of considerable age.

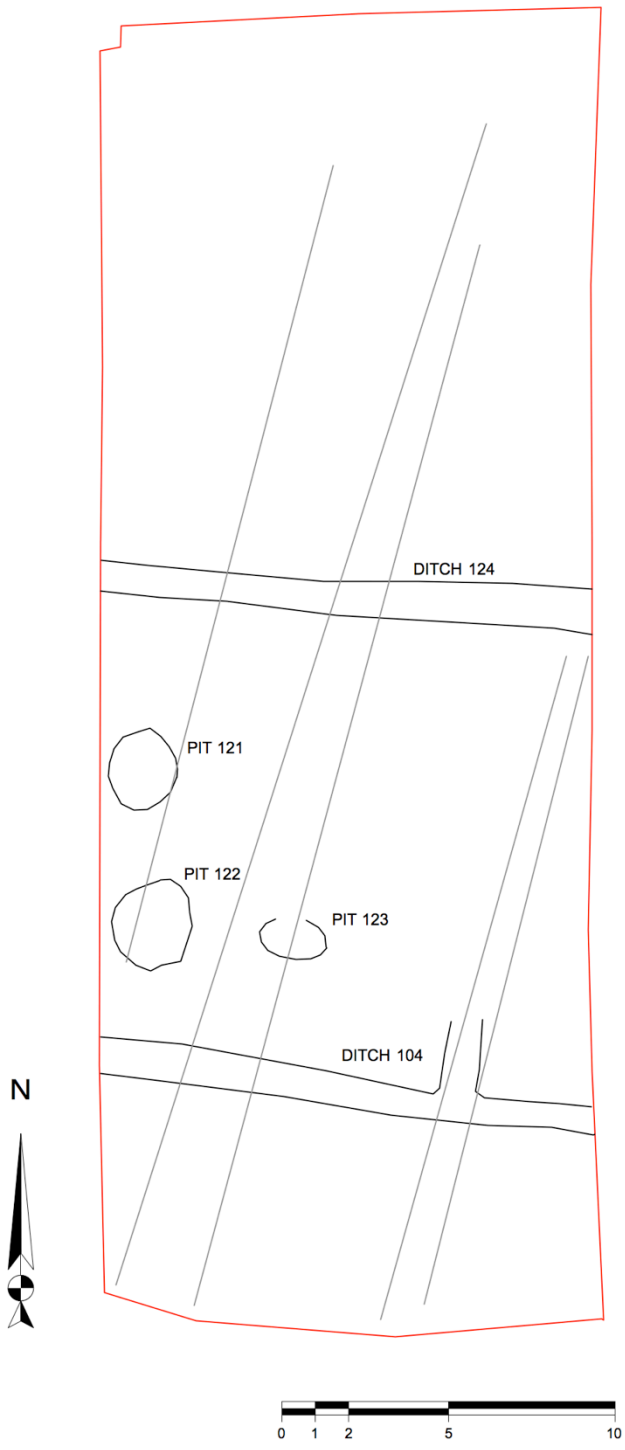

Fig. 4: Plan of archaeological features recorded during excavation

4.5 Modern: plough soil

All features were sealed and truncated by homogenous plough soil (100) comprising a mid, slightly greyish orange brown sandy loam. This varied in thickness from 0.4-0.6m. The majority of finds were recovered from this layer during the metal detector survey, which was undertaken in 0.2m spits during machining.

Plate 2: Dave and Pete Stanley detecting after first machining spit

5 FINDS

5.1 General Finds

Forty-seven individual finds were identified during the excavation, and 43 of these were recovered during the detector survey of the plough soil. These comprised 29 iron objects, ten copper-alloy artefacts, three copper-alloy coins, three lead objects, one possible jet object, and a stone axe. In addition 34 indefinable nail fragments, 84 droplets or fragments of lead, and ten copper-alloy fragments were also recovered from the plough soil but were not given individual database numbers. 23 objects were given twelve-figure grid reference coordinates, accurate to a one-metre square, using handheld GPS. Of the metal finds that can be securely dated, 75% date to the over-wintering; 12.5% are medieval and 12.5% post-medieval. Although the numbers are small it seems reasonable to infer from those proportions that the majority of the undated iron finds also belong to the over-wintering phase, and warrant further study. A full list of all individually catalogued finds is given in Appendix C.

5.2 Pottery, by Gareth Perry

Sixty-three sherds of pottery were recovered during the excavation, comprising 39 sherds of Iron Age / Romano-British pottery (including grey wares and Samian ware), four fragments of roof tile (including one with a hole), one abraded sherd of Torksey ware, and 19 sherds of medieval and post-medieval wares. The preponderance of Romano-British pottery, including fine wares, reflects the neighbouring farmstead site. The relative scarcity of Torksey ware is typical for the winter camp, reinforcing that the camp pre-dated the development of the Torksey industry. A full catalogue of all pottery sherds is given in Appendix D.

5.3 Ironwork, by Patrick Ottaway

5.3.1 Introduction
Twenty-nine iron objects from excavations at Torksey were submitted for study. They are mostly well preserved, although they have some surface corrosion. They were all X-radiographed at York Archaeological Trust and some have been cleaned. Although by no means all the objects can be dated closely, there is only one, a horseshoe, which is definitely late medieval while three cast iron items are modern. The remainder are, or could be, 9th to 10th century.

5.3.2 Weaponry
Sword Pommel knop. There is a tri-lobate pommel-knop (2312) from a Petersen (1919) Type L sword one feature of which is the composite pommel. This consisted of a pommel-knop with convex base to which a curved upper guard would have been fitted. The lower guard was typically curved over rather than straight as is usual on Viking-Age swords. The Torksey pommel-knop, pierced with a tapering socket would have fitted over the hilt. On each side are simplified animal heads. In the centre are raised discs with a central indentation which would have held non-ferrous decorative mounts; they would have been part of an overall decorative treatment using similar mounts. Type L swords are 9th or early 10th century. They are thought to be an English type (Bone 1989, 66) and are common in eastern and southern England (Ottaway 1992, 716).

5.3.3 Tools
Wedge. There is a small wedge (2306) which was probably used for splitting timbers.

5.3.4 Structural ironwork and fittings
There are six iron nails which could be of almost any date before the modern era. In addition, 2298 is a large stud with roughly rounded and slightly domed head, possibly from a door. 2323 is an incomplete strap, possibly part of a chest hinge. It is broken at one end and narrows towards a rounded, pierced terminal at the other. 2302 is a group of four interlinked tear drop-shaped chain

links. 2303 consists of two irregular shaped plates held together with two short pins at the straight end. It probably served as sheathing for a wooden object. 2320 is a small incomplete fitting, perhaps from a casket. It would originally have been pierced at each end before narrowing towards the centre where it was raised into a low triangular shape. It is plated with non-ferrous metal, probably tin alloy. This is probably Viking Age in date and is somewhat similar in form to small fittings and buckle-plates from York (Ottaway 1992, fig. 296, 3746 and 3759; fig. 299, 3795-6).

