Archaeological excavation at Avanti Fields School Leicester

Worcestershire Archaeology

for Orion Heritage

October 2020

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AVANTI FIELDS SCHOOL THURMASTON LANE LEICESTER

Archaeological excavation report

Worcestershire Archaeology
Worcestershire Archive & Archaeology Service
The Hive
Sawmill Walk
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Worcester
WR1 3PD

SITE INFORMATION

Site name:	Avanti Fields School
Site code:	P5800
Local planning authority:	Leicester City Council
Planning reference:	20191832
Central NGR:	SK 6259 0659
Commissioning client:	Orion Heritage
Client project reference:	PN2172
WA project number:	P5800
WA report number:	2837
Oasis reference:	fieldsec1-400471
Museum accession number:	Y.A2.2020

DOCUMENT CONTROL PANEL

Version	Date	Author	Details	Approved by
1	25/09/2020	R Bradley	Draft for comment	D Hurst
2	09/10/2020	R Bradley	Curator comments	D Hurst

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Excavation at Avanti Fields School, Leicester

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Summary

An archaeological excavation was undertaken at Avanti Fields School, Leicester (NGR SK 6260 0648), between March and May 2020. The project was commissioned by Orion Heritage on behalf of BAM Construct UK, in advance of the construction of a school building and sports hall with associated external recreation areas, sports facilities, access and landscaping. Planning permission had been granted subject to a programme of archaeological works: previous geophysical survey and excavation during the past two decades had shown that surrounding extensive Iron Age settlement, as well as ridge and furrow agriculture, extended to within the site boundaries. As a result, excavation was targeted and took place in the northern part of the development, covering an area just over 0.28 hectares in size (2832m^2).

This known potential was borne out during the investigations. A small background scatter of residual worked flint provided evidence of intermittent activity on the site over a considerable period, but most of the archaeological features comprised elements of the mid to late Iron Age Humberstone 'aggregated' settlement, previously excavated during development work immediately adjacent. There was some direct overlap between features in earlier excavations and good correlation overall with the geophysical survey. Activity was defined by at least three roundhouses and an enclosure ditch and, in common with previous areas, the roundhouses were characterised by substantial encircling penannular drainage ditches but only occasional evidence for the building structure itself. The roundhouses appeared to have domestic functions, with evidence for small-scale bone-working and metal-working, and much of the pottery and worked stone was locally made and/or traded from within the surrounding area. More unusual material however, such as a charred grape pip and a small piece of blue-green glass, may be Roman items representing significant trading contacts: such finds are characteristic of later deposits throughout the Humberstone Iron Age settlement. In general, the environmental remains suggested a mixed self-sufficient farming regime, and in this particular area pastoralism was probably the main economic activity.

Although only a small area was opened, the site adds an important new contribution to the dataset previously established for the Iron Age settlement, thought to be the largest in Leicestershire. It provides comparable and complementary archaeological evidence to the other excavations nearby, and these can now be considered together to improve our understanding of later prehistoric occupation more widely.

Later activity was limited to a narrow system of plough furrows dated to the post-medieval period, as well as a series of modern intrusions associated with previous construction compounds for earlier development. Unfortunately, these had disturbed large areas of the site, thereby compromising the integrity of the archaeology in places.

Report

1 Introduction

1.1 Background to the project

An archaeological excavation was undertaken by Worcestershire Archaeology (WA) from March to May 2020 at Avanti Fields School, Leicester (NGR SK 6260 0648; Fig 1; Plate 1). This comprised one main excavation area and two additional evaluation trenches in the northern part of the overall development site, the rest of which had already been subject to evaluation trenching and topographic survey (see Walsh 2020). The project was commissioned by Orion Heritage on behalf of BAM Construct UK, in advance of the construction of a school building and sports hall with associated external recreation areas, sports facilities, access and landscaping. A planning application was submitted to Leicester City Council in 2019 and permission granted subject to a number of conditions, including a programme of archaeological works (planning reference 20191832).

The archaeological advisor to the local planning authority considered that the development had the potential to impact upon heritage assets. Extensive archaeological remains are known in the surrounding area and these extend within the development site boundaries in the form of Iron Age settlement and medieval or post-medieval ridge and furrow agriculture. A phased programme of archaeological investigation was, therefore, carried out, concluding with the excavation reported on here (see archaeological background section below).

The project conforms to a Written Scheme of Investigation (WSI) prepared by Orion Heritage (Orion Heritage 2019), supplemented by a method statement (MS) prepared by Worcestershire Archaeology in advance of the excavation (mitigation) stage (WA 2020). These were approved by the archaeological advisor to the local planning authority (Grahame Appleby). The excavation also conformed to the industry guidelines and standards set out by the Chartered Institute for Archaeologists in *Standard and guidance: for archaeological excavation* (CIfA 2014a).

1.2 Site location, topography and geology

The site is located approximately 4.3km north-east of Leicester city centre, with the overall development covering approximately 3.8 hectares (Fig 1). Archaeological excavation and additional evaluation took place in the northern part of the development site across an area just over 0.28 hectares in size (2832m^2; Fig 2 and Fig 3).

The excavation area was bounded to the north and east by recent residential development, to the south by current ongoing construction of Avanti Fields School (on what was previously agricultural land), and Thurmaston Lane and the Humberstone Heights golf course to the west. The north-west corner of the site was restricted in extent by the presence of a tree protection zone (Plate 1).

Prior to the excavation, land in this part of the development site had been largely waste ground used for pasture, incorporating extensive dumping of modern construction material and redeposited soil bunds from the adjacent residential development (Plate 2). It is apparent from modern aerial images that site compounds had been built in this area on two occasions. This had raised the ground level and also introduced some undulations into the topography, though overall it was broadly level across the area at around 98m AOD. Further to the south and to the north the ground gradually falls away into the valleys of the Scraptoft and Melton Brooks respectively, these watercourses eventually feeding into the River Soar.

The underlying geology is mapped as mudstones of the Blue Lias Formation, overlain by superficial diamicton deposits of the Oadby Member (BGS 2020).

2 Archaeological and historical background

The development site itself and the surrounding landscape have been subject to a several stages of archaeological assessment and investigation over the past 25 years, revealing a large and significant area of late Bronze Age and Iron Age activity in the north-eastern/eastern hinterland of Leicester (Fig 2; Appendix 2). Prior to the most recent stages of work (this report; see also Walsh 2020), an archaeological desk-based assessment (DBA) was undertaken by Mott MacDonald on behalf of the Education and Skills Funding Agency (Cooper and Luker 2018). This assessment examined historic mapping, previous archaeological reports, and Leicester Historic Environment Record (HER) and Historic England National Heritage List for England (NHLE) datasets to produce a baseline summary of the existing historical and archaeological information for the development site. As such, the findings presented in the DBA are used as the basis for the summary below.

2.1 Earlier prehistoric

Neolithic flint and early Bronze Age pottery have been recorded during excavations on Elms Farm (HER ref. ELC88; Charles *et al* 2000), 400m to the east of the site, and early prehistoric flint was also recovered from excavations at Manor Farm, 150m to the east (HER ref. ELC119; Thomas 2008). In addition, Mesolithic, Neolithic and Bronze Age flints were identified to the immediate north-east during archaeological excavations in 2010 (HER ref. ELC859; Harvey 2011).

Further afield, some 800 to 900m north and north-east of the site, were a series of prehistoric lithic scatters (HER refs. MLC430; MLC433; MLC880). Although these are insecurely dated, it could be expected that they will range from Palaeolithic to early Iron Age in date. Just over 1.2km to the north-east, close to the Melton Brook, a late Bronze Age or early Iron Age ditch system (possibly for livestock management) and small-scale open settlement has been investigated (Beamish and Shore 2008).

2.2 Iron Age

As noted above, the site occupies an area within a significant landscape of late Bronze Age and Iron Age activity (Appendix 2). It is possible that the focus of this was at Elms Farm to the east (excavated in 1998), where a substantial mid to late Iron Age settlement may have had origins within the remains of a middle Bronze Age enclosure (HER ref. ELC88; Charles *et al* 2000). This settlement, comprising roundhouses with adjacent enclosures, appeared to have at least three phases. Alongside a considerable pottery assemblage and evidence of iron production, widespread trading links were also indicated through the presence of silver coins of the Roman Republic (dated to 154BC and 32–31BC; see Charles *et al* 2000).

Geophysical survey and trial trenching demonstrated the continuation of this occupation to the west into the Manor Farm area, effectively forming the Humberstone ‘aggregated’ Iron Age settlement (perhaps more than 8ha in size, making it the largest in Leicestershire). Subsequent excavation (2001 to 2002 and in 2007) revealed an extensive area of mid to late Iron Age open settlement consisting of roundhouses and enclosures in a broadly linear spread to the south of an east–west boundary ditch, as well as another area of occupation further to the south within a sequence of large enclosures (HER ref. ELC119; Thomas 2008). The artefactual and environmental evidence was comparable to the Elms Farm site. There was a substantial pottery and animal bone assemblage, as well as evidence for craft activities: the site was also part of a wider network of trade and exchange, with a Kentish bronze coin (a potin) recovered (Thomas 2008).

Additional investigation from 2009 onwards has established that the settlement activity observed on the Elms Farm and Manor Farm sites continued further west again, onto land directly north and north-east of the current Avanti Fields School development. An initial geophysical survey revealed an enduring pattern of linear occupation concentrated alongside the same boundary ditch, suggesting that this further extension of the Humberstone Iron Age settlement meant that it covered an area up to 700m long in total (HER ref. ELC403; Butler 2009). As a result, following various stages of trial

trenching (HER ref. ELC806; Harvey 2010), two adjoining excavation areas were completed (HER ref. ELC859; Harvey 2011; HER ref. ELC897; Higgins 2015). These excavations revealed that the linear boundary delineates the northern extent of the settlement, marking a significant landscape division, and that it appears to have had at least three phases of remodelling. The roundhouses and enclosure ditches were again dated to the mid to late Iron Age, with indications that the latest phase of activity on site was within the early 1st century AD. Evidence for craft activities also reflected that seen elsewhere within the settlement, with querns, furnace bases and metal-working waste recovered: in addition, a possible zoned area associated with pottery production was identified to the rear of a roundhouse (Harvey 2011; Higgins 2015).

2.3 Romano-British

There is a Roman field system recorded to the east of the site (HER ref. MLC2263), and an unstratified 2nd century Roman brooch as well as a group of Neronian coins in the top of an Iron Age ditch were recovered during the Manor Farm excavations (HER ref. ELC119; Thomas 2008). Further Romano-British evidence is recorded 900m to the south-west, comprising pottery sherds (HER refs. MLC2699; MLC584) and a cremation burial (HER ref. MLC587). Overall, however, there is limited indication of Roman activity in the vicinity, and it would appear that there was a cessation of occupation on the Humberstone Iron Age settlement in the early part of the 1st century AD, prior to the Roman conquest. The site was thereafter likely to have been largely agricultural land in the wider hinterland surrounding Roman Leicester, an important regional centre.

2.4 Anglo-Saxon and medieval

Although unstratified, a 6th-century Anglo-Saxon brooch and a decorated medieval buckle plate fragment were found during the Manor Farm work, east of the current site (HER ref. ELC119; Thomas 2008). Elsewhere, around 700m to the south, what was the village of Humberstone (now Old Humberstone Conservation Area) is thought to have Anglo-Saxon origins, and a boundary ditch and trackway were uncovered on Main Street (HER ref. MLC1350). Humberstone was within the Hundred of East Goscote and first appeared as '*Hunboerhts stan*' (stone), before being identified as '*Humerstan*' in the Domesday records (Morgan 1979). There were two manors associated with village, dating to at least the 12th century (Rahtz 1959).

Throughout the medieval and post-medieval periods, the landscape remained rural, and it was not until the later 19th century that the village become incorporated into the city boundaries of Leicester. As such, for a considerable period the agricultural land in the surrounds of Humberstone was an integral part of the local manorial holdings. Parts of the medieval ridge and furrow field system still survive in pockets close to the village, and, until more recent development, elements remained as upstanding earthworks to the north (Harvey 2011), across the development site itself (HER ref. MLC2707; Walsh 2020), and on land to the east (Thomas 2008).

2.5 Previous archaeological work on the site

As previously mentioned, the site, and land to the immediate north and north-east (now developed for residential use), was subject to a geophysical survey undertaken by Northamptonshire Archaeology in 2009 (HER ref. ELC403; Butler 2009). The excavation areas completed by University of Leicester Archaeological Services (ULAS) prior to the previous development are directly adjacent to the current excavation (HER ref. ELC859; Harvey 2011; HER ref. ELC897; Higgins 2015; see Fig 2 and Fig 4).

The archaeological desk-based assessment (DBA) undertaken by Mott McDonald for the overall development site at Avanti Fields School (Cooper and Luker 2018) preceded another stage of work prior to this excavation. Archaeological evaluation and topographic survey of extant ridge and furrow was completed by Worcestershire Archaeology (WA) between September and November 2019, covering the area of the development south of the pre-defined excavation area (Walsh 2020). Only a small number of Iron Age features were identified; these were thought to be peripheral landscape components not representing a direct continuation of the settlement, suggesting that the geophysical survey had accurately determined the extent of occupation areas.

3 Project aims and objectives

The principle aims of the archaeological excavation stage were set out in the Written Scheme of Investigation (Orion Heritage 2019) as follows:

- determine the presence or absence of archaeological remains;
- determine the character, extent, date, complexity, integrity, state of preservation and quality of any archaeological remains present, therefore ensuring their preservation by record

The general objectives for the excavation stage were to ensure:

- the protection and recording of archaeological assets discovered during the archaeological works;
- that any below-ground archaeological deposits exposed are promptly identified; and
- the recording of archaeological remains, to place this record in its local context and to make this record available.

The WSI also stated that further, more detailed, research aims may be generated from the results of the fieldwork, specifically in relation to the East Midlands Updated Research Agenda (Knight *et al* 2012).

4 Project methodology

The Written Scheme of Investigation (WSI) for the archaeological investigations on the development site was prepared by Orion Heritage (Orion Heritage 2019). Following a stage of evaluation and topographic survey (Walsh 2020), this was supplemented by a specific method statement (MS) prepared by Worcestershire Archaeology for the excavation (mitigation) stage (WA 2020).

One main excavation area, amounting to just over 2500m² in size, was opened in the northern part of the development site. Two additional evaluation trenches, both 20m long, covered a block of land approximately 332m² in size just to the south of the excavation. These were numbered in sequence (as Trench 14 and Trench 15) with the recent Worcestershire Archaeology evaluation (Walsh 2020) and positioned between evaluation Trench 1 and Trench 2 of this earlier work. Completion of the additional trenches confirmed the absence of significant archaeology south of the well-established Iron Age settlement and resolved the potential requirement for any further mitigation works in this area, following discussion between Orion Heritage and the archaeological advisor.

Excavation was initially undertaken between 2nd March and 24th March under standard conditions. However, fieldwork was then terminated following a UK government announcement on 23rd March which outlined measures to control the COVID-19 pandemic. As a result, a small project team returned to site between 27th April and 5th May to complete the excavation under strict guidelines and risk management safety procedures. A portion of the site had been left fenced and secured for the intervening period and the archaeological record of this block was not compromised, excepting that the ground had dried and cracked considerably. A few small mapped but unexcavated features in the south and south-west of the site area (approximately four small pits and two small gullies) had, however, been removed/covered during ongoing development works.

Deposits considered not to be significant were removed under constant archaeological supervision using a 360º tracked excavator, employing a toothless bucket. Due to the compromised nature of the ground in large parts of the excavation area – a result of extensive dumping of modern construction material from adjacent residential development – initial deposit removal was completed in three main stages: turf and redeposited topsoil; construction waste and modern levelling layers; any surviving subsoil. From the outset, it was clear that the waste material, as well as embedded concrete slabs/post bases and compacted modern deposits, had affected the integrity of some features, with possible contamination and intrusive material (Plate 2; Plate 3). This affected where archaeological

interventions could be productively achieved. It also demonstrated that the archaeological horizon had suffered truncation from various sources in the recent past.

Following removal of the overlying layers, subsequent archaeological excavation was undertaken by hand. Clean surfaces were inspected, and selected deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were recorded according to standard Worcestershire Archaeology practice (WA 2012) and trench and feature locations were surveyed using a GNSS device with an accuracy limit set at <0.04m. On completion of excavation, the area was left for reinstatement by BAM Construct UK, who were on site with works in progress for the ongoing school construction.

4.1 Post-fieldwork analysis

All fieldwork records were checked and cross-referenced. Analysis was undertaken through a combination of combination of structural, morphological, artefactual and environmental evidence, allied to the information derived from other sources such as scientific dating.

A database of all records was created, and a phased matrix was completed after the fieldwork. Interpretation of the structural sequence was further developed by combining contexts into associated elements as context groups (such as a series of related postholes, or a roundhouse, or an enclosure) to form higher level reference and interpretation units. These are denoted throughout the following text as ‘CG’ followed by a reference number. Taking into consideration the wider context, and due to the small overlap between features, the roundhouses and enclosures forming the known Iron Age settlement identified in this stage of work have been numbered in a consistent sequence with those recorded by ULAS on the immediately adjacent sites (see Harvey 2011; Higgins 2015).

The project archive is currently held at the offices of Worcestershire Archaeology (Appendix 1). Subject to the agreement of the landowner it is anticipated that it will be deposited with the Leicester City Museum and Galleries service under the accession number Y.A2.2020.

5 Archaeological results

5.1 Introduction

The features recorded in the excavation area are shown in Figures 3–10 and Plates 1–15.

The following section describes these by archaeological phase, with sub-division by reference to the main feature or any associated feature where necessary.

5.2 Phasing descriptions

5.2.1 Natural deposits across the site

The natural deposits were consistent across the site, comprising a mid to light yellow brown clay with frequent of limestone and flint pebbles (Plates 1–3). In places, there were patches of underlying blue-grey clay visible. This reflects the British Geological Survey (BGS) mapping.

5.2.2 Phase 1: early prehistoric

No features could be securely attributed to this phase, but flint dating from the Upper Palaeolithic period to the Bronze Age was present as residual material. This flint was recovered from deposits within Iron Age features, furrows, and in the redeposited topsoil, suggesting at least some level of limited early prehistoric activity in the vicinity that has been truncated by later land use. Although not conclusive, it is possible that a portion of the prehistoric flint may represent examples of a limited, informal flint-working practice during the Iron Age.

5.2.3 Phase 2: mid to late Iron Age

As anticipated, the majority of the archaeological features on the site could be identified as elements of the mid to late Iron Age Humberstone ‘aggregated’ settlement, previously excavated during work

immediately adjacent and on other nearby sites (Fig 3; Fig 4). There was even some direct overlap between features in these earlier excavations and the northern parts of the current site (e.g. Roundhouse 1 and 2; Harvey 2011) and good correlation overall with the geophysical survey (Butler 2009).

Despite truncation from both ridge and furrow agriculture (Phase 3) and modern construction (Phase 4), which was extensive in places, the Iron Age archaeology was relatively well-preserved (Fig 3; Plate 3).

Roundhouse 1 (CG08)

Roundhouse 1 was represented by a small section of ditch visible in the north-eastern corner of the site, clearly being a further part of the partial penannular ditch located at the southern edge of a previous excavation area (Harvey 2011, 17–18). It aligned well with a clear geophysical anomaly and probably had an overall external diameter of just over 16m. A substantial portion of this roundhouse appears to have been lost to recent residential development, although this specific area is now garden space, suggesting that the archaeology may not have been wholly removed.

Due to the position against the limit of excavation the ditch could only be partially investigated during this excavation: it was, however, at least 1m in width. The ditch contained a greyish brown silty clay fill with a small assemblage of occupation debris comprising heat-cracked stone, charcoal, animal bone and mid to late Iron Age pottery (fill 2031).

Roundhouse 2 (CG01)

Roundhouse 2, in the northern portion of the site, again matched a geophysical anomaly and could be seen as a continuation of two segments of penannular ditch identified at the western edge of a previous excavation area, forming a roundhouse with an east/east-south-east facing entrance (Harvey 2011, 24–26). In this case, the alignment of the ditches between areas was not exact (possibly due to survey anomalies, or a visual distortion due to the gap in excavation areas and/or furrow truncation), but comparison with the geophysical survey suggests that, together, they formed a roundhouse measuring around 14.5m in external diameter (Fig 5).

The ditch was variable (Fig 6), generally with a moderately sloping concave profile up to 0.60m in width and 0.31m in maximum depth, but had been subject to some furrow truncation, as well as being partly damaged by modern pits filled with construction waste (Plate 2). There were clear indications of maintenance, with an initial re-cut along part of the ditch length, then a partial realignment with a new terminus created, perhaps demarcating a change of entrance into the roundhouse area. This had also subsequently been re-cut.

Throughout this roundhouse, the primary phases of the ditch had lighter, brownish-yellow fills that appeared to be derived from natural siltation (likely necessitating later maintenance): in contrast, the secondary phases had noticeably darker brownish grey fills, with more charcoal and artefactual evidence (Plate 4). The later, darker fills included heat-cracked stone, animal bone and moderate amounts of mid to late Iron Age pottery, though there was a larger group of pottery from a slot in the southern side of the ditch (fill 2019). This was characteristic of deliberate infilling, perhaps closure deposits, following end of use for the roundhouse. The evidence of the profile, the re-cutting, and the infill process combined suggests that the ditch does not represent the remains of foundations for the roundhouse building itself, but rather is an encircling eaves-drip or drainage ditch. Environmental evidence indicated that the ditch and surrounds was likely to have been at least periodically waterlogged, with some standing water.

Internal to the surrounding ditch, probably the only surviving structural element of the roundhouse, was a single off-centre posthole (2024). This was sub-oval in plan – 0.81m by 0.72m in size, and up to 0.28m in depth – with a flat base and had been packed with limestone and flint cobbles to support a post (Fig 6; Plate 5).

Just over 3m to the west of the roundhouse, probably to the rear of the building and likely associated, was a shallow oval pit. It had a homogenous dark brownish grey fill but was only 0.1m in depth and lacked finds. It is possible that furrow truncation was a factor in this poor survival.

Roundhouse 8 (CG02)

Roundhouse 8 was prominent as the most substantial and most visible roundhouse identified within this stage of work. Located in the eastern half of the excavation area, it consisted of a large complete penannular drainage ditch around 17m in external diameter, with termini forming an east/east-south-east facing entrance up to 4.66m wide (Fig 7; Plate 3). There were also internal structural features, such as a curving foundation slot, a small antenna gully/partial enclosure extending from the entrance, and a larger contemporary enclosure extending from the north-western side (termed Enclosure D (CG03), see below). All of this corresponded with anomalies highlighted by the geophysical survey. There was some truncation from ridge and furrow agriculture, but also a number of damaging intrusions containing modern construction waste from the adjacent residential development.

The surrounding ditch was of two phases. The original form was small and shallow, probably an eaves-drip gully: this was a maximum of 0.68m in width and 0.17m deep and had lighter, yellow-brown fills with a limited amount of mid to late Iron Age pottery and animal bone within. The second phase redefined this on broadly the same footprint but was far more substantial, clearly cut as a large drainage ditch that also interlinked with Enclosure D. Where it had survived without later truncation, the ditch had a well-defined V-shaped profile, with steep sloping sides and a narrow but rounded base, up to 1.17m wide and 0.84m deep (Fig 8; Plate 6). This became shallower and more concave at both the northern and southern entrance terminals, though these were potentially affected by a furrow across the top (Plate 7). The fill sequence was broadly consistent around the length of the ditch, with a lower blue-grey silty clay deposit resultant from persistent waterlogging in the base, brownish-yellow redeposited natural (probably from weathering of the sides), then a humic, artefact rich, dark brownish grey upper backfill. This final deposit was again characteristic of deliberate infill of waste post-use, with environmental indicators suggesting the presence of midden or latrine material, as well as deposition of crop processing waste. Heat-cracked stone fragments were apparent throughout, as well as larger limestone cobbles: the lower redeposited fills contained rare charcoal flecking, occasional animal bone and some iron slag; the upper backfills had abundant quantities of charcoal, animal bone and mid to late Iron Age pottery (a lot of which was decorated), as well as a broken saddle quern, fired clay, iron slag forming part of a furnace base, and copper alloy waste.

Internally, this roundhouse contained clear elements of the structural foundations for the building itself. Along the southern side was a curving foundation slot, around 12m in length, that had a sharp, narrow U-shaped profile with near-vertical sides and a slightly rounded base (up to 0.44m wide and 0.30m maximum depth; Fig 8). This was filled with a dark greyish-brown compact silty clay with frequent pottery, animal bone and heat-cracked stones (Plate 8). A large proportion of the mid to late Iron Age pottery from this feature came from the eastern terminus (fill 2192), where several near-complete vessels had been deposited; these may be considered indicative of some structured deposition on site.

There was no comparative foundation slot in the northern half of the roundhouse, probably due to modern truncation, though an oval pit or posthole was located close to, or just inside, the projected alignment (2164; Plate 9). This feature contained a dark charcoal-rich fill with fragments of fired clay and pottery, as well as a part of an iron object and some burnt animal bone (fill 2165). It is possible that this formed part of the foundations, or perhaps was an internal hearth, though there was no obvious *in situ* burning evidence. From the fill, a sample of animal bone was radiocarbon dated 390–170 cal BC (2220±30BP; Beta-566202): this corresponds with the pottery from the site and the nature of the archaeology, as well as being consistent with scientific dating of other parts of the Humberstone Iron Age settlement. Unusually, a small piece of charred grain from the same fill produced a rather anomalous later Roman date of cal AD 230–410 (1750±30BP; Beta-566201). This is difficult to

satisfactorily resolve, although, given the consistency of all the surrounding evidence demonstrating a mid to late Iron Age settlement site, it is considered most likely that this piece of grain is intrusive from later agricultural disturbance and/or truncation.

Two further postholes were located inside the projected perimeter of the foundation slot, just to the north of the eastern terminus. These posthole bases – 2174 and 2191 – were only 0.11m and 0.06m in depth but did contain some packing stones; they were 1.47m apart and probably mark the location of doorframe posts, or were part of a small porch at the entrance into the roundhouse.

External to the roundhouse, at the rear of the building and outside of the surrounding drainage ditch, was a small, sterile pit or posthole (2199), only 0.10m in depth. Close to the northern terminus of the roundhouse entrance, on the eastern side, was a small antenna gully. This was concave in profile, 0.42m wide and 0.21m in depth, becoming wider and shallower where it terminated at the edge of the roundhouse. Posthole 2206 was positioned in this terminus, suggesting that perhaps this gully formed a partition or was part of a fenced paddock; the geophysical survey indicated that it may turn to the north and enclose a small area between Roundhouse 8 and Roundhouse 1 (CG08).

