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A Bronze Age and Early Iron Age landscape at Harlestone Quarry, Northampton

by

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Summary

At Harlestone Quarry five areas were excavated in advance of ironstone extraction between 2006 and 2014, a total area of 4.1ha. This took in part of a Bronze Age to early Iron Age landscape, uncluttered by later activity apart from medieval field boundaries and furrows of the former field system. A single pit and residual charcoal from a pit alignment have been radiocarbon dated to the early Bronze Age. A system of shallow linear boundary ditches and a curvilinear ditch, perhaps forming part of a large enclosure, are undated but are most likely to date to the late Bronze Age. A scatter of pits, largely within the enclosure, contained domestic material including pottery and hearth debris. Two pits contained pyramidal fired clay loomweights, and one of these pits has been radiocarbon dated to the late Bronze Age. A pit alignment lay to the south of the ditched boundaries. It is undated but probably had an origin in the early Iron Age. An area to the south of the pit alignment contained two possible four-post structures and scattered pits containing late Bronze Age to early Iron Age pottery. To the north, a loose cluster of pits included another possible four-post structure and an outlying pit has been radiocarbon dated to the end of the early Iron Age. To the east, beyond the excavated area, the pit alignment appears to terminate at a triple-ditched boundary system.

Introduction

In 2006, 2007, 2011 and 2014 open area excavations were carried out by Northamptonshire Archaeology (now MOLA Northampton) at Harlestone Quarry, on the western outskirts of Northampton (NGR: SP 708 641; Fig 1). The work was undertaken as part of a planning consent for the extraction of ironstone. These areas took in parts of a pit alignment and nearby ditch systems and scattered pits.

The excavations followed a programme of archaeological assessment: desk-based assessment (Dawson 2001), a geophysical survey and fieldwalking project (Taylor and Fisher 2003), phases of watching brief (Maull 2002 and Lewis 2004) and a trial trench evaluation (Upson-Smith and Maull 2004). The first phase of open area excavation in 2006 was reported on at the time (Field & Chapman 2006) while the works between 2007 and 2014 were covered in a single client report (Chapman *et al* 2015), which forms the basis for this publication.

The extent of the works was established at a meeting between Myk Flitcroft, Senior Environmental Planner of Northamptonshire County Council, and Mike Dawson, of CgMs Consulting, on the 14 November 2003. The aims of the archaeological investigation were set out in a Project Design prepared by CgMs Consulting (Dawson 2006). The objectives of the excavation were to determine the presence of any archaeological features or deposits within the application area and to date and characterise their extent, depth of burial and state of preservation.

Acknowledgements

For MOLA Northampton, the fieldwork manager was Anthony Maull and the post-excavation manager was Andy Chapman. For the earlier stages of fieldwork, Mike Dawson of CgMs Consulting acted on behalf of the quarry company, Peter Bennie. The text is by Andy Chapman, utilising draft contributions from Jason Clarke and Anne Foard. The team leaders in the field were Leon Field in 2006, Jason Clarke in 2007 and 2014, Anne Foard in 2011 and Carol Simmonds in 2014. They were assisted by Amir Bassir, David Haynes, Rob Smith, Carol Simmonds, Nathan Flavell, Robin Foard, Robyn Pelling and John Walford. The worked flint has been examined by Yvonne Wolframm-Murray and Andy Chapman, other prehistoric finds are by Andy Chapman, the animal bone by Lazlo Lichtenstein and the charred plant remains by Karen Stuart. The illustrations are by Andy Chapman.

Location and geology

The site lies immediately to the south of the village of Harlestone and to the west of the A428, and to the north-west of Northampton. It lies on the eastern edge of a plateau of undulating higher ground that ascends to above 115m at 1km to the south-west and reaches a high point of 140m at 4km to the south-west of the site. The ground drops away gradually to the south, where there is another tributary stream, and it descends towards the east before rising again across Harlestone and Dallington Heath (Fig 1). To the north the ground drops more abruptly to a stream that flows north-eastwards and then south-eastwards, circling around Harlestone and Dallington Heath and a known causewayed enclosure and further pit alignments, with the stream joining the Brampton branch of

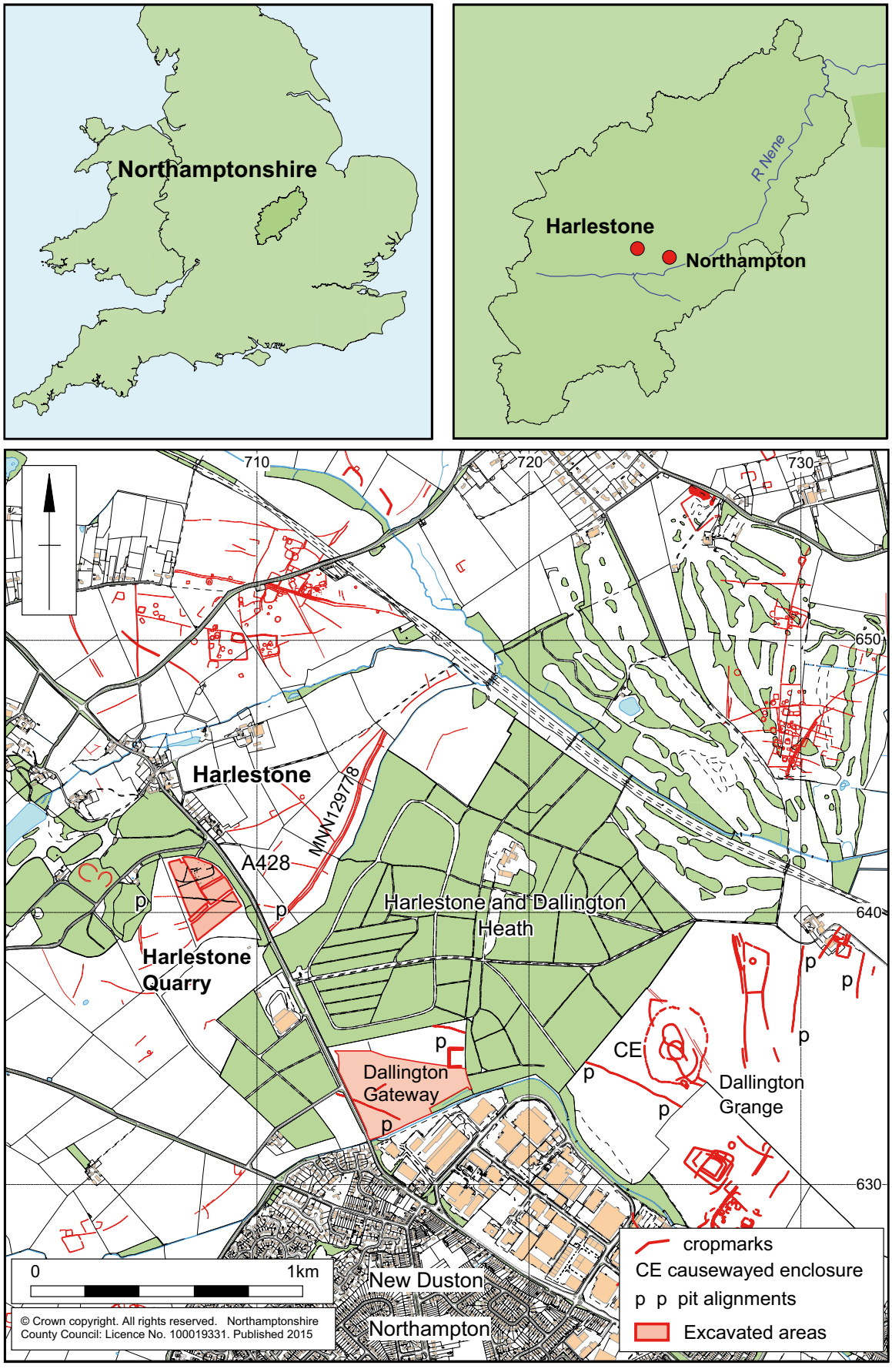


Fig 1: Site location

the river Nene 3km to the east of the site. The Brampton branch then flows southwards to join the main river at Northampton.

Across the site the ground rose by 4m from *c.*99m aOD in the south to *c.*103m aOD, 300m to the north, at the northern end of the site. Along the pit alignment, the ground rose gently from 100m aOD at the eastern end to the 101m aOD at the western end. The enclosure and boundary ditches and the pit scatters to the north lay between 102.15 and 102.90m aOD.

The underlying geology is mapped as glacial boulder clay overlying strata comprising Upper Estuarine Series, Lower Estuarine Series and Northampton Sand and Ironstone (BGS 1990, sheet 185).

On the higher ground to the north-east, shattered ironstone was exposed directly beneath the modern ploughsoil. To the south and west the surface geology was of silty clays over ironstone.

Historical and archaeological background

The site lies *c.*1.5km to the north-west of a complex of prehistoric monuments at Dallington Grange including a Neolithic causewayed enclosure with a probable late Neolithic/early Bronze Age henge within it (Fig 1, CE). There are also several lengths of pit alignment within this area (Fig 1, p – p). Recent geophysical survey (Butler *et al* 2012), trial trenching (Walker and Wolframm-Murray 2012) and area excavation by Jim Burke for MOLA Northampton in 2014 at Dallington Gateway (Chinnock and Muldowney 2016), 1km to the south-east of the quarry, has examined a length of one of these nearby pit alignments.

A middle/late Iron Age settlement lies to the south of the Neolithic complex at Dallington Grange and areas of probable Roman settlement are also recorded (RCHME 1981, 97-100) and have been subject to trial trench evaluation by Oxford Archaeology (Laws 2007).

In 2006, sixteen pits at the eastern end of the pit alignment at Harlestone Quarry were examined, along with an area of scattered pits and postholes, which included the remains of two possible posthole roundhouses and two four-post structures dating to the late Bronze Age/early Iron Age, as well as a medieval boundary ditch (Fig 3) (Field & Chapman 2006).

Beyond the quarry, the pit alignment is recorded as a cropmark mapped by aerial reconnaissance (Figs 1 and 3). To the east it runs towards a triple-ditched boundary system, which extends for well over 1km, and has not been recorded further to the east, although much of that area lies within woodland. To the west of the quarry it is also lost where it enters woodland, giving a total recorded length of at least 500m.

Methodology

The successive stages of excavation coincided with the quarries mineral extraction programme, and the hiatus

Fig 2: View across quarry workings to the excavation area in 2011

between 2007 and 2011 shows the impact of the economic recession, when quarrying came to a standstill through lack of demand.

A 360º tracked mechanical excavator fitted with a 2m-wide ditching bucket was used to remove overburden to the natural substrate. The limit of excavations, features and medieval furrows were surveyed using a Leica 1200 GPS surveying system. The areas were cleaned sufficiently to enable the identification and definition of archaeological features. A hand-drawn plan of all archaeological features was made at a scale of 1:50 or 1:100, and was related to the Ordnance Survey National Grid. Photography was with 35mm black and white film, supplemented with digital images. Sections were drawn at scale 1:10 or 1:20, and related to Ordnance Survey datum. Spoil heaps and features were scanned with a metal detector.

All works were conducted in accordance with the Chartered Institute for Archaeologists' *Code of Conduct* (CIfA 2014a) and *Standards and Guidance for Archaeological Excavation* (CIfA 2014b).

Radiocarbon dating

The pits of the pit alignment, the probable ditched enclosure and boundary system and the scattered pits produced sparse collections of finds indicative of activity broadly within the late Bronze Age and early Iron Age, but not more closely datable.

A programme of radiocarbon dating was required to provide a finer chronology. The major difficultly in achieving this was the availability of material suitable for dating. The ditches of the probable enclosure in the northern area were shallow and the excavated sections failed to produce any bone or carbonised remains. The date of these ditch systems is therefore uncertain, although the absence of residual charcoal or pottery coming from activity contemporary with the nearby pits may indicate that these northern ditches pre-dated the pits, although it might just mean that only the lower ditch silts had accumulated so rapidly that they did not include any settlement debris.

The pit alignment produced some dateable material, but wood charcoal from a length excavated in 2006 gave a date in the early Bronze Age, which is likely to be residual from earlier activity (Table 1). A further sample, from pit 622, produced a spurious date (8710-8485 Cal BC, 9340+-40 BP, Beta-402869). A third charcoal sample from the pit alignment is radiocarbon dated to the late Bronze Age, 1060-920 Cal BC (95% confidence, 2840 ± 30 BP, Beta-419139) and can be considered as a *terminus post-quem* for its construction, although the material is probably residual from the nearby pits.

Summary of site chronology

Early Bronze Age activity (2100-1700BC)

Two radiocarbon dates in the early Bronze Age come from an isolated pit and a pit of the pit alignment, both in the southern area excavated in 2006 (Chapman and Field 2007). They indicate that there was a sparse local presence at this time, at around 2000 BC, although there are no recovered finds of this date (Table 1).