5.3.5 Pin head
2284 is a domed pin (or tack) head plated with non-ferrous metal.

5.3.6 Horseshoe
2310 is the left branch of a horseshoe. It has a fullered groove, pierced with four holes, and a turned over calkin. This a late medieval object.

5.3.7 Other objects
2304 and 2309 are spikes which taper to a point. 2304 is curved over at the thicker end. 2309 is curved. 2307 is a strip with a pointed end and a slight loop at head. 2296 and 2305 are small iron bars, possibly a smith's raw materials.

A full catalogue of all iron objects is given in Appendix E.

6 ANIMAL BONE, by Lenny Salvagno

6.1 Introduction

Animal bones were recovered from only two contexts (109 and 113) both interpreted as fills of a Romano-British pit (121). The poor state of preservation of the bones – which are highly fragmented and heavily worn by taphonomic processes – has detrimentally affected the number of specimens which could be identified to species level. Sieving was carried out at the site for context 113, using 2mm and a 4mm sieves. This produced only a few identifiable specimens, which would have, nevertheless, been missed, if recovery had only relied on hand-collection.

6.2 Methodology

Identifications were aided by use of the reference collection held at the *Tony Legge Zooarchaeology Laboratory* at the Department of Archaeology, University of Sheffield (UK), with the additional support of identification atlases and papers (e.g. Schmid 1972; Barone 1976; Prummel 1988; Boessneck 1969; Davis 1980). Most identifiable remains belonged to cattle, with a very small number of sheep/goat remains.

Considering the small sample size, the recording was not carried out with the selective diagnostic-zone method – which involves the recording of a pre-defined set of skeletal parts – instead, every fragment which could be anatomically and taxonomically identified was recorded. The Number of Identified Specimens (NISP) has been calculated for each species but no further types of quantification were performed, because the assemblage is too small. The NISP was obtained by tallying the number of identified specimens for each identified taxon.

The fusion of post-cranial bones for all taxa was recorded following Albarella and Davis (1994). Mandibular jaws were used to gain information about the age at death of the animal. Teeth were attributed to an eruption or wear stage according to Payne (1973; 1987) for sheep/goat, and Grant (1982) for cattle and pig. Evidence of butchery, pathology and gnawing was recorded when present. Very few specimens could be measured, which was done according to von den Driesch (1976).

6.3 Results

The Romano-British assemblage is very small, which restricts our ability to present a detailed analysis. A total of 22 specimens were identified (Table 1). The identified specimens comprise only cattle and sheep/goat (even though roe deer cannot be excluded). For some specimens the state of preservation was so poor and the morphological diagnostic traits so compromised, that certain identification to species level could not be reached.

The small assemblage size does not allow commenting on the content of the two contexts - 113 (mainly) and 109. Both contexts have been interpreted as the fill of pit 121, which contained a small amount of Iron Age pottery, Romano-British grey wear and slag concretions. Such pit may have been simply used to dump material.

6.3.1 Cattle are represented only by seven fragments. These include a number of loose teeth (five), a mandibular jaw with teeth (second and third molar) and a maxillary bone with first and second molars embedded. No information was available for ageing. There are a number of fragments which are likely to belong to cattle (five) among which the diaphysis of a metapodial, two distal diaphyses of a humerus, a fragment of a calcaneus and an astragalus. Due to the bad preservation of these specimens a certain identification could not be reached but the size of the remains is compatible with cattle.

Table 1: Numbers of identified Specimens (NISP) for each species

Species		**Post-Cranials**	**Cranials (mainly teeth)**	**Total**
Cattle	*Bos taurus*	-	7	**7**
Cattle?	*Bos Taurus?*	5	-	**5**
Sheep/Goat	*Ovis aries/Capra hircus*	3	2	**5**
Sheep/Goat?	*Ovis aries/Capra hircus?*	4	-	**4**
Sheep/Goat/Roe deer?	*Ovis aries/Capra hircus/Capreolus capreolus*	1	-	**1**
Total		**13**	**9**	**22**

6.3.2 Five specimens have been attributed to sheep/goat. Distinction between sheep and goat was not possible as the recovered elements were undiagnostic. They include a number of loose teeth (two) and three fragments of a calcined first phalanx, retrieved from the flotation sample (4mm sieve).
As with cattle, there are a number of specimens which could not be surely attributed to sheep and goat but are likely to belong to this category. These include the diaphysis of a femur and three fragments of unfused and calcined vertebra disks. These latter were retrieved from the 4mm flotation sample. Interestingly, most of the small finds from the flotation samples (which unfortunately were mainly un-identifiable due to fragmentation), showed exposure to high temperature as they were either calcined or combusted.

6.3.3 One calcined fragment of metacarpal diaphysis, probably belonging to sheep/goat (even though roe deer cannot be excluded), was identified among the 4mm flotation remains. This specimen is completely calcined (white colour) and has been clearly exposed to high temperature as the diaphysis, which is usually straight in the metapodial, presented an unnatural curvature.

6.4 Discussion

The presence of cattle and sheep/goat is unsurprising, as these domesticates tend to be common in Romano-British faunal assemblages. These animals were likely to be exploited for a variety of products, including dairy products, meat, wool (in the case of sheep) and leather, which would involve keeping a fair proportion of animals into adult age.

Even though very limited, there was evidence of exposure to fire, but no butchery. It is likely that the rubbish thrown in the pit was deliberately burnt, though this only seems to have affected some layers.

Overall, the very small size of the assemblage means that the information that can be retrieved is very limited. However, the remains recovered here do fit, to a certain degree, within the wider patterns known for Romano-British sites in England (Albarella et al. unpublished).

A full catalogue of all animal bones is given in Appendix F.

7 CHARRED PLANT MACROFOSSILS AND WOOD CHARCOAL, by Ellen Simmons

7.1 Introduction

Two bulk sieving soil samples, each of twenty litres in volume, were taken from two probable Romano-British rubbish pits (121 and 123) and processed by flotation for the recovery of charred plant macrofossils and wood charcoal. The resulting samples were sorted for charred plant remains and a representative sample of the wood charcoal assemblage was identified, in order to investigate the agricultural economy of the site as well as aspects of the local environment.

7.2 Methodology

The bulk sieving samples were processed by flotation for the recovery of charred plant material and wood charcoal using a water separation machine, by the Sheffield Archaeobotanical Consultancy. Floating material was collected in a 300µm mesh, and the remaining heavy residue retained in a 1mm mesh. The flots and heavy residues were air dried and the heavy residues were re-floated in order to maximise the recovery of charred material. The greater than 4 mm fractions of the heavy residues were fully sorted for organic remains and artefacts. The 2-4mm fractions of the heavy residues were sorted for bone and wood charcoal. The sorted and unsorted fractions of the heavy residues were retained.

The samples were sorted for charred plant macrofossils using a low power binocular reflected light microscope (x10 – x 65). Quantification of cereal grains was based on the presence of embryo ends, glume bases, rachis nodes and the nodes of straw (Jones 1990, 92). Charred plant material was stored in gelatine capsules, or glass tubes with plastic stoppers, in sealable plastic bags.