Enclosure D (CG03)

Enclosure D was contemporary with Roundhouse 8, with the south-eastern side of the enclosure effectively forming the north-western side of the roundhouse drainage ditch, and, therefore, constructed as part of a designed complex (Fig 7). It extended beyond the northern limit of excavation into an access road and driveway of the recent residential development; as a result, a disturbed part of the base of the northern segment of the ditch could be seen in the section of the excavation area, effectively lost to modern truncation (Plate 10).

Externally, this sub-rectangular enclosure was 17m long and 11.5m wide, enclosing a space approximately 15m by 8.80m in size (just over 132m^2 in area). An entrance gap 2.40m wide, defined by rounded terminals, faced west/west-south-west, broadly opposite to the roundhouses (Plate 10). There were no contemporary internal features.

The ditch was largely consistent in profile, being a wide V-shape with moderately steep sides narrowing to a slightly concave rounded base, up to 1.28m wide and 0.87m in depth (Fig 8; Plate 11). It was smaller in part of the south-west section however, where it was badly disturbed by a concrete slab that had been part of a recent construction compound. The ditch fills suggested a single-phase construction, with no indication of re-cutting, and exhibited a sequence of deposits that was, as expected, largely comparable to the contemporary roundhouse. Basal fills comprised blue-grey and orange-grey silty clay deposits resultant from waterlogging, with rare animal bone and pottery; these were then overlain by greyish and brownish-yellow mixed redeposited natural fills, some of which contained animal bone and mid to late Iron Age pottery. At the south-east corner in particular, the junction with Roundhouse 8 (CG02), a substantial assemblage of partial vessels had been deposited alongside animal bone (fill 2096; allocated to Roundhouse 8; Plate 12). A final humic, dark brownish grey upper backfill was present around the enclosure, particularly in the termini, with large amounts of heat-cracked stone and other cobbles. This deposit comprised a deliberate dump of waste material, rich in mid-late Iron Age pottery, animal bone and fired clay, also including fuel waste, copper alloy fragments and daub with wattle impressions.

Roundhouse 9 (CG04)

Roundhouse 9 was defined by a partial penannular ditch in the western part of the site, extending beyond the limit of excavation into a tree protection zone which meant that just under a third of the roundhouse was not investigated (Fig 9; Plate 1). This continuation is clearly visible on the geophysical survey. There was some truncation of the roundhouse from ridge and furrow agriculture, but far less modern disturbance in this part of the site. Although not as large as Roundhouse 8 (CG02), the drainage ditch was again prominent at just over 15m in external diameter, with rounded termini forming an east/east-south-east entrance that was 4.22m wide. It is noteworthy that the centre point of this entrance almost directly aligns with Roundhouse 8 (CG02) to the east, and there is

enough space between the two main roundhouses (Roundhouse 8 and 9) and Enclosure D (CG03) to suggest that they may all relate to one contemporary block of settlement.

Comparable to Roundhouse 2 (CG01), there were clear indications of maintenance: the ditch had been intermittently re-cut on several occasions, with a slightly different pattern in the southern part compared to the northern segment. This adjustment and partial re-cutting had created an irregular shape overall (Fig 10; Plate 13).

The earliest phase of the southern extent of the ditch cut though a shallow and sterile pit of uncertain use on the outer edge (pit 2126). Here, and along the rest of this side excepting the terminus, an original ditch and a re-cut were up to 1.37m wide and 0.50m in depth, with greyish and brownish-yellow mixed redeposited natural fills, the upper parts of which contained a limited amount of animal bone and mid to late Iron Age pottery. This was mirrored on the northern side, where the first phase of the ditch and re-cut were up to 1.20m wide and 0.32m in depth. Thereafter a partial realignment of the drainage ditch occurred on a slighter smaller footprint, itself also re-cut in some places, although the south side of the terminal entrance remained unaltered. This later phase was 0.83m wide in the south and 0.70m wide in the north, and up to 0.35m in depth. The re-aligned ditch once again had initial fills that were light brownish-yellow in colour and fairly sterile, whereas the final infilling of the re-cut was a darker grey, with more charcoal and artefactual evidence (Plate 14). Finds from the later fill included heat-cracked stone, animal bone, fired clay, and moderate amounts of mid to late Iron Age pottery. As with the other roundhouses and the enclosure, this was characteristic of deliberate infilling following the end of use for the roundhouse. Notable finds in the southern terminal entrance included a charred grape pip, uncharred fig seeds, and a small piece of blue-green glass: these are thought to be Roman in origin and may be demonstrative of significant trading contacts for the site in the later Iron Age (as also seen at both the Elms Farm and Manor Farm parts of the settlement; see Charles *et al* 2000 and Thomas 2008). Alternatively – given the unexpected and inconsistent radiocarbon date from Roundhouse 8 – they perhaps show that parts of the site continued in use until later than the archaeological evidence would indicate, or these may be intrusive and result from agricultural and modern disturbance. It must be considered, however, that it would be very fortuitous for such finds to survive out of context for any length of time and then later be grouped together in an Iron Age ditch.

Internally, Roundhouse 9 contained a loose arrangement of postholes, pits and an internal gully that could represent structural foundations, although this was not clear. They mainly followed the internal edge of the southern part of the drainage ditch and were shallow, typically 0.10m to 0.20m in depth and lacking in artefacts. The exception to this was circular posthole 2113, which was 0.43m in diameter and 0.35m in depth, with a clear angled post-pipe surrounded by packing material.

Two further postholes – 2093 and 2095 – were located slightly off-centre but in line with the entrance to the roundhouse: these were shallow at only 0.07m and 0.08m in depth respectively, and may variously be interpreted as the base of central posts for stabilising the roof apex (or as repairs), part of a post-ring structure for the main walls of the roundhouse, or an internal post-ring. At 2.68m apart, they are unlikely to represent doorframe or porch posts.

External pits and postholes associated with Roundhouse 9 (CG07)

A group of features situated to the immediate south and south-west of Roundhouse 9 (CG04) may have been contemporary with the building, although this remains unconfirmed. Against the southern edge of the drainage ditch was a small circular posthole (2137), 0.20m in depth, that had cut the original phase of the ditch after it had silted up. Nearby, and again very close to the original phase of the ditch but in this case not cutting it, was a large oval post-socket, 1.10m by 1m in size and 0.53m in depth (2141; Fig 10; Plate 15). This feature had been packed with stones and redeposited natural in order to hold a substantial post, perhaps for an external repair to the roundhouse. The packing included re-used saddle quern fragments, and the upper fill of this post-socket contained a moderate assemblage of mid to late Iron Age pottery, animal bone, fired clay, and a further piece of broken quern. Conspicuous as the most substantial and best preserved discrete feature identified within this

stage of work, there were similarities between this and the structural posthole internal to Roundhouse 2 (CG01), further north (2024; Plate 5).

Further to the north-west, a pair of small post-holes (2154 and 2157) were located 1.85m apart. These had differing profiles but were both near circular in plan and with visible post-pipes, 0.30m and 0.27m in depth respectively. It is possible that they represent the truncated remains of a two-post structure. A similar pair of features was mapped around 6m further west, but these were unexcavated.

Just over 4.5m to the south of Roundhouse 9 (CG04) was another stone-packed posthole, 1m by 0.74m in size, and up to 0.40m in depth (2160). Amongst the stone packing was some mid to late Iron Age pottery and a polished bone tool (probably a gouge), and a post-pipe was visible.

Small gully, possible roundhouse/ancillary structure (CG06)

Halfway between Roundhouse 8 (CG02) and Roundhouse 9 (CG04), but badly affected by modern disturbance and intrusions, was a small curving gully just over 6.5m in total length, up to 0.32m wide and 0.20m in depth. Where surviving, this had a sharp, narrow U-shaped profile with near-vertical sides and a slightly rounded base, suggesting that it may be the remains of a curving foundation slot similar to that seen as the structural foundations internal to Roundhouse 8 (CG02). Occasional mid to late Iron Age pottery and some animal bone was recovered.

Other features

In the vicinity, also between the two larger roundhouses, were two further isolated features; these could be related to either Roundhouse 8 (CG02) or Roundhouse 9 (CG04), or perhaps the small possible roundhouse/ancillary structure (CG06). Posthole 2047 was oval in shape, up to 0.26m in depth, with occasional mid to late Iron Age pottery and animal bone. Similar finds were also found in a nearby irregular pit or posthole 2038, which was of uncertain use.

5.2.4 Phase 3: medieval/post-medieval

In the western half of the site, where there had been less modern disturbance from recent development, a 0.20m in depth yellowish-brown silty clay subsoil survived, sealing the Iron Age features. A mixed assemblage of finds suggested this had formed during the medieval and post-medieval period, and probably related to the ridge and furrow agriculture.

Furrows across the site (CG05)

Numerous north-east to south-west aligned furrows crossed the site, truncating the Iron Age archaeology, and continued into the additional evaluation trenches to the south (Fig 3). These furrows were generally spaced between 4m to 4.5m apart, part of a narrow system, and were mostly straight. Although much of the surrounding ridge and furrow systems have been identified as medieval date, this typology may suggest this grouping is later. Alongside some post-medieval pottery, residual finds such as early prehistoric flint, Iron Age pottery and animal bone were recovered from the furrows.

5.2.5 Phase 4: Modern

Modern intrusions were broadly spread across the entirety of the site area, but extensive truncation and damage was most apparent in the eastern half (Fig 3; Plate 3). Here, machine dug pits containing dumps of very recent waste, inserted pipes, posts, concrete pads and crushed hardcore had affected the integrity of the archaeology. It also appeared that parts of the site had been cleared to create a level area and then compacted, with hardcore and modern ceramics pressed into Iron Age features (layer 2007). As noted above, modern aerial images show that construction compounds for the immediately adjacent residential development had been built in this area on two occasions, and the extent of these is also visible on Lidar survey data (see Walsh 2020, fig 6). Subsequent to this (very) modern activity, it was evident that the topsoil had been redeposited from soil bunds during reinstatement of the ground.

In addition, and of lesser impact, modern agricultural field drains were observed crossing much of the site.

5.2.6 Undated

A few small features in the south and south-west of the site area remained unexcavated, including two linear gullies. As such, these remain undated, though it could be expected that they will be associated with the mid to late Iron Age settlement activity.

6 Artefactual evidence, by C Jane Evans and Rob Hedge

The assemblage contains artefacts ranging from the upper Palaeolithic/Mesolithic to the post-medieval periods, but predominantly of mid-to late Iron Age date.

6.1 Aims

The finds were analysed in relation to the main project aims (Section 3 above) as well as relevant research themes identified in the East Midlands Updated Research Agenda for the later Bronze Age and Iron Age (Knight *et al* 2012, 58–69) and the Prehistoric Ceramics Research Group (PCRG 2016). Themes specific to individual classes of find are discussed in the relevant sections below but can be summarised as:

- chronology of the finds and the site (PCRG 2016 Theme B);
- character (function and status) of the finds and the site (PCRG 2016 Themes E and G);
- production and trade (PCRG 2016 Themes C and D);
- site formation processes and settlement organisation (PCRG 2016 Themes A and F).

6.2 Methodology

This artefact report conforms to standards and guidance issued by the Chartered Institute for Archaeologists (CIfA 2014b), as well as further guidance on pottery analysis and reporting, archive creation and museum deposition created by the three period pottery research groups (PCRG/SGRP/MPRG 2016), the Archaeological Archives Forum (AAF 2011), and the Society of Museum Archaeologists (SMA 1993) respectively.

6.2.1 Recovery

Recovery of artefacts was undertaken according to standard Worcestershire Archaeology practice (WA 2012).

The majority of ceramic artefacts were recovered by hand. A small quantity of further material was retrieved from environmental samples. The latter is included in the tables below, with the exception of three tiny fragments of pottery from fills 2019 (sample <01>; Roundhouse 2) and 2175 (sample <11>; Roundhouse 8); these were too small to identify and from contexts already with hand-retrieved pottery.

Approximately half of the stone artefacts collected in the field were recovered by hand. The remainder were retrieved from environmental samples.

6.2.2 Method of analysis

All finds, including those from environmental samples, were examined. They were identified, quantified and dated to period. A *terminus post quem* date was produced for each stratified context. This was then used for determining the broad date of the phases defined. All information was recorded on a Microsoft Access 2007 database, with tables generated using Microsoft Excel.

The pottery was recorded with reference to the Prehistoric Ceramics Research Group Guidelines (PCRG 2010). Fabrics were examined under x20 magnification with reference to the Leicestershire Prehistoric Fabric Series (Marsden 2011). Forms were recorded using the typology created for analysis of the assemblage from Grove Farm, Enderby (Elsdon 1992a, fig 1; Elsdon 1992b), and with reference to illustrated examples from neighbouring sites.

The diagnostic pottery forms are illustrated by context group (Fig 17; Fig 18), and a selection of decorated examples are also illustrated (Fig 19).

Rims made up *c* 7% of the assemblage by count. Many were quite fragmentary with only short profiles surviving, but they usually provided sufficient evidence to identify vessel types, particularly when rim diameter and decoration were also taken into consideration. The majority of the assemblage (89% by count) comprised body sherds which could not be closely identified by form. However, Elsdon's classification included small to medium, medium, and larger sized jars and bowls. Sherd thickness was therefore recorded to provide some indication of the vessel sizes represented (5-10mm, 10-15mm and 15-20mm). This allowed for some level of functional analysis and comparison between the forms represented in different fabrics, while recognising the limitation that sherd thickness could vary across a single vessel. Most of the assemblage showed low level abrasion, but it was possible to identify decoration, surface finish, and very occasional evidence for use (external sooting). Where possible, groups of sherds that looked likely to be from the same vessel were recorded as a single database record. If this wasn't possible, linked records were signposted in a 'comments' field.

The pottery was quantified primarily by count and weight. Rim diameter and the percentage of rim extant were measured where possible. This proved difficult for smaller handmade rims, so while Estimated Vessel Equivalents (rim EVEs) are presented in tables they should be used with an element of caution. Most sherds showed some level of surface abrasion, though relatively few were heavily abraded. Average sherd weights were variable, as discussed further below.

Very little metalwork was recovered. One of the iron objects was radiographed by Pieta Greaves of Drakon Heritage. The other, unfortunately, was retrieved from a soil sample too late in the post-excavation process to be included.

Classification of worked flint follows conventions outlined in Ballin (2000), Inizan *et al* (1999), and Butler (2005); the material was catalogued according to type and dated where possible. Visible retouch, edge-damage, cortex, raw material characteristics and quality, burning, and breakage were noted.

6.2.3 Discard policy

Artefacts from topsoil and subsoil and unstratified contexts will normally be noted but not retained, unless they are of intrinsic interest (e.g. worked flint or flint debitage, featured pottery sherds, and other potential 'registered artefacts'). Large assemblages of post-medieval or modern material, unless there is some special reason to retain (such as local production), may be noted and not retained, or, if appropriate, a representative sample will be retained. Discard of finds from post-medieval and earlier deposits will only be instituted with reference to museum collection policy and/or with agreement of the local museum.

6.3 Results

The results are summarised in Table 1.

Period	Material class	Material subtype	Object specific type	Count	Weight (g)
Mesolithic	Stone	Flint	Tool	1	1
Mesolithic/early Neolithic	Stone	Flint	Debitage	4	125
Neolithic/Bronze Age	Stone	Flint	Tool	1	5
Later prehistoric	Stone	Flint	Debitage	9	150
Prehistoric	Stone	Flint	Tool	1	27
Prehistoric	Stone	Flint	Debitage	24	45
Iron Age	Stone	Various	Saddle quern	4	7998

Period	Material class	Material subtype	Object specific type	Count	Weight (g)
Iron Age	Stone	Granitic stone	Objects	2	228
Iron Age	Stone	Unident	Rubber	1	1390
Iron Age	Stone	Various	Burnt Stone	29	1248
Middle to late Iron age	Ceramic	Earthenware	Pot	751	10880
Middle to late Iron age	Bone	Animal bone	Tool frags	2	10
Roman?	Glass	Pale green	Fragment	1	0
Post-medieval	Ceramic	Earthenware	Pot	3	105
Post-medieval/modern	Ceramic	Earthenware	Pot	1	10
Post-medieval/modern	Ceramic	Fired clay	Clay pipe	1	1
Undated	Ceramic	Earthenware	Pot	1	1
Undated	Ceramic	Fired clay	Fragment	86	522.5
Undated	Metal	Copper alloy	Fragment	1	6
Undated	Metal	Copper alloy	Strip	1	1
Undated	Metal	Iron	Iron object	1	1
Undated	Slag	Slag (fe)	Fragment	3	129

Table 1: Quantification of the finds by period and material

The assemblage totalled 928 finds weighing 22.994kg (Table 1). Finds came from 77 stratified contexts. The assemblage included finds dating from the Mesolithic to the post-medieval period, but the majority dated to the middle to late Iron Age (Phase 2). A small quantity of post-medieval finds was recovered from furrows and subsoil (Phase 3), and a single flint from redeposited topsoil (Phase 4). The later finds are quantified in Table 1 but only briefly summarised in the text. The focus of the report is, therefore, the assemblage associated with the middle to late Iron Age settlement. The results presented below consider the prehistoric finds in the context of their date, site location and phase, and within their wider regional context. The importance of individual finds is commented upon as necessary.

6.3.1 Worked flint, by Rob Hedge

The results are summarised in Table 2.

The assemblage comprised 40 pieces of worked flint, of which 3 (33g) were retouched tools and pieces with clear evidence of use-damage; the remaining 37 (320g) were unmodified flakes, and other debitage.

Raw material was varied. Material from environmental samples indicates that natural flint is present across the site; this comprises poor-quality, contused light grey to orange pebble flint. The majority of the worked flint was mid to dark-grey translucent pebble flint with a thin, cream-coloured cortex. This was probably derived from local fluvial sources or glacial till. A small quantity of opaque cream to light blue-grey Wolds flint was also present. There was no clear correlation between raw material and date, suggesting that knappers did not restrict themselves to particular sources at certain dates. One blade core was fully recorticated with a light blue-grey patina. Several others were partially re-corticated.

Condition was generally good, although pieces in more recent and/or disturbed contexts (such as the early blade core, from a furrow fill) showed signs of post-depositional edge-damage, consistent with agricultural activity.

Period	Object class	Object type	Count	Weight (g)
Mesolithic	Tool	Scalene microtriangle	1	1
Mesolithic/early Neolithic	Debitage	Blade core	1	119
		Blade (medial)	2	2
		Core tablet	1	4
Neolithic/bronze age	Tool	Combination tool	1	5
Later prehistoric	Debitage	Chunk	1	3
		Flake	7	41
		Flake core	1	106
Prehistoric	Tool	?Utilised chunk	1	27
	Debitage	Burnt chunk	1	26
		Burnt flint	4	2
		Chip	8	3
		Chunk	1	2
		Flake	10	12
		Totals	**40**	**353**

Table 2: Quantification of worked flint

Summary of worked flint by site phase

Mesolithic/early Neolithic
The sole diagnostically Mesolithic artefact was a small scalene microtriangle, 10mm in diameter, recovered from an environmental sample. It was residual within fill 2027 of ditch terminus 2030, Enclosure D (CG03). It is characteristic of middle to late Mesolithic flint-working (*c* 8000–4000 BC).

Several other pieces of debitage are likely to be broadly contemporary, including medial blade segments and a core tablet. One large multi-platform blade core may be Mesolithic, but the presence of multiple platforms at 90 degrees from one another is perhaps more indicative of an early Neolithic date.

Neolithic/Bronze Age
A combination tool comprising an end scraper with a notched lateral margin was recovered from fill 2067 of furrow 2068. It is a type typically associated with later Neolithic and early Bronze Age flint-working, but represents the only diagnostic piece of this date within the assemblage.

Later prehistoric
A number of pieces of flake debitage display characteristics typical of later Bronze Age and Iron Age flintwork (Humphrey and Young 1999): squat hard-hammer flakes with no platform preparation, high proportions of dorsal cortex, and profligate use of raw materials. All were from Iron Age contexts, and they were frequently encountered in artefact-rich deposits associated with the abandonment of Iron Age structures, such as fill 2192 of gully 2193 (Roundhouse 8; CG02) and fill 2212 of ditch terminus 2215 (Enclosure D; CG03). Due to the small size of the assemblage, it is unclear whether this association represents a meaningful concentration in these areas, or whether it is due to increased sampling and recovery rates. Nonetheless, the fresh condition of these artefacts and their secure stratification with other Iron Age material lends support to the hypothesis that these represent traces of an informal Iron Age flint-working tradition.

Prehistoric
The majority (63%) of pieces of worked flint could not be reliably ascribed to any particular period, in part because many of these represent small chips and flakes recovered from environmental samples. They are likely to represent material from each of the periods of activity listed above.

Overview

The assemblage is somewhat challenging to interpret; it is relatively small, rendering metric analysis statistically unprofitable. Given the high proportion of finds recovered from environmental samples, the spatial distribution is somewhat skewed. Nonetheless, a number of characteristics can be deduced.

The assemblage is similar in character to those previously recorded by Cooper (2008; 2011a; 2011b), which likewise appeared to contain residual material from a wide range of periods, with a small Upper Palaeolithic component, some Mesolithic material, but the majority being Neolithic or Bronze Age in date. The 2008 assemblage appears to have also contained Iron Age flintwork (Cooper 2008).

A small background scatter reflects activity on the site in the middle to late Mesolithic, possibly extending into the early Neolithic. The combination tool demonstrates that the small-scale later Neolithic/Bronze Age activity encountered in the earlier excavations (Cooper 2008; 2011a; 2011b) did extend into the current site area. The strong association of worked flint in secure Iron Age contexts appears to confirm Cooper's suggestion that the Iron Age inhabitants were knapping and using flint, albeit in a casual and probably informal tradition.

6.3.2 Worked and burnt stone, by Rob Hedge

Period	Material	Object type	Count	Weight(g)
Iron Age	Granitic rock	Fragment	1	188
		Disc	1	40
	Quartz sandstone	Saddle quern	2	5184
	Sandstone	Saddle quern	2	2814
	Unident	Rubber	1	1390
	Various	Unworked burnt stone	29	1248
		Totals	**36**	**10864**

Table 3: Quantification of worked stone

A total of 36 pieces of burnt and/or worked stone (10.864kg) were recovered. The majority were from Iron Age contexts. Of these, four were fragments of saddle querns. One rubber (SF5) was also present, though this was residual within subsoil deposits. No rotary quern fragments were observed. Roe and Thomas (2008) similarly noted a preference for saddle querns, although their assemblage also contained rotary quern fragments. Of the saddle quern fragments, two were made from relatively coarse-grained quartzitic sandstone. Two other fragments were found together and were probably from the same quern, being made from a fine-grained sandstone that showed signs of having been subjected to heat prior to or during breakage. The raw materials were probably derived from local boulder clays.

The two pieces of fine-grained sandstone quern were in fill 2139 of post-socket 2141, part of a group of features adjacent to Roundhouse 9 (CG07). One of the quartzitic sandstone fragments was nearby, within a group of packing stones (2144) on the south side of the socket. The remaining quern fragment had been deposited in an artefact-rich closing fill 2173 of penannular drainage ditch 2170, part of Roundhouse 8 (CG02).

A quantity of heat-cracked stone from environmental samples largely comprised sandstone and quartzite cobbles, probably used as domestic potboilers.

The nearby Thurmaston Lane 2014 excavations yielded small concentrations of granodiorite within roundhouse drainage ditches and drip gullies (Higgins 2015); on the current site, a piece of granitic

stone resembling the local Mountsorrel granodiorite was recovered from closing fill 2056 of ditch terminus 2057 at the entrance to Roundhouse 9 (CG04). Adjacent excavations (*ibid*) recovered querns in this material, but this fragment is not thought to be part of a quern. At Thurmaston Lane, this material was thought to be associated with pot-making, and the granodiorite-tempered pottery fabric R1 is likewise the most common Iron Age fabric within the assemblage from this site. Although there is no direct evidence that this material was being prepared for pottery production on-site, it demonstrates that Mountsorrel granodiorite was in circulation in a variety of forms.

One further piece of granitic stone – of uncertain origin but possibly another example of Mountsorrel granodiorite – was present within closing deposit 2216 in a truncated section of drainage ditch 2217, Roundhouse 8 (CG02). It comprised an unusual sub-circular disc, 10–14mm thick, with a maximum diameter of 78mm. The function is unclear, but rounded edges and a slightly polished upper surface are consistent with use-wear.

6.3.3 Pottery, by C Jane Evans

Mid to late Iron Age pottery

Fabrics and forms

A great deal of research has been undertaken on Iron Age pottery from this region, providing a well-established framework for analysis. Fabrics were recorded using a version of the Leicestershire Prehistoric Fabric Series, devised by Marsden (2011) and recently amended (eg Phillips and Cooper in prep). Four main fabric groups are classified (Table 4): Sandy; Quartz; Granitic Rock; and Shell-tempered. The simplified fabric series recognises that the original subdivisions within the granitic fabric (Group R) are difficult to apply in practice (N Cooper, pers comm). These are now grouped as Fabric R1, characterised by the presence of plates of biotite mica. Sherds with similarly large and angular quartz but no visible biotite mica were classified as Q4. There is likely to be some overlap between these two fabrics as inclusions could be variable. Sparse or rare granitic inclusions might not always have been visible in the sherd break selected for microscopic examination, for example, particularly on smaller sherds. Some of the sherds recorded as Fabric R1 contained black and white rock inclusions. These were not separated out for quantification but in retrospect might include some examples of the syenite tempered fabric (Leicestershire R1Sy), which contains predominantly black and white rock inclusions. The sandy, shell and mudstone fabrics were more easily distinguished. All the pottery was handmade, with coil breaks sometimes evident.

Leicestershire Fabric	Leicestershire description
Q1 Quartz sand	Common to abundant sub-rounded to rounded quartz sand (0.25-1mm)
Q4 Sandy fabric with quartz	Q1 with rare to sparse sub-angular to sub-rounded quartz (probable pebble source, 0.5-5mm, occasionally larger, up to 10mm)
Q6 Sandstone	Q1 with moderate sub-rectangular sandstone <5mm
R1 Granodiorite	Rare to moderate sub-angular granodiorite (0.5-4mm) and rare to sparse sub-rounded to rounded quartz sand (0.25-1mm). Inclusions include plates of biotite (yellow) mica
R2 Granite with sand	R1 with sand as Q1
S1 Shell	Moderate to very common shell or plate-like voids (1-5mm)
S2 Sandy fabric with shell	As S1, but common to very common sub-rounded to rounded quartz sand (0.25-1mm)
M1 Ferruginous Mudstone	Common rounded to sub-rounded red mudstone pellets (0.5-2mm) with sparse-moderate rounded quartz sand (0.25-1mm). Mudstone naturally occurring in the clay?