The early charcoal from the pit aligment must be seen as residual material, entering the pit at a later date. The only demonstrable early Bronze Age feature is therefore a pit, 222, in the southern area (see Fig 13). The pit was oval, 0.83m long by 0.58m wide and 0.18m deep, with a fill of mid-brown silty sand containing some burnt stones and charcoal, probably hearth debris. The charcoal has given a date of 1920-1670 Cal BC (95% confidence, 3470±50 BP, Beta-227088).

Pit 222 lay beyond the western margin of a broad scatter of pits and postholes, but many of these produced pottery dating to the late Bronze Age/early Iron Age, which therefore appear to form a separate and later episode of activity.

It is possible that other isolated pits scattered across the quarry area may have been comtemporary, perhaps specifically those with charcoal-rich fills, such as pit 442 to the north-east (Fig 5) and pit 481 to the south-west (Fig 13). Pit 442 was 0.50m diameter by 0.10m deep, with steep sides and a fill (441) of black sandy loam containing much charcoal and a little burnt bone. A soil sample produced 71g of charcoal, dominated by oak, with a little hazel and field maple, the second largest quantity from the site after pit 481. There was also 11g of burnt bone and some burnt stones. As this was an isolated feature, it was not selected for radiocarbon dating. Pit 481 also had a charcoal-rich fill and contained a flake from a Neolithic polished stone axe.

Given the paucity of the evidence there is no further description of this period of activity.

Late Bronze Age ditched enclosure and boundary system (*c*.1000BC)

The ditched enclosure and associated ditches in the northern part of the site most probably date to the late Bronze Age. The ditches contained no residual material that could be related to the pit assemblages, see below, and this is interpreted as suggesting that the ditches came first and had partially silted before the earliest episodes of pit digging reated to settlement within this area.

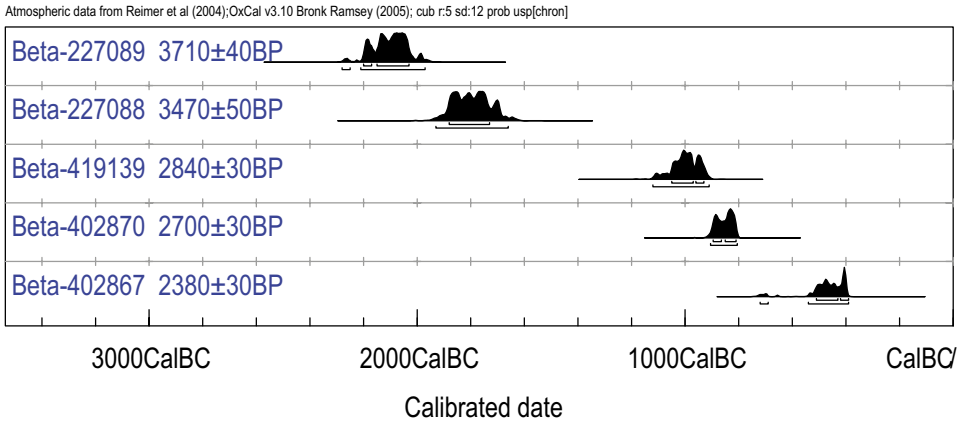
Late Bronze Age pits (1050-800 BC)

Wood charcoal from pit 718 in the pit alignment (see Fig 12) has been dated to around 1000 Cal BC (1060-920 Cal BC, 95% confidence, Beta-419139, 2840±30 BP). This date is early for a pit alignment and it is suggested that this was residual material, more likely to be associated with the enclsoure and pit scatter to the north. In the northern area, pit 698 (see Fig 4) contained a deposit of fired clay loomweights of pyramidal form and charred barley grains from this pit have given a date in the late Bronze Age (905-805 Cal BC, 95% confidence, Beta-402870, 2700±30 BP). Another pit further south contained a single loomweight, and it is suggested that the sparse scatter of pits to the south of this are also broady contemporary.

Table 1: The radiocarbon determinations

Laboratory & Sample No.	**Context**	**Sample Details**	**C13/ C12**	**Conventional Radiocarbon Age BP**	Cal BC Intercept(s) *68% confidence* **95% confidence**
Beta-227089 HQ06/261	Pit 263 Pit alignment	Wood charcoal	–25.0	3710±40	2130/2080/2060 *2190-2180 (6%)/ 2140-2030 (62%)* **2200-1980**
Beta-227088 HQ06/221	Small pit 222	Wood charcoal	–25.5	3470±50	1760 *1880-1740* **1920-1670**
Beta-419139 HQ14/716	Pit 718 Pit alignment	Charcoal Ash	–25.3	2840±30	1005 *1020-970 (52%)/ 955-940 (16%)* **1060-920**
Beta-402870 HQ14/698	Pit 698 (loom weights)	Charred Barley grains	–24.2	2700±30	830 *890-875 (25%)/ 845-815 (44%)* **905-805**
Beta-402867 HQ14/414	Pit 414	Charcoal Alder	–26.9	2380± 30	405 *415-400* **535-395**
Beta-402868 HQ14/501	Ditch 501	Charcoal Hazel/ Alder	–25.8	1100±30	970 Cal AD *895-925 (26%)/ 940-985 (43%)* **865-1015 Cal AD**

Laboratory: Beta Analytic
Calibration: Beta 227088-227089 INTCAL04; Others INTCAL13



The early Iron Age pit alignment (c.800-c.500 BC)

The position of the pit alignment within the site chronology is uncertain. The radiocarbon date from pit 718 indicates that it was in existence at or sometime after the late Bronze Age. It seems unlikely to have been contemporary with the ditched enclosure and boundary system, so it is suggested that it was a later introduction, probably sometime betweem 800 BC and 500 BC, and perhaps broadly contemporary with the scatter of early Iron Age pits.

Early Iron Age pits (500-400 BC)

In the eastern part of the northern area, alder charcoal from a small pit, 414 (see Fig 5), has been radiocarbon dated to the early Iron Age (535-395 Cal BC, 95% confidence, Beta-402867, 2380±30 BP), most probably the end of the early Iron Age (415-400 Cal BC, 68% confidence). It is suggested that many of the other pits in this area are also of the same date. The more dense scatter of pits and postholes to the south-east, excavated in 2006 (Field and Chapman 2006), which included two possible four-post structures and arcs of postholes that may have been remnants of post-built roundhouses, may also have been contemporary.

Early medieval/late Saxon (middle to late 10th centuries AD)

A linear ditch system in the southern part of the site has been dated to the late Saxon period (Cal AD 865-1015,

98% confidence, 1100±30 BP, Beta-402868), probably centred on the middle to late 10th century (940-985 Cal AD, 43% confidence). The date may indicate that this boundary system was established in the later 10th century, as part of a broader organisation of the landscape following the re-conquest of the Danelaw by the Saxon kings.

General stratigraphy

The underlying surface geology varied across the excavated areas. On the higher ground to the north and east, it was sand and shattered ironstone. In a small valley to the south, it was silty, sandy clay with ironstone inclusions (Fig 3). This occurred as light-mid grey or orange-brown sandy clay and occasional angular to sub-angular gravel and ironstone fragments.

The natural substrate was encountered between 0.2-0.5m below the modern ground surface. The subsoil was mid orange-brown sandy clay with ironstone fragments and sub-rounded stones. The topsoil was dark orange-brown sandy loam with gravel pebbles & ironstone fragments.

The late Bronze Age enclosure and boundary system

A continuous curvilinear ditch system at the northern end of the quarry, spanning both the 2011 and 2014 excavation areas, may have been the southern half of a large ditched

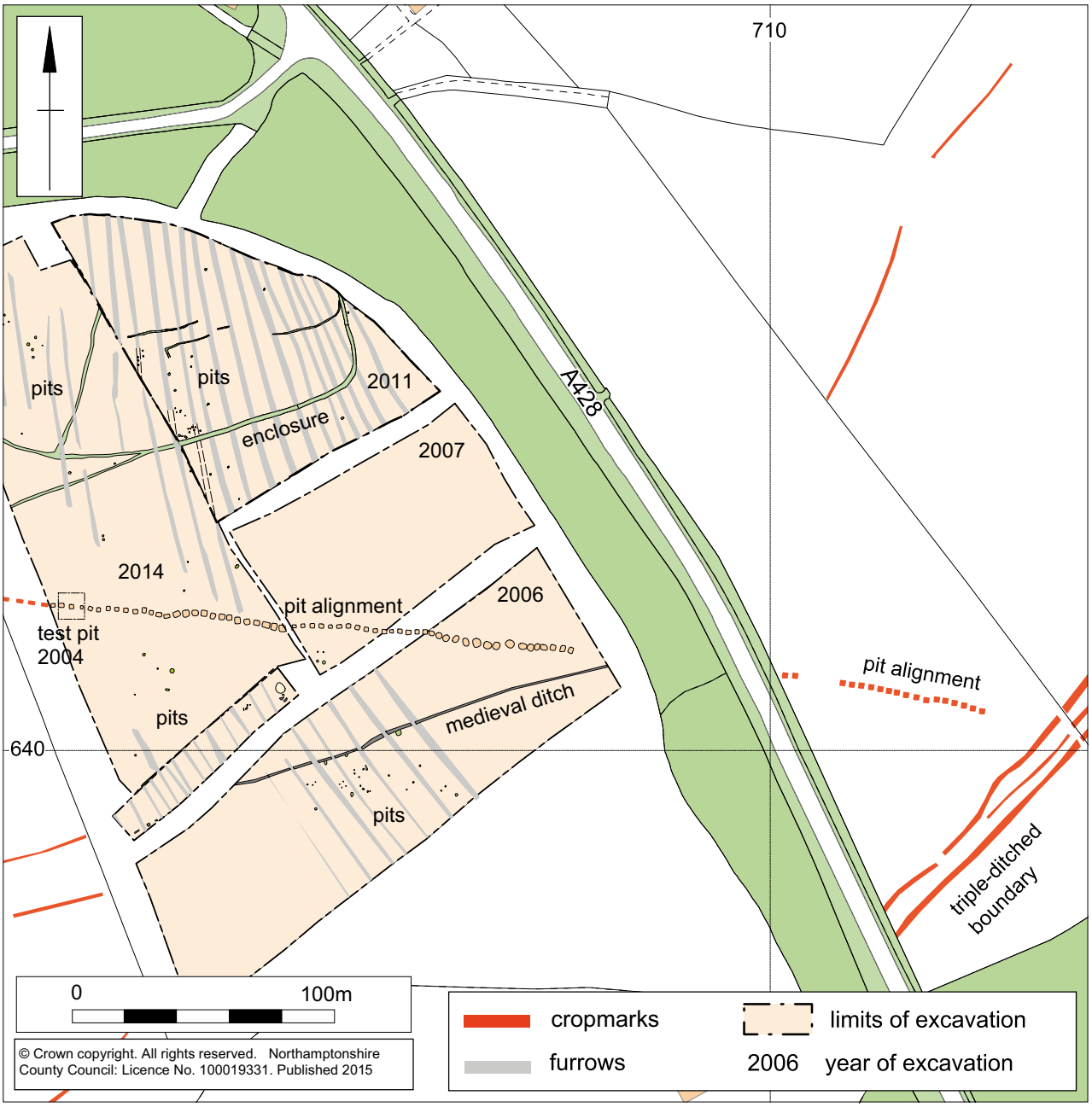


Fig 3: General site plan

enclosure, with either an oval or a D-shaped plan (Figs 4-5). There was a rounded right-angled corner to the east and to the west the ditch bifurcated, with a gently curving ditch and a straight ditch, that latter probably a later addition. If this ditch system had been part of an enclosure, it would have measured in excess of 150m east-west and in excess of 90m south-north. An area of 1.0ha lay within the excavated area, and the enclosure might have encompassed as much as 2.0-2.5ha.

On the eastern (515 and 452) and southern arms (450, 410 and 428) the enclosure ditch was consistently 1.30-1.50m wide by 0.20-0.35m deep, with steep sides and a broad flat to uneven base. To the west, the curving arm (651, 617, 695, 700 and 746) was 1.00m wide and 0.24-040m deep, slightly narrower than the ditch to the east (Fig 8, Section 105), and the straight arm (649, 615, 665, 734 and 702) was generally of similar but slightly smaller dimensions (Fig 8, Section 123).

On the southern arm, to the immediate east of the bifurcation, ditches 428 and 410 showed stepped bases, deeper to the north and south respectively (Figs 7 and 8, Sections 71 and 74). This may have been a result of recutting, although no cut was visible within the homogeneous fills of mid orange-brown sandy clay. At the bifurcation, the curving ditch, 651, was the deeper, at 0.40m deep, while the straight ditch to the south, 649, was 0.20m deep. These differences in depth follow the pattern seen in the single ditch to the immediate east, and suggest that the curving ditch forming the south arm of the enclosure is most likely to be the original ditch. The straight ditch is likely a later addition, which continued eastwards along at least part of the original southern arm.