A rich assemblage, of well over 500 wood charcoal fragments greater than 2 mm in size, was present in sample 1 from pit fill 113 and just over one hundred wood charcoal fragments greater than 2mm in size, were present in sample 2 from pit fill 111. Preliminary examination of the wood charcoal fragments using low power microscopy, indicated that the charcoal assemblage present in pit fill 113 was composed entirely of ring porous taxa which appeared morphologically similar to oak (*Quercus* sp.), while both diffuse porous and ring porous taxa were noted as present in pit fill 111. Twenty-five wood charcoal fragments greater than 4mm in size and 25 wood charcoal fragments 2-4mm in size were randomly selected from pit fill 113 for further identification, in order to confirm the apparent dominance of oak. All of the wood charcoal fragments greater than 4mm in size and eighty wood charcoal fragments 2-4mm in size were randomly selected for identification from pit fill 111, with the aim of providing a representative sample of all the taxa potentially represented in this context (Stuijts 2006, 28). Wood charcoal fragments were fractured manually and the resultant anatomical features observed in transverse, radial and tangential planes using high power binocular reflected light (episcopic) microscopy (x 50, x 100 and x 400).

A record was also made, where possible, of the ring curvature of the wood and details of the ligneous structure, in order for the part of the woody plant which had been burnt and the state of wood before charring, to be determined (*cf.* Marguerie, & Hunot 2007). Where at least three growth rings were present, the ring curvature of the charcoal fragments was designated as weak, intermediate or strong, indicating larger branches or trunk material, intermediate sized branches and smaller branches or twigs, based on the classification in Marguerie and Hunot (2007, 1421). The presence of narrow rings which may indicate slow grown wood or poor growing conditions was recorded (Marguerie and Hunot 2007, 1422). The presence of thick walled tyloses in vessel cavities, which indicate the presence of heartwood and therefore mature trunk wood, was recorded. The presence of fungal hyphae, which indicate the use of dead or rotting wood, was recorded (Marguerie and Hunot 2007, 1419). The presence of radial cracks, which may relate to the dampness of the wood prior to charring as well as to the anatomy of the wood was recorded (Marguerie and Hunot 2007, 1421). The degree

of vitrification of the charcoal fragments was recorded as a measure of preservation, with levels of vitrification classified as either low brilliance refractiveness (degree1), strong brilliance (degree 2) or total fusion (degree 3) (Marguerie and Hunot 2007, 1421). The presence of mineralisation in the vessel cavities, whereby mineral deposits penetrate into the vessels of the wood charcoal fragments obscuring morphological characteristics, was also recorded as a measure of preservation.

Identification of charred plant material and wood charcoal was carried out to as high a taxonomic level as possible by comparison with modern reference material in the Department of Archaeology, University of Sheffield and various reference works (e.g. Cappers *et al* 2006; Schweingruber 1990; Hather 2000). Cereal identifications and nomenclature follow Jacomet (2006). Other plant nomenclature follows Stace (2010). The archaeobotanical composition of the samples is recorded below in Table 2 and the composition of the wood charcoal assemblage is recorded below in Table 3. The seed, in the broadest sense, of the plant is always referred to in Table 2 unless stated otherwise. The abbreviation *cf*. means 'compares with' and denotes that a specimen most closely resembles that particular taxa more than any other. Information regarding the ecology of the identified plant and wood charcoal taxa was taken from the habitat information listed in Stace (2010) and Preston *et al* (2002).

7.3 Preservation

No intrusive roots were present in sample 1 from pit fill 113. Intrusive roots were present as a moderate proportion of sample 2 from pit fill 111, indicating a somewhat increased likelihood that that the charred material present in this context may be intrusive. The preservation of charred cereal grain was poor with grains exhibiting puffing and distortion and identifiable by gross morphology only. The preservation of wood charcoal in sample 1 from pit fill 113 was good, with minimal evidence for vitrification or mineralisation. The preservation of wood charcoal in sample 2 from pit fill 111 was somewhat poor with a relatively high proportion of charcoal fragments unidentifiable due to vitrification.

7.4 Charred plant macrofossils

7.4.1 Results

Charred crop material was present in both pit fills, although at low densities. A single oat grain (*Avena* sp.) and hulled barley grains (*Hordeum* sp.) were present in pit fill 113. Probable barley grains (cf. *Hordeum* sp.) and a spelt wheat glume base (*Triticum spelta*) were present in pit fill 111, along with glume bases which could only be identified as either emmer or spelt wheat (*Triticum dicoccum / spelta*). An indeterminate large seeded legume was also present in pit fill 111. Hazel nutshell (*Corylus avellana*) and bramble seeds (*Runus fruticosus*) which were present in pit fill 113, as well as elder seeds (*Sambucus nigra*) in pit fill 111, may be representative of the collection of wild food resources.

The charred wild or weed plant seed assemblage included taxa commonly associated with fertile disturbed soils and arable fields such as pale persicaria / redshank (*Persicaria lapathifolia / maculosa*), knotgrass (*Polygonum aviculare* agg.), fat hen (*Chenopodium album*), black nightshade (*Solanum nigrum*) and scentless mayweed (*Tripleurospermum inororum*). Stinking chamomile (*Anthemis cotula*) is a typical crop weed which is associated with the cultivation of heavy clay soils while sheep's sorrel (*Rumex acetosella*) and wild radish (*Raphanas raphanistrum*) are more characteristic of acid sandy soils. Taxa which are commonly associated with both grassland and cultivated fields but are frequently occurring taxa in archaeobotanical charred plant remains assemblages, included medicks / clovers (*Medicago* spp. / *Trifolium* spp.), curled / clustered / broad leaved dock (*Rumex crispus / conglomeratus / obtusifolius*), and small seeded grasses (<2mm Poaceae). Bulbous / meadow / creeping buttercup (*Ranunculus bulbosus/acris/repens*) is also representative of grassland. Spike rush (*Eleocharis palustris/uniglumis*), and many of the species of rushes (*Juncus* spp.) and sedges (*Carex* spp.) potentially represented, are commonly associated with damp soils. A particularly high concentration of sedge seeds was present in pit fill 111 along with a

high concentration of tuber / rhizome fragments. Hedgerows and scrub were represented by hazel nutshell and seeds of bramble and elder.