Table 4: Pottery fabrics (based on Leicestershire Prehistoric Fabric Series with amendments; from Phillips and Cooper in prep)

Fabric class	Fabric code	Count	% count	Weight (g)	% weight (g)	Average weight (g)	Rim EVE	% rim EVE
Mudstone	M1	73	10%	701	6%	10	0	0%
Sandy	Q1	59	8%	491	5%	8	0.15	10%
	?Q1	1	0%	1	0%	1	0	0%
Quartz	Q4	117	16%	1019.5	9%	9	0.2	14%
	Q6	3	0%	127	1%	42	0.05	3%
Granitic rock	R1	349	46%	7274.5	67%	21	0.75	51%
	?R2	10	1%	122	1%	12	0	0%
Shell-tempered	S1	81	11%	560	5%	7	0.29	20%
	S2	58	8%	584	5%	10	0.03	2%
Total		**751**	**100%**	**10880**	**100%**	**14**	**1.47**	**100%**

Table 5: Quantification of the pottery by fabric

This assemblage is similar to those from neighbouring sites, being in the scored ware tradition characteristic of the region (Elsdon 1992a; 1992b): 36% of sherds by count had scored decoration. The excavations produced a radiocarbon date of 390–170 cal BC, providing an indication of the likely date of the assemblage as a whole. It was dominated by granitic fabrics (Table 5) with a source in the Mountsorrel and Charnwood Forest areas of Leicestershire. All were classified as Fabric R1, with the exception of 10 sherds with more abundant sand which were classified as ?R2. The proportion of granitic fabrics is broadly comparable to other assemblages in the vicinity (Fig 11). However, the Avanti Field School assemblage appears to have a much higher proportion of quartz-tempered Fabric Q4. This probably does not reflect a chronological or functional difference between the sites. Rather, it is more likely to be a product of the amended fabric definitions; it is most similar to the more recently recorded Glenfield Park assemblage (Phillips and Cooper in prep). The element of uncertainty in separating out Fabric R1 and Fabric Q4 should also, perhaps, be taken into account, particularly as no photographs of fabrics were available for comparison.

Twenty-four rims were recorded in Fabric R1. Based on this small sample, and quantified by rim EVE (Fig 12), large rounded jars (Elsdon Type 2), were the most common form (45% by rim EVE, Fig 17. 4, 12; Fig 18.17). Other forms included: small-to-medium rounded bowls/jars (Elsdon Type 1, Fig 17.2, 13; Fig 18.15); medium, slack-profile jars (Elsdon Type 3, Fig 17.3, 11; Fig 18.14); large/ very large slack-profile jars (Elsdon Type 4, Fig 18.19); a small, straight-sided bowl (Elsdon Type 5, Fig 17.6) and a lug handle (Fig 18.16). The latter is more unusual; not many have been found on Leicestershire sites, although they are more common in Northamptonshire (N Cooper, pers comm). The emphasis seems to have been on large and very large form types in this fabric (Types 2 and 4). Larger vessel sizes are also reflected in sherd thicknesses, with notably fewer of the thinner sherds than in other fabrics (Fig 13). Scoring was the main type of decoration, predominantly deep scoring (SCR, 67 sherds), but also scored fine lines (SCRA, 42 sherds) and light brushing (BRL, 26 sherds). Fingernail- and fingertip-impressed decoration was noted on four rims. Occasional burnishing (Fig 14) was also noted. No indications of vessel use were evident.

Only seven rims were recorded in Fabric Q4, including Types 1, 2 and 4 (Fig 17.5, 8, 9). While it is difficult to make interpretations on such a small number of sherds, analysing sherd thickness also suggests that smaller, thinner-walled vessels were more common in this fabric than in R1 (Fig 13). Thicker-walled sherds (15–20mm) were also less common. Scored decoration was common, with deep scoring and fine scored lines well represented (SCR 23 sherds, SCRA 18 sherds), and light brushing also noted (BRL 4 sherds).

Ten sherds, including a base, were identified as Fabric ?R2, based on the higher proportion of sand included in the fabric. All sherds are from the same vessel, deposited at the junction of Enclosure D (CG03) and Roundhouse 8 (CG02; fill 2096). They were undecorated and there was no evidence for use.

The shell-tempered fabrics, thought to have with a source in Rutland, South Lincolnshire or Northamptonshire (Knight *et al* 2003, 121), were more easily distinguished. Two fabrics were identified; S1, which generally had a 'soapy' feel, and S2, distinguished by the presence of sand. Some variation was noted in the frequency of shell inclusions within both these fabrics, from moderate to abundant. Marsden (2011, 32) has noted that the quantity of shell-tempered ware was unusually high at both Manor Farm and Elms Farm when compared to other local Iron Age sites. If true, this seems to be a pattern reflected in the other sites in the vicinity. The proportion of shell-tempered ware is slightly higher than at Thurmaston Lane and Elms Farm (Cooper 2015; Marsden 2000) and slightly lower than Land east of Thurmaston Lane and Manor Farm (Cooper 2011; Marsden 2011), but these do not seem to represent significant variations. Only eight rims were recorded, making statistical analysis unreliable: there were seven in Fabric S1 and one in Fabric S2. A range of forms was noted (Fig 12), some of which are illustrated (Fig 17.10; Fig 18.18, 21). The proportion of thinner sherds, suggesting smaller vessels, was higher in the shell-tempered wares, particularly in Fabric S1 (Fig 14). Scoring was noted on both fabrics. Deep scoring was the most common type on Fabric S1 (SCR, 18 sherds), but fine scored lines and light brushing were also recorded (SCRA, 4 sherds, BRL 3 sherds). Similar numbers of sherds with deep scoring and fine scored lines were noted in Fabric S2 (SCR 13 sherds, SCRA 12 sherds), and one sherd with light brushing. Fingernail- and fingertip-impressed decoration were present in Fabric S1, one rim each, but not in S2. Two body sherds in Fabric S1 had external sooting.

The proportion of sandy Fabric Q1 is comparable to all but Thurmaston Lane (Cooper 2015), where the proportion was notably higher (Fig 11). The assemblage there was thought to date to the later rather than middle Iron Age, perhaps as late as 1st BC or early 1st century AD (Cooper 2015, 33), which may be significant. Only four rims were present. Forms tended towards the smaller end of the range, with Type 1 and Type 3 equally common. This pattern is reflected in sherd thicknesses, with an emphasis on thinner sherds (Fig 13). Scored decoration was less common in this fabric, and burnished decoration notably more common (Fig 14). In general, the finer finish (burnish) was associated with thinner walled vessels. No deep scoring was present; there were five sherds with light brushing (BRL) and four with scored fine lines (SCRA). One rim had finger-impressed decoration (Fig 17.7). Two body sherds had external sooting.

Only three sherds with sandstone inclusions were identified (Fabric Q6), two from different contexts in Roundhouse 9 (CG04) and one from Roundhouse 8 (CG02). One was a coarsely-tempered rim from large, Type 4 storage jar (Fig 18.20). The sherds all varied in thickness, from this large vessel (15-20mm) to a thin sherd (5-10mm) decorated with light brushing (BRL). There was no evidence for use.

The sherds of mudstone-tempered fabric M1 all came from the same, thin-walled (5-10mm) vessel decorated with scoring. The scoring was mainly light brushing (37 sherds) though one sherd had more scored fine lines. Given that all sherds were from one vessel it is interesting to note the proportion of decorated and undecorated sherds. Again, there was no evidence for use.

Pottery by Context Group (CG)

The majority of the pottery came from features associated with the roundhouses (Table 6: CG01; CG02; CG04; CG06; CG07; CG08), though Enclosure D (CG03) also produced one of the larger assemblages. Most of the pottery had been deposited in ditches or gullies, with much smaller quantities coming from the other features recorded (Table 7). More pottery was recovered from postholes than from pits but the average sherd weight for postholes was very low, probably indicating material that had lain around for a while before becoming incorporated in the posthole fills. The pottery from the pits had the highest average sherd weight, followed by the ditches. This might suggest more deliberate deposition of rubbish in these features, either directly or from middens.

Context Group no	CG name	Feature type	Count	% count	Weight (g)	% weight (g)	Average weight (g)	Rim EVE	% rim EVE
CG01	Roundhouse 2	Ditch	57	8%	904	8%	16	0.02	1%
CG02	Roundhouse 8	Ditch	280	37%	6249.5	57%	22	0.53	36%
		Gully	165	22%	1555	14%	9	0.51	35%
		Pit	3	0%	11	0%	4	0	0%
		Posthole	2	0%	16	0%	8	0	0%
Total CG02 Roundhouse 8			450	60%	7831.5	72%	17	1.04	71%
CG03	Enclosure D	Ditch	117	16%	1094	10%	9	0.09	6%
CG04	Roundhouse 9	Ditch	78	10%	722.5	7%	9	0.14	10%
		Pit	1	0%	55	1%	55	0.05	3%
		Posthole	2	0%	9	0%	5	0	0%
Total CG04 Roundhouse 9			81	11%	786.5	7%	10	0.19	13%
CG05	Furrows	Furrow	1	0%	10	0%	10	0	0%
CG06	Possible roundhouse	Gully	6	1%	5	0%	1	0	0%
CG07	Postholes adjacent to Roundhouse 9	Posthole	30	4%	92	1%	3	0.13	9%
CG08	Roundhouse 1	Ditch	2	0%	12	0%	6	0	0%
n/a	Pit 2038	Pit	3	0%	98	1%	33	0	0%
	Posthole 2047	Posthole	4	1%	47	0%	12	0	0%
Total			**751**	**100%**	**10880**	**100%**	**14**	**1.47**	**100%**

Table 6: Quantification of pottery assemblage by context group and feature type

Feature type	Count	% count	Weight (g)	% weight (g)	Average. weight (g)	Rim EVE	% rim EVE
Ditch	534	71%	8982	83%	17	0.78	53%
Furrow	1	0%	10	0%	10	0	0%
Gully	171	23%	1560	14%	9	0.51	35%
Pit	7	1%	164	2%	23	0.05	3%
Posthole	38	5%	164	2%	4	0.13	9%
Total	**751**	**100%**	**10880**	**100%**	**14**	**1.47**	**100%**

Table 7: Quantification of pottery assemblage by feature type

Two roundhouses overlapped with structures identified by previous excavation: Roundhouse 1 and Roundhouse 2 (Harvey 2011). Roundhouse 1 (CG08) was only very partially excavated in this more recent phase of fieldwork (see Fig 4). There was very little pottery (Table 6); two body sherds of scored ware (Fabric R1) from the fill of the ditch (2032, fill 2031). Roundhouse 2 (CG01) produced 57 sherds, all from secondary fills of the ditch (Table 6) and associated with a variety of other domestic waste. The largest groups came from a slot inside the southern side of the ditch (2020, fill 2019, 40 sherds, 640g) and an upper fill of a re-cut (2014, fill 2008 11 sherds, 205g). The slot produced a base (Fig 17.1) and body sherds from a large jar (21 sherds, 582g), the rim from another smaller jar (Fig

17.2) and a number of sherds with scored decoration (Fig 15). The assemblage was dominated by granitic Fabric R1 (Fig 16), with smaller quantities of Fabrics Q1 and Fabric Q4 also present.

By far the largest assemblage of pottery came from Roundhouse 8 (Table 6, CG02). This partly reflects the fact that this was the most substantial of the roundhouses excavated, wholly exposed within the excavation area. Added to this, a sizeable assemblage from the junction of the roundhouse drainage ditch and the Enclosure D ditch (CG03, feature 2108 2109) was assigned to CG02, rather than CG03. A radiocarbon date of 390–170 cal BC (2220±30BP; Beta-566202) was obtained from a pit in the northern half of the roundhouse. This provides the only independent dating for the assemblage as a whole. This is consistent with dates obtained for other parts of the Iron Age settlement, though it should be noted that only three fragmentary sherds were found directly associated with the C14-dated animal bone. Two vessels are illustrated from this group (Fig 17.3-4).

Context groups CG02 and CG03 produced similar fills, as discussed further below. Pottery was recovered from 22 fills attributed to CG02. The majority came from the surrounding penannular drainage ditch (Table 6), predominantly from the upper backfill; three vessels are illustrated (Fig 17.11-13). Another large assemblage came from the fill of the internal foundation slot, particularly from its eastern terminus (2193, fill 2192; 130 sherds, 1231g). Four vessels are illustrated from this slot (Fig 17.7-10). The average overall average sherd weight for the ditch (Table 6) does not accurately reflect the pattern of deposition in individual contexts. One of the fills from the junction (2096) produced 45 sherds with an average weight of 56g; all but ten sherds were from a single, scored ware jar (Fig 17.4). An associated (fill 2107) produced four scored ware sherds from another thick-walled jar (15-20mm), with an average sherd weight of 92g. A fill of the drainage ditch (2172) produced three sherds with an average weight of 81g.

The Roundhouse 8 assemblage was dominated by granitic fabric R1 (Fig 16) but a range of other fabrics was also noted. The sherds of mudstone-tempered ware (Fabric M1) were all from a single vessel found in the eastern terminus of the foundation slot (fill 2192); a base and body. The shell-tempered Fabric S1 was relatively common in this assemblage. Decoration was also relatively common (Fig 15), primarily scoring (deep scoring SCR 22%, light brushing BRL 13% and fine scored lines SCRA 5%), along with burnishing and fingernail or fingertip impressions.

As noted above, Enclosure D (CG03) was contemporary with Roundhouse 8 (CG02), had a similar backfill and shared overlapping fills at the junction of the ditches. It is likely, therefore, that the finds are derived from the same source. The average sherd weight was lower than for Roundhouse 8 (Table 6); only 2g for terminus 2030, and 10g or 11g for the other slots. This is perhaps biased by the inclusion of finds from the ditch junction, where most material appears to have been dumped, in CG02. The fabric profile is broadly similar to Roundhouse 8 (Fig 16) but with a higher proportion of shell-tempered wares. The proportions of plain and decorated sherds were also similar to Roundhouse 8 (Fig 15), though in this assemblage the rims with impressed decoration also had scoring on the body (eg Fig 18.14). Three vessels are illustrated from this context group (Fig 18.14-16), including a lug handle.

Roundhouse 9 (CG04) produced another smaller assemblage, with additional sherds coming from associated post holes (CG07). Four vessels are illustrated (Fig 18.17-20) from the roundhouse and one from the associated postholes (Fig 18.21). As with Roundhouse 8, the pottery was mainly deposited in later fills, particularly 2056 and 2114 (25 sherds, 163g and 22 sherds, 180g respectively). Pottery was recovered from 15 contexts with average sherd weights varying considerably between them: a single sherd in pit 2086 (fill 2088) weighed 55g, while seven sherds from ditch terminus fill 2092 had an average weight of only 1g. The proportion of granitic Fabric R1 was similar to that found in Roundhouse 8 and Enclosure D (Fig 16), but this assemblage contained a higher proportion of sand-tempered Fabric Q1 and Fabric Q6. The latter included the rim from a large, coarsely-tempered jar (Fig 18.20). The proportion of decorated sherds was similar to that from Enclosure D, again having sherds with both impressed and scored decoration (eg Fig 18.19).

The illustrated pottery, by context group

Roundhouse 2, CG01 (Figure 17)

1. Fabric R1. Flat base of a large jar, 15–20mm thick; oxidised orange external surface and margin, reduced core and interior. Oxidised external surface and margin, reduced core and internal surface. Ditch 2020, fill 2019, SF1. Database Rec 171

2. Fabric R1. Rim from a Type 1 jar/bowl. Diameter uncertain, 2%, thickness 5–10mm. Reduced black core and patchily fired surfaces. Ditch 2020, fill 2019. Database Rec 169

Roundhouse 8, CG02 (Figure 17)

3. Fabric R1. Rounded rim Type 3 jar with a. Diameter uncertain, 4%, thickness 5-10mm. Recorded on site as part of SF2 but from a different vessel. Ditch 2108/ 2109, fill 2096. Database Rec 35

4. Fabric R1. Rim, body sherds and flat base from a Type 2 jar with deeply scored decoration. Diameter 26cm, 22%, thickness 10–15mm. Oxidised surfaces, reduced core. Ditch 2108/ 2109, fill 2096, SF2. Database Recs 1, 4, 5

5. Fabric Q4. Rim from a Type 1 jar/bowl. The flat rim is decorated with small fingertip impressions. Diameter 13cm, 8%, thickness 5–10mm, thickness *c* 6mm, reduced throughout. Gully 2189, fill 2188. Database Rec 129

6. Fabric R1. Flat-topped rim from a Type 5 bowl, with a burnished/lightly brushed surface. Diameter 11cm, 6%, thickness 5–10mm. The fabric is a finer variant of R1. The vessel has black surfaces and a very dark brown core. The external surface is burnished/lightly brushed and the internal surface is wiped smooth. Gully 2189, fill 2187. Database Rec 71

7. Fabric Q1. Rim from a Type 3 jar. The flat-topped rim has impressed, fingertip decoration. Diameter 22mm, 6%, thickness 5–10mm. Patchily fired surfaces and reduced core. Gully 2193, fill 2192. Database Rec 228

8. Fabric Q4. Fragmentary rim from a Type 4, large jar, with finger-tip decoration on and just below the flat-topped rim. Diameter uncertain, 3%, thickness 15–20mm. Brown oxidised surfaces and a dark grey core. Gully 2193, fill 2192. Database Rec 65

9. Fabric Q4. Rounded rim from a Type 2 jar, with impressed fingertip and fingernail decoration. Diameter 23cm, 6%, thickness 10–15mm. Reduced throughout. Gully 2193, fill 2192. Database Rec 60

10. Fabric S1. Rim from a Type 2 jar, with impressed fingernail decoration on the flat-topped rim. Diameter 20cm, 5%, thickness 10–15mm. Patchy firing. Gully 2193, fill 2192. Database Rec 28

11. Fabric R1. Flat-topped rim from a Type 3 jar, with impressed fingernail decoration. Diameter uncertain, 3%, thickness 5–10mm. Very abraded, with a black external surface, oxidised orange margin, reduced core, patchily fired internal surface. Ditch 2208, fill 2207. Database Rec 283

12. Fabric R1. Lid-seat rim from a Type 2 jar, external surface lightly brushed. Diameter 22cm, 4%, thickness 10–15mm. Black external surface, oxidised internal surface, core variable firing. Ditch 2208, fill 2207. Database Rec 285

13. Fabric R1. Fine rounded rim from a Type 1 jar/bowl, with impressed fingernail decoration on the rim, small impressed ‘dots’ below, and scored fine lines on the body of the vessel. Diameter 12cm, 5%, thickness 5–10mm. Reduced black throughout. Ditch 2217, fill 2216. Database Rec 255

Enclosure D, CG03 (Figure 18)

14. Fabric R1. Downturned rim from a Type 3? Jar, with impressed, ovoid decoration on the rim and fine criss-crossing scored lines on the body. Diameter uncertain, thickness 5–10mm. Reduced throughout. Ditch 2149, fill 2146. Database Rec 142
15. Fabric R1. Fine, flat-topped rim from a Type 1 jar/bowl. Diameter 13cm, 3%, thickness 6mm. Oxidised orange surfaces and black core. Ditch 2215, fill 2213. Database Rec 252
16. Fabric R1. Lug handle. Patchily oxidised surface and black core. Ditch 2215, fill 2212. Database Rec 274

Roundhouse 9, CG04 (Figure 18)

17. Fabric R1. Flat-topped rim from a ?Type 2 jar. Diameter 20cm, 3%, thickness 10mm. Patchily fired surfaces and reduced core. Ditch 2057, fill 2056. Database Rec 214
18. Fabric S1. Rim from a large Type 4 jar. Diameter 33cm, 5%, thickness 5–10mm. Black surfaces, external surface, and core, (burnished?). Pit 2086, fill 2088. Database Rec 197
19. Fabric R1. Flat rim with impressed decoration, from a large Type jar 4. Scored fine lines on the body. Diameter 22cm, 6%, thickness 5–10mm. Patchily fired surfaces and reduced core. Ditch 2115, fill 2114. Database Rec 85
20. Fabric Q6. Flat rim from a large Type 4 jar, external surface very abraded. Diameter 32cm, 5%, thickness 15–20mm. Oxidised light brown external surface and black core and interior. Ditch 2121, fill 2118. Database Rec 288

Postholes adjacent to Roundhouse 9, CG07 (Figure 18)

21. Fabric S1. Rounded rim from a Type 1jar/bowl. Diameter 13cm, 7%, thickness 5–10mm. Patchily fired surfaces and a reduced core. Posthole 2141, fill 2139. Database Rec 92

6.3.4 Other Iron Age finds, by C Jane Evans

Only a very small assemblage of other finds was recovered.

An incomplete bone gouge came from the fill of an isolated posthole to the south of Roundhouse 9 (SF3; Fig 20). Various suggestions have been made for the use Iron Age gouges (Sellwood 1984, 382–7). They are primarily thought to be associated with weaving but the particular wear on this type, resulting in a flattened surface (*ibid*, Class 2, 385, fig 7.34), suggests 'considerable pressure against a resistant surface,' indicating a use perhaps in hide dressing. The gouge is made from a sheep or goat tibia (M Holmes, pers comm). This is both consistent with the evidence at Danebury (Hants; Sellwood 1984, 382–7) and other sites in the vicinity of Avanti Fields School (eg Elms Farm; see Allen 2000, 193). Another fragment of worked bone was identified amongst the animal bone assemblage from Roundhouse 8 (CG02). It is described as a sheep or goat metacarpal with a pierced hole (see below).

Two copper alloy artefacts were recovered. A fragment of copper alloy strip, catalogued below but too fragmentary for illustration, was found amongst other domestic waste in an upper fill of one of the Enclosure D ditch termini (SF7; CG03). This may be a decorative component from a more complex object, although the surviving fragment shows no sign of attachment. The other artefact was a fragment of copper alloy waste (SF6, not illustrated), found in a ditch of Roundhouse 8 (CG02, 2176, fill 2175). This hints at small-scale copper working on the site, as noted at Elms Farm (Northover 2000, 192).

Two corroded iron artefacts were both associated, directly or indirectly, with Roundhouse 8. A double headed rivet (not illustrated), found in the upper fill of Enclosure D ditch terminal (CG03, 2030, fill 2027), is likely derived from the roundhouse. This was retrieved from an environmental sample (<3>) after x-ray had been completed. It is 13mm long with a rectangular shank and irregularly shaped, flattened ends. A badly corroded iron fragment, 22mm long, was found amongst other domestic waste in a pit associated with the roundhouse (2165, fill 2164, SF4). This was submitted for x-ray but remains too fragmentary to identify with any confidence. It could perhaps be a brooch pin tip, a

needle/pin tip or the shaft of a nail, similar to examples published from Danebury (Sellwood 1984, fig 7.24, 2.176–187), or part of a longer, unidentified object.

A very small quantity of iron slag was recovered from Roundhouse 8; two fragments from ditch 2176 (fill 2175, 117g) and a small fragment of possible ore from ditch 2182 (fill 2180, 12g). The larger piece, found in an environmental sample from the southern entrance terminal of the ditch (2176, fill 2175, sample 11, 106g) is an edge fragment from a hearth bottom associated with smelting. This is a dense fragment 29mm deep, with a curving underside. Similar fragments have been noted on other sites in the vicinity, for example at Elms Farm (Keys 2000, 190). However, no hammerscale was identified in environmental samples.

Fragments of fired clay were recovered from a range of context groups, with slight concentrations around Roundhouse 8, Roundhouse 9 and Enclosure D (Table 8). The majority came from ditch fills, with only occasional fragments from other feature types. Fragments were generally very small, reflected in the average sherd weights, and undiagnostic. The only larger fragment (126g) was a piece of structural material with wattle impressions, probably from an oven and found in the upper fill of a terminus of the Enclosure D ditch (CG03; 2030, fill 2027). The associated soils included charred fragments and fuel ash slag, suggesting that the deposit included discarded fuel (see below). Like many of the fired clay fragments, this had inclusions of sand and shell. Some of the less diagnostic fragments may also be burnt daub or oven. Twenty fragments were vitrified, also suggesting an association with burning and/or high temperature processes. Seventeen of these (40g) came from Roundhouse 8, ditch 2176 (fill 2175; CG02). This is likely to be derived from the metal working that produced the copper alloy waste and iron furnace bottom described above. Further, very small fragments of vitrified clay came from Roundhouse 8 ditch terminus 2208 (fill 2207, 1, 7g); Roundhouse 2, ditch 2020 (fill 2019, 1, 2g); and Roundhouse 9, ditch terminus 2057 (fill 2056, 2, 0.5g). No briquetage or diagnostic fragments from loom weights were present.

A tiny shard of blue-green glass (not illustrated) was retrieved from a soil sample, taken from the upper fill of a ditch terminus in Roundhouse 9 (CG04, 2089, fill 2092, <06>). This was 0.8mm thick, with a maximum surviving length of 5mm. The very small size made identification difficult, but the colour and presence of bubbles are consistent with Roman products. The soil sample also produced a charred grape pip and uncharred fig seed, again suggestive of ‘Romanised’ activity. Roman finds have been found in Iron Age contexts elsewhere in the settlement (Charles *et al* 2000, Thomas 2008) and these finds might therefore hint at similar late Iron Age trading contacts on this site. The only associated finds were seven very fragmentary sherds of middle to late Iron Age pottery (9.5g), also retrieved from soil samples. This part of the site was less affected by the modern disturbance noted in some areas excavated, so intrusive finds are less likely but cannot be ruled out.

Context Group no	CG name	Count	% weight	Weight (g)	% weight	Average weight
CG01	Roundhouse 2	9	10%	41	8%	5
CG02	Roundhouse 8	46	53%	151.5	29%	3
CG03	Enclosure D	11	13%	223	43%	20
CG04	Roundhouse 9	16	19%	104.5	20%	7
CG05	Furrows	1	1%	1	0%	1
CG06	Possible roundhouse	2	2%	0.5	0%	0
CG07	Postholes adjacent to Roundhouse 9	1	1%	1	0%	1
Total		**86**	**100%**	**522.5**	**100%**	**6**

Table 8: Quantification of the fired clay by context group

Other finds (Figure 20)

1. Two fragments from a bone gouge; a broken section of shaft and the pointed terminal. The gouge has an all over all surface polish and the point and lower surface of the shaft have been worn flat through friction, as in Danebury Class 2 (Sellwood 1984, 385, fig 7.34, 3.117-120). There are fine scratch marks on the curving side of the terminal. The handle end of the tool is missing. At Danebury, all examples of this type were broken at this end, and it was suggested that this reflected a weakness caused by hollowing or perforation. Posthole 2160, fill 2161. SF3, Rec 112
2. (not illustrated) Fragment of parallel-sided strip in copper alloy, with a curving terminal; possibly a decorative fitting from an object in wood or leather, although the surviving fragment has no perforation for attachment. Enclosure D, CG03, Ditch 2215, fill 2212. SF 7, Rec 115

6.3.5 Post-medieval finds, by C Jane Evans

The only other finds comprised four sherds of pottery and a fragment of clay pipe, all recovered from post-medieval furrows (CG05) and subsoil (Phase 3). The pottery included sherds dating from *c* 1700 to *c* 1800: a sherd of black-glazed orange ware; a sherd from a pancheon or bowl in orange ware with a brown internal glaze; and the rim from a slip-ware plate. A rim from a flower-pot and the clay pipe stem were only broadly datable to the post-medieval to modern periods.