All of these ditches had fills of mid orange-brown sandy clay with sparse to moderate inclusions of ironstone chips and small fragments of ironstone. They were all too shallow to show any differential silting.

Six sherds of pottery, weighing 13g, recovered as individual sherds in six lengths of ditch (428, 615, 617, 665, 693, and 746), is too little to interpret with any confidence. However, it is notable that four of the six sherds, all from ditches to the west, are in sandy fabrics, unlike the shelly pottery from the pits to the north or pit 663 that lay between the bifurcating ditches. This may indicate that the ditch system pre-dated the pits by at least enough time for the primary fills to have accumulated, as otherwise it seems likely that more shelly pottery would have found its way into these ditches.

A linear ditch (693, 728, 645, 653 and 647) branching northwards from the curving ditch was 1.00m wide and 0.20-0.25m deep; it may have formed an internal sub-division (Fig 4). To the north, it was quite shallow and it was not recorded in the 2011 excavation area, perhaps as a result of heavier machine stripping. Similarly, a narrow curving gully, (516, 472 and 470), at least 27m long by 0.4m wide and up to 0.15m deep, running westwards from the eastern arm of the enclosure, may have formed a sub-division in the southern-eastern corner of the enclosure (Fig 5).

In the eastern half of the enclosure there were intermittent lengths of shallow truncated gullies, 468, 483 and 485, all aligned roughly east to west, with one having a right-angled corner at the west end, which returned southwards. These gullies may have been internal divisions within the enclosure or were associated with a scatter of pits to the south of the gullies, at least some of which date to the early Iron Age.

The late Bronze Age to early Iron Age pit groups

The scattered pits appear to form a number of distinct larger groupings, along with other more dispersed or smaller clusters. Those to the north-west, largely within the limits of the ditched enclosure but including some pits further south, include one pit radiocarbon dated to the late Bronze Age. This pit and a further pit to the south contained pyramidal loomweights and domestic hearth debris. One pit in the group to the north-east has been radiocarbon dated to the end of the early Iron Age, and the same date might apply to the southernmost pit group, excavated in 2006 (Field and Chapman 2006).

The north-western pit group (late Bronze Age)

Pit 698 was oval, 1.80m long by 1.03m wide and 0.34m deep, with steep sides and a flat base (Figs 4 and 9). The lower fill (697) was of domestic debris, comprising grey-black sandy silt with charcoal, some burnt stone, two complete and numerous fragments from 12 pyramidal loomweights, each with a single perforation (see Fig 19), much of a small grinding stone/saddle quern and the largest group of pottery, although only weighing 369g, from any of the pits. The loomweights were clustered together in the north-western half of the pit (Fig 9). The pottery was from several vessels, both thin and thick-walled, including the rim of a thin-walled shouldered bowl with grey-brown surfaces (see Fig 18, 7). A soil sample produced 38g of charred plant remains and wood charcoal. The charred grain assemblage is dominated by barley with low numbers of emmer and oat, perhaps as weeds of the barley crop. The low numbers of wild seeds suggest it was from a finished crop. Barley grain from this sample gave a radiocarbon date in the late Bronze Age (905-805 Cal BC, 98% confidence, 2700 $\pm$ 30 BP, Beta-402870). The wood charcoal was from a wide range of species: oak, cherry-type (*Prunus* sp.), willow/poplar, alder, birch, beech, elm and hazel, with most coming from small branch wood, although larger timbers of oak and alder were also present (Fig 23). The upper fill, 696, above the level of the loomweights and other finds, comprised a similar soil matrix of hearth debris.

Pit 732, a near neighbour of pit 698, also oval with steep sides and a flat bottom, but a little smaller at 1.37m long by 0.35m deep, was probably closely contemporary. The lower fill (730) was of dark grey-brown sandy silt also containing some burnt ironstone. There was a pottery assemblage of similar size, 315g, also from several vessels both thick and thin-walled, including several thin sherds, 4mm thick, with dark grey highly burnished surfaces.

To the north-east, a cluster of four pits, 624, 629, 643 and 639, are likely to be closely contemporary with each other. Pits 624 and 629 were near circular, at 0.85m and 0.88m diameter by 0.25m deep, with moderately steep sides and flat bases, while pits 639 and 643 were both

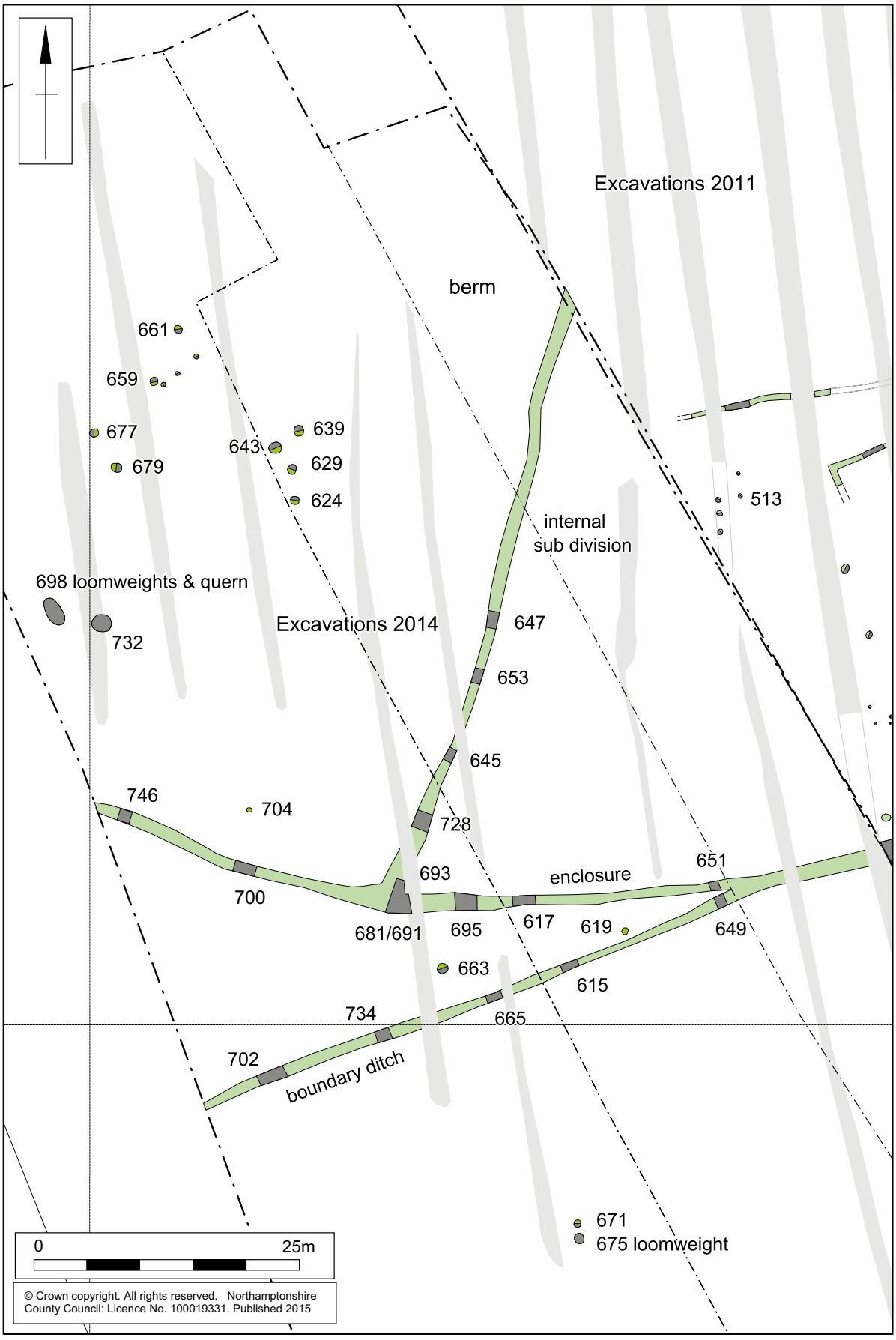


Fig 4: Western half of enclosure and late Bronze Age pits

Fig 5: Eastern half of enclosure with Bronze Age and Iron Age pits

Fig 6: Excavation in 2011, showing the eastern arm of the possible enclosure

Fig 7: The southern arm of the enclosure, ditch 428, showing stepped profile, looking west

oval, 1.10m long by 0.20m deep. All four had fills of grey-brown sandy silts containing some charcoal. Pits 624 and 629 contained pottery groups from several vessels, mainly thick-walled with some showing fingertip decoration on the base or as corrugations on the body. A much smaller group from pit 639 was similar in character, and one of only three sherds from pit 643 was a body sherd with a shallow fingertip impression.

To the north-west, pits 677 and 679 were of similar size, at 0.70m and 0.56m in diameter by 0.20m and 0.15m deep, with fills of dark grey-brown sand silt and few small pieces of ironstone, and both also produced a couple of sherds of pottery. The northernmost features, 659 and 661, were either postholes or small pits, at 0.25m diameter by 0.12m and 0.15m deep, with moderately steep sides and rounded bases.

An isolated pit 704, to the south near the curving enclosure ditch, 0.50m diameter by 0.18m deep, had a distinctive upper fill of densely-packed small stones, many of which were burnt.

Two pits, 619 and 663, lay between the southern arm of the enclosure and the linear ditch (Fig 4). Pit 663 was 0.68m in diameter by 0.38m deep, and the fill of grey-brown sandy silt produced numerous joining and non-joining sherds that make up around half of a small thin-walled open bowl, decorated with oblique striations along shallow finger-impressed grooves (Fig 18, 4). To the east, pit 619, 0.52m diameter by 0.15m deep, contained hearth debris of larger burnt stones, up to 100mm diameter, and pockets of dark charcoal-rich soils within the fill produced 38g of wood charcoal, but no significant charred plant remains. The wood charcoal was dominated by oak, along with Pomoideae-type wood, hawthorn and others, and ash.

Twenty-five metres to the south of the enclosure, there was a pair of pits, 671 and 675. Pit 675 was 0.75m in diameter by 0.28m deep, with steep sides. On the base of the pit a pyramidal loomweight lay on its side, and the fill above was of grey-black sandy silt, heavily mottled with brown sand (Fig 10). While the outside of the loomweight was hard, the inside was still soft and unfired, which is why the upper part of the weight, including the perforation, had disintegrated. There was also the full base and lower body of a small carinated bowl (Fig 18, 5).

A soil sample from the fills of this pit contained a significant assemblage of weed seeds usually associated with cereal crops, such as black bindweed, goosefoots, orache and corn spurrey (Table 4). There was also much cereal chaff, and those cereal grains not heat distorted were

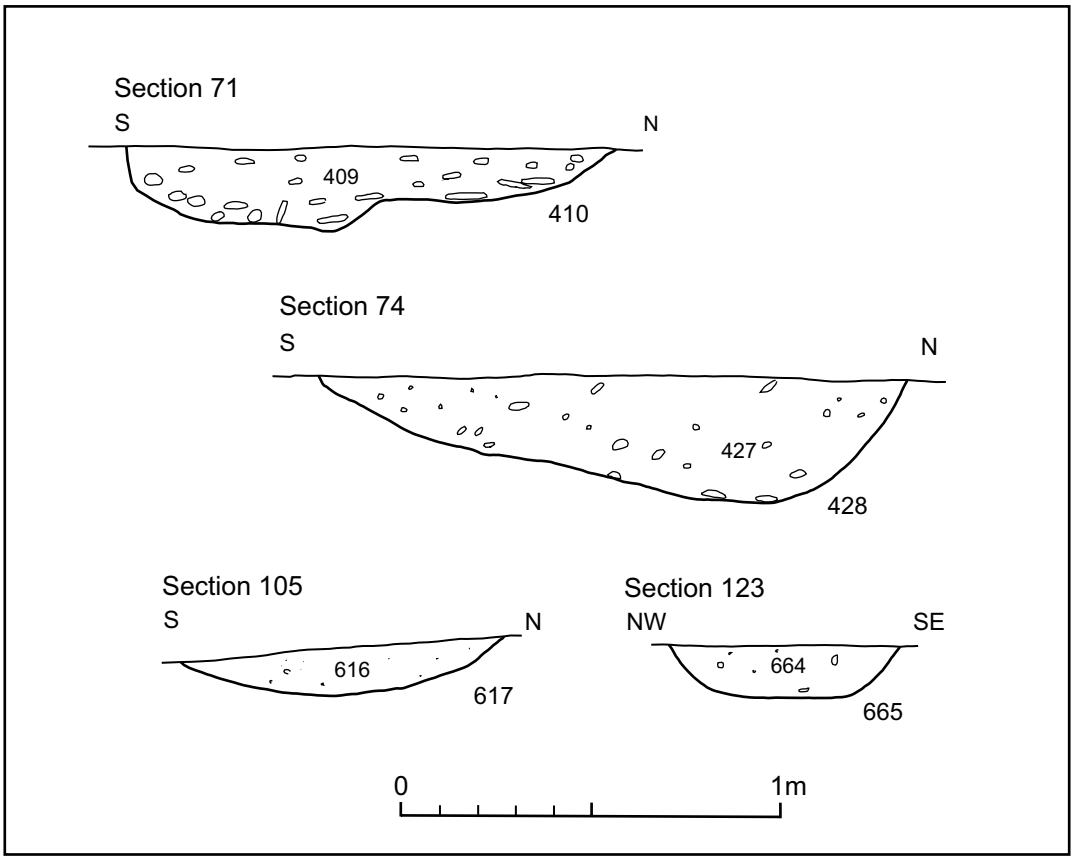


Fig 8: Sections of enclosure and boundary ditches

Fig 9: Pit 698 showing the scattered fragments of loomweight

mainly barley with some emmer. Charred stems, some likely to be cereal straw, were also identified, as were several charred roots, some of an onion-couch type. This charred assemblage is likely to represent the waste from the later stages of crop processing, where the final particles of chaff and wild seeds are removed from the grain. These may have been used as fuel in a hearth, and were then dumped in the pit with the rest of the hearth debris.