Table 2: Macroscopic charred plant remains from Torksey

Context number	113	111
Feature number	121	123
Sample number	1	2
Sample type	BS	BS
Feature type	Pit	Pit
Provisional date	Romano-British	Romano-British
Sample volume (litres)	20	20
Flot volume (ml)	150	50
% Intrusive roots	0	40
Cereals and other economic plants		
Large seeded legume		1
Corylus avellana (hazel) nutshell	4	
Avena sp. (oat) grain	1	
Hordeum sp. (barley)		
indeterminate grain (hulled)	5	
indeterminate grain	3	
cf. *Hordeum*		
indeterminate grain	2	3
Triticum spelta (spelt wheat) glume base		1
Triticum dicoccum / spelta (glume wheat) glume base		1
Triticum indet. (indeterminate wheat) grain		5
Indeterminate cereal grain	1	3
Wild or weed plant seeds		
Ranunculus bulbosus/acris/repens (bulbous/meadow/creeping buttercup)	1	
Trifolium spp. / *Medicago* spp.) (clover / medick)		2
Rubus fruticosus agg. (bramble)	3	
Raphanus raphanistrum L. (wild radish) seed pod fragment	1	
Persicaria lapathifolia / maculosa (pale persicaria / redshank)	1	1
Polygonum arenastrum / aviculare (knotgrass)		1
Rumex crispus / conglomeratus / obtusifolius (curled / clustered / broad-leaved dock)		2
Rumex acetosella agg. (sheep's sorrel)	1	3
Chenopodium album L. (fat hen)	2	1
Solanum nigrum L. (black nightshade)		1
Stachys sp. (woundwort)	1	
Clinopodium sp. (calamint)		1
Sambucus nigra L. (elder)		1
Anthemis cotula L. (stinking chamomile)	3	
Tripleurospermum inororum (L.) Sch. Bip. (scentless mayweed)		1
Juncus spp. (rushes)		2
Eleocharis palustris/uniglumis (spike rush)	1	12
Carex spp. (sedges)	1	107
< 2mm Poaceae (small seeded grasses)		9
Rumex spp. / *Carex* spp. (dock / sedge) kernal	2	
Morphologically indeterminate charred plant material		

Context number	113	111
Feature number	121	123
Sample number	1	2
Sample type	BS	BS
Feature type	Pit	Pit
Provisional date	Romano-British	Romano-British
Tuber / rhizome		73
< 2mm culm node / monocot stem fragment		1

7.4.2 Discussion

The low density of barley grains present in both pit fills are likely to have been charred accidentally during parching or food preparation. The spelt wheat glume base present in pit fill 111 is likely to have been charred as waste following removal from the crop during crop processing. The association of the wild or weed plant seeds with charred crop material indicates that many of the wild or weed plant seeds are likely to have been harvested along with the crops and charred as waste following removal during crop processing. Other sources of wild or weed plant seeds include tinder, fodder and waste roofing, bedding or flooring material however. The high concentration of wild or weed plant seeds and tuber / rhizome fragments in pit fill 111 indicates that this material is likely to be representative of a deliberate dump of charred material, probably domestic hearth waste. The low density of charred plant remains in pit fill 113 indicates that this material is more likely to have become incidentally incorporated into the pit fill.

The crop types represented in the samples are typical of the Romano-British period. Spelt wheat glume bases in particular, are a typical component of Romano-British archaeobotanical assemblages (Monckton 2006, 274). Ethnographic evidence suggests that glume wheats are generally put into storage as sheaves in areas with wet summers, with the final stages of processing to remove the chaff and weed seeds carried out as and when needed (Hillman 1981, 155). This results in an increased likelihood of spelt wheat chaff being discarded onto household fires and becoming preserved by charring. Hulled barley, spelt wheat chaff, pulses and hazel nutshell are also all present in rich assemblages of charred plant remains of Romano-British date from the North Lincolnshire settlement site of Dragonby (van der Veen 1996), the Romano-British farmstead site of Turnscoe, near Doncaster in South Yorkshire (Giorgi 2004) and in deposits of Romano-British date from the Sarah Swift building, Lincoln (Simmons 2017). Spelt wheat and hulled barley were also present in a rich archaeobotanical assemblage of Romano-British date from Dunston's Clump, Babworth, Nottinghamshire (Jones 1987). A small proportion of oat grains were present in the archaeobotanical assemblage from Thurnscoe and the Sarah Swift Building but, as no oat floret bases were present, it could not be determined whether the grains were representative of wild plants or a cultivar. Oat floret bases of wild oats were present at Dunston's clump along with oat grains.

Stinking chamomile is a characteristic crop weed, the increasing occurrence of which in archaeobotanical assemblages of the Roman period onwards, has been linked to the expansion of agriculture into heavy and damp soils (Jones 1981, 110). Taxa more typical of damp grassland habitats such as buttercup, spike rush and sedges may also relate to the cultivation of soils with poor drainage in the Iron Age and Roman periods (van der Veen 1992, 104) or may be representative of turves or plants collected for use as fodder or bedding. The cultivation of acid sandy soils is suggested by the presence of sheep's sorrel and wild radish, possibly indicating the exploitation of different soil types in the vicinity of the site, although these taxa were present in low numbers, so no firm conclusions can be drawn. Fat hen, knotgrass, pale persicaria / redshank, black nightshade and scentless mayweed are all typical crop weeds of nutrient rich soils.

Taxa present in the rich assemblages of wild or weed plant seeds from Dragonby (van der Veen 1996) and Thurnscoe (Girogi 2004) included sheep's sorrel and wild radish, indicating the cultivation of sandy soils. Sedges and spike rush were also present at Dragonby and Dunston's Clump (Jones 1987), sedges and buttercup were present at Thurnscoe and sedges were present at the Sarah Swift

Building (Simmons 2017). Stinking chamomile was not however identified as present at Dragonby, Dunston's Clump or the Sarah Swift Building. Stinking chamomile also could not be established as present with certainty at Thurnscoe, as this species was identified during the evaluation phase of excavation at the site but not during full analysis (Giorgi 2004, 76). Stinking chamomile is however present in archaeobotanical assemblages of Romano-British date from South Lincolnshire and Leicestershire (Monckton 2006).

7.5 Wood charcoal

7.5.1 Results

All the fifty wood charcoal fragments greater than 2mm in size examined from pit fill 113 were identified as oak (*Quercus* sp.). Oak charcoal cannot be identified to species using morphological characteristics so either sessile oak (*Quercus petraea* (Matt.) Leibl.) or pendunculate oak (*Quercus robur* L.) is represented.

Growth ring curvatures were observable on 22 of the charcoal fragments from pit fill 113, of which ten had intermediate ring curvature and twelve had weak ring curvature. Tyloses were observed in the vessel cavities of 28 of the charcoal fragments. Closely spaced annual growth rings were present on four of the charcoal fragments. Radial cracks were present on thirty-two of the charcoal fragments. Fungal hyphae were not observed as present in the vessel cavities of any the charcoal fragments. None of the fragments exhibited signs of vitrification

Oak was also the dominant taxa present in the charcoal assemblage from pit fill 111. Small proportions of blackthorn (*Prunus* cf. *spinosa*), bird / wild cherry (*Prunus* cf. *avium / padus*), hawthorn, apple, pear, and rowan family (Pomoideae), poplar / willow (*Populus / Salix*) and ash (*Fraxinus excelsior*) were also present. Bird / wild cherry (*Prunus avium /* padus) charcoal cannot be differentiated using morphological characteristics. Pomoideae, which cannot be differentiated using morphological characteristics, is a large sub-family of the rose family (Rosaceae) containing many species, although the native woody plant species most likely represented would be wild pear (*Pyrus communis* L.), crab apple (*Malus sylvestris* (L.) Mill.), service tree (*Sorbus domestica* L.), rowan (*Sorbus aucuparia* L.), common whitebeam (*Sorbus aria* (L.) Crantz.), hawthorn (*Crataegus monogyna* jacq.) or Midland hawthorn (*Crataegus laevigata* (Poir.) DC.). Poplar / willow (*Populus / Salix*) charcoal also cannot be differentiated using morphological characteristics.