6.4 Summary

Site name	Count	Weight (g)
Avanti Fields School (this report)	**751**	**10880**
Elms Farm (Marsden 2000)	6709	66579
Land east of Thurmaston lane 2010 (Cooper 2011)	252	3498
Thurmaston Lane 2014 (Cooper 2015)	480	5917
Manor Farm (Marsden 2011)	5651	77047

Table 9: Quantification of Iron Age pottery from associated sites

The pottery and other finds from Avanti Fields School complement the evidence from other sites associated with the Humberstone Iron Age settlement. While smaller than the assemblages from Manor Farm and Elms Farm, it is the largest of the three assemblages in the immediate area (Table 9). Roundhouse 8, the most complete of the roundhouse excavated, produced an assemblage of 450 sherds (7831.5g). This alone is more than recovered from the excavations to the east of Thurmaston Lane (Cooper 2011), though this only excavated partial sections of two roundhouses, and is similar to the total found at Thurmaston Lane (Cooper 2015). The middle to late Iron Age pottery is in the scored ware tradition and is similar, in fabric composition and the range of forms, to the assemblages from these other sites. As a group, therefore, is adds further data on pottery use across the settlement and within the individual roundhouses.

The other finds, the bone gouge for working cloth or leather and the industrial residues, provide evidence for the crafts typical of Iron Age settlements. However, very few metal finds were recovered. This seems typical of sites of this period in the county: evidence for small-scale metalworking is relatively common but metal artefacts are not (Clay 2001, 11). The tiny fragment of glass, along with the more exotic environmental evidence, might hint at wider contacts in the later pre-Roman Iron Age or early post-conquest Roman periods; periods not represented in the pottery assemblage. These finds are consistent with the suggestion elsewhere that the Humberstone settlement had high status trading contacts in the later Iron Age (Thomas 2011, 163-4), before Leicester overtook it in status.

6.5 Significance

The middle to late Iron Age pottery assemblage is of national significance, as part of the much larger assemblage derived from the various excavations across the Humberstone settlement. This larger

assemblage has potential to contribute to much wider research, particularly as the material from individual sites has been recorded using a consistent methodology so that data is more broadly comparable. The other Iron Age finds contribute to the understanding of the site and, as such, are of more local significance.

The post medieval finds are of negligible significance.

6.6 Recommendations

6.6.1 Discard/retention

The prehistoric finds should be retained. The post-medieval finds could be discarded, with the agreement of the receiving museum.

7 Environmental evidence, by Elizabeth Pearson, Kath Hunter Dowse, Matilda Holmes and Rebecca Gordon

7.1 Introduction

The environmental project conforms to guidance by CIfA (2014a) on archaeological excavation, and further guidance on environmental work by English Heritage (2011).

The underlying soils consist of slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils of moderate fertility (Cranfield Soil and AgriFood Institute 2020). As noted above, the superficial geology comprises diamicton deposits of the Oadby Member (BGS 2020).

7.2 Overall sample methodology

7.2.1 Sampling policy

Samples were taken according to standard Worcestershire Archaeology practice (2012). A total of 15 bulk samples (each of up to 40 litres) were taken from the site (Table 10).

7.2.2 Processing and analysis

The samples were processed by flotation using a Siraf tank. The flots were collected on a 300µm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were scanned by eye and the abundance of each category of environmental remains estimated. A magnet was also used to test for the presence of hammerscale. The flots were scanned using a low power MTL stereo light microscope. Plant remains were identified using modern reference collections maintained by Worcestershire Archaeology, and a seed identification manual (Cappers *et al* 2012). Nomenclature for the plant remains follows Stace (2010).

7.2.3 Discard policy

All flots, sorted remains from flots and residues, and hand-collected animal bone should be retained for archive. Scanned residues and remaining soil samples will be discarded after three months, following submission of this report, unless there is a specific request to retain them.

Context	Sample	Feature type	Fill of	Context Group no	CG name	Period	Phase	Sample volume (L)	Volume processed (L)	Residue assessed	Flot assessed
2019	1	Ditch	2020	CG01	Roundhouse 2	Iron Age	2	20	20	Yes	Yes
2025	2	Posthole	2024	CG01	Roundhouse 2	Iron Age	2	20	20	Yes	Yes
2027	3	Ditch	2030	CG03	Enclosure D	Iron Age	2	40	40	Yes	Yes
2049	4	Ditch	2055	CG03	Enclosure D	Iron Age	2	40	0	No	No
2056	5	Ditch	2057	CG04	Roundhouse 9	Iron Age	2	20	20	Yes	Yes
2092	6	Ditch	2089	CG04	Roundhouse 9	Iron Age	2	20	20	Yes	Yes
2139	7	Posthole	2141	CG07	Postholes adjacent to Roundhouse 9	Iron Age	2	20	20	Yes	Yes
2143	8	Gully	2142	CG02	Roundhouse 8	Iron Age	2	20	0	No	No
2145	9	Ditch	2149	CG03	Enclosure D	Iron Age	2	20	0	No	No
2165	10	Pit	2164	CG02	Roundhouse 8	Iron Age	2	20	20	Yes	Yes
2175	11	Ditch	2176	CG02	Roundhouse 8	Iron Age	2	40	40	Yes	Yes
2179	12	Ditch	2182	CG02	Roundhouse 8	Iron Age	2	40	0	No	No
2187	12	Gully	2189	CG02	Roundhouse 8	Iron Age	2	20	0	No	No
2192	14	Gully	2193	CG02	Roundhouse 8	Iron Age	2	20	0	No	No
2207	15	Ditch	2208	CG02	Roundhouse 8	Iron Age	2	40	40	Yes	Yes

Table 10: List of all bulk samples

7.3 Plant macrofossil remains and charcoal by Kath Hunter Dowse

7.3.1 Introduction and methods

Following excavation, nine samples were assessed, but no further work recommended. The assessment results are, however, presented in Table 11 and the text below. The samples were taken from deposits associated with three mid to late Iron Age roundhouses, external postholes, and an enclosure ditch of the same date.

Due to restriction of time and the availability of only low-power microscopy the assessment of charcoal is considered to be basic. It attempted to identify the presence of ring porous or diffuse vessel patterns. Where possible the author attempted to identify whether the charcoal represents roundwood, heartwood, twig or root. However, the act of trying to identify the above characteristics in abraded charcoal is by necessity destructive, so this was not carried out on all of the fragments for this assessment. The frequency of all environmental remains has been recorded using the following criteria: * = 1–5 items, ** = 6–10 items, *** = 11–50 items, **** = 50–100+ items.

The frequency for charcoal, as recorded in Table 11 in parentheses, represents the proportion that appears to be larger than 2mm in all dimensions and may be identifiable to species.

Where identification of other plant macrofossils has taken place, the nomenclature follows Stace (2010). The term ‘seed’ may include achene, fruit, nutlet etc.

The criteria used to select samples for further analysis of archaeobotanical remains was based on a scheme developed by Wendy Carruthers (pers comm). This allows various factors to be taken into account when assessing samples. The priority categories used in this assessment are as follows:

A = high potential on archaeobotanical grounds (i.e. rare or interesting plant taxa or exceptional preservation) or due to the scarcity of information from this type of deposit (e.g. Neolithic contexts);

B = good potential due to reasonable preservation and/or frequent identifiable charred plant remains, i.e. the assemblage can provide a useful amount of information;

C = some charred material but present in low concentrations or very poorly preserved. The samples will only be worth including if part of a group, or if the context is especially important or particular information is required;

D = no charred material or so few to have been fully identified and recorded. Any information recovered from C and D samples can be included in the final report if necessary.

7.3.2 Results

Results are presented by Context Group (CG) and summarised in Table 11.

Roundhouse 2 (CG01)

Aside from some charcoal fragments the only charred plant remain material is an unidentifiable seed fragment from posthole fill 2025. The presence of water flea (*Daphnia* sp) ephippia with watercrow foot seeds (*Ranunculus* sp Subgen *batrachium*) in ditch fill 2019, and rush seeds (*Juncus* sp) from fill 2025, suggest that the immediate area was at least periodically waterlogged with some standing water in the features.

Roundhouse 8 (CG02)

Samples from Roundhouse 8 contained the richest charred cereal remains with evidence of glume wheats (*Triticum spelta/dicoccum*), hulled barley (*Hordeum* sp) and possibly oat (cf *Avena* sp). However, these were still only present in relatively small numbers and probably represent either secondary or tertiary deposition of crop processing waste that has subsequently been used for fuel. The presence of ostracods in ditch fills 2175 and 2207 again suggest that these features contained standing water at some time. Waterlogged fig seeds (*Ficus carica*), from a fruit normally assumed to have been introduced during the Roman period in Britain, were present in ditch fill 2207. The mineralised cists in this sample may suggest the presence of midden or latrine waste that could have been dumped into the ditch, or are intrusive.

Oat (*Avena* sp) and unidentified cereal grains were radiocarbon dated from pit fill 2165, returning a mid to late Roman date of 230–410 cal AD (alongside animal bone dated to 390–170 cal BC). The implications of this unusual, anomalous result are discussed in the radiocarbon dating section.

Enclosure D (CG03)

The presence of water flea ephippia and ostracods suggest that the ditch contained water for prolonged periods. Aside from the charcoal the only charred plant remains were possible oat grain fragments with seeds of cleavers (*Galium aparine*), grass (Poaceae), a small indeterminate legume and poorly preserved nutshell. The presence of amorphous charred fragments and fuel ash slag may suggest that this deposit provides evidence of discarded fuel.

Roundhouse 9 (CG04) and associated postholes (CG07)

Fills 2056 and 2092 from the ditch termini associated with this roundhouse contained a small number of ostracods. This again suggests that these features contained standing water at least periodically. Potentially waterlogged seeds from ditch fill 2056 also include fig. Fill 2092 contained a single charred grape pip (*Vitis vinifera*) which again is thought to have been a Roman introduction. The seeds are relatively small and could have fallen down through cracks in the soil or have been brought down through the action of roots or soil fauna: alongside a piece of Roman vessel glass from the same context it is, therefore, possible that both the fig and grape pips represent intrusive remains

associated with later agricultural activity across the site. However, it cannot be ruled out that this group of items in Roundhouse 9 represents evidence of extensive trading links for the period.

All samples from Roundhouse 9 contained poorly preserved charred cereal fragments, which, where identification was possible, appeared to be of an oat type (*Avena* sp). A small fragment of oat awn was present in fill 2092. None of these remains retain features to distinguish between a cultivated (*Avena sativa*) and wild oat (*A. fatua*). Fill 2092 also contained a small number of weed seeds associated with arable land, grassland and disturbed habitats. Hazelnut shell fragments (*Corylus avellana*) in ditch fill 2056 may represent evidence of a gathered food resource.

			Charred							Mineralised	Waterlogged				
Context and type	Sample	Context Group	Grain	Cereal NFI	Chaff	Legume	Seed	Fruit/nut	Charcoal	Cists/frags	Seed	Insect	Comments	Potential	Charcoal Potential
2019 Ditch fill	1	CG01							(**) ***		**	**	Potentially waterlogged seeds including Water crowsfoot (*Ranunculus* sp. subgen *batrachium*) and nettle (*Urtica dioica*), *Daphnia* sp. Ephippia. Pottery, bone. Possibly modern roots and seeds.	D	fair
2025 P/H fill	2	CG01					*		(**) **		*		Indet charred seed.Burnt bone, mollusc.Abundant modern roots and seeds including birch (*Betula* sp.) and rush (*Juncus* sp.).	D	fair
2027 Ditch fill	3	CG03		*			*	*	(**) ****		*	*	*Daphnia* sp. Ephippia and ostracods. Charcoal includes diffuse porous and root/knot wood. Charred seeds include possible oat (cf. *Avena* sp.), cleavers (*Galium aperine*) grass (Poaceae), 2mm legume seed.indet nut shell. Amorphous charred fragments, fuel ash slag, Abundant modern/waterlogged roots, fragments of dicotyledonous leaves, insects and seeds inc. thistle type (*Cirsium* sp.) some may be waterlogged.	C	poor
2056 Ditch fill	5	CG04		**	*		**	*	(***) ****		*		Ostracods. Charcoal includes roundwood**.** Charred poorly preserved cereal grain fragments, an oat (*Avena* sp.) awn fragment, Hazelnut shell fragments (*Corylus avellana*) blinks (*Montia fontana* ssp *fontana*), narrow-fruited cornsalad (*Valerianella dentata*), scentless mayweed (*Tripleurospermum inodorum*), dock (*Rumex* sp.), eyebright/bartsia (*Euphrasia*/*Odontites* sp.) grass (cf. *Poa* sp.), Goosefoot type (*Chenopodium* sp.), breadlike fragments. Waterlogged fig (*Ficus carica*), nettle (*Urtica dioica*), thistle type (*Cirsium* sp.). Abundant roots. Fuel ash slag, amorphous charred fragments.	C	fair
2092 Ditch fill	6	CG04	*	*	*	*	*	*	(**) ****		*		Ostracods. Charcoal includes semi ring porous roundwood, ring porous and thorns. Some of the charcoal is impregnated with iron concretion. Charred grape pip (*Vitis vinifera*), possible wheat grain (cf. *Triticum* sp.), cereal grain indet.oat awn fragment (*Avena* sp.). Amorphous charred fragments possible waterlogged seeds including bramble (*Rubus* sp.) and nettle (*Urtica dioica*).	C	fair
2139 P/H fill	7	CG07		*					(**) ****				Cereal grain indet, amorphous charred fragments, amphibian bone, possible coal, abundant modern roots.	D	fair

			Charred							Mineralised	Waterlogged				
Context and type	Sample	Context Group	Grain	Cereal NFI	Chaff	Legume	Seed	Fruit/nut	Charcoal	Cists/frags	Seed	Insect	Comments	Potential	Charcoal Potential
2165 Pit fill	10	CG02	*	*					(****) ****	*			Charcoal includes ring porous, diffuse and twig. Possible wheat grain (cf. *Triticum* sp.), cereal grains indet, wheat glume base (*T.spelta/dicoccum*),mineralised cists, pottery, burnt bone, possible coal. Few modern roots and seeds.	C	good
2175 Ditch fill	11	CG02	*	**				*	(***) ****		*		Ostracods. Charcoal includes ring and diffuse porous. Charred possible barley (cf.*Hordeum* sp.) and wheat grains (cf.*Triticum* sp.) including long narrow glume wheat type grains (cf. *T. spelta*). Cereal grains indet., eyebright/bartsia type (*Euphrasia/Odontites* sp.) seed. Waterlogged possible fig (cf. *Ficus carica*), nettle (*Urtica dioica*), daisy family (Asteraceae). Pottery, glassy slag, fuel ash slag. Abundant modern roots and seeds.	C	poor
2207 Ditch fill	15	CG02	**	**	*		*	*	(*) ****	*	*		Ostracods. Charcoal includes ring porous and twig. Charred Barley (*Hordeum* sp.), possible barley (cf.*Hordeum* sp.) long narrow grained wheat (*Triticum* cf. *spelta*), possible oat (cf. Avena sp.) cereal grains indet, wheat spikelet fork and glume bases (*Triticum spelta/dicoccum*). False oat grass basal internode (*Arrhenatherum elatius*) (weed seeds include blinks (*Montia fontana* ssp. *fontana*), bird's-foot-trefoil type (Lotus sp.),grass (Poaceae), daisy family (Asteraceae). Mineralised cists. Waterlogged fig (*Fiscus carica*), thistle (*Cirsium* sp.), bramble (*Rubus* sp.) Burnt bone, pottery, fuel ash slag.	C	poor

Table 11: Detailed results from samples assessed

7.3.3 Summary

The results of this assessment suggest a background presence of charred cereal remains across the site. This is very similar to assemblages from the other excavations nearby and on other Iron Age sites in the area (e.g. Jarvis and Monckton 2004; Monckton 2008; Monckton and Hill 2011; Small 2015a; Pearson 2020). These also produced low levels of glume wheat and barley remains with some weed seeds.

Pelling (2000) identified an assemblage of a cleaned spelt grain deposit, from a possible granary posthole, along with charred cereal chaff, backfilling a grain storage pit at Elms Farm. This may suggest the focus of large-scale processing of cereal crops in the vicinity. The assemblages from the other sites, including from Avanti Fields School, suggest the deposition of charred cereal waste used as fuel in domestic or industrial activities. This charred material then accumulated and was preserved in open features.

The single charred grape pip and the fig seeds may be intrusive finds from later agricultural activity but it is possible that they could have been traded from continental Europe during the Iron Age period. The find of an olive stone from an Iron Age well deposit at Silchester suggest that this kind of trade in foodstuffs occurred during the Iron Age (Lodwick 2014).

Due to the relative paucity of identifiable plant remains from all of the samples, full analysis was not recommended. However, future analysis along with the data from this assessment might become relevant if a synthesis of all plant remains from the settlement area was to be carried out.

7.4 Animal bone by Matilda Holmes and Rebecca Gordon

7.4.1 Introduction and methods

A small assemblage of just over 1200 fragments of animal bone was recovered, largely from Iron Age features associated with settlement, the main focus of which probably lay to the east of the excavation area. In total, 300 fragments could be identified to taxa: the text below considers the findings in detail and in relation to the wider settlement previously excavated.

Bones were identified using the author's reference collection. Due to anatomical similarities between sheep and goat, bones of this type were assigned to the category 'sheep/goat', unless a definite identification could be made (Zeder and Lapham 2010; Zeder and Pilaar 2010). Bones that could not be identified to species were, where possible, categorised according to the relative size of the animal represented (micro – rat/vole size; small – cat/rabbit size; medium – sheep/pig/dog size; or large – cattle/horse size). Ribs were identified to size category where the head was present, vertebrae were recorded when the vertebral body was present, and maxilla, zygomatic arch and occipital areas of the skull were identified from skull fragments. Due to problems with the identification of post-cranial bones of micro-mammals, only their mandibles and maxillae were identified to taxa.

Tooth wear and eruption were recorded using guidelines from Grant (1982) and Payne (1973), as were bone fusion, metrical data (von den Driesch 1976), anatomy, side, zone (Serjeantson 1996) and any evidence of pathological changes, butchery (Lauwerier 1988) and working. The condition of bones was noted on a scale of 0–5, where 0 is fresh bone and 5, the bone is falling apart (Behrensmeyer in Lyman 1994, 355). Other taphonomic factors were also recorded, including the incidence of burning, gnawing, recent breakage and refitted fragments.

All fragments were recorded. A number of sieved samples were collected but because of the highly fragmentary nature of bone from such samples a selective process was undertaken, whereby fragments were recorded only if they could be identified to species and/or element or showed signs of taphonomic processes.

Bones were included in final analysis if they came from Iron Age features. Quantification of taxa and body parts used a count of all fragments (NISP – number of identified specimens). Mortality profiles were constructed based on tooth eruption and wear of mandibles (Grant 1982; Jones and Sadler 2012) and bone fusion (O'Connor 2003). Cattle and sheep/ goats were sexed on the basis of the morphology of pelves (Davis 2000; Greenfield 2006), and pigs by their canines (Schmid 1972).

7.4.2 Results

Taphonomy and condition

Bones were in good condition, but highly fragmentary (Table 12). There was a high proportion of refitted fragments, and a moderate number of fresh breaks, indicating that bones were friable on excavation. It is possible that this this was due in part to the unavoidable break in excavation causing the exposed surface to dry out in very warm conditions over a period of several weeks. Approximately a quarter of the assemblage exhibited signs of canid gnawing, and this, and the prevalence of loose teeth, indicates that many of the bones were not buried immediately following discard, but were available for dogs to chew, and teeth to fall out of their respective mandibles. Canid gnawing of animal bone was also identified on all other previously excavated areas of the settlement, though notably on a much smaller percentage of examples than here at Avanti Fields (Charles 2000; Browning 2008; Browning 2011; Small 2015b).

Few burnt bones were recorded in the hand-collected material, but several substantial groups (≥ 20 fragments) of largely unidentified burnt and calcined bone came from the samples. Pit 2164 and ditch

terminus 2208, part of Roundhouse 8 (CG02), and ditch termini 2057 and 2089 forming the entrance to Roundhouse 9 (CG04) all contained such material, with smaller quantities coming from features associated with Roundhouse 2 (CG01), Enclosure D (CG03) and the postholes adjacent to Roundhouse 9 (CG07). These deposits may have been material from a fire or hearth, or deliberately burnt as a cremation. A single pig lateral phalanx could be identified from the group of burnt and calcined bone from pit 2164.

There were no obvious deposits of primary butchery, craft-working or skin-processing waste to imply specific activity areas. There were no associated bone groups, though contexts 2056 and 2173 included loose epiphyses alongside their corresponding metaphyses, suggesting that these bones were deposited with soft tissue still holding them together, and were subject to little post-depositional disturbance.

A single sheep/ goat metacarpal had a hole pierced through the medial aspect of the proximal end, which may relate to the manufacture of an object.

Condition	Number
Fresh	-
Very good	-
Good	212
Fair	14
Poor	1
Very poor	-
Total	**227**
Refit	101=27
Fresh break	27
Gnawed	56
Loose mandibular teeth*	16
Teeth in mandibles*	10
Butchery	31
Burning	2

*Table 12: Condition and taphonomic factors affecting the Iron Age assemblage identified to taxa and/or element. Teeth included where stated. * = deciduous and permanent 4th premolar and molars*

Carcass representation and butchery

Butchery marks were fairly common (Table 12), representing carcass reduction stages from skinning, horn core removal and disarticulation to splitting the carcass into sides and filleting meat from the bones. Most butchery was done with knife work, though a few chop marks were observed on dense elements such as vertebrae, the humeral-radial joint and the foot, which is typical of Iron Age techniques (Grant 1987). The majority of butchery was observed on the bones of cattle, which is consistent with the need for greater disarticulation and jointing on these large carcasses. A few bones of smaller animals such as sheep/goats and pigs also bore butchery marks, and a horse tibia had a cut mark on the distal shaft, possibly from meat removal.

Bones came from all parts of the body, though there was an over-abundance of meat-bearing long bones, indicating that the assemblage resulted from food waste rather than incorporating bones resulting from carcass processing (such as head, vertebrae and foot bones; Table 13). There was no difference between groups, although Roundhouse 8 (CG02) contained relatively more bones from the head (horn core and loose teeth) and feet (phalanges) than other features.

	CG01			CG02				CG03				CG04		CG06		All contexts			
Element	**C**	**S/G**	**P**	**C**	**S/G**	**P**	**H**	**C**	**S/G**	**P**	**H**	**C**	**S/G**	**C**	**S/G**	**C**	**S/G**	**P**	**H**
Horn core	1			1								2				4			
Occipital				1		1										1		1	
Zygomatic				1		1										1		1	
Maxilla with teeth				2												2			
Mandible with teeth				2	2	1			1				1			2	4	1	
Loose teeth	2	1	1	17	8	2	3	9	3		1		1			28	15	3	4
Hyoid								1								1			
Atlas				1												1	1		
Axis									1								1		
Cervical vertebra								1								1			
Lumber vertebra				6					1							6	1		
Sacrum				1												1			
Scapula				5	1	5		2	1	2		1				8	2	8	1
Humerus				8	3	6		5		1		1				14	3	7	
Radius				6	4			4	2		1	8		1		19	6		1
Ulna				2	2			2				1		1		6	2		
Carpal				2				1				1				4			
Pelvis	2			4	2			4	1			2	1			12	4		
Femur	2			2		2		3	2		1					7	2	2	1
Patella						1		1								1		1	
Tibia				3	7	1	2	5	1			1	1			9	9	1	2
Astragalus				3	1			1								4	1		
Calcaneus				2		1		1								3		1	
Metacarpal				6	1			3	1			1				10	2		
Metatarsal	1			11	2		2	1	3			2	1			15	6		2
Metapodial				7	2			1								8	2		
Navicular				2				1				1				4			
1st phalanx				1					2						1	2	3		
2nd phalanx	1			1				1							1	3	1		
3rd phalanx	1															1			
Total	**10**	**1**	**1**	**97**	**35**	**21**	**7**	**47**	**19**	**3**	**3**	**21**	**5**	**2**	**2**	**178**	**65**	**26**	**11**

Table 13: Species representation of the major domesticates by anatomical element (fragment count) for the larger groups, and whole assemblage. Hand collected bones. C= cattle; S/G= sheep/goat; P= pig; H= horse

Species representation and diet

Cattle were by far the most dominant taxa in all features except Roundhouse 1 (CG08; Table 14), but this roundhouse was only partially investigated in this phase of fieldwork and so the numbers cannot be directly compared. Sheep/goat were next most common followed by pigs then horse and canid (dog or fox). A single fragment of deer antler tine bore no signs of working. Several micro-mammal bones were recovered from the samples, with field voles identified from the teeth. Field voles are non-

specific environmental indicators, inhabiting grass-, heath- and moorland, suggesting that the surrounding landscape incorporated relatively open areas.

If the animal bones are an indicator of diet, beef would be by far the most commonly consumed, followed by lamb and pork. Butchery of a horse bone implies that horse meat may also have been eaten. There were no other taxa recorded that were likely to contribute to the diet. Dogs were most likely working animals, and most of the dog remains came from Enclosure D (CG03). Deer were represented by antler, which does not imply a hunted animal, and the voles were most likely background species. Low levels of game in the Iron Age diet is not unusual, and is typical of a domestic-focused way of life (Hambleton 2008).

The sole fill of pit 2164, associated with Roundhouse 8 was unusual as it contained no cattle bones, as well as antler tine and a group of calcined and burnt bones including a pig phalanx.

Previous excavations of the same settlement have provided comparable animal bone assemblages, as summarised in Table 15. Differences in the relative proportions of the major domesticates between various areas of the site highlight the effects of limited excavations on extrapolating wider trends. Cattle are dominant in all of the five areas excavated, except at Manor Farm Area A, which has a higher quantity of sheep/goat and pig bones. The larger assemblages from Manor Farm and Elms Farm also produced a greater range of taxa, incorporating the bones of red and roe deer, fox, hare, chicken, duck, crows/rooks, woodcock and *turdus* sp (e.g. blackbird/ thrush), albeit in very small numbers. More diverse assemblages such as these may be due to spatially distinct activities, but is probably more likely a result of the larger sample size.