Fig 10: Pit 675, showing loomweight, and pit 671, looking north

Pit 671 was smaller and shallower, at 0.55m diameter by 0.06m deep, but with a similar fill, which also produced a small amount of pottery.

To the east of pits 671 and 675, were two isolated pits 611 and 641, 0.56m and 0.50m in diameter and 0.11m and 0.28m deep with grey-brown fills with black mottles and the occasional burnt stone, but no pottery or other finds (Fig 12).

The north-eastern pit group (Bronze Age to early Iron Age)

Within the eastern area there were some 27 small pits and postholes (Fig 5). The pits were generally sub-circular, between 0.11-0.75m diameter and 0.10-0.30m deep with fills of mid grey-brown sandy clay. Small quantities of pottery came from only three features within the main cluster, pits 414, 460 and 505, with a little more from posthole 408, which lay to the south of the enclosure ditch.

The largest pottery assemblage, 310g, came from an isolated pit to the north, 457, and included a vessel with fingertip impressions on the shoulder, a feature characteristic of the late Bronze Age/early Iron Age, and a vessel with a handle or lug. Pit 457 was up to 0.68m diameter by 0.25m deep, and partially retained a lining of light grey clay. The fill was of orange-brown to black silty sand containing some charcoal and quantities of small, burnt cobbles and ironstone.

From pit 414 within the scattered pits within the eastern half of the enclosure, there are 25 sherds largely from a single vessel, a plain jar with light brown surfaces, which are irregular and pitted from the loss of inclusions. Alder charcoal from this pit has given a date at the end of the early Iron Age (535-395 Cal BC, 2380 ± 30 BP, Beta-402867). Pit 460 was up to 0.72m diameter by 0.29m deep and, as with pit 457, it retained a partial clay lining, and the dark fill contained charcoal and burnt stones.

To the west there was scatter of postholes, each around 0.30m diameter by 0.23m deep, and one of these, 513, contained a small fragment of fuel ash slag (Fig 4).

Fig 11: Four-post structure in the eastern pit group

To the south, there was a possible four-post structure, with a rectangular plan, measuring 1.9m east to west by 1.4m north to south (Figs 5 and 11). The postholes were 0.25-0.35m diameter by 0.10 deep.

To the south of the enclosure ditch there were very few features (Fig 5). Posthole 408 produced a few sherds of pottery and posthole 406, which was up to 0.50m diameter by 0.15m deep, produced a fine stone spindle whorl (Fig 20).

The southern pit group (Bronze Age/early Iron Age)

To the south of the pit alignment there was a dispersed scatter of pits and postholes with some localised clustering. Few of these produced any pottery or other datable finds.

In the narrow strip excavated in 2011, there were two small clusters of pits (Fig 13). To the east, a cluster of small pits 478, 481 and 488, had fills of mid to dark orange-brown sandy soil, which contained varying quantities of charcoal and burnt ironstone. They lay beside an oval spread of burnt ironstone (486), at least 4m by 3m and approximately 0.10m thick. To the west there was a small pit 492, and three small pits or postholes 494, 496 and 498.

Pit 481 produced 85g of charcoal, the largest quantity from the site, and a flake from a polished stone axe. It has been considered previously as possibly dating to the early Bronze Age, and perhaps the nearby features might also date to the early Bronze Age.

A sparse scatter of pits to the west, including 681, 683, 686 and 687, all had grey-black fills, but none produced any pottery or other finds (Fig 12). They were typically roughly circular and shallow, although pit 687 was

sub-rectangular, 1.35m long by 0.65m wide and 0.16m deep, and the fill of dark black-grey sandy clay contained charcoal and some burnt stones. The southernmost pit, 655, although totally isolated, was 0.45m in diameter by 0.18m deep, with a charcoal-rich fill that included a fragment of nutshell.

In the south-west corner of the area excavated in 2007, there were a further two pits and two postholes, with fills of brown-grey sandy clay with ironstone inclusions (Fig 13). The rectangular four-post arrangement with sides measuring 3.5m and 2.5m may suggest that this was a four-post structure, although the southern pits are not quite square to the postholes and there is a marked disparity in diameters, unless posts set in the southern pits had been dug out.

The south-eastern pit group (Bronze Age/early Iron Age)

To the south of the medieval boundary ditch there was an extensive scatter of small pits and postholes (Fig 13), excavated in 2006 (Field and Chapman 2006).

Pit 222, a little to the west of the others, has been radiocarbon dated to the early Bronze Age, and may be unrelated to the other features.

On the north-western margin of the group, four postholes in a roughly rectangular arrangement, Structure 2, were interpreted as a possible four-post structure with sides of 2.0-2.5m, while another cluster of four-postholes to the south, Structure 4, could have formed a very small structure with sides of only 1.0-1.2m. To the south-east of both of these possible four-posters, arcs of postholes were tentatively interpreted as remnants of post-built round-houses, Structure 1 and Structure 3.

A small quantity of pottery, just over 1kg, came from five features, but over 900g came from a single vessel, a plain jar form. The overall characteristics were similar to the material recovered to the north, with a similar lack of clearly diagnostic sherds, and the early Iron Age date (5th-4th centuries BC) was only a tentative proposal. Soil samples produced very small quantities of carbonised wood and seeds; with naked barley seeds the most common cereal along with one seed of bread wheat.

The early Iron Age pit alignment

In the excavations of 2006 (Field and Chapman 2006), 2007 and 2014, a length of 199m of a pit alignment was examined, with 59 pits recorded (Figs 3, 12 and 13). It lay on a relatively flat plateau, with the natural at the eastern end at 99.9m aOD and at the western end at 101.3m aOD, a rise of 1.4m in 199mm. Twenty-five pits were excavated, with 23 sectioned and two fully excavated after they were sectioned. Sixteen sections were at 90^0 to the alignment, and seven were along the alignment.

The alignment

The pit alignment follows a straight, if slightly wavering, line for its entire excavated length and for the recorded lengths to the west and east. A straight line will intersect the majority of the pits, leaving four or five places where a couple of pits lie slightly beyond a straight line.

While the line did waver, the way it came back on line suggests that there was a line to follow, with this defined in some visible fashion. The simplest option would have been to take visual back sights along the length already existing, assuming that excavation began at one point and progressed from there, and this would be sufficient to maintain a straight course within the limits recorded.

Without any referencing through back sights, or some other markers, perhaps including some fore markers, the line could not have maintained such a close approximation to a straight line over a length of 199m, so clearly there was a certain, but not excessive, degree of care taken in the maintenance of this line during construction.

The pits

In terms of size and shape, the plan shows some variations in both, but the range of variations was broadened by erosion of the upper edges of the pits during silting, which largely depended on the natural that the pits were cut into. This ranged from sands and shattered ironstone gravels to the east and variations of sandy to silty clays to the west, with shattered ironstone sometimes appearing in the sides of the pit below the surface clay deposits.

The alignment comprised rectangular pits that were typically elongated along the alignment, although there were examples that were near square and a few broader than their length, such as pits 622 and 738. Pits appearing circular or oval on the surface were, when excavated, shown to have squared bases the same as the rectangular pits, which indicated that all the pit alignment pits had originally been rectangular.

Given such a large number of pits with recorded surface plans, of which nearly a half have been excavated, it is possible to examine the recorded dimensions statistically to define both the average pit and the range of variation.

The average pit was rectangular, 1.93m long by 1.77m wide and 0.66m deep, with a squared flat base, 0.76m long by 0.69 wide, with at least 50% of all pit dimensions within 0.20m of these averages. Some outliers at the larger end were partly a result of unusually excessive erosion, see below. Most of the pits at the smaller end were genuinely smaller than average, such as pits 307, 736 and 206, although in some cases localised excessive machining of soft silty clay natural had partially removed the eroded upper edges. In particular, this heavier machining accounts for the clear rectangular form of the pits within the central area, excavated in 2007.

The typical pit profile had a flat base, with a sharp angle onto the four sides, which were steeply inclined at angles of *c.*25-30^0 to the vertical (Fig 16). The primary silts had often preserved the lower sides to depths of 0.20-0.40m, but in some pits the softer sides had begun eroding almost immediately, with these becoming the larger more rounded pits as seen on the surface. In a few pits the upper sides were only eroded to slightly shallower angles than the lower sides, indicating that they had silted quite rapidly; and these tended to be slightly smaller than