Growth ring curvatures were observable on 15 of the charcoal fragments from pit fill 111, of which twelve had weak ring curvature, two had intermediate ring curvature and one had weak ring curvature. Tyloses were observed in the vessel cavities of seven of the charcoal fragments, all of which were of oak. Closely spaced annual growth rings were not noted as present on any of the charcoal fragments. Radial cracks were present on 20 of the charcoal fragments. Fungal hyphae were present in the vessel cavities of three the charcoal fragments. Twenty-six of the fragments exhibited signs of vitrification.

Table 3: taxa present in the wood charcoal assemblage from Torksey

Context number	113	111
Feature number	121	123
Sample number	1	2
Sample type	BS	BS
Feature type	Pit	Pit
Provisional date	Romano-British	Romano-British
No. of fragments with strong ring curvature		12
No. of fragments with intermediate ring curvature	10	2
No. of fragments with weak ring curvature	12	1

No. of fragments with closely spaced growth rings	4			
No. of fragments with radial cracks	32		20	
No. of fragments with tyloses	28		7	
No. of fragments with fungal hyphae			3	
No. of fragments exhibiting vitrification			26	
Number / weight of fragments	No.	weight (g)	No.	weight (g)
Taxon (common name)				
Prunus cf. *spinosa* (blackthorn)			3	0.288
Prunus cf. *avium / padus* (bird / wild cherry)			13	0.120
Pomoideae (hawthorn, apple, pear, rowan family)			9	0.170
Quercus sp. (oak)	50	12.291	58	0.875
Populus / Salix (poplar / willow)			1	0.006
Fraxinus excelsior L. (ash)			2	0.030
Indeterminate			14	0.651
Total weight / number of fragments	**50**	**12.291**	**100**	**1.489**

7.5.2 Discussion

Charcoal assemblage composition is likely to be influenced by many factors, including differences in availability and anthropogenic fuel wood selection strategies, as well as to taphonomic factors such as differential charcoal preservation and recovery (Asouti and Austin 2005, 8; Théry-Parisot *et al* 2010). It is therefore unlikely that the composition of the wood charcoal assemblage is directly representative of the nature and extent of woodland and scrub in the local environment. The high proportion of oak in the charcoal assemblage from both pit fills, is therefore likely to be related both to the excellent properties of oak as a fuel wood (Webster 1919, 44; Porter 1990, 93) and as a structural timber, as well as to the availability of oak in the surrounding environment.

The composition of the charcoal assemblage from pit fill 113 is consistent with the specific selection of large diameter oak, including oak heartwood, as fuel. Oak, particularly oak heartwood is an excellent fuel wood, burning hot and slowly (Webster 1919, 44; Porter 1990, 93). The apparent selection of oak as fuel in pit fill 113 would also be consistent with the presence of metal-working debris in this context. The more mixed composition of the charcoal assemblage from pit fill 111, including the use of small, intermediate and large diameter wood, would be more likely to be consistent with general hearth waste. All the taxa present in the charcoal assemblage from pit fill 111 are also good fuel woods.

The range of taxa present in the charcoal assemblage from both pit fills indicate that mature oak woodland, woodland clearings, woodland margins, scrub and hedgerow habitats are all likely to have been locally available and utilised for the collection of fuel wood. Oak is one of the most common mixed deciduous woodland trees (Rackham 2003, 283) as is ash (Rackham 2003, 203). Hawthorn, wild apple, wild pear and members of the rowan family which are represented by Pomoideae, along with wild / bird cherry and blackthorn are all hedgerow and scrub taxa as well as being frequently occurring underwood taxa in deciduous woodland (Rackham 2003, 349-58).

Wood charcoal assemblages of Romano-British date from the East Midlands region generally indicate increasing pressure on woodland resources, with the use of small diameter wood and the presence of a wide range of taxa sourced from a range of habitat types (Murphy 2001, 16-8). Pollen from near the North Lincolnshire settlement site of Dragonby indicated that substantial woodland and scrub clearance occurred during the Romano-British period (Holland 1996). Charcoal from Dragonby also provided evidence for an increase in scrub taxa in the Roman period, consistent with the pollen evidence for woodland clearance, although oak was well represented throughout the sequence (Hayes

and May 1996). Oak was also the predominant taxa type in an assemblage of charcoal of Romano-British date from the Sarah Swift Building, Lincoln, with tyloses present in a small proportion of the oak charcoal fragments indicating some use of heartwood from mature trees. Taxa representative of a range of habitat types was also present however, and the use of both small and large diameter wood was indicated (Simmons 2017). The use of primarily oak, including the use of heartwood, as a fuel source was present in an oven or kiln feature at the Romano-British settlement site of Thurnscoe in South Yorkshire, while the charcoal assemblage from other contexts included the use of heather as well as blackthorn, hazel, alder and maple (Gale, 2004).

7.6 Summary

Charred plant remains were generally present in low concentrations in Romano-British pit fills 111 and 113, with the exception of a significant concentration of sedge seeds and tuber / rhizome fragments in pit fill 111. The crop types present were hulled barley and spelt wheat which are both typical crops of the Roman period. Wild food resources such as hazel nutshell, bramble fruits and elder berries may also have been utilised. The wild or weed seed assemblage associated with the charred cereal grain included a range of typical crop weeds of fertile soils and provided tentative evidence for the exploitation of heavy clay soils as well as sandy soils for agriculture. The high concentration of sedge seeds and tuber / rhizome fragments present in pit fill 111 may also relate to the cultivation of soils with poor drainage or may be representative of turves or plants collected for use as fodder or bedding. The crop types and wild or weed seed assemblage are consistent with those present in archaeobotanical assemblages of Romano-British date from the region.

A rich assemblage of well over five hundred wood charcoal wood charcoal fragments greater than 2mm in size was present in pit fill 113, which indicated the selection of large diameter oak, including heartwood, for use as fuel. The dominance of oak in this context is likely to be due to the excellent properties of oak as a fuel wood, but also indicates the presence of mature oak woodland in the vicinity of the site. Just over one hundred wood charcoal fragments greater than 2mm in size were present in pit fill 111 and included a range of open woodland, woodland margin, underwood, scrub and hedgerow taxa, along with a high proportion of oak. The diversity of taxa present along with evidence for the use of both small, intermediate and large diameter wood is consistent with the utilisation of a range of habitat types for the collection of fuel. Palynological evidence from the region indicates substantial woodland clearance during the Romano-British period and wood charcoal assemblages of Romano-British date also indicate the need for the utilisation of a range of habitat types for the collection of fuel.