	CG01		CG02		CG03		CG04		CG06	CG08	
Taxa	**H**	**S**	**H**	**S**	**H**	**S**	**H**	**S**	**H**	**H**	**Total**
Cattle	10		97	4	47		21	8	2		**178**
Sheep/ goat	1		30	3	16	2	5	1	2	3	**57**
Sheep			5		3						**8**
Pig	1		21	6	3	1				1	**26**
Horse	1		7		3						**11**
Canid			2		6	6					**8**
Deer			1								**1**
Field vole		2		1		5		3			**11**
Total identified	**13**	**2**	**163**	**14**	**78**	**14**	**26**	**12**	**4**	**4**	**300**
Large mammal	32		359		176		74		27	1	**669**
Medium mammal	6		141		66		21		9	7	**250**
Micro-mammal		2		1		2		2			**7**
Unidentified mammal			2								**2**
Total	**51**	**4**	**665**	**15**	**320**	**16**	**121**	**14**	**40**	**12**	**1228**

Table 14: Species representation (NISP) of hand-collected assemblage. H= hand-collected; S= samples

Site name	Total	% cattle	% sheep/goat	% pig
Avanti Fields School (this report)	269	66	24	10
Elms Farm (Charles 2000)	1225	66	30	4
Manor Farm Area A (Browning 2008)	517	34	48	18
Manor Farm Area B (Browning 2008)	918	59	34	7
Land east of Thurmaston lane 2010 (Browning 2011)	269	57	34	9
Thurmaston Lane 2014 (Small 2015b)	70	60	39	1

Table 15: Comparison of relative proportions of cattle, sheep/goat and pigs from the wider settlement, as recovered from previous excavations

7.4.3 Summary

Most of the assemblage from Avanti Fields School appears to have originated as domestic food waste, and an under-representation of head and foot fragments indicates that butchery waste was disposed of elsewhere. Consumption of beef would have dominated the diet, although pork and lamb would also have provided variety. Evidence from this excavation, as well as previous interventions, have recorded butchery of horse carcasses, suggesting that these animals, too, were sometimes eaten at the end of their working life.

Cattle mortality data imply that animals were culled at all ages, though a number of adult and elderly animals are evident from the fusion data (Table 16). Only two mandibles were complete enough to calculate wear stages, indicating a young adult at wear stage E and an elderly animal at stage J. Sheep/goats were also subject to a steady mortality (Table 16), though there was no evidence for elderly animals as all the latest fusing elements (vertebrae) were unfused, and mandibles came from immature (stage C) and adult (stages F and G) sheep/goats. Fewer data were available for pigs, though there was no evidence for them living into adulthood, with a single mandible at wear stage D or E, indicative of a young adult. A broken pig canine was identified as coming from a male animal.

There was no evidence for calves, although isolated bones of perinatal lambs and piglets were recovered, to suggest that these animals were bred nearby. All horse bones were fused, reflecting their importance for other purposes such as traction or transport.

	Cattle			**Sheep/goat**			**Pig**		
Stage	U	F	%F	U	F	%F	U	F	%F
Neonatal	-	13	100	1	5	83	-	-	-
Early	1	26	96	3	7	70	1	2	67
Intermediate	2	15	88	2	5	71	-	1	100
Late	5	8	62	3	1	25	2		0
Final	-	10	100	2	-	0	-	-	-
Total	**8**	**72**	**-**	**11**	**18**	**-**	**3**	**3**	**-**

Table 16: Fusion data for the major domesticates

The mortality profiles are typical of self-sufficient farming, with cattle kept for meat and secondary products such as milk or traction, sheep for meat and small-scale wool or dairy production, and pigs to provide meat. This assemblage is generally similar to those from other excavations across the same settlement, although differences in the greater proportion of sheep bones, wild taxa and younger animals from Manor Farm Area A implies that those living in this area may have received a slightly different diet or undertaken different activities than other areas. Similar mortality profiles were also observed, again except for Manor Farm Area A, which produced a greater proportion of younger cattle and sheep/ goats. Caution must be taken with extrapolating interpretations from this however:

as Browning (2008) noted in her original report, that this part of the Humberstone site produced a relatively small number of bones.

7.5 Radiocarbon dating, by Elizabeth Pearson

A total of two radiocarbon determinations have been achieved from fill 2165 in pit 2164 (part of CG02). The samples comprised (i) charred *Avena* sp and Cereal sp indet grains, and (ii) non-heated medium mammal bone (rib). These two dates were selected from the same context in order to allow chronological modelling, which in the event did not prove possible (see below). The samples were dated at Beta Analytic, Florida by AMS.

The results showed that the animal bone is of middle Iron Age date, which is consistent with the pottery dating and the general nature of the archaeology. However, the charred cereal grains date to the late Roman period. As the animal bone fragment was considerably larger than the charred cereal grains and is less likely to have moved down the profile, it is thought most likely that the middle Iron Age date is the more reliable.

It is probable, therefore, that the charred cereal remains of late Roman date are intrusive, having passed through cracks in the clayey subsoil or been pressed in during the compound construction for the adjacent development works that had affected the site.

7.5.1 Results

The results are conventional radiocarbon dates (Stuiver and Polach 1977) and are listed in Table 17. The calibrated date ranges for the samples have been calculated using the maximum intercept method (Stuiver and Reimer 1986) and are quoted with end points rounded outwards to ten years. The probability distributions of the calibrated dates, calculated using the probability method (Stuiver and Reimer 1993), are shown in Appendix 3. Dates have been calculated using OxCal v4.2 (Bronk Ramsey 2009) and the current internationally-agreed atmospheric calibration dataset for the northern hemisphere, IntCal13 (Reimer *et al* 2013).

Laboratory code	Context number	Material	δ13C (‰)	Conventional Age	OxCal calibrated age (95.4% probability or 2 sigma)
Beta-566201	2165	Charred plant *Avena* sp and Cereal sp indet grains	-24.0 (‰)	1750 +/- 30 cal BP	230–410 cal AD
Beta-506202	2165	Bone (non-heated) Medium mammal rib	-22.00 (‰)	2220 +/- 30 cal BP	390–170 cal BC

Table 17: Radiocarbon dating results

7.6 Stable isotope analysis, by Elizabeth Pearson

A single sample from a fragment of medium mammal rib bone was sent to Beta Analytic laboratory, Florida (Table 18).

These data provide only a guideline for the relative importance of nitrogen and carbon stable isotopes in the diet. Many factors including plant species grazed (or eaten as fodder) and environmental conditions can affect these results. They are, therefore, presented here purely as data which may be useful for comparison with other sites, and that may lead to future interpretation within studies of Iron Age Leicestershire.

The results (Fig 21) show that the δ13C and δ15N levels are in the middle range of selected comparison sites from the Oxfordshire Ridgeway (Schulting *et al* 2019) and the Severn Estuary (Britton *et al* 2008).

Sample type	Species dated	Context ID	Sample ID	IRMS δ13C o/oo	IRMS Δ15N o/oo	*C/N Ratio	% Carbon	% Nitrogen
Animal bone (non-heated) rib	Medium mammal	2165	P5800/2165A	-22.0	+6.8	3.3	37.9	13.51

*Table 18: Stable isotope results, * = Carbon/Nitrogen*

7.7 Environmental overview, by Elizabeth Pearson

The farming economy is likely to have revolved around mixed rotational grazing and crop cultivation, considering that the underlying soils are seasonally wet, loamy and clayey soils of moderate fertility. Today, the location is most suited to grass production for dairying or beef, with some cereal production often for feed (Cranfield and AgriFood Institute 2020). The same may have been true for the Iron Age period, and likewise, not all cereal production was necessarily for human consumption (requiring parching, sieving and grinding). The lack of, or limited chaff residue, on previously excavated sites in the vicinity is thought to result from chaff being used for animal feed (Monckton and Hill 2011).

It is suggested that at the Avanti Fields School site cereal crop processing was small-scale and undertaken at a household level, presumably with parching taking place on domestic hearths rather than in bulk in corn drying structures. Although quern fragments suggest the grinding of grain for flour on the settlement, this need not have involved large-scale processing. Charred cereal crop waste was sparse, and at similar levels to those recorded from the excavations at Manor Farm to the north-east (Monckton and Hill 2011) and at land to the east of Thurmaston Lane to the north (Small 2015a). Pastoral farming was thought to be predominant on both sites.

It should be noted, however, that whilst the remains are discussed here as being contemporary with middle to late Iron Age roundhouse settlement, there is some uncertainty surrounding the date of the sparse scatter of charred cereal remains given the rather anomalous late Roman radiocarbon date derived from exactly this material. Some of the plant remains from Iron Age roundhouse ditch or gully fills, or associated pits and postholes, were also slightly unusual. These included a single charred grape pip, uncharred fig seeds and mineralised cists. Alongside a small fragment of Roman glass, and the radiocarbon date, it is uncertain whether these small quantities of debris can be conclusively associated with the middle to late Iron Age settlement.

Grape and fig are usually considered alongside material of Roman or later date: as such, a number of possible scenarios can be proposed. The material may, in a similar vein to the charred cereal grain dated to the middle to late Roman period, be intrusive via cracks in overlying clay deposits or subsoil. Alternatively, due to the variety of items and the fact that the combination of these plant remains (with mineralised cists) is similar to those recovered from Elms Farm (Pelling 2000), dating to the later Iron Age and into the early part of the first century AD, the material from Avanti School could result from activity of a slightly later phase than that indicated by the pottery. At Elms Farm, charred elderberry (*Sambucus nigra*) seeds and fragments of sloe stone (*Prunus spinosa*), along with other mineralised weed seeds, show a similar composition of fruit fragments and mineralisation. Rare charred fruit remains were also found at Manor Farm (although these were not Roman in character; Monckton and Hill 2011), where activity could also have extended into the early part of the first century AD. Taken on their own it is, therefore, difficult to determine whether such possible 'Roman' foodstuffs date to the late Iron Age or are early post-conquest in date. These remains are, however, broadly consistent with artefactual evidence from elsewhere on the settlement that suggests some Humberstone inhabitants enjoyed high-status trading contacts in the later Iron Age (Thomas 2011, 163–4).

On balance, it is thought that the charred grape pip, fig seeds and mineralised remains are most likely to represent either late Iron Age pre-conquest connections with the trading networks linked to the Continent, or have been deposited following early post-conquest Roman agricultural activity, and so still retain significance for the site even if their context is considered not conclusively secure.

8 Discussion

8.1 Pre-Iron Age activity

A small background scatter of residual worked flint provided evidence of intermittent activity on the site over a considerable period, a similar pattern to that seen from nearby excavations (Thomas 2008; Harvey 2011). Much of the assemblage comprised flakes and other waste pieces, though diagnostic items included a Neolithic or Bronze Age combination tool. The patinated condition of one blade core suggests an early date and could indicate activity from the Upper Palaeolithic onwards, whilst some examples amongst the cruder debitage are consistent with a later Bronze Age or even an Iron Age date.

8.2 Iron Age occupation

Although only a small area has been investigated during this stage of work, the excavation at Avanti Fields School contributes to the developing dataset that has already been established for the Humberstone 'aggregated' Iron Age settlement (Appendix 2). Wider occupation is spread along a ridge of land between two stream valleys, just over 3km east of the River Soar, and extending for up to 700m from this site to the Elms Farm excavation much further east (Charles *et al* 2000). This is a significant element of the archaeology of the region, being one of the largest Iron Age settlements in Leicestershire. There is no reason to discount the possibility that this linear settlement was in fact even larger in extent, both to the east and the west, and it may continue beyond the current limit of excavation under Thurmaston Lane and the golf course to the immediate west. Certainly, the geophysical survey clearly demonstrates the continuation of roundhouses into the tree protection zone (see Butler 2009).

Settlement sequence and dating

There were few stratigraphic relationships on the site and a general lack of intercutting features; much of the settlement activity appeared to form a broadly contemporary block of land use. Undoubtedly, Enclosure D was concurrent with the final form of Roundhouse 8, likely constructed together as one interlinked complex, and there was enough space between all the roundhouses in this area for them to have comfortably co-existed. Within the roundhouse drainage ditches (in particular Roundhouse 2 and Roundhouse 9) there were indications of natural silting and then repeated maintenance through partial re-cutting and realignment, suggesting an element of permanence and longevity to the structures. It also appeared that an earlier small drip-gully was replaced by the substantial drainage ditch defining Roundhouse 8, with this plot either having two phases of occupation or perhaps that the drip-gully was not functioning as desired and needed expansion. A characteristically dark and artefact-rich backfill in all the ditches appeared to be a deliberate infill of waste, perhaps even representing a closure deposit, following the end of use for each roundhouse.

Nearby excavations suggest that the east–west boundary ditch located just to the north was relatively long-lived, with a history of renewal comprising at least three distinct phases (Thomas 2008; Harvey 2011). This may demonstrate repeated use of the same area, perhaps initially focussed on the remains of a middle Bronze Age enclosure at Elms Farm (Charles *et al* 2000), and then shifting westwards south of this boundary in a linear array through several phases of occupation (Thomas 2008; Harvey 2011; Higgins 2015). Whilst now visible with an overall ground plan that appears as one continuous settlement, it is more likely that within this spread are clusters of buildings representing seasonal occupation, or specific craft/industrial/stock management functions, which developed as smaller individual groupings over an extended period. It is perhaps notable that large-scale study of Bronze Age and Iron Age settlements has suggested abandonment of roundhouse structures after

just one generation of use, sometimes less than 15 years, with a planned shift to new structure a short distance away on the same site (Pope 2003, 385).

Although no radiocarbon dating was completed following the immediately adjacent excavations (Harvey 2011; Higgins 2015), dating from Manor Farm (Thomas 2008) suggests that occupation of the Humberstone settlement began in the middle Iron Age and lasted until the late 1st century BC or early years of the 1st century AD (420–300 cal BC to 40 cal BC/cal AD 10). Further to the east, radiocarbon dates show that activity on the Elms Farm part of the settlement took place from around 415 cal BC to 46 cal BC (Charles *et al* 2000). The artefactual data from Avanti Fields would appear to fit within this broad date range: all pottery was handmade and dated to the middle and late Iron Age, with other associated artefacts such as worked bone, iron and copper objects consistent with this. It is notable that a radiocarbon dating of animal bone from an oval pit or posthole within Roundhouse 8 produced a date of 390–170 cal BC, supporting the pottery dating and corresponding to the general nature of the surrounding archaeology. A small piece of charred grain from the same feature returned an anomalous later Roman date of cal AD 230–410 however, an inconsistency which is thought to result from later intrusions but is difficult to conclusively resolve. In addition, very small finds of a charred grape pip, fig seeds, and piece of glass from Roundhouse 9 comprise probable Roman foodstuffs/items within Iron Age contexts; whilst it remains possible that these are also intrusive and represent a background scatter of later activity across the settlement, something observed at Manor Farm and Elms Farm to the east, significant widespread trading contacts during the later Iron Age have also been demonstrated from these previous excavations (Thomas 2008; Charles *et al* 2000).

Settlement morphology

The overall form of the Humberstone Iron Age settlement has been classed as ‘aggregated’, comprising both open and enclosed elements alongside a major landscape boundary. Such settlements are characterised by extensive size and material culture, complexity of organisation and multifunctional use (sometimes specialised), as well as longevity of occupation (Willis 2006, 109–110; Thomas 2011, 1). The boundary, just outside this most recent excavation area, defined the northern edge of occupation and marked a clear division within the landscape; this layout and development of settlement pattern has been paralleled with that at Beaumont Leys 4km to the west (see Thomas 2011). The form and size of these two sites is relatively unusual across Iron Age Leicestershire more widely however, as settlements more commonly appear as smaller enclosed farmsteads, presumably consisting of extended family groups (e.g. Enderby I; Clay 1992, Enderby II; Meek *et al* 2004, Huncote; Meek *et al* 2004, and Hallam Fields; Speed 2010).

At Avanti Fields School there was a continued trend from the previous excavations of the Humberstone settlement whereby activity was defined by roundhouses and enclosure ditches, with the roundhouses characterised by an encircling drainage ditch but only occasional evidence for the building structure itself. The footprints of the surrounding ditches were often substantial, their external diameters measuring between 14.5m to 17m (sometimes projected in combination with previous excavation results or the geophysical survey), leaving internal space that suggested building foundations from 9m to 12.5m in diameter. It is interesting to note that across all the excavation areas at Humberstone, the roundhouse diameters are consistently at the upper end of the average range for others in northern and central Britain, where around 90% of circular structures are between 4m and 12m in diameter (see Pope 2003, 101). They are most comparable in scale to those in the enclosures at Enderby (Enderby Enclosure I up to *c* 13.5m diameter and Enderby Enclosure II *c* 7.7m to 10.2m diameter), which are amongst the biggest known from the East Midlands (Clay 1992, 16–17; Meek *et al* 2004, 6–9), but are generally larger than those seen at the comparable major ‘aggregated’ Iron Age settlement in Leicestershire, Beaumont Leys (*c* 5m to 9m diameter; Thomas 2011). With Roundhouse 8, the surrounding ditch was particularly well-defined, being the deepest and most imposing of all, and it can be suggested that this perhaps demonstrates a symbolic enclosing of space beyond purely practical needs (see Moore 2007, 273; Thomas 2011, 154–155).

The sizeable Roundhouse 8 also exhibited the best-preserved structural evidence, comprising a partial curving internal foundation slot that had probably been packed with contiguous timber uprights or, less likely, timber and wattle wall panels. Alternatively, it may have served as a solidly packed base for sill-beams, though these outlines are normally polygonal in shape (Pope 2003, 96–97). The only other potential structural evidence came from paired postholes aligned with entrances, examples of which were evident in Roundhouse 8 and Roundhouse 9, and the stone-packed posthole in Roundhouse 2. In Roundhouse 8 the posts probably define the location of a doorframe or porch (Pope 2003, 192–197), whereas in Roundhouse 9 these were further back from the entrance and may mark the location of central posts for stabilising the roof apex (Pope 2003, 113). Elsewhere within the Humberstone settlement, at both Elms Farm and Manor Farm to the east, there was a similar absence of extensive structural evidence other than entrance-way posts (Charles *et al* 2000, 157; Thomas 2008, 108).

Whilst the extensive and damaging modern truncation is likely to be a factor, the clear survival of the enclosing drainage ditches and a number of small pits and stone-packed postholes may suggest that the general lack of visible structural elements signifies that alternative building methods were employed. It is possible that the buildings were constructed either using mass walls, such as turves or cob laid directly on the ground, or were freestanding timber-framed constructions built off horizontal timbers that did not go very deep (Knight 1984, 143; Pope 2003, 189–190). Such interior features are unlikely to be visible once an area has been subject to centuries of ploughing and then modern disturbance, as in this case. There is also a possibility that not all of the curving/penannular ditches represent the locations of roundhouses, and the internal space could have been used for small animal shelters and storage structures of varying shape and size, or even as temporary processing areas or places for haystacks (Knight 1984, 143). The small curving gully located between Roundhouse 8 and Roundhouse 9, projected to have a much smaller external diameter of around 5.5m, could have been part of a foundation slot defining an area for this type of ancillary activity.

Where visible, there was a common east/east-south-east entrance to the roundhouse drainage ditches, consistent with the pattern seen on adjacent sites (Thomas 2008; Harvey 2011; Higgins 2015). This orientation is also regularly apparent across Leicestershire as a whole (Clay 2001, 9), and more broadly in Iron Age Britain; detailed collation and large-scale analysis has shown that nearly half of all roundhouse structures opened towards the east and south-east (Pope 2003, 176). It is thought that these building arrangements are preferred so as to shelter from prevailing westerly and south-westerly winds and to provide warmth and light from the morning sun. Such consideration does not appear to have been necessary for the sub-rectangular Enclosure D, contemporary with Roundhouse 8, which had a west/west-south-west entrance. This orientation and the lack of evidence for internal features suggests that it may have served a non-domestic function. Small-scale livestock management is likely here (there was only around 132m^2 of internal space), with a clear division from, but also a direct association with, nearby roundhouses. It is possible that daily or seasonal activities that required penning were undertaken within the enclosure. Although the substantial size of the enclosing ditch is thought more demonstrative of protection/control for animals, use as a storage space or an enclosed area for metal-working and craft-working is also a possibility; it may be significant that a number of examples of burnt daub with wattle impressions were recovered from the ditch, as well as discarded fuel waste, perhaps representing the remains of furnaces or oven structures.

Environment and land use

Positioned on a prominent boulder clay ridge on the eastern side of the River Soar valley there is evidence that the Humberstone settlement developed in a landscape intermittently occupied at various times in prehistory, with background scatters of Palaeolithic to early Iron Age worked flint recovered from many of the previous excavations in the area, as well as on this site (see above). At a wider level there was an increase in woodland clearance and a predominance of grassland across Leicestershire in the Bronze Age (Clay 2001, 2) and, as noted previously, there is local evidence for a middle Bronze Age enclosure becoming a focus of occupation in the Iron Age at Elms Farm (Charles

et al 2000). A livestock management ditch system in the late Bronze Age or early Iron Age was also present at Hamilton to the north-east (see Beamish and Shore 2008). From the middle Iron Age onwards the east–west linear boundary directly north of the site may have parcelled up the local landscape into distinct zones, or perhaps was used to define access to resources (Thomas 2008, 105).

The adjacent excavations have found little environmental evidence for crop production along the ridge, with domestic occupation alongside small-scale pastoralism thought to be the major land use (Thomas 2008; Harvey 2011; Higgins 2015). It is probable that land division for large-scale grazing and arable cultivation occurred in the lower lying valleys either side, though there was extensive evidence of crop storage in four-post structures at Elms Farm to the east (Charles *et al* 2000) and clear indications of crop processing, presumably for domestic consumption, via large quern stone assemblages (both saddle and rotary) from Elms Farm (Charles *et al* 2000, 162) and Manor Farm (Thomas 2008, 110).

This model was again continued at Avanti Fields, with only a general background presence of charred cereal remains comprising glume wheats, hulled barley and oat. These are mainly identified as representative of secondary or tertiary deposition of crop processing waste, subsequently used for fuel. A small group of broken saddle querns, comparable to those seen elsewhere on the settlement, indicate low level (probably on an individual household basis) processing and consumption. There was also limited evidence for the utilisation of scrubland and woodland resources, with fragments of hazelnut shell present; it is likely, therefore, that collection of surrounding wild resources supplemented the agricultural economy on the site.

In general, it appears that Iron Age settlement at Humberstone was supported within a mixed farming regime, and, in this particular area of the complex, pastoralism was probably the main economic activity. Micro-mammal faunal evidence suggests that the surrounding landscape incorporated relatively open areas. This land was probably occupied by animals required for typical self-sufficient farming, with cattle kept for meat and secondary products (such as milk or traction), sheep for meat and small-scale wool or dairy production, and pigs to provide meat. On a limited scale, butchery of a horse bone implies that horse meat may also have been eaten at the end of the animals working life, as seen to a larger extent on the Elms Farm site (Charles 2000). There was very little evidence for the consumption of wild species, although low levels of game on Iron Age sites across the country is not uncommon and this may be a result of the small sample size. Most of the animal bone assemblage from Avanti Fields School appears to have originated as domestic food waste, and whilst butchery marks indicating jointing and filleting of meat were common, primary butchery waste was not present in large numbers.

Despite the absence of any clear deposits of primary butchery, craft-working or skin-processing waste to demonstrate specific activity areas in the assemblage, there was some small objects of worked bone that suggests animal bone was being used for functional purposes as and when required. In common with every previous excavation area of Humberstone Iron Age settlement (Manor Farm, Elms Farm, Thurmaston Lane), which have all yielded at least some indications of bone-working, at Avanti Fields there was a polished sheep/goat tibia fashioned into a bone gouge for working cloth or leather, as well as a pierced sheep/goat metacarpal. An unworked fragment of antler tine was present, and again, the faunal evidence from every previous excavation area has shown that deer antler was being opportunistically retrieved or harvested locally (presumably from nearby woodland), mainly for the manufacture of tools (Charles *et al* 2000; Thomas 2008; Harvey 2011). There were no loom weights identified however, in contrast to elsewhere at Humberstone, suggesting textile production may have occurred in other parts of the settlement. Additionally, this site continued the pattern of small-scale evidence for metal-working (particularly in relation to Roundhouse 8), probably for the domestic production of tools and essential repairs. Fragments of vitrified fired clay suggest an association with high temperature processes; clay with wattle impressions was noted, and copper alloy waste, a small quantity of iron slag, fuel ash and an iron furnace base were also recovered, although no hammerscale was identified. Limited evidence for metal-working is relatively widespread

across all other parts of the settlement, and, in comparable areas of both the Manor Farm and Elms Farm sites, the evidence suggests that more intensive iron and copper-working activity may have occurred in one specific zone around 275m to the east (Thomas 2008, 109–110).

Overall, there is a general impression of domestic functions for the roundhouses at Avanti Fields, with the structures and enclosures used at a single household level for the processing of meat and other foodstuffs. This may have taken place alongside limited, opportunistic flint-working as well as small-scale bone-working and metal-working activity, involving both iron and copper and perhaps using small furnaces.

Trade

Many of the utilitarian objects on site – particularly bone items, querns and pottery – were locally made, though some could have been acquired through a trading network involving similar nearby communities, such as Beaumont Leys (Thomas 2011) and the multitude of smaller enclosed farmsteads common to the region (Clay 1992; Meek *et al* 2004; Speed 2010). Much of the flint raw material (potentially continuing in use during the Iron Age) was derived from local fluvial sources or glacial till, and previous excavation has suggested the likelihood that the local Mountsorrel granodiorite was used as a tempering agent for the Iron Age pottery (Harvey 2011, 46), with production possibly even taking place in the vicinity of Roundhouse 1. The sandy, quartz or granitic-rock tempered wares could all have made use of locally available outcrops of such materials, though larger pieces probably came from the Mountsorrel and Charnwood Forest areas of Leicestershire; in contrast, the shell-tempered pottery is thought likely to have come from further afield, from Rutland, South Lincolnshire or Northamptonshire. Briquetage was not present in this excavation, whereas previous work has recovered an example from Cheshire which suggested the import of salt from the Nantwich or Middlewich area (Thomas 2011, 158).