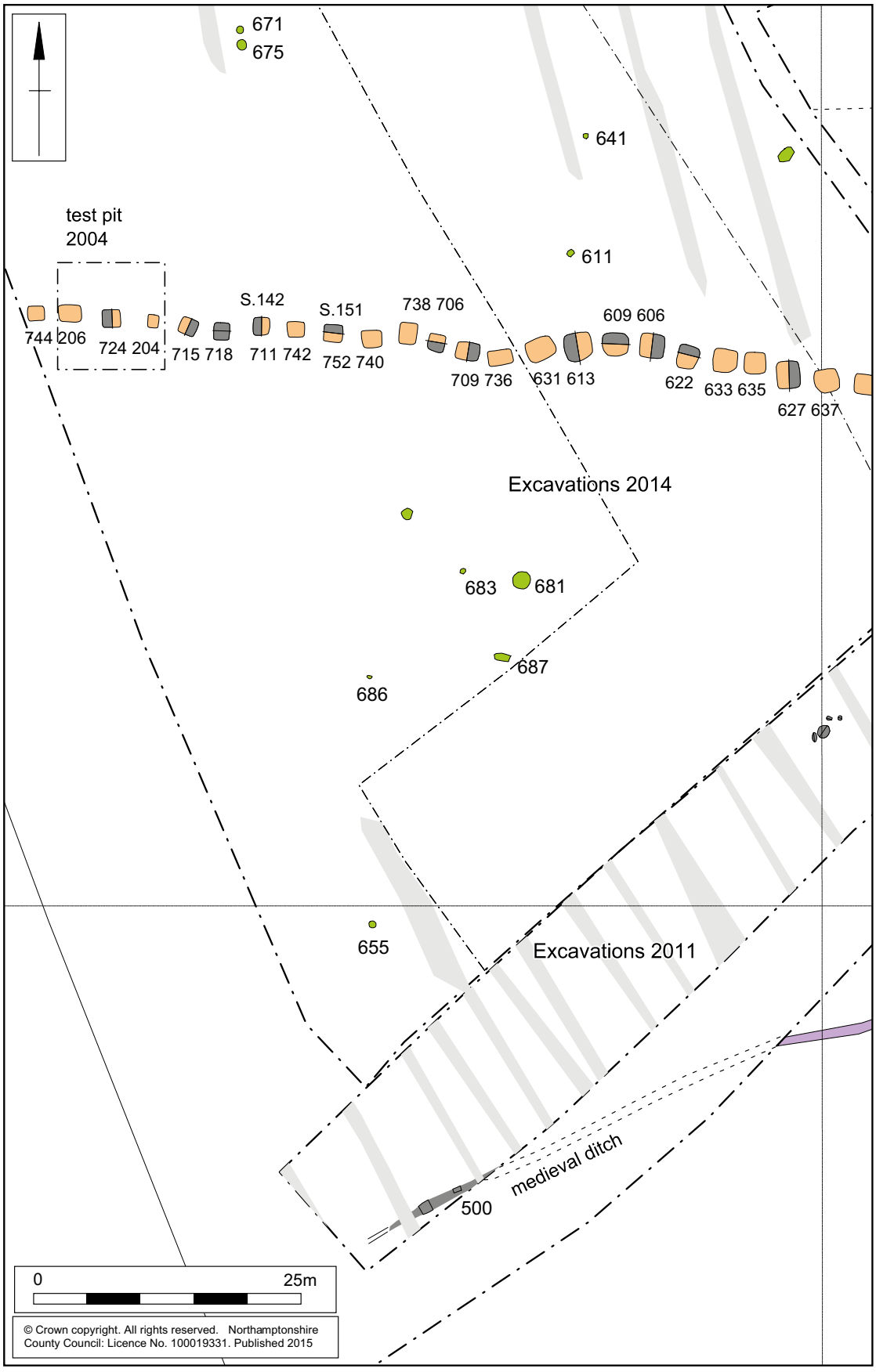


Fig 12: Southern area with western half of the pit alignment

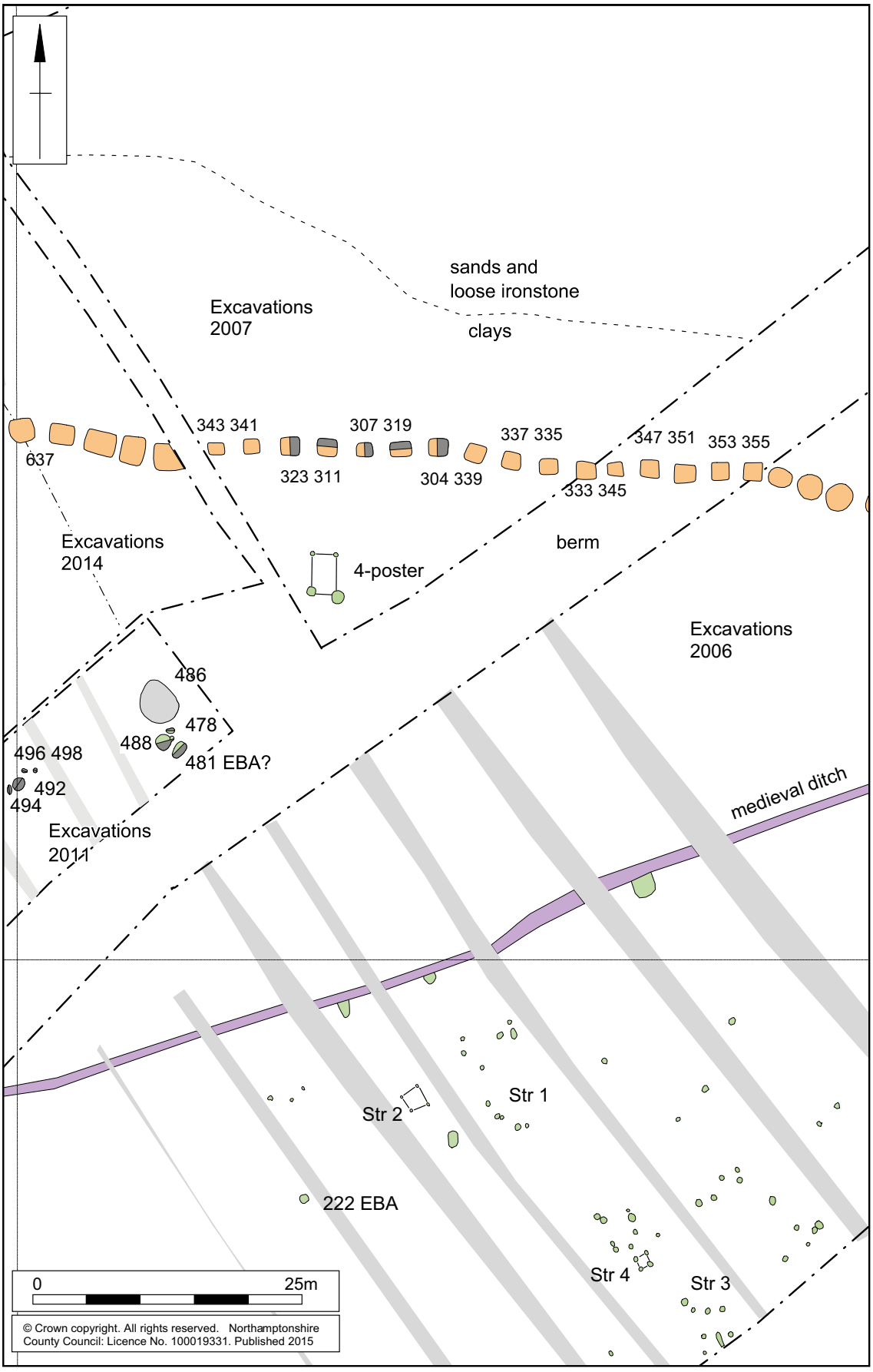


Fig 13: Southern area with eastern part of the pit alignment

Fig 14: The westernmost end of the pit alignment in 2014, looking east, pit 206 in foreground

average on the surface, and retained the rectangular plan form most closely.

If the pits had originally retained the same side-slope to the surface, the average pit might originally have been *c.*1.55m long by 1.35m wide and 0.66m deep. These measurements apply to the surface of the natural, and we can suggest that originally they were both longer and wider by at least an additional 0.30m, and around 0.30m deeper, so that when dug the average pit was around 1.85m long by 1.65m wide and 0.96m deep.

The one measurement not affected by erosion is the centre-to-centre spacing of the pits. This varied from 2.50-4.50m with an average of 3.34m, and 73% of pits had a centre-to-centre spacing between 3.0m and 3.5m, showing a high degree of consistency in the spacing with occasional exceptions.

Given an average spacing of 3.34m, and an average original pit length of around 1.85m, as originally set out the gaps between the pits probably measured *c.*1.49m, so the pits formed around 55.4% of the total length and the gaps 44.6%, with the gaps obviously narrowing over time as the pit edges eroded.

The sequence of silting

All of the pits showed a simple sequence of natural silting, often with fairly homogeneous and slowly accumulating silts that were sometimes difficult to separate in excavation, so that in some instances only one or two context numbers were allocated to the fills even though the actual sequence of silting was likely to have been more complex than this.

Typically, primary silt had accumulated against the pit sides either to a little below or up to the break between the steep lower and eroded upper edges. The primary silt was cleaner that the secondary fills although its exact nature varied with the natural particular pits cut through. In areas where pits cut through shattered ironstone and sands, the fills were consequently stony, while across the silty clay naturals the fills were relatively stone free.

Pit 752 was one of the deepest excavated, showing a clear sequence of silting (Fig 16, Section 151). The longitudinal section shows a thin primary silt (751) of stone-free light orange-yellow sand. A lower secondary fill (750) had also accumulated quite rapidly, protecting the steep sides from erosion. This was a looser grey-brown sand containing chips and small pieces of ironstone, which must have come from either a surface deposit, such as an adjacent bank or heap, or a thin upper natural lost to later ploughing, since as excavated the pit did not cut natural containing ironstone.

The upper secondary fills (749 and 748) comprised yellow-brown to orange-brown sandy loam, containing occasional small pieces of ironstone against the eastern end of the pit and across the bottom (749), but free of stones against the western end of the pit (748). The pit fills probably reached stability with the accumulation of this fill, forming an earthwork hollow at least 0.40m deep, around half its original depth. Towards the centre of the lower part of the slowly accumulating final fill, a number of larger pieces of ironstone had fallen in, but otherwise the fill of mid grey-brown silty sand contained few stones.

Pit 711, at 0.60m deep, was a little below the average (Fig 16, S142). It had a flat base and moderately steep sides to a height of 0.4m. The photograph (Fig 15) appears to show a sequence of primary, secondary and final fills, although only a single context number was allocated. The photograph of the section also appears to show the presence of a shallow subsidence hollow at the centre of final fill.

Fig 15: Pit 711 of pit alignment, cross-section, looking east (see Fig 23, S142)

Finds and environmental evidence

As is typical of pit alignments, finds of any description were scarce. Nine sherds of pottery, weighing 9g, came from the primary (1 sherd), secondary (4 sherds) and final fills (4 sherds) of four pits, 304, 311, 606 and 718 (Table 2). Although a small group, the fabrics are comparable to the late Bronze Age material from the pit scatter further to the north, and this is interpreted as residual material eroding into a few pit alignment fills at a later date, suggesting that the pit alignment was later in origin than the late Bronze Age pit scatter.

Small quantities of charred material were recovered from soil samples, The final fill (716) of pit 718 contained a small and very abraded charcoal assemblage in which Ash (*Fraxinus excelsior*) was the dominant though oak (*Quercus* sp.) was also common, and the ash has given a later Bronze Age date (1060-920 Cal BC, 2840+/-30 BP, Beta-419139). Wood charcoal from pit 263, excavated in 2006, gave a date in early Bronze Age (1920-1670 Cal BC, 3710+/-40 BP, Beta-227089). Both of these dates must be regarded as coming from residual material, with the pit alignment, therefore, only broadly attributable to the late Bronze Age/early Iron Age, at sometime between 900-400 BC.

The final fill of pit 622 did produce a collection of large fruits, the size and superficial appearance of shrivelled acorns. On examination, these proved to be desiccated and not carbonised. A sample of mixed carbonised seed and wood charcoal from the same deposit submitted for radiocarbon dating (Beta-402869), produced a spurious date, suggesting that the deposition of the large fruits had been within a modern disturbance, most likely an animal burrow, which had not been recognised in excavation.

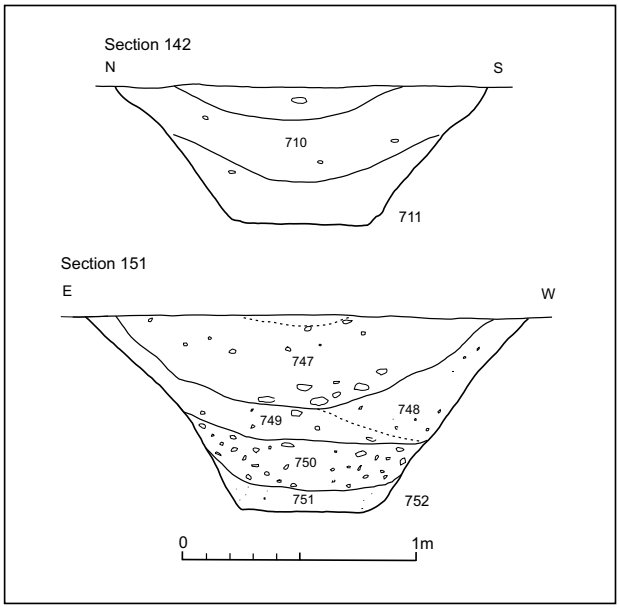


Fig 16: Sections of pits 711 and 752 in the pit alignment

The medieval field system

A linear boundary ditch lay largely within the area excavated in 2006, but the westernmost end, 500, lay within the narrow strip investigated in 2011 (Figs 2, 12 & 13). It was aligned north-west to south-east and was 1.05m wide by 0.16m deep, with a shallow U-shaped profile. The fill (501) of dark grey-brown sandy clay contained no finds, but wood charcoal from a soil sample has given a radiocarbon date centred on the 10th century AD (865-1015CalAD, 1100+/-30BP, Beta-402868).

The furrows of the medieval field system, see below, cut across this ditch, suggesting that this boundary later became redundant, and indicating that the open field system was established at a later date, probably sometime after the Norman Conquest in the late 11th or 12th centuries.

Truncated furrows of the medieval ridge and furrow cultivation system survived across much of the investigated area. Elements of the system were present across the shattered ironstone natural across the eastern part of the area excavated in 2007, but were not recorded.

The furrows were typically 1.00-1.50m wide, and occasionally a little more, and were spaced at varying intervals of between 7-10m centre-to-centre. The furrows had been almost totally lost to more recent ploughing in some areas. On average they were 0.15m deep with fills of mid to dark brown silty sand.

The parish of Harlestone was reordered into three equal fields in 1410 (Hall 1995, 288) and it is likely that the furrows are part of those fields. No map appears to have survived of the area, but ridge and furrow earthworks are visible on the ground throughout the parish and can be seen on aerial photographs (RCHME 1981).

The finds

The worked flint

by Yvonne Wolframm-Murray and Andy Chapman

Ten pieces of worked flint were recovered as residual finds from late Bronze Age/early Iron Age pits excavated in 2006 and 2011. They comprise a core, six flakes, two scrapers and a spall from a polished stone axe. The condition of the assemblage is good. The flints show post-depositional edge damage and there is patination on two flakes, varying from mottled white to completely white. Two flakes have thermal fractures and patination.

The raw material is a vitreous flint of light to dark greys and browns. Cortex on three pieces is mid to dark brown in colour, and the flints generally have smooth, rolled and weathered surfaces. The raw material was likely to have come from local gravel deposits.