8 DISCUSSION

The excavation has confirmed that the features visible in the geophysical survey (Brown 2012) relate to the Romano-British farmstead. This includes the N-S and E-W rectilinear enclosures, and also the group of sub-circular anomalies which were previously of unknown date, but which can now be identified as a group of pits dug near the edge of one of these enclosures. These were back-filled with metal-working debris and dumped burnt material and yielded pottery exclusively of Romano-British date. Charred plant remains in the pits are consistent with those present in archaeobotanical assemblages of Romano-British date from the region. They included evidence for the cultivation of barley and wheat, and also the possible utilisation of wild food resources such as hazelnuts, bramble fruits and elder berries. The charcoal indicates a range of open woodland, woodland margin, underwood, scrub and hedgerow taxa, along with the use of a high proportion of oak as fuel in metal-working, reflecting the presence of mature oak woodland, which palynological evidence suggests was cleared during the period (Stein 2012).

An absence of early/middle Anglo-Saxon pottery correlates with an already identified general paucity of such pottery in Torksey, and the absence of later Torksey ware is also typical for the Winter Camp site, but nor were any metal objects dateable to the Anglo-Saxon or Viking periods recovered from any of the features, whereas they were present in large numbers in the plough soil.

We have at least established that these features are visible during excavation, especially upon being freshly exposed in damp conditions, but they are very ephemeral in places. Indeed, the level of truncation of the Romano-British ditches, in one case almost down to its base shows why no occupation horizons relating to any later activity have survived. Nonetheless, the continued recovery of artefacts relating to the over-wintering from the overlying plough soil confirms that they were once part of occupation levels which have been disturbed and now form part of the homogenous plough soil. This indicates the value of continued metal detector survey and plotting of finds across the Winter Camp site.

Clearly the movement of the sand as a result of wind action, combined with the modern aggressive agricultural regime has removed any trace of activity which can be definitely related to the Winter Camp, at least in this part of the site. This may have been a product of erosion from one of the highest points of the site, but the ancient hedgerow – adjacent to the excavation – might have been expected to have afforded some protection. It remains possible that elsewhere, where there is a much greater depth of Aeolian sand, this may have protected the Viking occupation layers, but given the sand also makes it difficult to use techniques of remote sensing to define any archaeological features across the rest of the site, it is therefore very difficult to identify any areas to target for further excavation, within the overall 55 hectares that comprises the area of the camp.

9 THE ARCHIVE

The physical archive and paper records for the excavation will be deposited in Lincoln Museum, under the accession code TORK16. The digital archive will be deposited with the Archaeology Data Service, as an update to doi:10.5284/1018222.

Acknowledgements

The Torksey project is a collaboration of the Universities of Sheffield and York, with external partners including the Yorkshire Museum and the Portable Antiquities Scheme. The project directors are Professor Dawn Hadley (University of Sheffield), and Professor Julian Richards (University of York).

Funding for the excavation was provided by the Society of Antiquaries of London, the Universities of Sheffield and York and the Robert Kiln Trust. Permission to undertake the excavation was granted by Rodger and Alison Brownlow of Kettlethorpe.

The TORK16 excavation was undertaken by Wessex Archaeology (North) on behalf of the Universities of Sheffield and York, and thanks are due to Andrew Norton, Regional Manager North. On-site academic direction was undertaken by Julian Richards, with excavation supervision by Philip Weston and assistance from Hannah Holbrook. University of Sheffield postgraduate students Paula Allen, Alexandra Kriti, Kristen Schlesak, and Tegid Watkin provided excavation assistance. Paula Allen and Charlotte Howsam assisted with post-excavation finds processing. Invaluable support was also provided by freelance metal detector users, Dave and Pete Stanley and Neil Parker.

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Plates

Plate 3: Romano-British ditch (124); west facing section, also showing depth of plough soil