Animal husbandry has been identified as a major component of the local agricultural regime; stock management was probably undertaken using the large enclosure systems evident on the Manor Farm part of the settlement, so there may have been only limited need for import and exchange of animals when refreshing herds (Thomas 2011, 156–157). Reference has also been made in this report to the value of stable isotope analysis of animal bone for future research and, accordingly, the opportunity has been taken here to produce some data towards this. Investigation of topics such the possible droving of livestock either to summer pastures or to market will eventually become more accessible through this type of data, once enough has been collected and made available, building on the work of recent studies on the movement of animals during the Iron Age and Roman period in both Britain and further afield (Madgwick *et al* 2017; Gan *et al* 2018; Groot *et al* 2020).

At a wider level, the presence of two Roman Republican coins at Elms Farm (Charles *at al* 2000), and a Kentish potin at Manor Farm to the east (Thomas 2008), has suggested that in the later Iron Age Humberstone was a site of some standing regionally, whose inhabitants enjoyed contacts with communities elsewhere in Britain and even the Continent. Whether this was a direct or indirect association is uncertain but further unusual items have also been recorded during this stage of excavation. Uncharred fig seeds were retrieved from both Roundhouse 8 and Roundhouse 9, with a charred grape pip and a small piece of blue-green glass also found in the terminus of the drainage ditch forming Roundhouse 9. As noted above, the possibility that these Roman items are later intrusions from agricultural activity cannot be ruled out; however, the variety and repeated recovery of such exotic and high-status finds across a wide area of the settlement would suggest that these are absolutely characteristic of Humberstone and represent significant extensive trading contacts.

Deposition

Limited conclusions can be drawn from this part of settlement, given that only a small area has been investigated, though most of the artefact assemblage was retrieved from roundhouse drainage ditches and the adjacent enclosure, predominantly from the upper backfills. Notable pottery concentrations, including near-complete single vessels, came from the junction between Roundhouse

8 and Enclosure D and the terminus internal foundation slot forming the surviving outline of the Roundhouse 8 structure. Both deposits appear to have occurred as single dumping (or placing) events following disuse or the end of a particular occupation phase of the site, and may be related to closure. The disposal of unworked fragment of antler tine alongside a group of burnt bones in a pit from Roundhouse 8 could suggest a defined group of waste material, deposited when the roundhouse was out of use.

Previous excavations at Humberstone have highlighted differential deposition, with a general concentration of finds centred on the main building remains and enclosure ditches. These were normally of mixed composition and relatively fragmented, although specific deposits of unusual items were noted, including human skulls, clusters of horse skulls alongside quern stones, and groups of partially worked red deer antler (Charles *et al* 2000, 159-160; Thomas 2008, 110–111). Midden accumulations are thought to have existed in close proximity to the roundhouse entrances at Manor Farm (Thomas 2011, 161), and whilst this was not so defined at Avanti Fields School, the high average sherd weight of pottery in pits and ditches could suggest the deliberate deposition of rubbish from middens into these features. Additionally, around a quarter of the animal bone assemblage showed evidence of canid gnawing, indicating that many of the bones were lying around and available for dogs to chew, possibly on middens, and mineralised cists from environmental samples could potentially suggest the presence of midden or latrine waste dumped in the drainage ditches.

Although not to the same extent, the reuse or selected redeposition of quern stones, a pattern previously noted in the packing of postholes with querns and rubbing stones at both Elms Farm and Manor Farm (Charles *et al* 2000, 136, Thomas 2008, 12), was continued at Avanti Fields. Three fragments of quern, of two different materials, were found in the stone packing and infill of a post-socket adjacent to Roundhouse 9, another in the upper backfill of the Roundhouse 8 drainage ditch. A stone rubber was also found close to a further posthole associated with Roundhouse 9, though this was recovered from the subsoil deposits just above it. Beyond pragmatic reuse, the deposition of querns and other stone artefacts in later prehistory is frequently thought to be an act imbued with significance, these being items essential for production of food and thus maintenance of life but then broken and specifically buried in pits, postholes and hearths, maybe as foundation or closing deposits (Hill 1995; Brück 1999, 152–155; Moore 2006, 122–124; Willis 2006, 125; Thomas 2011, 91–92). It has been suggested that such depositions in both construction features and in disuse/infill deposits, particularly where a quern stone has been inverted, may denote a change in the function of structures, or an alteration in the extent or nature of the household economy (Pope 2003, 382).

8.3 Later activity

There was no clear evidence of continuity on site into the Roman period, though there may have been limited Roman land use in the vicinity from which some of the more unusual finds and environmental evidence on the Humberstone settlement is derived (see above). At Avanti Fields, there are no defined phases of activity after the mid to late Iron Age, and it is likely that following the end of use of the roundhouses the area reverted to a general agricultural landscape.

A thin former subsoil in the western part of the site covered the Iron Age archaeology, with a mixed assemblage of finds within this. A narrow system of plough furrows was dated to the post-medieval period, probably part of an open-field ridge and furrow landscape associated with the manorial holdings in the surrounds of Humberstone. This is broadly reflective of a general shift in agricultural and settlement patterns from the Saxon period onwards. Post-medieval and modern land drains demonstrate an attempt at later land improvement.

A series of very recent modern intrusions associated with previous construction compounds for the immediately adjacent residential development were problematic and had disturbed large areas of the site, compromising the integrity of the archaeology in places.

9 Conclusions

The excavated site at Avanti Fields School was dictated by the extent of development and the presence of a tree protection zone, but even accounting for the limitations regarding the size of the sample, as well as the disturbance of ridge and furrow agriculture and modern truncation/contamination, there can be a relatively high degree of confidence that the aims of the project have been achieved. Conditions were suitable to identify the presence or absence of archaeological features, to conduct appropriate levels of sample investigation, and to consider the site record in relation to the local archaeological context.

Effectively, the site offers comparable, complementary and directly related archaeological evidence to that from the Elms Farm, Manor Farm, and Thurmaston Lane areas (Charles *et al* 2000; Thomas 2008; Harvey 2011; Higgins 2015) that can be considered together to improve understanding of later prehistoric occupation more widely. Undoubtedly the settlement overall is of regional significance, as one of the largest Iron Age sites in Leicestershire, though elements of it, such as the combined artefact assemblage, may be considered at a national level. It is unfortunate but unavoidable in the nature of development-led archaeology that the settlement has been excavated in piecemeal blocks over a long period of time by differing organisations, and future integrated analysis and synthesis combining all artefactual and environmental assemblages from both the more recent and previous work, as well as reviewing groups associated with every roundhouse or enclosure, may be productive.

Despite the problems inherent with only a small sample of a larger whole, the Avanti Fields site contains many elements which are of relevance to the regional research frameworks (Willis 2006; Knight *et al* 2012). These are especially applicable when considered alongside the previous investigations of the wider settlement (Charles *et al* 2000; Thomas 2008; Harvey 2011; Higgins 2015). For example, improving understanding of the Iron Age ceramic chronology and adding to the dataset of settlement sites on higher ground away from river valleys and on clay geologies are both priorities for the region (Willis 2006, 128–130; Knight *et al* 2012, 58). With regard to the middle and late Iron Age in particular, understanding the dating sequences of open and enclosed settlement, the character of aggregated settlements (including intra-site morphology), the relationship of settlements to agriculture and the emergence of land division are all of major interest (Willis 2006, 130–131; Knight *et al* 2012, 58). Artefactual and environmental evidence from the site also demonstrates aspects of Iron Age life such as character of deposition, craftworking and industry, circulation and consumption of commodities, transport and exchange of technology and materials, and the possibility of continuing flint use into the first millennium BC (Willis 2006, 132–134; Knight *et al* 2012, 58). As a result, therefore, the site may offer some contributions to the major research questions and the following specific objectives in the East Midlands Updated Research Agenda for the later Bronze Age and Iron Age (Knight *et al* 2012, 58–69):

> Research Agenda 4.1 – Dating
>
> Research Agenda 4.4 – Middle Iron Age settlements
>
> Research Agenda 4.5 – Late Iron Age settlements
>
> Research Agenda 4.9 – Finds, craft, industry and exchange
>
> Research Objective 4A – Compile an audit of radiocarbon, dendrochronological and other scientific dates
>
> Research Objective 4B – Refine first millennium BC ceramic chronology by additional radiocarbon dating and typological analyses
>
> Research Objective 4E – Assess the evidence for the evolution of settlement hierarchies
>
> Research Objective 4G – Study the production, distribution and use of artefacts

Overall, it can be considered that the nature, density and distribution of archaeological features provides an accurate characterisation of the site impacted by the development, and that this adds an

important new contribution to the dataset previously established for the Humberstone Iron Age settlement.

10 Project personnel

The fieldwork was led by Richard Bradley MCIfA and Andrew Mann MCIfA, assisted by Elspeth Iliff PCIfA, Jamie Wilkins ACIfA, Martina Locatelli, Ed Pearson, and Yago Terroba-Souto PCIfA.

The project was managed by Tom Rogers MCIfA (fieldwork) and Derek Hurst ACIfA (post excavation). The report was produced and collated by Richard Bradley, with background research completed by Martina Locatelli and editing by Derek Hurst. Specialist contributions and their individual sections of the report are attributed to the relevant authors throughout the text. The specialist work was completed as a collaboration with internal Worcestershire Archaeology staff and external independent specialists.

11 Acknowledgements

Worcestershire Archaeology would like to thank the following for the successful conclusion of the project: Cathy Patrick and Rob Smith (Orion Heritage), Kabir Rasool and Paresh Joshi (BAM Construct UK), and Grahame Appleby (city archaeologist, Leicester City Council).

Jane Evans would like to particularly thank Nick Cooper of ULAS for sharing his detailed knowledge of the Leicestershire pottery fabrics and forms.

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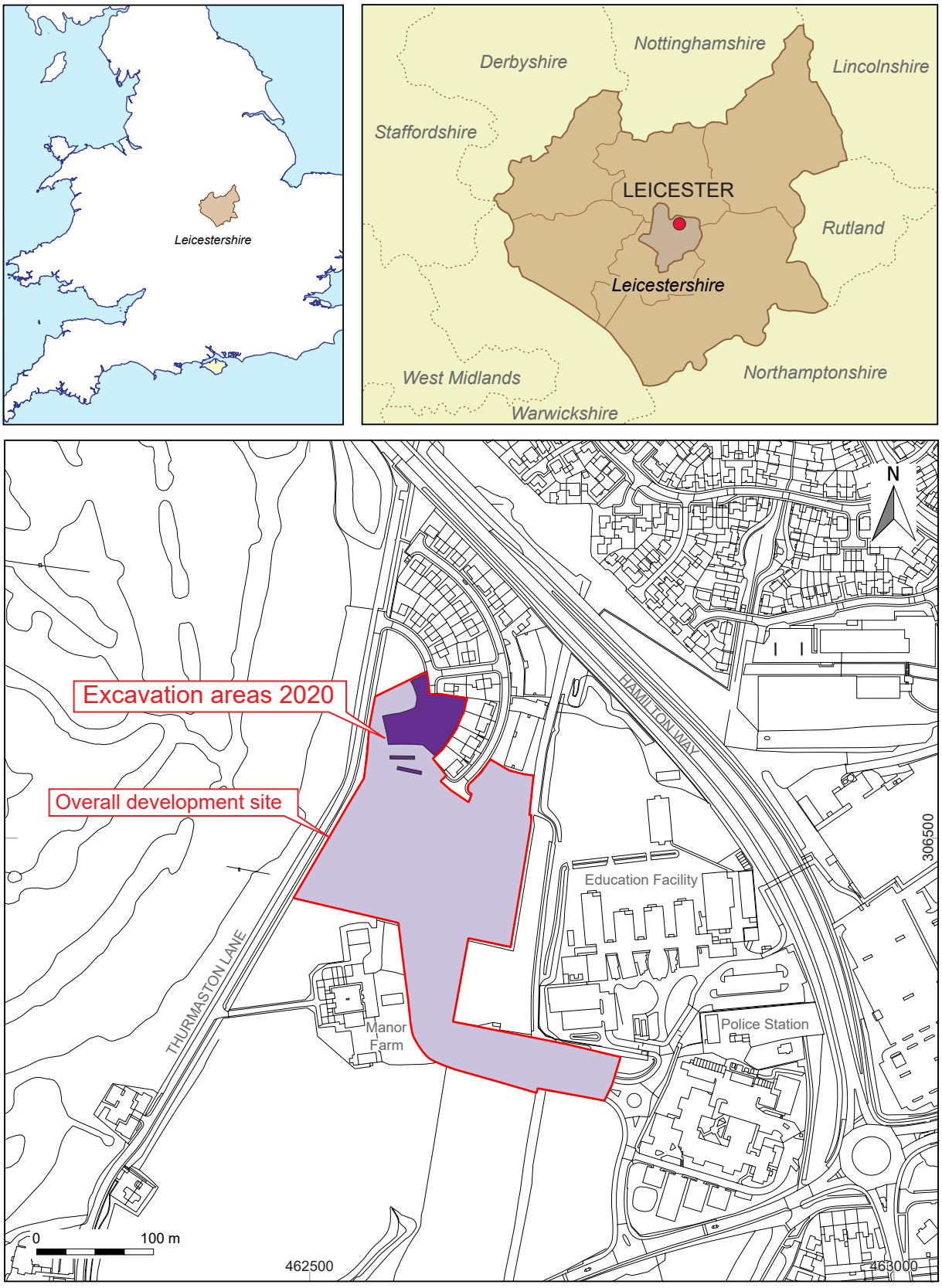
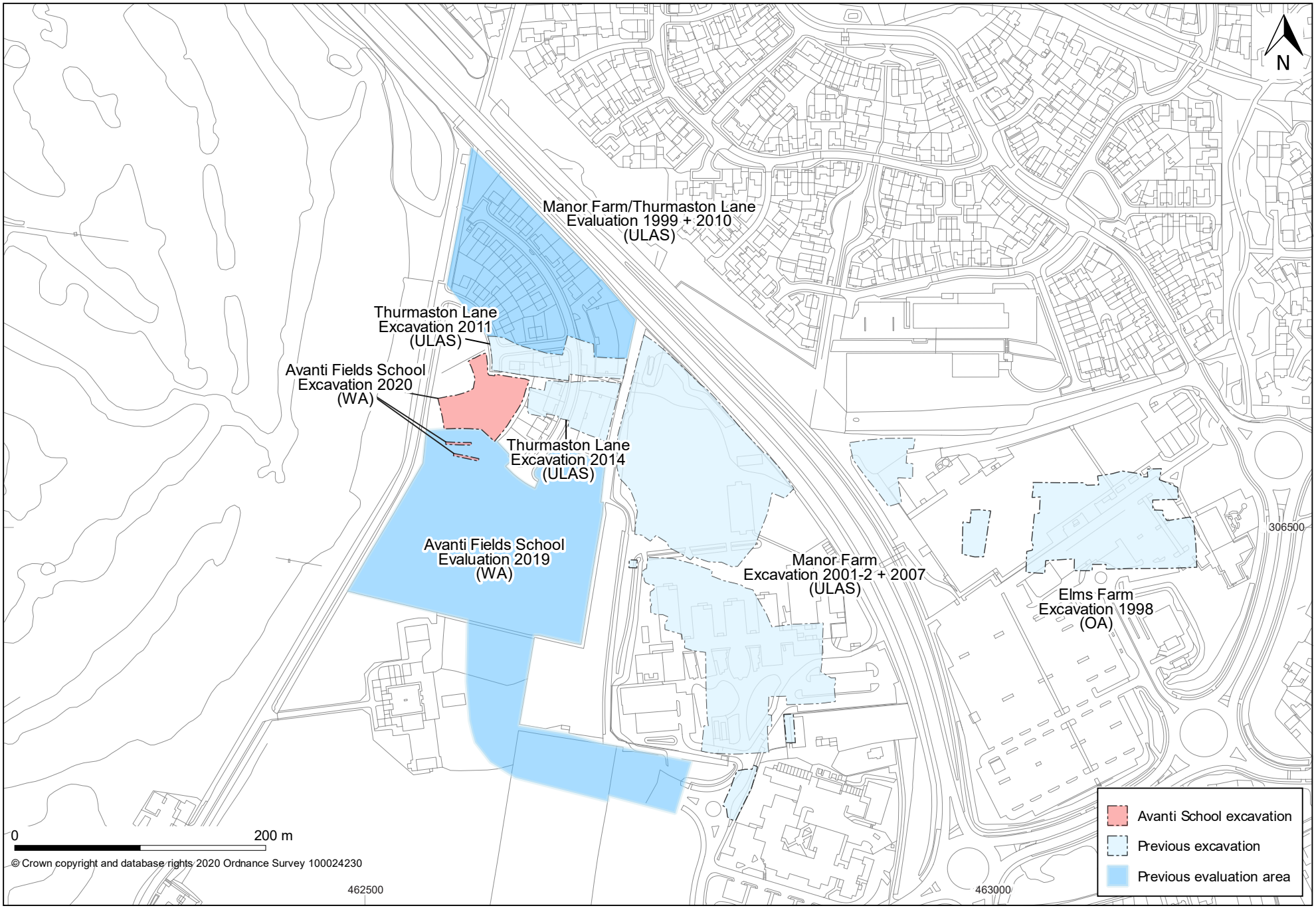
Figures



Location of the site *Figure 1*



The excavation area and previous archaeological works in the area

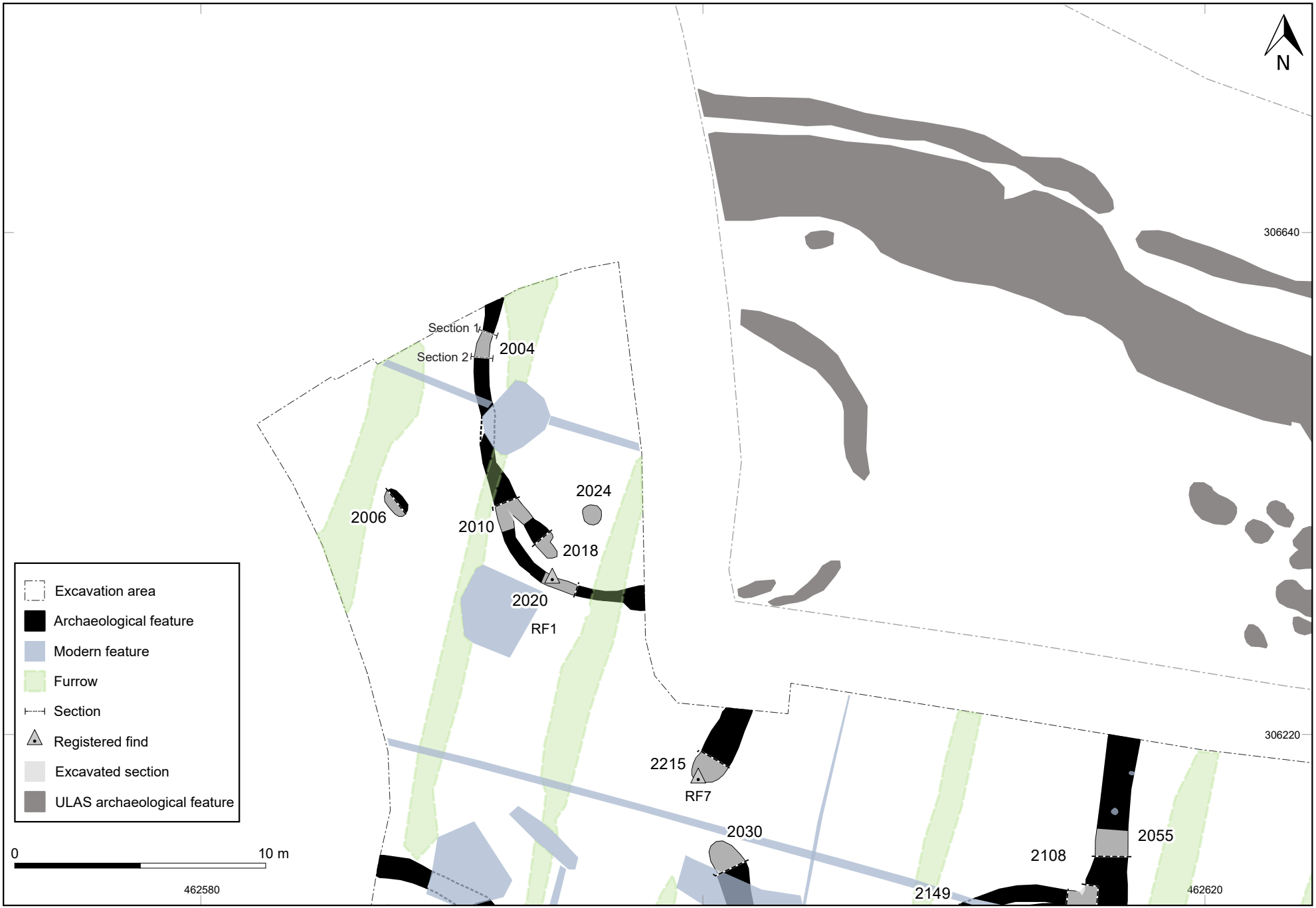
Figure 2

The excavated areas

Figure 3

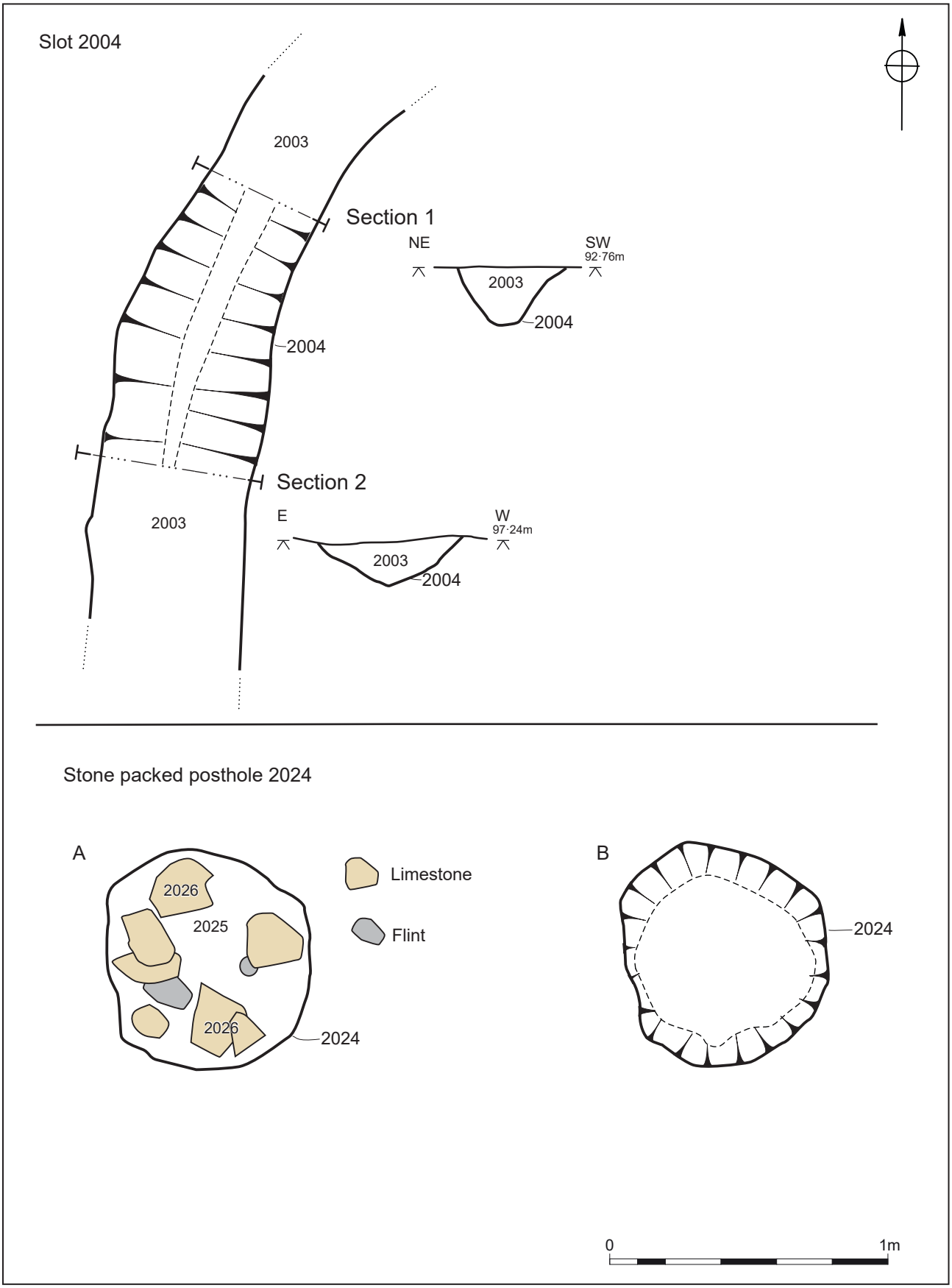
The archaeological features identified at Humberstone 'aggregated' settlement