There is a multi-platform flake core and six waste flakes, two broken. There is an end/side scraper, with abrupt and semi-abrupt retouch on the distal end and one lateral edge, and the other scraper has invasive retouch on the distal end half way up the lateral edges, suggesting use as a composite tool.

There is also a small thermal spall from the lateral edge of a Neolithic polished stone axe, with the distinctive green colour indicating that it is from Group VI, epidot-

Pit 304 (2007), cross-section, looking west

Pit 606, cross-section, looking west

Pit 613, cross-section, looking east

Pit 709, cross-section, looking west

Pit 706, longitudinal section, looking north

Pit 715, cross-section, looking west

Fig 17: Views of selected pits of the pit alignment

ised tuff from the Langdale region of Cumbria, from pit 481 in the southern area.

The 2014 excavations produced a further two worked flints. From the pit 643 (SF9), there is a blade-like cortical flake and from linear boundary ditch 746 there is an irregular flint with removals around one edge suggesting that it is an unfinished discoidal scraper, of the late Neolithic/early Bronze Age.

A broad Neolithic to late Bronze Age date would appropriate for the range of worked flint recovered.

The prehistoric pottery
by Andy Chapman

The excavations in 2011 and 2014 produced 404 sherds of hand-built pottery weighing 2.75kg (Table 2). The vast majority of this, 99.2% by weight, came from the scattered pits in the northern part of the site. Eight pits produced assemblages weighing between 135g and 444g, and a further 11 pits/postholes produced smaller quantities, typically one to three sherds each. There are only six sherds from the ditches of the enclosure/boundary system and nine sherds, weighing 9g, from pits of the pit alignment. The average sherd weight is 6.8g.

Fabrics

Fabric 1, Shelly: comprising a soft fabric containing numerous small voids where the shell inclusions have been leached. The surfaces are characteristically light brown, with some orange and grey patches. Body sherds are typically around 8mm thick, but there are also a small proportion of thin-walled vessels, 4-5mm thick. It is this fabric that is characteristic of the late Bronze Age assemblage. 370 sherds (91.6%).

Fabric 2, sandy: a harder fabric containing small quartz grains, but also often containing voids from leached shell inclusions, so essentially just a sandy variation of Fabric 1. 10 sherds (2.5%).

Fabric 3, organic: containing linear voids from apparent leached organic inclusions. A soft fabric probably similar to Fabric 1. A single vessel only from an isolated pit and perhaps therefore anomalous. 20 sherds (5.0%).

Fabric 4, flint: a hard fabric containing angular flint. Present in very small quantities. 4 sherds (1.0%).

General characteristics

The majority of the assemblage is in a soft fabric containing frequent small voids from leached shell inclusions. The core is typically brown to grey-brown with light brown to light orange-brown surfaces, with some light grey mottling. The sherds are typically 7-9mm thick, and they probably come from small to medium-sized jars or bowls. Most of the larger groups also contain a proportion of thinner-walled sherds, down to 3-4mm thick, which come from small bowl or jar forms. Some of these smaller vessels have light brown surfaces (see Fig 18, 5), but a higher proportion have dark brown to grey surfaces. These smaller thinner-walled vessels also tend to be harder, and many have smoothed to burnished surfaces.

The material from the excavations in 2011 and 2014 is broadly similar to the assemblage from the pit cluster excavated in 2006 (Chapman 2006).

The enclosure/boundary ditches

It is difficult to make a meaningful comparison between the pottery from the enclosure/boundary system and the scattered pits when the clean ditch fills have produced only six sherds. However, four of these six sherds are in a harder sandy fabric, and two of these do not contain any shell inclusions. In addition, the four sherds from four lengths of ditch to both the north and south of pit 663 have no similarity to the vessel from that pit.

As a result, it can be tentatively suggested that if none of the pottery being deposited in the pits had found its way into the ditch systems, this would imply that the pits and the ditch system are not contemporary in origin or use. It is suggested that the ditch system may have pre-dated the pits scatter, and had largely silted up before the pits were excavated, indicating a middle to late Bronze Age date for the enclosure/boundary system, perhaps at or around 1000BC, with it perhaps providing a focus for the later usage of the area.

The pit alignment

There are only nine small sherds of pottery from the pit alignment. There are two small sherds/crumbs and two small pieces of fired clay from the final fill (301) of pit 304, and four small sherds/crumbs, weighing 1g, from the secondary fil (309) of pit 311 are dark grey in colour and contain voids from leached shell inclusions. The single sherd from the primary fill (605) of pit 606 is in a sandy fabric. Two small sherds from the final fill (716) of pit

Table 2: Quantification of prehistoric pottery

fill/cut	feature group	Fabric 1 shelly	Fabric 2 sandy	Fabric 3 organic	Fabric 4 flint	Total sherds	Total weight (g)
Totals	pit alignment	8	1	–	–	9	9
Percentages						2.2%	0.3%
Totals	enclosure	2	4	–	–	6	13
Percentages						1.5%	0.5%
Totals	pits	360	5	20	4	389	2732
Percentages						96.3%	99.2%
Totals		**370**	**10**	**20**	**4**	**404**	**2754**
Percentages		**91.6%**	**2.5%**	**5.0%**	**1.0%**	**Ave. sherd**	**6.8g**

718 have brown surfaces and contain voids, similar to the material from the pits. It would therefore appear that a little of the material from the pits appears as residual sherds within the pit alignment, suggesting that the pit alignment was later in date than the scattered pits.

Selected pit groups

From pit 414 within the scattered pits within the eastern half of the enclosure, there are 25 sherds largely from a single vessel, a plain jar with light brown surfaces, which are irregular and pitted from the loss of inclusions.

The largest assemblage in the eastern area comprises 50 sherds from two vessels in pit 457, an isolated feature lying to the north of the main scatter of pits. There is a slack-shouldered jar, with a flattened uneven rim and a row of shallow fingertip impressions encircling the shoulder (Fig 18, 1). Short linear striations on the body and within the fabric suggest that this vessel had organic inclusions. The other vessel contains sparse small voids, probably from the leaching of fine shell inclusions. It is better finished with a smoothed to burnished surface, mottled brown to grey in colour, and the base of a probable broad lug survives (Fig 18, 1).

In the western half of the enclosure, pit 624 produced sherds from several vessels in shelly fabrics, typically thick walled although there are sherds from a single thin-walled vessel with a simple flattened rim. The body sherds are largely plain with light brown surfaces, although one vessel has an uneven surface with broad but shallow corrugations, finger/thumb width, running vertically. A sherd with an overhanging lip is probably part of an overhanging rim, although the rim itself is missing.

The assemblage from a nearby pit, 629, is broadly similar to that from pit 624 in containing sherds from several vessels, in shelly fabrics and largely thick-walled with light brown surfaces. One body sherd is decorated with broad but shallow fingertip impressions, similar to those on a vessel from pit 457 to the east. The flat base of either the same or a similar vessel has small bold fingertip impressions around its circumference (Fig 18, 2). There are sherds from the rim of a small, thin-walled bowl with grey surfaces, a pronounced shoulder and a simple upright flattened rim (Fig 18, 3).

A small group from another nearby pit, 639, is also similar in character to the material from pits 624 and 629, comprising body sherds and two base sherds, with one body sherd showing faint striations similar to those on the near complete vessel from pit 663. One of three sherds from the fill (642) of pit 643 is a body sherd with a shallow fingertip impression.

Pit 663, which lay between the curving enclosure ditch and the linear boundary, contained joining and non-joining sherds making up around half of a single vessel in the shelly fabric with a pale grey-brown core and mottled light brown to pale orange surfaces (Fig 18, 4). It forms a deep open bowl, standing 125mm high, with a flat base 100m diameter and a simple upright rounded rim with an internal chamfer, 170m in diameter. The maximum diameter, at 35-40mm below the rim, was 178mm. The body of the vessel is only 5mm thick, tapering in to 3-4mm at the rim and having a maximum thickness of 9mm at the raised centre of the base. The external surface is uneven with shallow slightly oblique striations and shallow grooves running from 20-25mm below the rim to 20-40mm above the base, which are now quite faint.

Pit 675, which lay to the south of the enclosure, produced the intact base and walls of a small jar, and body sherds from another vessel, thicker-walled with mottled brown to grey surfaces. In the soil within the intact pot there was a rim sherd from further similar vessel. The small bowl has a light grey core and uniform light brown inner and outer surfaces, although the outer surface of the base and the base angle on one side is greyish-brown in colour (Fig 18, 5). While the fabric contains voids from leached shell inclusions, it is still obvious that the outer surface had been smoothed, but not burnished. The base is 70mm in diameter and at the well-developed rounded shoulder it is 140mm in diameter. The height is estimated at 120mm with a rim diameter of *c*.100mm. Below the shoulder, the body is 7-8mm thick, but above the shoulder it thins rapidly to 4-5mm thick. The single rim sherd is also from a thin-walled vessel, 4mm thick, with light brown surfaces. There is an abrupt angle 23mm below the simple upright, rounded/flattened rim, which is slightly turned (Fig 18, 6).

Pit 679, within the western half of the enclosure contained a rim sherd from a thin-walled vessel with an everted rim and brown surfaces, smoothed to burnished.

Pit 698, within the western half of the enclosure, and containing a large assemblage of pyramidal loomweights, also produced pottery sherds from several vessels, both thin and thick-walled, typically with dark brown surfaces, although a few are light brown. The group includes the rim of a thin-walled shouldered bowl with grey-brown surfaces (Fig 18, 7), broadly similar to the vessel from pit 663 (see Fig 18, 4). The adjacent pit 732 contained a mixed assemblage from several vessels both thick and thin-walled, with the surface colour predominantly grey but including some light orange-brown surfaces. Most notable are several thin sherds, 4mm thick, in a hard fabric with dark grey surfaces that retains a highly burnished surface, even though it is pitted where shell inclusions have been lost.

Catalogue of illustrated pottery

(Fig 18, 1-7)

1. Fingertip decorated jar (top) and lug (bottom) from pit 457
2. Circumference of base with bold fingertip impressions from pit 629
3. Small thin-walled bowl from pit 629
4. Small bowl from pit 663
5. Bowl from pit 675
6. Bowl rim from pit 675
7. Shouldered bowl from pit 698

Fired clay

Fired clay typically occurs as one or two small fragments, weighing around 10g within some of the larger pottery groups from pits 629 and 639 in the north-western area and pit 675, south of the enclosure. The only larger group is 256g of fired clay comprising two irregular lumps measuring up to 40mm and several smaller fragments from pit 677.

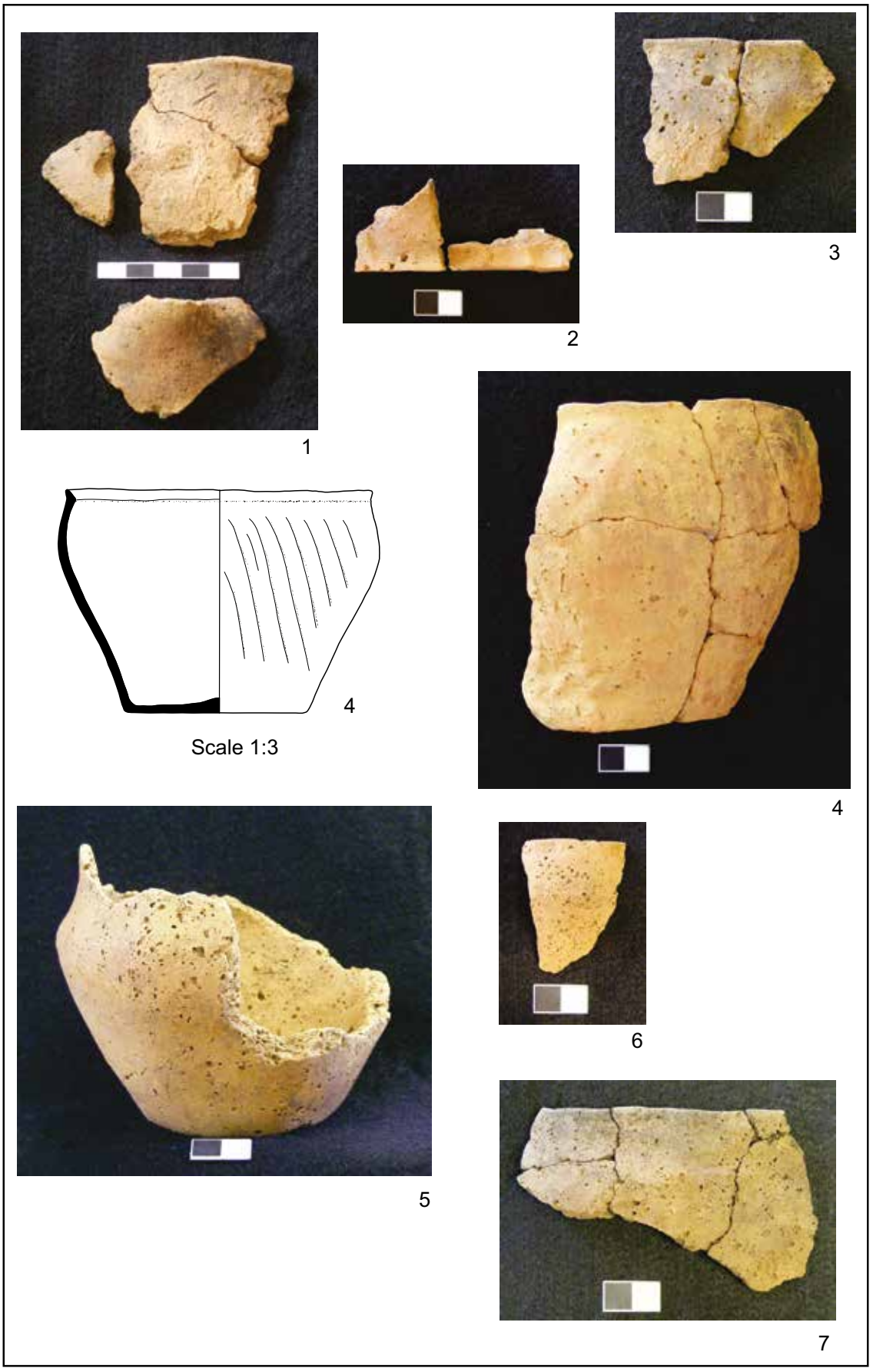


Fig 18: Late Bronze Age and early Iron Age pottery (Scales 50mm and 20mm)

Other finds
by Andy Chapman

The loomweights
Much of a single loomweight came from pit 675 while in pit 698 there was a dumped deposit of 12 loomweights that were complete, semi-complete or fragmented (Fig 19).