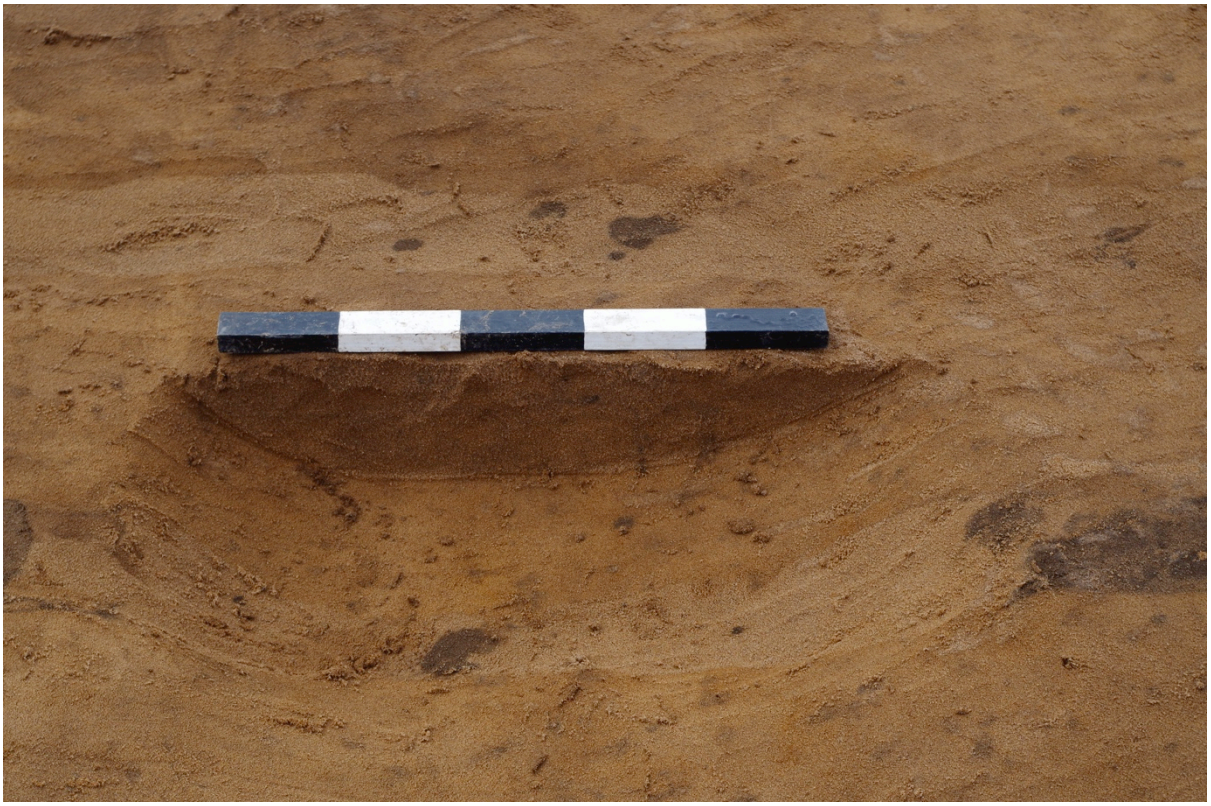

Plate 4: Romano-British ditch (104); east facing section

Plate 5: Pit 121; east facing

Plate 6: Pit 122; east facing

Plate 7: Pit 123; west facing, showing upper and lower fills

Appendix A: Context register

Context	Type	Description	Context group	Interpretative group	Dimensions	Depth
100	Layer	Topsoil across site: mid, slightly greyish orange brown sandy loam				0.00 m - 0.60m
101	Layer	Natural sand: mid to light yellowish brown sand with a little silt				N/A
102	Cut	Ditch cut: linear U-shaped slot	124		<15m x 1.4m	0.4m
103	Fill	Ditch fill: light brown loose sand	124		<15m x 1.4m	0.4m
104	Cut	Ditch cut: linear slot			<5m x 0.6m	0.12m
105	Fill	Ditch fill: mid brown loose sand			<5m x 0.6m	0.12m
106	Cut	Pit cut: sub-circular with steep sides and concave base	122		2.2m diam	0.75m
107	Fill	Pit fill: mid orangish-brown sand with charcoal flecks	122		2.2m	0.75m
108	Cut	Pit cut: sub-circular with steep sides and concave base	121		2.2m-2.35m	0.95m
109	Fill	Pit fill: mid reddish-orangish brown with occasional stones	121		2.2m	0.75m
110	Cut	Pit cut: oval with steep sides and concave base	123		1.42m-2.1m	0.3m
111	Fill	Pit fill: very dark grey/black sand with 60% charcoal	123			0.18m
112	Cut	Pit cut: circular with steep sides and flat base	121		2.5m diam	0.9m
113	Fill	Pit fill: mid brown sand with 10% charcoal	121		2.5m	
114	Cut	Pit cut: circular with moderate slope and flat base	122		2.7m	0.77m
115	Fill	Pit fill: mid brown sand with 10% charcoal	122		2.7m	0.77m
116	Cut	Pit cut: oval with steep sides and concave base	123		1.42m-2.1m	0.3m
117	Fill	Pit fill: very dark grey/black sand with 60% charcoal	123			0.18m

118	Cut	Ditch cut: linear U-shaped slot	124		<15m x 1.25m	0.46m
119	Fill	Ditch fill: light brown loose sand	124		<15m x 1.25m	0.46m
120	Cut	Plough scars, running N-S and E-W			<40m x 0.1m	0.15m
125	Fill	Basal pit fill: mid to dark reddish brown silty sand	123			0.16m
126	Fill	Basal pit fill: mid to dark reddish brown silty sand	123			0.16m

Appendix B: Context groups

Group number	Interpretative category	Constituent elements
121	Pit	108, 109, 112, 113
122	Pit	106, 107, 114, 115
123	Pit	110, 111, 116, 117, 125, 126
124	Ditch	102, 103, 118, 119

Appendix C: Finds catalogue for all finds given individual database numbers

DB no	Context	Material	Description	Length (mm)	Width (mm)	Weight (gms)	Easting	Northing
2279	100	Pb	Sheet, with grooves?	21	9		483559	380610
2280	100	Fe	Corner bracket with rivet?	37	29	12	483560	380603
2281	100	Fe	Unident frag				483562	380602
2282	100	Cu	Tack	9	5		483560	380601
2283	100	Cu	Strip	29	7		483552	380599
2284	100	Fe	Domed pin head; Cu plated?	11	11		483558	380598
2285	100	Pb	Gaming piece				483550	380594
2286	100	Cu	Mount	10	3		483557	380594
2287	100	Jet?	Blunt point; decorated?	17	5		483555	380593
2288	100	Cu	Folded strip				483552	380593
2289	100	Cu	Sheet with folded ends	18	10		483559	380589
2290	100	Cu	Coin: Elizabethan?				483557	380588
2291	100	Cu	Styca: Wigmund: Coenred				483557	380588
2292	100	Cu	Stud				483557	380588
2293	100	Fe	Nail head	30	28		483557	380587
2294	100	Cu	Rod	37	3		483551	380587
2295	100	Cu	Strip, bent		4		483557	380586
2296	100	Fe	Tapered bar - sword hilt?	100	20	95	483554	380585
2297	100	Fe	Slag	155	100	330	483564	380585
2298	100	Fe	Large stud	95	60	230	483560	380583
2299	100	Cu	Styca: Æthelred II: Coenred				483560	380583
2300	100	Cu	Mount, with cross	10	6		483563	380580
2301	100	Cu	Stud				483557	380580
2302	100	Fe	Chain corroded - 4-5 links	93	33	140		
2303	100	Fe	Sheathing, with 1 rivet	62	60	90		
2304	100	Fe	Spike	110	11	26		
2305	100	Fe	Bar	75	20	90		
2306	100	Fe	Wedge	61	16	40		
2307	100	Fe	Strip	75	7			
2308	100	Fe	Plate fragment (cast iron)	36	37	60		
2309	100	Fe	Spike	155	13	80		
2310	100	Fe	Horseshoe fragment	115		130		
2311	100	Fe	Stud, badly corroded	22	22			
2312	100	Fe	Sword pommel knop	62	46	100		
2313	100	Fe	Sword pommel? / Slag	70	60	290		
2314	100	Fe	Nail	70				
2315	100	Fe	Nail	62				
2316	100	Fe	Nail	65	12			
2317	100	Fe	Nail	70	11	12		
2318	100	Pb	Possible vessel rim	93	40	75		
2319	100	Stone	Neolithic Langdale Axe			150		
2320	100	Fe	Fitting	46	8			
2321	100	Fe	Nail shank	46	9			
2322	109	Fe	Slag concretion			300		
2323	113	Fe	Strap, possibly hinge	85	20	40		
2324	113	Fe	Slag			100		
2325	119	Fe	Slag			126		