Figure 4

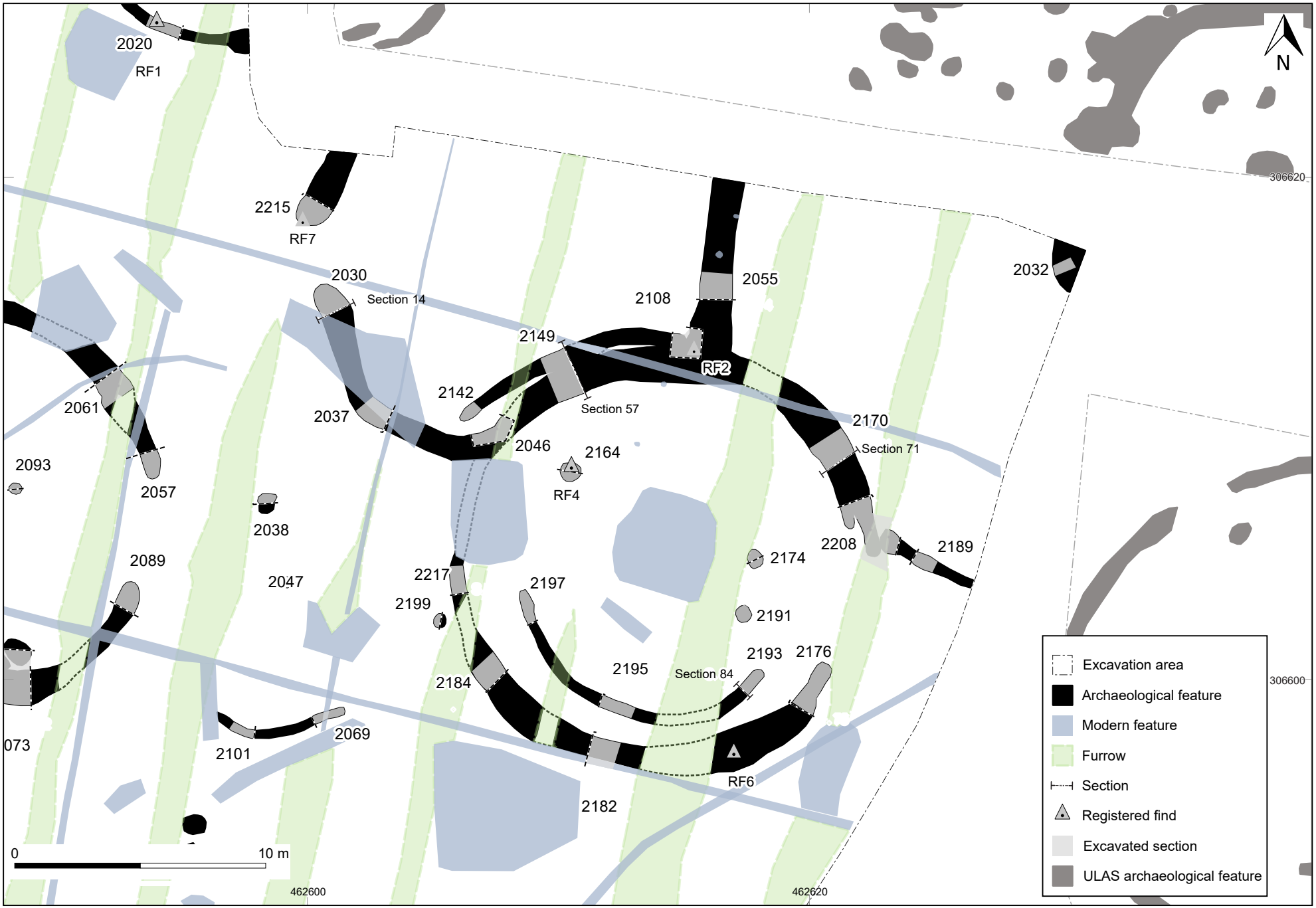


Roundhouse 2

Figure 5

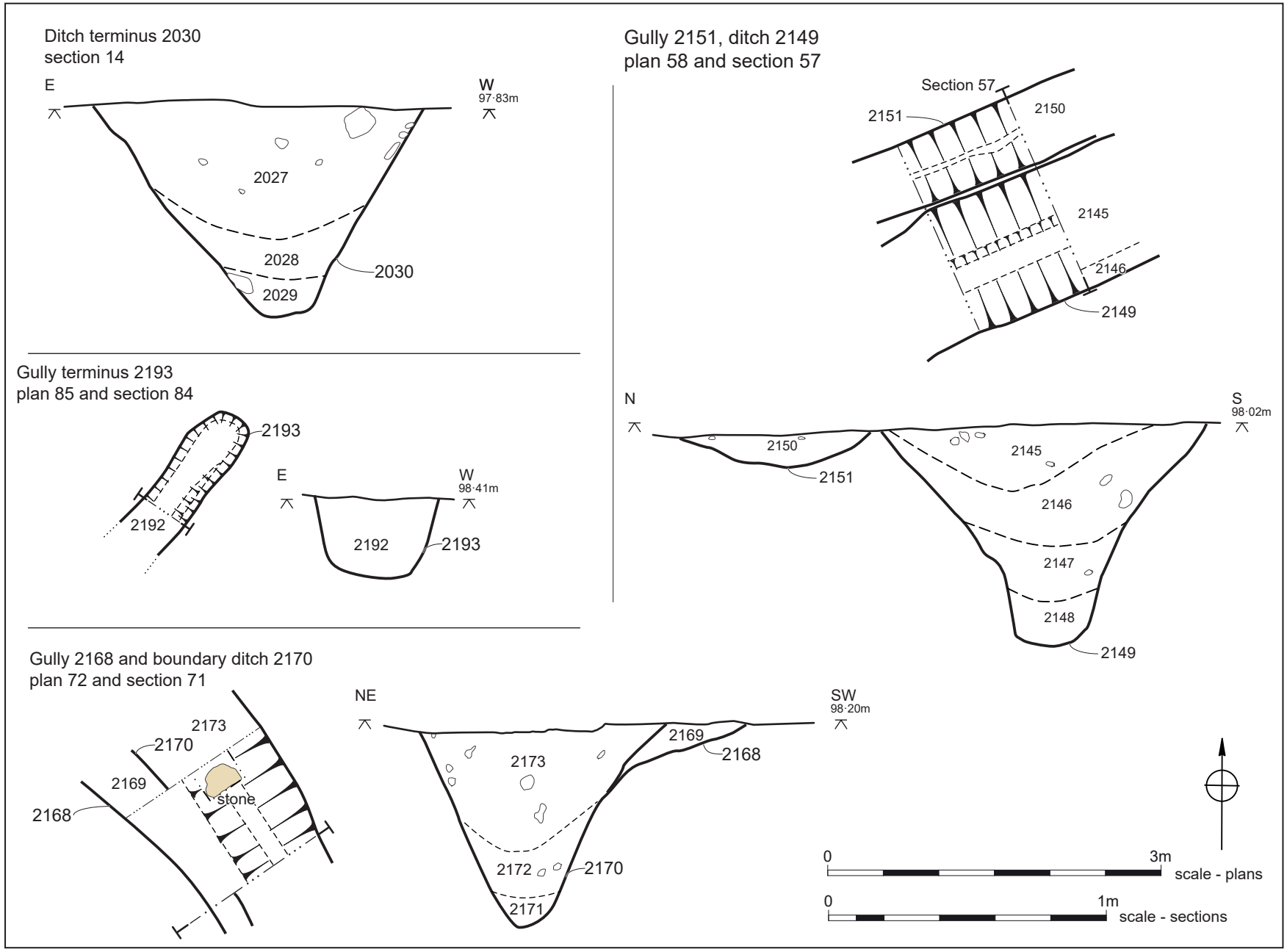


Roundhouse 2, slot 2004, stone packed posthole 2024 *Figure 6*



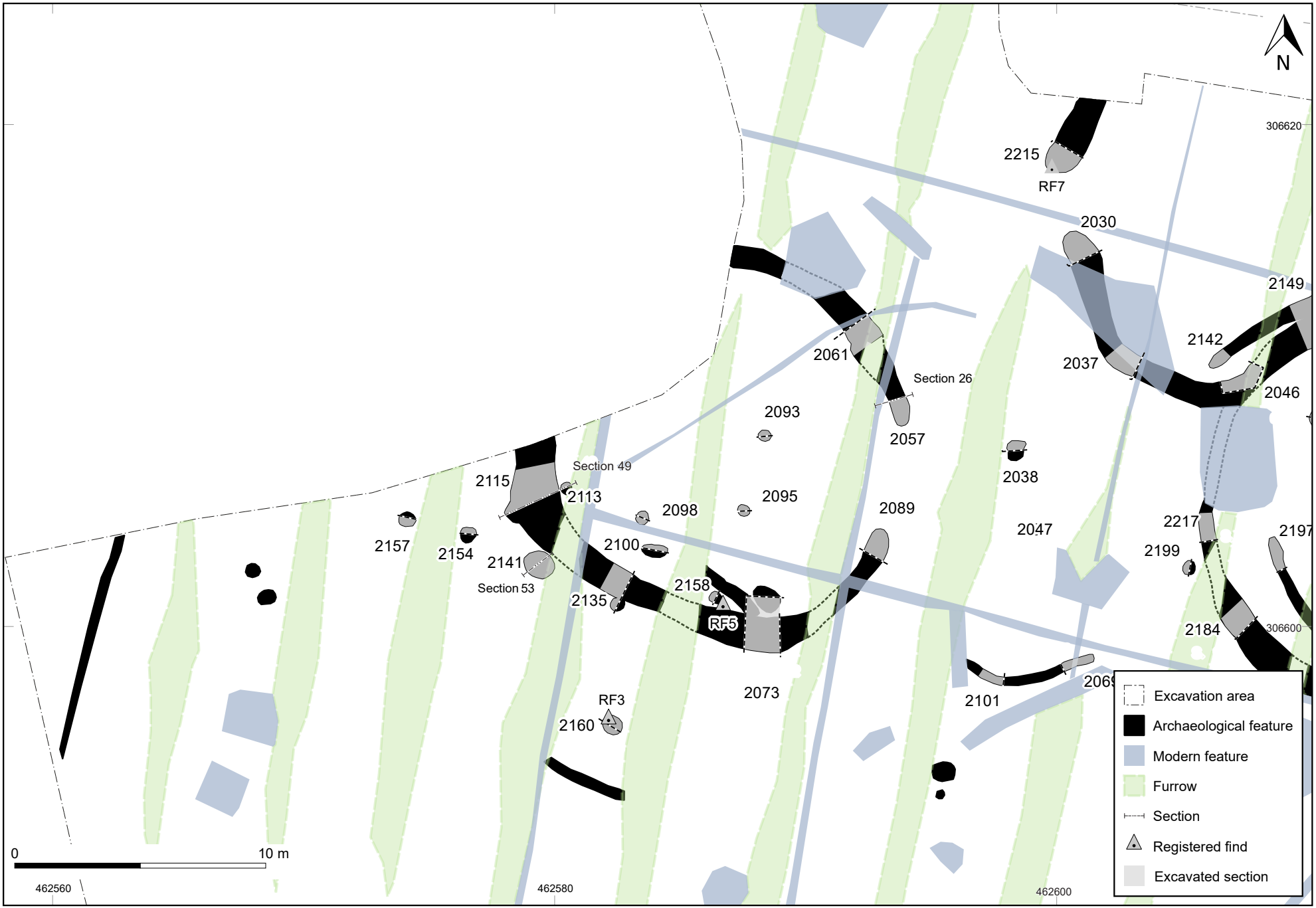
Roundhouse 8 and Enclosure D

Figure 7



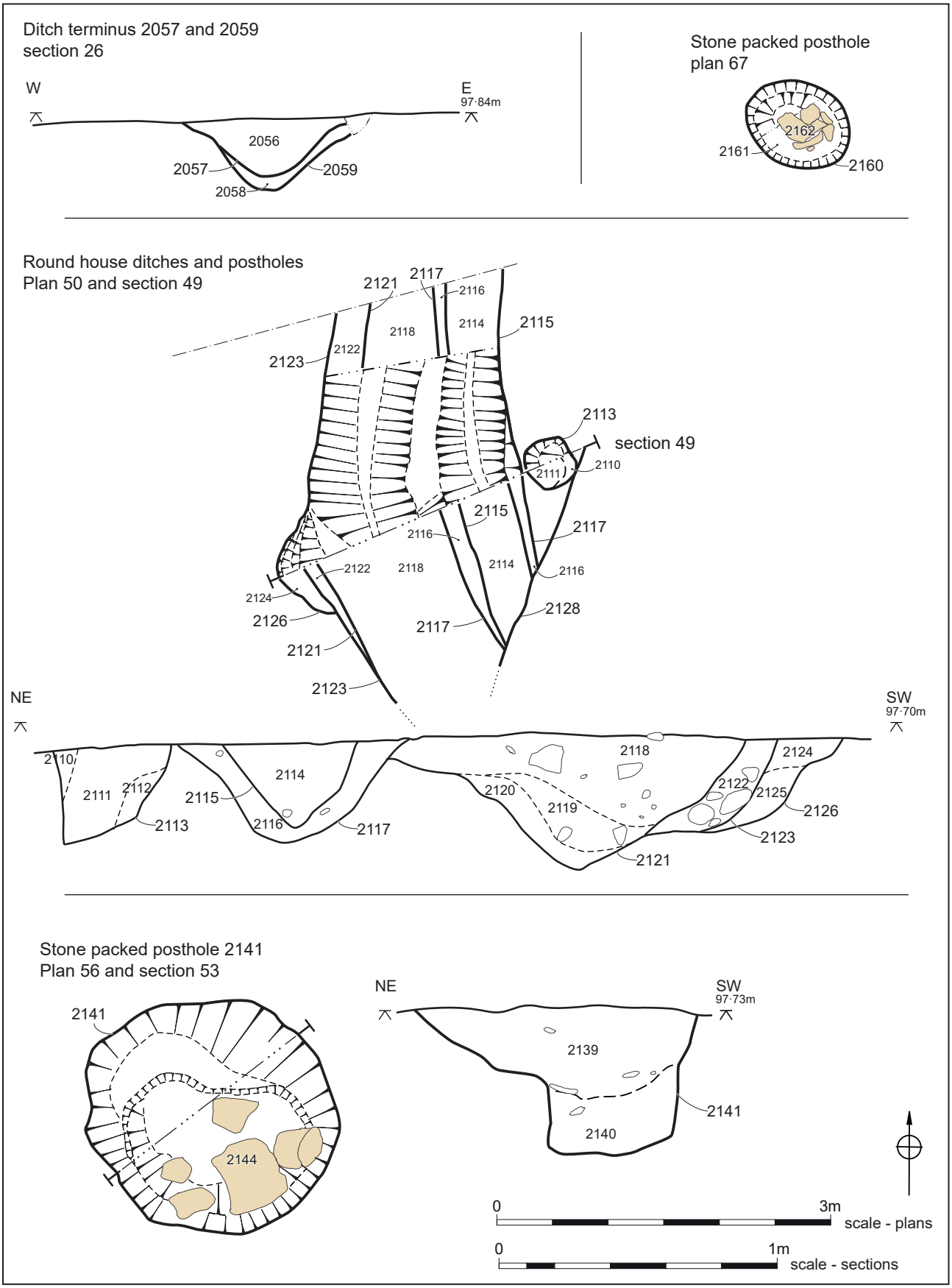
Enclosure D and Roundhouse 8 sections and plans

Figure 8

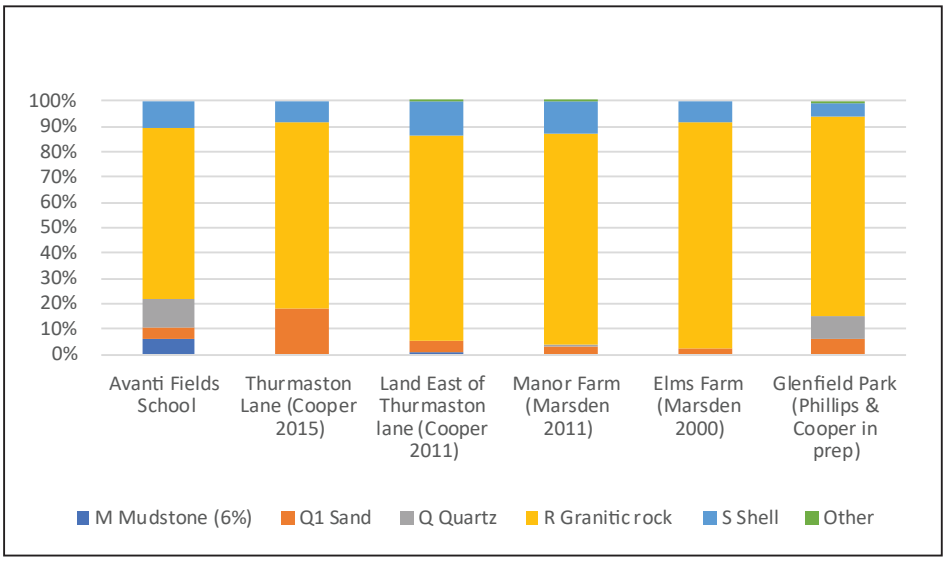


Roundhouse 9

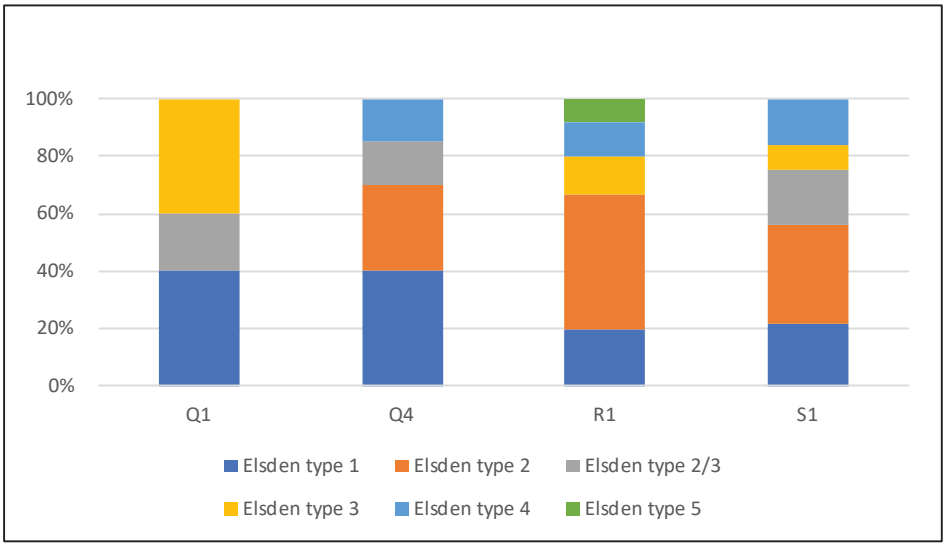
Figure 9



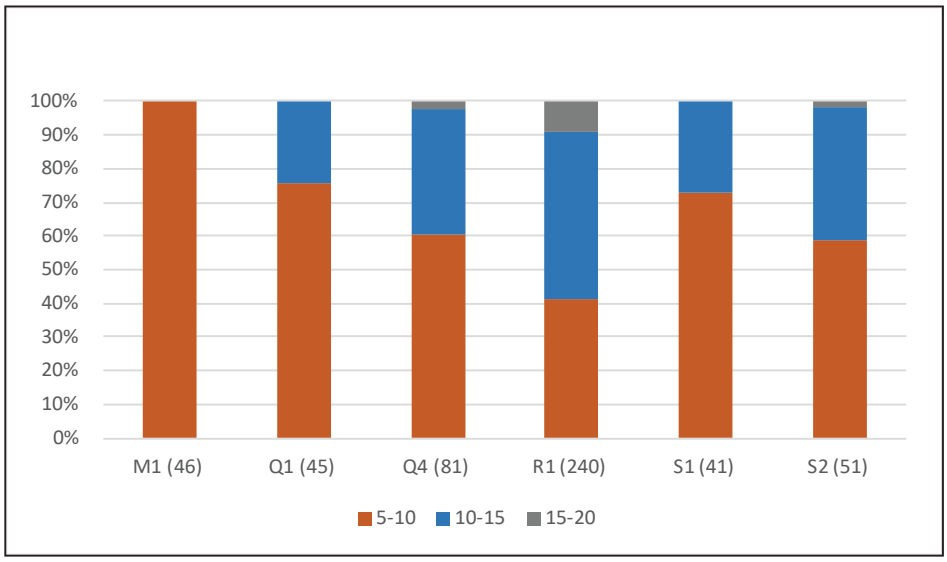
Roundhouse 9, detailed plans and sections *Figure 10*



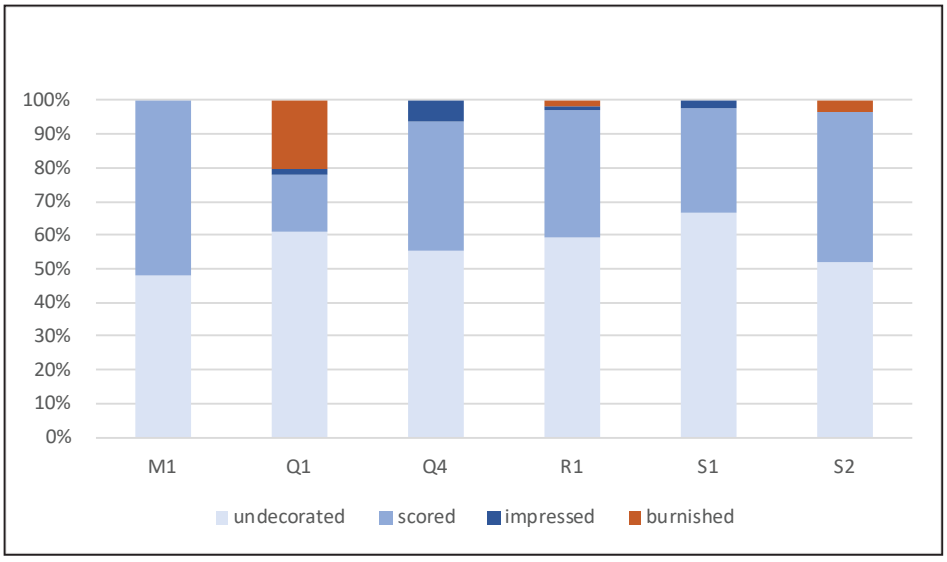
Pottery fabric classes by site (% weight) *Figure 11*



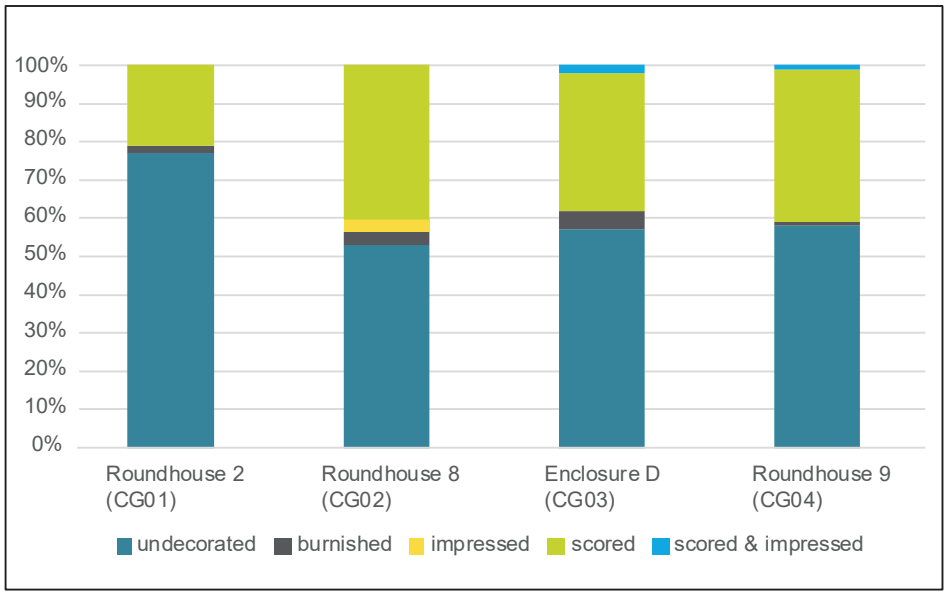
Pottery forms by fabric (% rim EVE) *Figure 12*



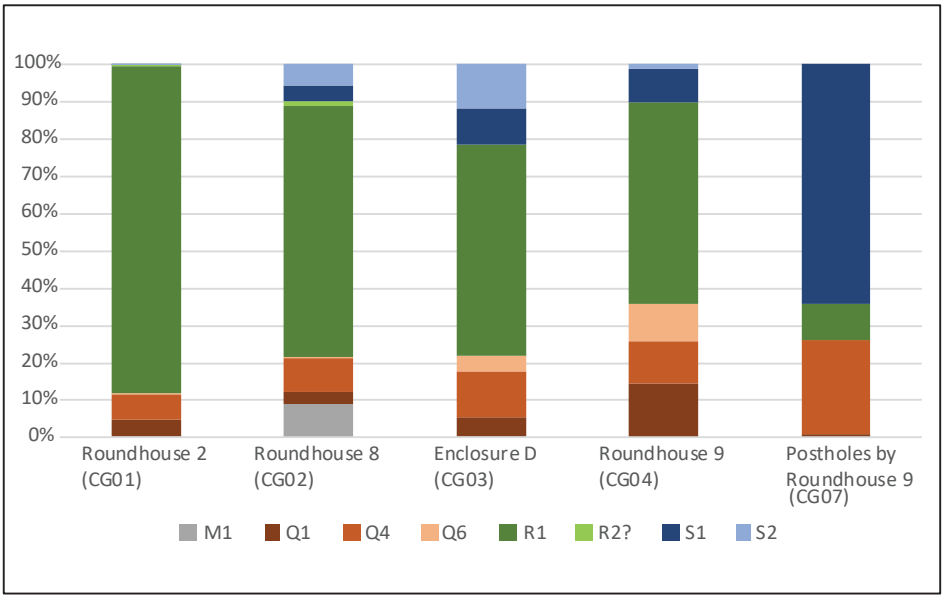
Middle to late Iron Age pottery, sherd thickness by fabric (% sherd count)
Figure 13



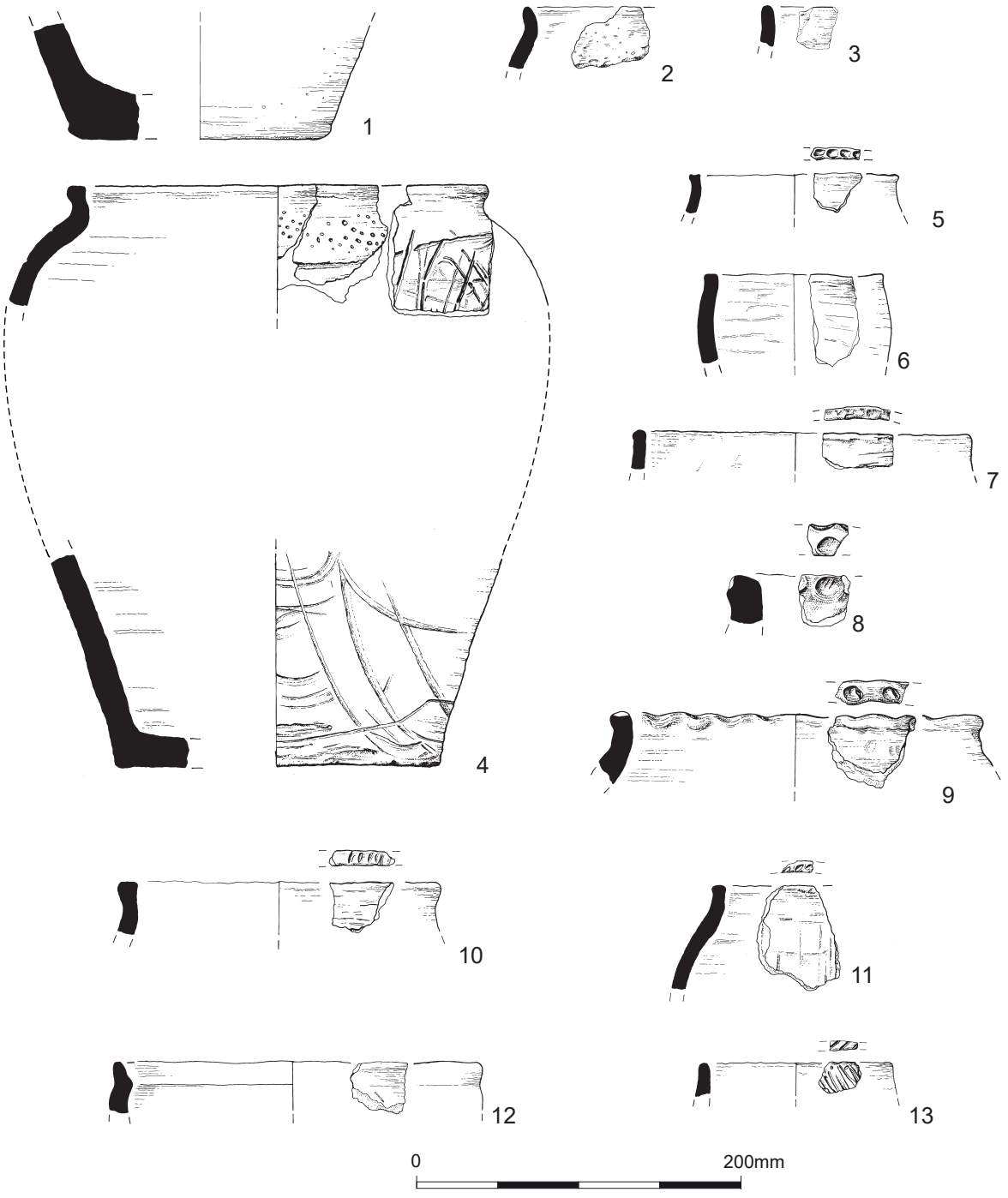
Middle to late Iron Age pottery, decoration by fabric (% count) *Figure 14*