A total of 31.8kg of loomweights and associated fragments was recovered from pit 698. At 2.59kg and 2.51kg, the two complete weights suggest that the average weight was around 2.55kg. The base of a weight and fragments, to a total of 2.3kg, from pit 675 suggests that there was a single weight, of which the upper part, including the perforation, had fragmented.

The weights are all of pyramidal form, square to rectangular with well rounded corners, a flat base and tapering to a rounded top (Figs 20 and 21). Three of the weights with complete bases are near square, with sides between 110mm and 123mm wide, while the other two are rectangular, with sides 117mm and 140mm long while the short sides are only 90-91mm long. The sides are typically slightly convex, although on one weight, SF16, the faces are slightly concave. Three weights survive to full height, at 144mm, 147mm and 158mm high. One weight, SF12, has a rounded top while SF16 has a squarer, flatter top.

There is a single perforation through the tapering upper half of the weights, centred 80mm above the base, with a minimum diameter of 16mm. On one weight, SF12, the perforation has been elongated vertically through wear, while the other is still near circular. On both weights there has been much wear around the edges of the perforation and both have grooves above the perforations that have been worn to depths of up to 10mm by cords that must have been at least 6mm but no more than 10mm thick.

The weight from pit 675 is also square, 110 by 102mm, with slightly convex sides and rounded corners. The sides are nearer vertical than those of the other weights. It survives to a maximum height of 130mm, but the top and all remains of the perforations have been lost, although there are some fragments from the upper body.

The clay has been quite well mixed, and typically contains only sparse small pebbles up to 10mm long. One of the fractured weights contained scattered small pieces of ironstone, up to 10mm. The weights are hard and well fired, and have probably fractured along lines of weakness, where the clay was not quite as thoroughly mixed. The body of the weights is typically grey to blue-grey, but occasionally broken surfaces are white to light grey, sometimes tinged pink, similar to the original surface colour. These are probably the planes of weakness where the clay was not bonded, allowing oxygen to penetrate during firing. The outer surfaces are typically fired pale brown to white to a depth of 5-12mm, sometimes tinged pink on the surface, with surface patches of fire blackening. On some of the fractured weights, the well-fired crust has flaked off, possibly because it was an applied surface clay layer on a roughly formed core.

The physical similarity of the weights from pit 698 suggests that they were manufactured and fired in a single batch. While the weight from pit 675 is generally similar in form, the different colour and slightly different shape indicate that it was of separate manufacture and firing. This weight has a soft, unfired, pale pink core and an outer skin that is slightly harder and brick red in colour, indicating that it had fired at lower temperature or for insufficient time for it to be fired throughout. Two faces are smoothed, while the other faces are rougher.

This group of loomweights have an associated radiocarbon date of 905-805 Cal BC (95% confidence, Beta-402870, 2700+/-30BP) on barley grains from the pit fill, indicating a date in the late Bronze Age.

Fig 19: Complete loomweights (SF12 & SF16) from pit 698

In form, they are quite distinct from the cylindrical loomweights of the middle Bronze Age, which have a single perforation along the length of the cylinder. They may be seen as an early stage in the development of the triangular loomweights, with a perforation across each corner, which are characteristic of the middle to late Iron Age.

Grinding stone
The fill (697) of pit 698 (SF17) produced a near square quern/grinding stone, 175mm long by 155mm wide and 50mm thick. It is broken at one end, but the corner survives, indicating that the original length was no more than 180-185mm. It is fashioned in fine-grained sandstone of unknown provenance. The under surface and sides have been only roughly shaped, with the corners rounded. The grinding surface is heavily worn and slightly concave. Even though Bronze Age saddle querns seem to be typically much smaller than those in use at the beginning of the middle Iron Age, a length of only 175mm seems insufficient to make an effective saddle quern for grinding cereal grain and it is considered more likely that this was used as a general grinding stone.

Stone spindle whorl
A large spindle whorl for the hand activity of spinning was recovered from the fill (405) of a posthole 406. The spindle whorl, in fined-grained sandstone, is discoidal, 65mm in diameter with a rectangular section 20mm thick, and weighs 113g (Fig 22). One surface is flat and worn smooth while the other is uneven and shows no sign of wear. The central spindle hole is waisted, 11-20mm in diameter, indicating that it was drilled from both sides.

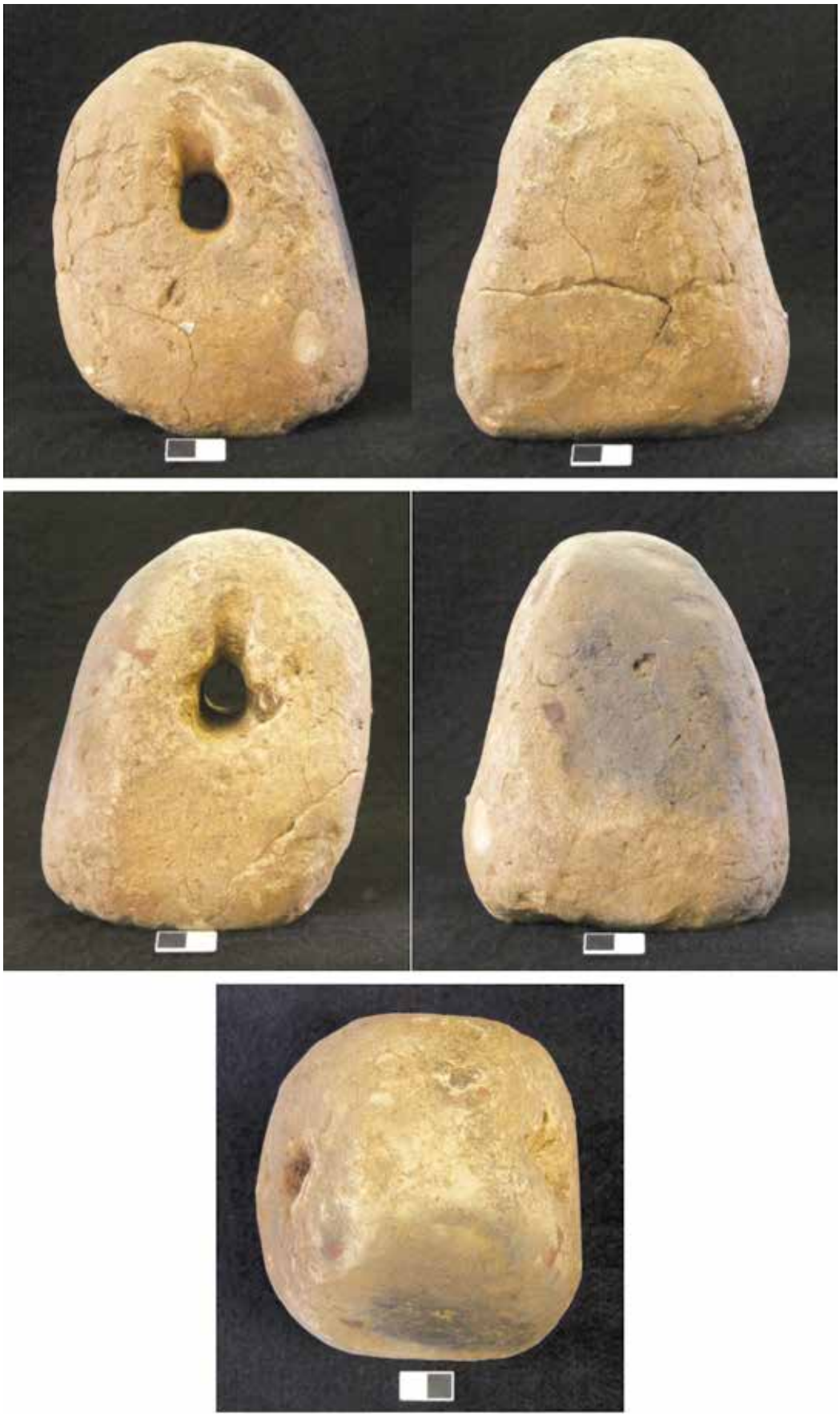


Fig 20: Loomweight SF12, showing sides, faces and plan (Scale 20mm)

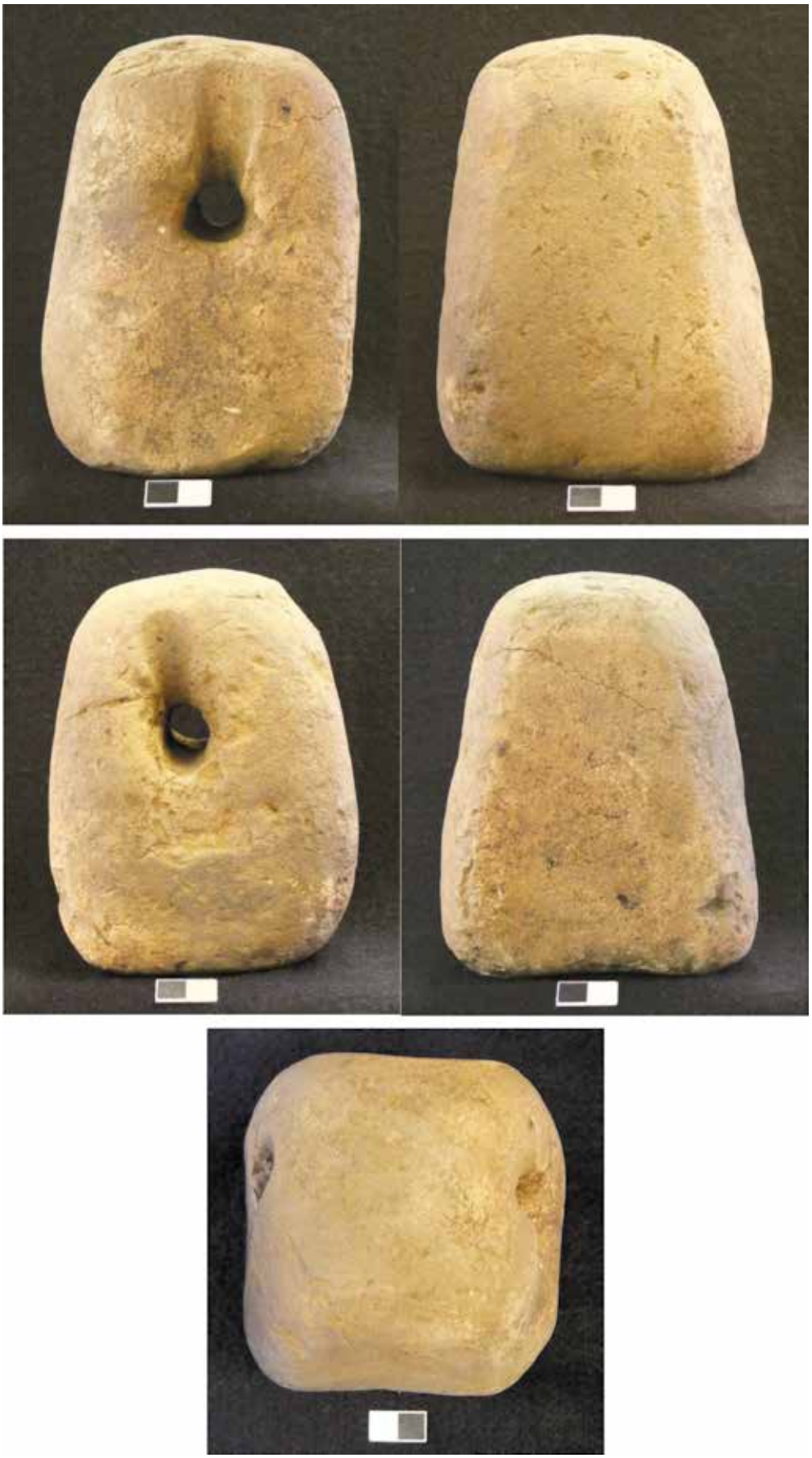


Fig 21: Loomweight SF16, showing sides, faces and plan (Scale 20mm)

Fig 22: The stone spindle whorl from posthole 406, showing the worn and unworn faces (Scale 20mm)

The broader end of the spindle hole is on the flat side of the whorl, suggesting that the whorl was put on the spindle with the flat face facing inwards/upwards (Walton Rogers 1997). Whorls of this form and size are well known from the Iron Age; a single example was recovered from Abingdon, Oxon (Parrington 1978, fig 59, 23) and large numbers manufactured from chalk were recovered from Danebury (Brown, 1984, 422).