Appendix D: Pottery catalogue, by Gareth Perry

ID	context	cname	sub fabric	form type	sherds	vessels	weight	decoration	part	description	earliest date	latest date	condition
1	100	Romano-British grey wares		Large bowl	2	2	149	One sherd with groove decoration	Rim		40	400	
2	100	Romano-British grey wares		Jar	1	1	32		Rim		40	400	
3	100	Romano-British grey wares			10	10	73		BS	Various body sherds	40	400	
4	100	Romano-British grey wares		Thin-walled vessel/jar	1	1	5		BS	Neck of vessel	40	400	
5	100	Romano-British grey wares			1	1	5	Applied decoration	BS		40	400	
6	100	Romano-British grey wares		Pedestal jar	1	1	15		Base		40	400	
7	100	Roman			1	1	5		BS				
8	100	Samian ware			2	2	6		Rim		60	250	
9	100	Samian ware			1	1	7		BS		60	250	
10	100	Iron Age	?ID - ESAX?		1	1	11		BS				
11	100	Iron Age	?ID		1	1	15		BS				Abraded
12	100	Torksey ware	?ID		1	1	10		BS		850	1100	Burnt and very abraded
13	100	Brown glazed earthenware			5	5	68		BS	Various body sherds	1550	1800	
14	100	Brown glazed earthenware			2	2	42		Base		1550	1800	
15	100	Unspecified English Stoneware			1	1	10		BS		1750	1900	
16	100	Unidentified late medieval wares	?ID - Nottingham/Lincolnshire ware?		2	2	4	One sherd glazed with ridges	BS		1350	1550	
17	100	Unidentified late medieval wares	?ID - Nottingham/Lincolnshire ware?		1	1	16		Handle		1350	1550	
18	100	Nottingham glazed ware			1	1	21	Relief horizontal line	BS		1250	1500	
19	100	Imported stoneware (unidentified)	?ID		1	1	13	Stamped linear decoration	BS		1450	1900	Burnt
20	100	Imported stoneware (unidentified)	?ID		1	1	12		Rim		1450	1900	
21	100	Imported stoneware (unidentified)	?ID	Jar? Bellarmine?	1	1	8		BS		1450	1900	
22	100	Imported stoneware (unidentified)	?ID		1	1	5	Stamped/relief decoration - person within zigzag border	BS		1450	1900	
23	100	Black-glazed wares			1	1	3		BS		1550	1750	
24	100	Cistercian-type ware			1	1	6	Relief decoration	BS		1480	1650	
25	100	Miscellaneous types			1	1	4		BS		400	1900	
26	100	Ceramic building material		Tile	4	4	108		BS	Various fragments - roof tile? - one with hole			
27	103	Roman			2	2	3		BS				
28	109	Romano-British grey wares			4	4	24	One sherd with relief horizontal line - triangular profile	BS		40	400	
29	109	Iron Age			1	1	2		BS				
30	111	Roman		Small bowl	1	1	7		Rim				
31	113	Romano-British grey wares			4	4	14		BS	Various body sherds	40	400	
32	113	Romano-British grey wares		Bowl	1	1	37		Rim		40	400	
33	119	Roman		Pedestal bowl	1	1	9		Base				Base worn from use
34	119	Roman		Thin-walled vessel	1	1	2		BS				
35	119	Roman			2	2	22		BS				

Appendix E: Ironwork catalogue, by Patrick Ottaway

Weaponry

2312. Sword pommel knop. Convex base, stylised animal head at each side, central slot tapers from base to top. Slightly raised disc on each face, indented in centre. Height 46mm, W.62mm, T.15mm

Tools

2306. Wedge. It has a slightly burred head. L.61mm, W.16mm, T.15mm

Structural Fittings

Nails

2293. Head

2314. L.70mm

2315. L.62mm

2316. L.65mm

2317. L.70mm

2321. Shank

Other fittings

2298. Stud. Roughly diamond-shaped, domed head. L. c.95mm, W. of head 60mm

2302. Four interlinked tear-drop shaped chain links. Each one L.42mm, W.26mm

2303. Sheathing for wooden object. Exists as two roughly D-shaped plates held together by short pins at the straight end. L.62mm, W.60mm, T.18mm

2320. Incomplete fitting. Originally pierced at each end before narrowing towards the centre where it is raised into a low triangular shape. Plated with non-ferrous metal, probably tin alloy. L.46mm, W.8mm, T.7mm

2323. Incomplete strap, possibly part of a hinge. Narrows from the broken end to a rounded pierced terminal. L.85mm, W.20mm

Pin head

2284. Domed pin (or tack) head. Plated with non-ferrous metal.

Horseshoe

2310. Left branch curved over at the tip to form calkin, fullering groove along the edge pierced four times (two nails in situ).

Other objects

2280. Fragmentary object which exists as strip with two perpendicular projections. Plated with non-ferrous metal. L.37mm, W.29mm

2296. Bar. Tapers towards one end where broken. L.100mm, W.20mm, T.15mm

2304. Tapering spike which curves over at the thicker end, rectangular (?) cross-section. L.110mm, T.11mm

2305. Bar of rectangular cross-section which tapers slightly. L.75mm, W.20mm, T.16mm

2307. Strip of rounded cross-section with a pointed tip and head slightly looped. L.75, T.7mm

2309. Curved spike of rounded cross-section. L.155, T.13mm

Fragments

2281, 2308 (cast iron) and 2311.

Also slag: 2297, 2313(?), 2322, 2324-5

Appendix F: The Animal Bones, by Lenny Salvagno

ID	Context number	Species	Anatomical element	Part	Side	N. of frags	Fusion state	Age stage	Measurements	Notes
1	109	Cattle	Metapodial	Diaphysis		1				broken
2	109	Cattle?	Humerus	Distal Diaphysis	L	1				broken
3	109	Sheep/goat	M1/M2 lower		L	1		5A		
4	109	Cattle	Mandible with M2 andM3	Ramus	R	1		M2=k	M3: L=35.2; B=16	M3 broken
5	113	Cattle	M1 and M2 in maxilla		L	1				
6	113	Sheep/goat	M1/M2 upper		L	1				
7	113	Cattle	M3 lower		R	1				broken
8	113	Cattle	P3 upper		R	1				broken
9	113	Cattle	P4 upper		R	1				broken
10	113	Cattle	M3 lower		L	1				broken
11	113	Cattle?	Humerus	Distal Diaphysis	L	1				broken
12	113	Cattle?	Calcaneum		R	1				broken
13	113	Cattle?	Astragalus			1				broken
14	113	Sheep/goat?	Femur	Diaphysis		1				broken
15	113	Cattle	M1/M2 upper		R	1				broken
17	113	Sheep/goat	1st Phalanx			3				
18	113	Sheep/goat?	Vertebra disk fragments			3	unfused			
19	113	Sheep/goat/ roe deer?	Metacarpal			1				

Appendix G: Photographic archive

Archive number	Description	View from
TORK16_0018	Pit [108] pre-excavation	N
TORK16_0019	Pit [110] foreground; pit [106] rear	E
TORK16_0030	General site shot	NW
TORK16_0033	Ditch [102]	W
TORK16_0034	Pit [106]/[114] pre-excavation	W
TORK16_0039	Excavation of pit [106]/[114]	W
TORK16_0047	W facing section ditch [102]	W
TORK16_0051	Plan [102] ditch	W
TORK16_0054	Pit quadrant [108]	E
TORK16_0058	E facing section ditch [104]	E
TORK16_0064	Plan of ditch [104]	E
TORK16_0072	E facing section pit [106]	E
TORK16_0075	N facing section pit [106]	N
TORK16_0081	W facing section pit [114]	W
TORK16_0084	E facing section ditch [118]	E
TORK16_0087	Plan [118] ditch	E
TORK16_0090	N facing section pit [116]	N
TORK16_0093	E facing section pit [116]	E
TORK16_0099	W facing section pit [110]	W
TORK16_0102	General working shot	W
TORK16_0105	General working shot	
TORK16_0106	General working shot	SW
TORK16_0109	N facing section pit [112]	N
TORK16_0117	Plan pit [112] and [108]	E
TORK16_0473	Pete and Dave Stanley detecting	
TORK16_0478	Machining Day One	S
TORK16_0480	Machining Day One	S
TORK16_0482	Machining Day One	W
TORK16_0485	Machining Day One - second spit	S
TORK16_0487	Machining Day One - second spit	W
TORK16_0491	Machining Day One - second spit	S
TORK16_0498	Working shot - defining ditch [102]	W
TORK16_0507	Pit [110] pre-excavation	W
TORK16_0511	Pit [114] and [106] working shot	W