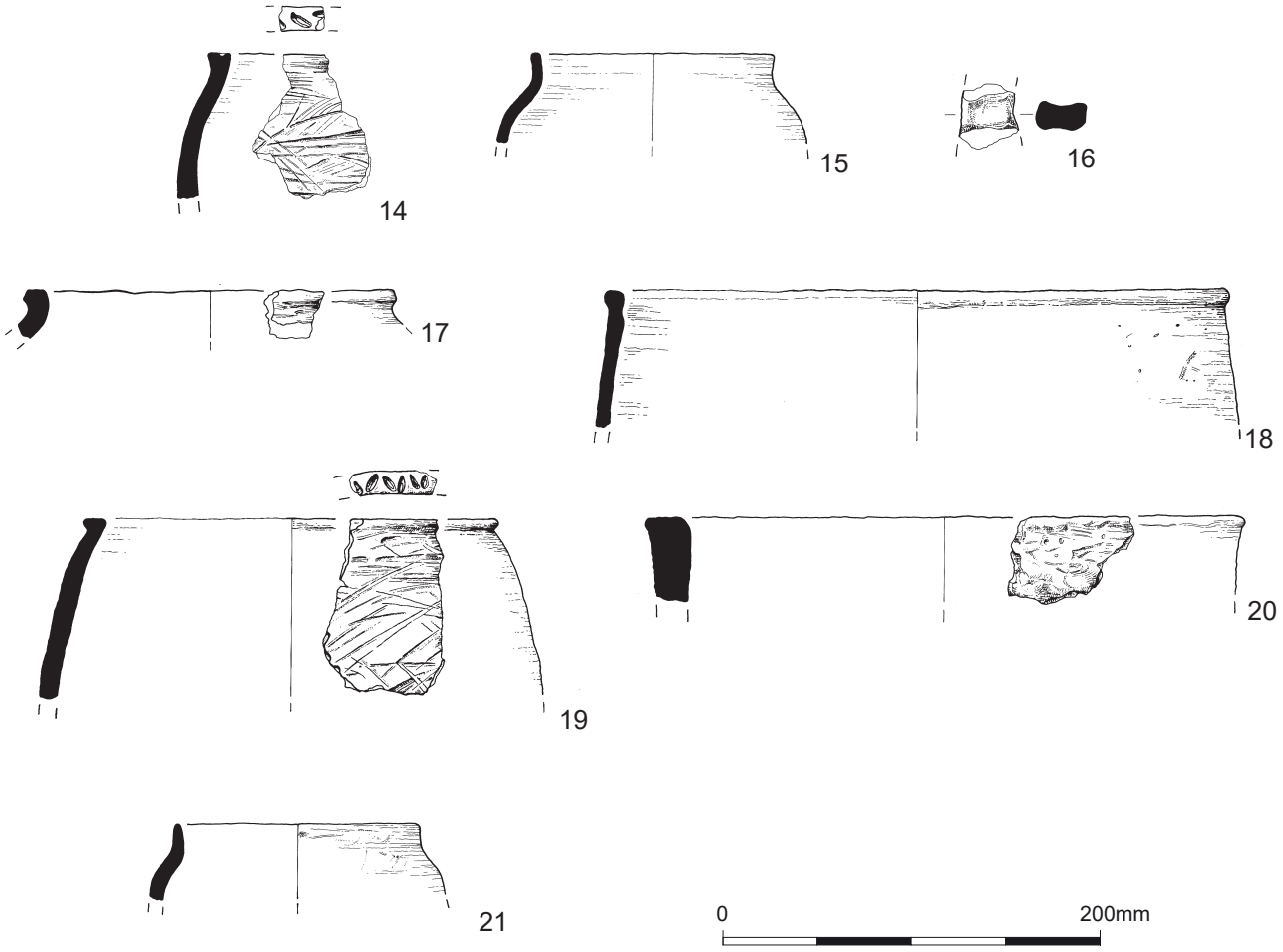
Pottery decoration from main context groups (% count) *Figure 15*



Pottery fabrics from main context groups (% weight) *Figure 16*

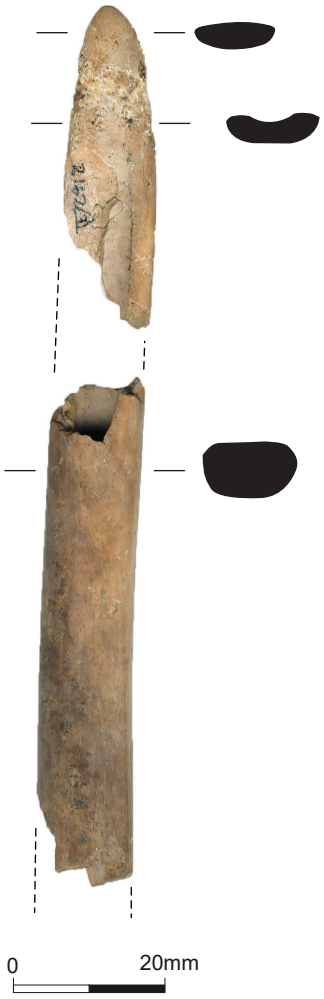


Pottery: Roundhouses 2 and 8 *Figure 17*

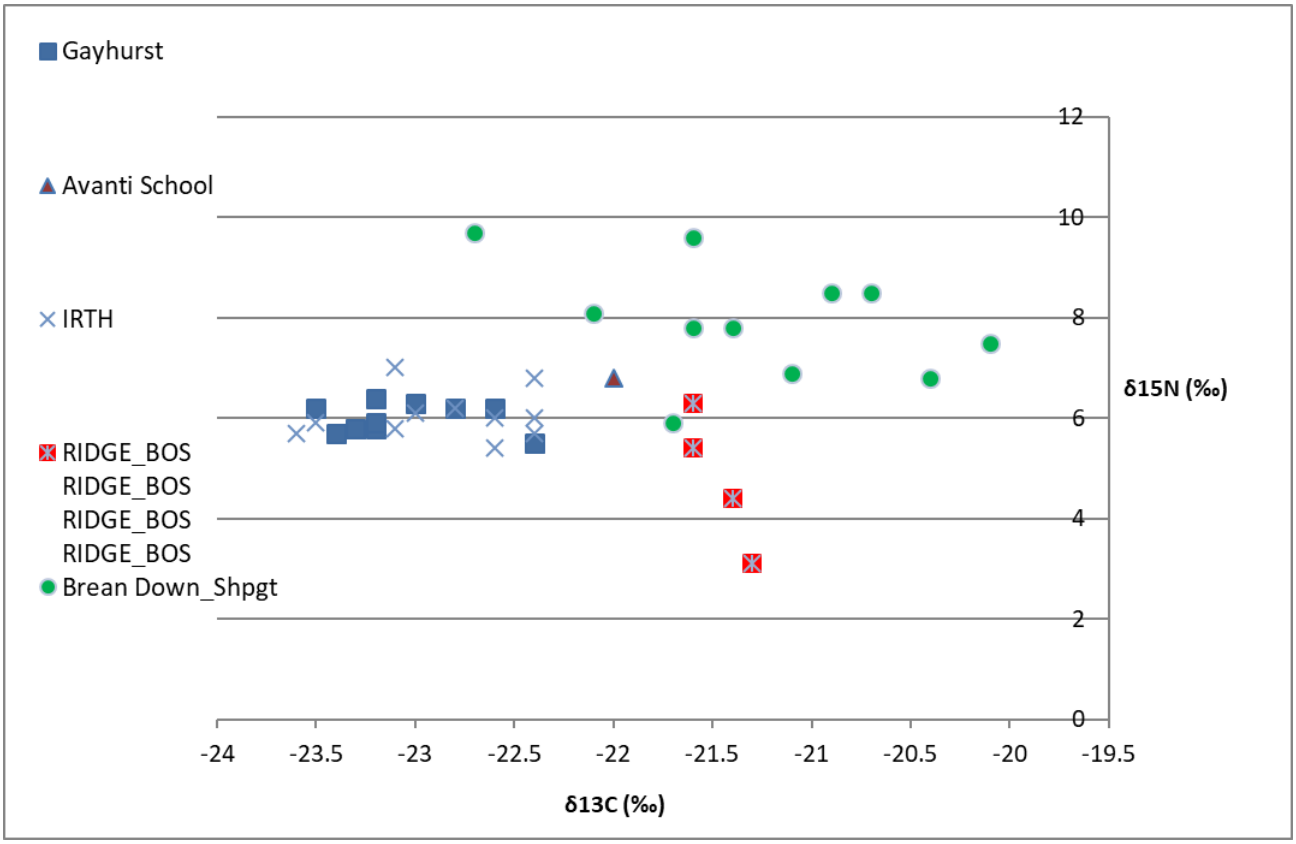


Pottery: Enclosure D and Roundhouse 9 *Figure 18*

Pottery: decoration *Figure 19*



Bone object SF3 *Figure 20*



Comparison of δ13C and δ15N results from Avanti School with other sites *Figure 21*

Plates

Plate 1: Excavation in progress with Roundhouse 9 (CG04) in foreground and the tree protection zone visible, facing north-west

Plate 2: Excavation in progress across Roundhouse 2 (CG01) with modern waste material being removed

Plate 3: Roundhouse 8 (CG02) during excavation, with furrows and modern intrusions clearly visible, facing north, 1m scales

Plate 4: Roundhouse 2 (CG01) terminus 2016/2018 with the darker second phase fill visible, facing north-west, 0.5m scale

Plate 5: Roundhouse 2 (CG01) internal posthole 2024 with stone packing, facing north, 0.5m scale

Plate 6: Roundhouse 8 (CG02) slot 2149/2151 showing earlier gully (left) replaced by larger drainage ditch, facing east, 0.5m and 1m scales

Plate 7: Roundhouse 8 (CG02) slot 2208/2211 at northern terminus, showing earlier gully (left) replaced by larger drainage ditch, facing north-west, 1m scale

Plate 8: Roundhouse 8 (CG02) terminus of foundation slot 2193, facing south-west, 0.3m scale

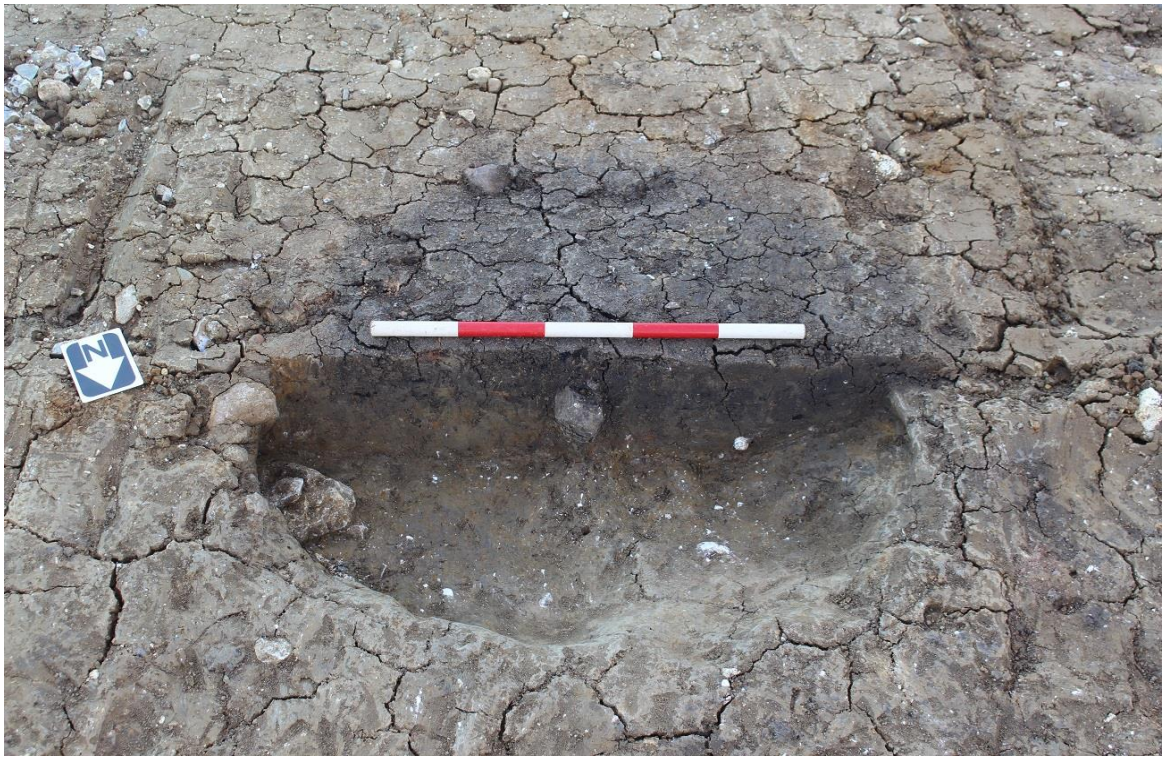


Plate 9: Roundhouse 8 (CG02) internal pit or possible hearth 2164, facing south-east, 0.5m scale

Plate 10: Enclosure D (CG03) entrance with termini slots 2030 and 215 in foreground, facing east, 1m scales

Plate 11: Enclosure D (CG03) terminus slot 2215 with stone from within the terminus, facing north-east, 1m scale

Plate 12: Enclosure D (CG03) and Roundhouse 8 (CG02) junction, with dump of pottery and animal bone visible during excavation, 0.5m scale

Plate 13: Roundhouse 9 (CG04) slot 2115/2117/2121/2123, with repeated re-cutting, and posthole 2113 on the inside edge (left), facing south-east, 0.4m and 1m scales

Plate 14: Roundhouse 9 (CG04) slot 2061/2064/2066, with re-cutting and the darker second phase fill visible on the inside edge (left), facing north-west, 1m scale

Plate 15: Roundhouse 9 (CG04) external post socket 2141, part of group (CG07), with stone packing visible, 0.5m scale

Appendix 1: Summary of project archive (Y.A2.2020)

TYPE	DETAILS*
Artefacts and Environmental	Animal bones, Ceramics, Environmental (charred plant remains, charcoal), Glass, Industrial, Metal, Worked bone, Worked stone/lithics, other
Paper	Context sheet, Correspondence, Diary (Field progress form), Drawing, Plan, Report, Section
Digital	Database, GIS, Images raster/digital photography, Spreadsheets, Survey, Text

**OASIS terminology*

The project archive is currently held at the offices of Worcestershire Archaeology. Subject to the agreement of the landowner it is anticipated that it will be deposited with the Leicester City Museum and Galleries service.

Appendix 2: Concordance table of sites comprising Humberstone Iron Age settlement

ite name	Source(s)	Dating evidence	Roundhouses			Additional features
			Number	Approximate size (diameter / internal space)	Characteristics	
Elms Farm	Charles *et al* 2000	middle to late Iron Age based on artefacts and C14 (415 cal BC to 46 cal BC)	minimum 3	*c*. 10m – 12m	Penannular drainage ditches. At least one roundhouse has both foundation slot and outer drainage ditch. East facing entrances.	Associated penannular enclosures (some of these may also be roundhouses). Pits and four-post structures. Animal burial and cremation burial. Pebble surfaces.
Manor Farm	Thomas 2008 Thomas 2011	middle to late Iron Age based on artefacts and C14 (420–300 cal BC to 40 cal BC / cal AD 10)	14	*c*. 8.5m – 13m	Penannular drainage ditches, some with paired entrance postholes. At least one roundhouse has both foundation slot and outer drainage ditch. East and south-east facing entrances.	Associated east – west boundary ditch. Small enclosures associated with roundhouses. Large rectilinear stock enclosures. Pits, and two-post and four-post structures. Hearths.
Thurmaston Lane 2010	Harvey 2011	middle to late Iron Age based on artefacts	2	*c*. 11m – 13m	Penannular drainage ditches. East-south-east facing entrances.	Associated east – west boundary ditch. Pit clusters.
Thurmaston Lane 2014	Higgins 2015	middle to late Iron Age based on artefacts	minimum 5	*c*. 10m – 13m	Penannular drainage ditches, some with paired entrance postholes. At least one roundhouse has both foundation slot and outer drainage ditch. East-south-east and south-east facing entrances.	Small enclosures associated with roundhouses. Pits. Sub-rectangular enclosure.
Avanti Fields School	This report (Bradley 2020)	middle to late Iron Age based on artefacts and C14 (390 cal BC to 170 cal BC)	minimum 2 (plus 2 that overlap with Harvey 2011)	*c*. 9m – 12.5m	Penannular drainage ditches, some with paired entrance postholes. At least one roundhouse has both foundation slot and outer drainage ditch. East-south-east facing entrances.	Small enclosure associated with roundhouse. Pits and oval post-socket. Two-post structure.

Appendix 3: Radiocarbon dating certificates

Beta Analytic Inc
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ISO/IEC 17025:2005-Accredited Testing Laboratory

August 31, 2020

Ms. Elizabeth Pearson
Worcestershire Archaeology
The Hive, Sawmill Walk, The Butts
Worcester, WRI 3PD
United Kingdom

RE: Radiocarbon Dating Results

Dear Ms. Pearson,

Enclosed are the radiocarbon dating results for two samples recently sent to us. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable. The Conventional Radiocarbon Ages have all been corrected for total fractionation effects and where applicable, calibration was performed using 2013 calibration databases (cited on the graph pages).

The web directory containing the table of results and PDF download also contains pictures, a cvs spreadsheet download option and a quality assurance report containing expected vs. measured values for 3-5 working standards analyzed simultaneously with your samples.

Reported results are accredited to ISO/IEC 17025:2005 Testing Accreditation PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators here. Since Beta is not a teaching laboratory, only graduates trained to strict protocols of the ISO/IEC 17025:2005 Testing Accreditation PJLA #59423 program participated in the analyses.

As always Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than +/- 30 years, a conservative +/- 30 BP is cited for the result. The reported d13C values were measured separately in an IRMS (isotope ratio mass spectrometer). They are NOT the AMS d13C which would include fractionation effects from natural, chemistry and AMS induced sources.

When interpreting the results, please consider any communications you may have had with us regarding the samples.

The cost of analysis was previously invoiced. As always, if you have any questions or would like to discuss the results, don't hesitate to contact us.

Sincerely,

Digital signature on file

Ronald E. Hatfield President

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REPORT OF RADIOCARBON DATING ANALYSES

Elizabeth Pearson — Report Date: August 31, 2020

Worcestershire Archaeology — Material Received: August 17, 2020

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 566201	**P5800/2165B**	**1750 +/- 30 BP**	IRMS δ13C: -24.0 o/oo
(95.4%)	**222 - 384 cal AD**	**(1728 - 1566 cal BP)**	

Submitter Material: Charcoal
Pretreatment: (charred material) acid/alkali/acid
Analyzed Material: Charred material
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 80.42 +/- 0.30 pMC
Fraction Modern Carbon: 0.8042 +/- 0.0030
D14C: -195.76 +/- 3.00 o/oo
Δ14C: -202.54 +/- 3.00 o/oo (1950:2020)
Measured Radiocarbon Age: (without d13C correction): 1730 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13

Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the 14C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.

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REPORT OF RADIOCARBON DATING ANALYSES

Elizabeth Pearson

Worcestershire Archaeology

Report Date: August 31, 2020

Material Received: August 17, 2020

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 566202	**P5800/2165A**	**2220 +/- 30 BP**	IRMS δ13C: -22.0 o/oo IRMS δ15N: +6.8 o/oo
(95.4%)	**375 - 203 cal BC**	**(2324 - 2152 cal BP)**	

Submitter Material: Bone (Non-heated)
Pretreatment: (bone collagen) collagen extraction; with alkali
Analyzed Material: Bone collagen
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 75.85 +/- 0.28 pMC
Fraction Modern Carbon: 0.7585 +/- 0.0028
D14C: -241.46 +/- 2.83 o/oo
Δ14C: -247.86 +/- 2.83 o/oo (1950:2020)
Measured Radiocarbon Age: (without d13C correction): 2170 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13
Carbon/Nitrogen: CN : 3.3 %C: 37.90 %N: 13.51

Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the 14C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: d13C = -24.0 o/oo)

Laboratory number **Beta-566201**

Conventional radiocarbon age **1750 ± 30 BP**

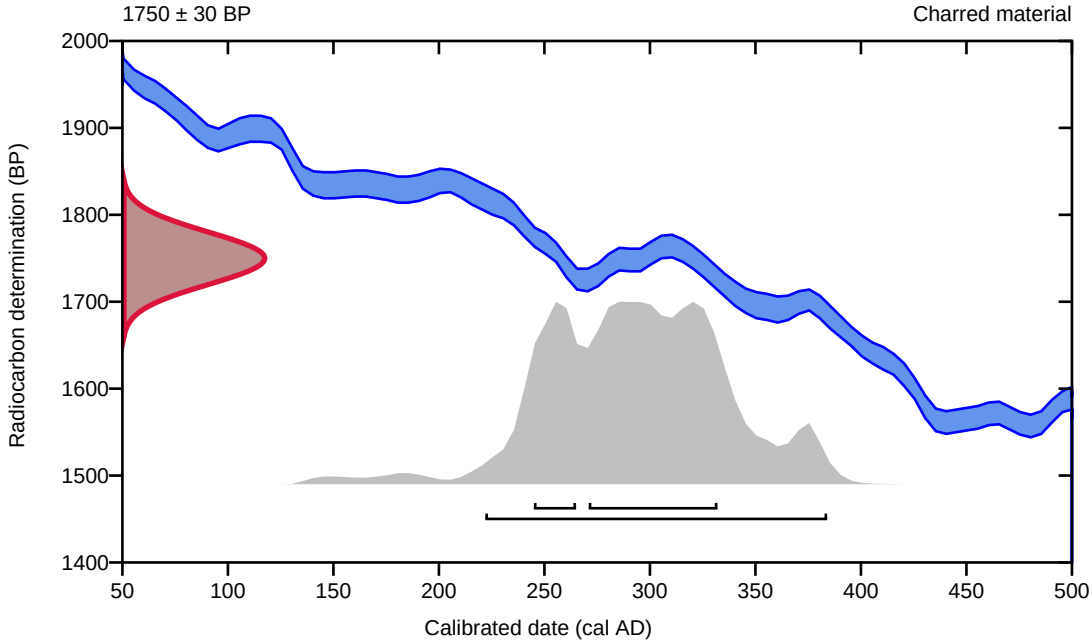
95.4% probability

(95.4%) 222 - 384 cal AD (1728 - 1566 cal BP)

68.2% probability

(51.8%) 271 - 332 cal AD (1679 - 1618 cal BP)
(16.4%) 245 - 265 cal AD (1705 - 1685 cal BP)

P5800/2165B



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

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BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: d13C = -22.0 o/oo)

Laboratory number **Beta-566202**

Conventional radiocarbon age **2220 ± 30 BP**

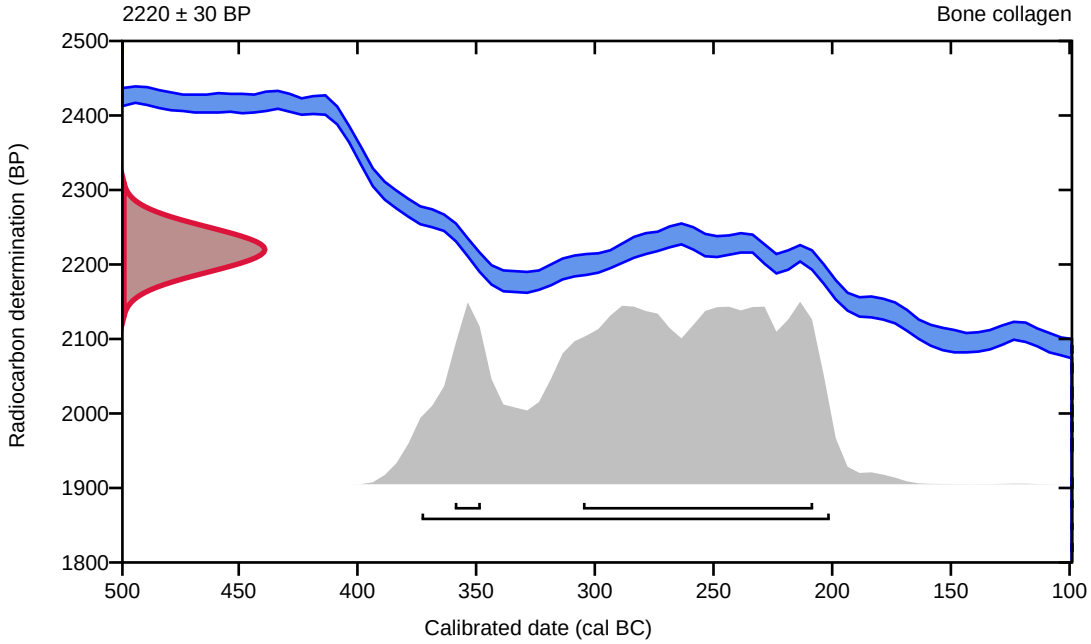
95.4% probability

(95.4%)	375 - 203 cal BC	(2324 - 2152 cal BP)

68.2% probability

(61.6%)	307 - 210 cal BC	(2256 - 2159 cal BP)
(6.6%)	361 - 350 cal BC	(2310 - 2299 cal BP)

P5800/2165A



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

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Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990B and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date: August 31, 2020
Submitter: Ms. Elizabeth Pearson

QA MEASUREMENTS

COMMENT: All measurements passed acceptance tests.

Validation: Digital signature on file

Date: August 31, 2020