Burnt stone and other debris

The bulk soil samples produced quantities of burnt ironstone from pits and postholes in the north-eastern area, pits 442, 457 and 513, and one in the south, pit 481; all from pits that had also produced quantities of charcoal.

The burnt ironstone comprises small rounded pebbles, from 5-40mm long, with the colour ranging from orange through dark red, to red-purple and near black. The fill of pit 513 produced a small lump of glassy, vesicular fuel ash slag, weighing 4.5g. The quantities of burnt stone and charcoal, and very small amounts of fuel ash slag, indicate that burnt debris was being deposited in some of the pits particularly in the north-east area, but also to the south. Several pits in the north-west also contained dumped hearth debris including quantities of charcoal and some burnt stone, but it was not quantified as in the north-eastern area.

The faunal and environmental evidence

Animal bone
by Lazlo Lichenstein

The animal bone was identified using Northamptonshire Archaeology's vertebrate reference collection, and guidelines from Schmid (1972), Driesch (1979) and Feher (1990). Bones that could not be identified to species were, where possible, categorised according to the relative size of the animal represented (large ungulate size: cattle or horse sized, small ungulate size: pig, sheep or goat). Ribs and vertebra were not identified to species.

This very small assemblage of bone fragments (17g) is too small to warrant full analysis, although it contains fragments, including a tooth, and a rib, from a small ungulate size animal. The state of preservation for bone on the site was generally poor and the amount of material retrieved was below the level anticipated for a site of domestic occupation. The majority of bone measured less than 20mm (Table 3). The pattern of the deposition is likely to have been distorted by acidic soils leading to the absence of both larger bones general and small bones (1-4mm) from sieved samples.

Table 3: Size of recovered animal bone

Size (mm)	Percentage
<20	96%
20–50	4%

The material was recovered from the fills of three prehistoric pits; fill (413) of pit 414, fill (441) of pit 442 and fill (455) of pit 457. The bone from pit 442 was burnt, which accounts for its survival. Pit 414 contained indeterminate bone fragments only.

No evidence for butchery, canid gnawing or pathological sign was recovered.

Given the small size of assemblage, nothing can be said about the economy and animal husbandry practises.

Catalogue of animal bone

(413) pit 414
unidentifiable bone fragment, weight: 1g
unidentifiable bone fragment, weight: 1g

(441) pit 442
burnt bone fragments, weight: 2g
burnt bone fragments, weight: 3g
burnt bone fragments, weight: 6g

(455) pit 457
1 tooth fragment in pieces, small ungulate sized animal, weight: 2g
fragment of costa extremitas vertebralis, corpus, rib in 2 pieces
small ungulate sized animal, weight: 2g

Charred plant remains and wood charcoal
by Karen Stewart

Samples were processed by flotation, using a flotation tank with meshes of 0.25mm and 1.00mm to catch the flot and residue respectively. Flots were dried and observed with a low-powered microscope. The residue was dried and sorted by eye for artefacts and environmental material.

Following processing, six samples were selected for macrobotanical analysis (Table 4). Five of these were from pit fills while Sample 24 was from a medieval ditch fill and produced little, and has been omitted. Four charcoal assemblages were selected for analysis.

Macroplant remains

Identifications were carried out using standard reference texts (Cappers *et al* 2006), and modern reference material. Plant names follow Stace (1991). Charred seeds and fruits were quantified, while less quantifiable material such as straw and charcoal was recorded using the following scale of abundance - + = rare, ++ = occasional, +++ = common, ++++ = abundant.

All plant remains with one exception, discussed below, were preserved by charring. In most samples some

modern seeds and worm egg cases were also present. The results are tabulated below in Table 4. Wood charcoal, charred cereal grains and charred wild seeds were the most numerous of the preserved plant remains.

Charring occurs when organic material is exposed to high heats with low oxygen – too much oxygen and the material turns to ash.

Pit 414, fill 413 (Sample 19) contained very low amounts of archaeological remains, with two identifiable barley grains (*Hordeum vulgare*) as well as two further grains that could not be identified to species. Wild taxa were represented by an onion couch tuber (*Arrhenatherum elatius*) and a seed of brome grass (*Bromus* sp.).

Pit 619, fill 618 (Sample 25) contained single charred seeds of fat hen (*Chenopodium album*) and black bindweed (*Fallopia convolvulus*). Low concentrations of charcoal were also recorded.

Pit alignment pit 622, fill 620 (Sample 26) contained some charcoal, as well as low numbers of charred grains, three of which were identified as barley. A single seed of vetch/wild pea (*Vicia/Lathyrus* sp.) was also recorded. The most interesting remains from this sample were 8-10 desiccated 'fruits' which currently remain unidentified. Desiccated plant remains are unheard of archaeologically in the British Isles and work on identifying the specimens more thoroughly is ongoing: similar specimens have been recorded from a medieval context in Norfolk (R Ballantyne pers comm Aug 2014), though comparison of the material will be required to confirm whether in fact they are the same material. Unfortunately, radiocarbon dating of a sample of Barley seed and wood charcoal gave a spurious date, indicating the pit has been disturbed and contaminated, with the desiccated fruits probably deposited as part of this disturbance, most likely an animal burrow.

Pit 675, fill 674 (Sample 29) contained a significant wild seed assemblage as well as high numbers of cereal chaff. Chaff was primarily represented by glume bases, a portion of the grain spikelet that tends to preserve well when carbonised (Boardman and Jones 1990). In this case the great majority of the glume bases were warped from heating and could not be identified further than to 'wheat', however, some were tentatively identified as emmer type (*Triticum dicoccum*). The wild seed assemblage was dominated by taxa that tend to segetal habitats. The most common of these were black bindweed, goosefoots (*Chenopodium* sp.), orache (*Atriplex* spp.) and corn spurrey (*Spergula arvensis*). Less common segetal taxa were knotgrass (*Polygonum aviculare*), ribwort (*Plantago lanceolata*) and brome (*Bromus* spp.). Cereal grains were also present in the sample, with most being too distorted by heat to be identifiable, though eight grains were identified as emmer, with half that identified as barley. Charred stems, some likely to be cereal straw, were also identified, as were several charred root, some of an onion-couch type (*Arrhenatherum* spp.). This charred assemblage is very likely to represent the waste from the later stages of crop processing, where the final particles of chaff and wild seeds are removed from the grain. These may have been thrown in a local hearth as fuel, and then dumped in a pit with the rest of the hearth refuse.

Pit 698, fill 697 (Sample 30) contained a significant charred grain assemblage, with barley the most commonly identified (32 grains), while a further 39 were too vesicular due to heating to be identified. Low numbers of emmer and oat (*Avena* spp.) grains were also recorded in the assemblage, and these may be present as weeds of the barley crop. The low numbers of wild seeds present in the assemblage suggest a finished crop, though those present certainly represent weed of crop fields such as field madder (*Sherardia arvensis*) and pale persicaria (*Persicaria lapathifolia*). Significant concentrations of charcoal were also noted in the sample.

Charcoal

A random selection of 30 fragments was made from all charcoal over 2mm in each chosen sample. These were fractured along the transverse, tangential and radial planes in order to observe the microscopic characteristics required for taxonomic identification of wood. The fragments were mounted on a glass slide and observed using reflected light at magnifications up to x400. Identifications were made using standard techniques by Schoch *et al* (1978), Hather (2000) and the International Association Of Wood Anatomist (IAWA) InsideWood database. Where there were fewer than 30 identifiable fragments in a sample, 100% of the fragments were identified. The taxa, fragment size, strength of ring curvature and any other interesting characteristics were recorded for each fragment (Fig 23).

Charcoal was noted in all of the samples analysed from the site, and five samples were chosen for wood species analysis. None of the charcoal fragments identified had any evidence of fungal or insect damage prior to burning, suggesting that it was not stored for significant periods before burning, or collected from the forest floor.

In posthole 416 (Sample 20), 100% of the sampled charcoal was identified as oak (*Quercus* sp.). Most of the fragments were noted to have very weak ring curvature, often a good indicator of wood from trunks or larger branches. Given this and the presence of just one taxon, the charcoal present may be structural, and may be the remains of the post for which the posthole was cut. Oak timber is known for its durability and strength and is a common structural timber.

In pit 442 (Sample 21), the charcoal assemblage was overwhelmingly of oak (*Quercus* sp.) though low numbers of other taxa were also present. Some burrwood fragments were also recorded (Burrwood is the result of damage to a tree, whether because of physical trauma such as a removed branch, or bacterial or fungal infection. The tree then grows new wood tissue in the area, but this new tissue grows in a haphazard manner rather than a straight grain, causing tightly knotted rounded lumps to form over the damage. This haphazard growth makes identification by microscopic characteristics very difficult and in these cases it was not possible to make any taxonomic identification). Single fragments of hazel (*Corylus avellana*) and field maple (*Acer campestre*) appeared to be much more slow grown than the oak present, with far more annual rings present than in oak fragments of similar size. However, ring width is very variable between species and can be also be quite reactive to environmental conditions. Oak makes excellent fuel and its dominance of the assem-

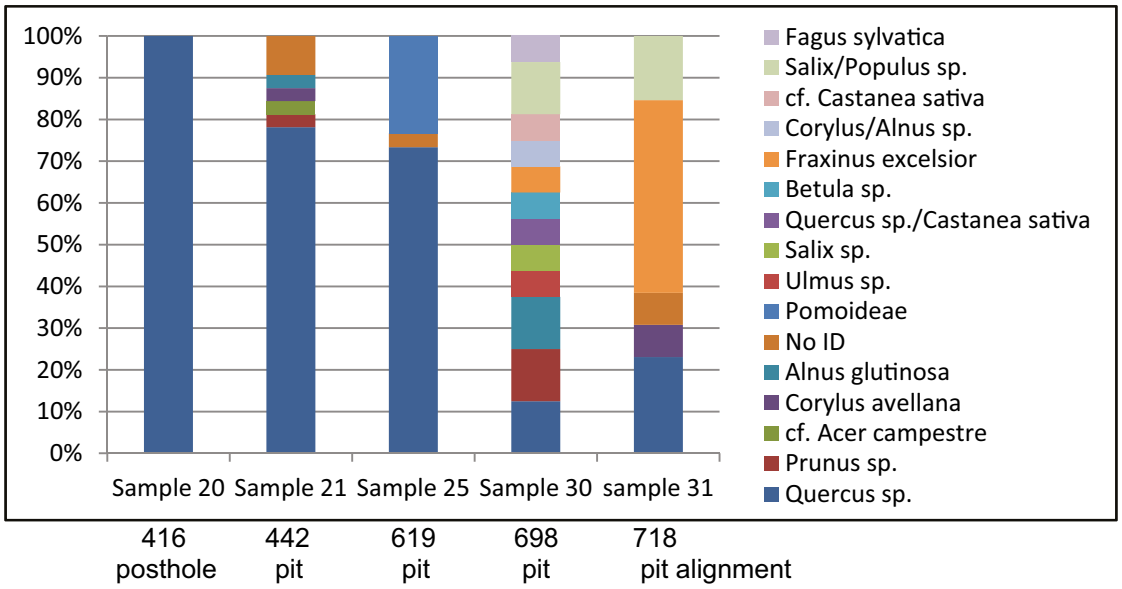


Fig 23: Taxonomic composition of charcoal samples

blage here is likely due to selection of its wood for this purpose.

Pit 619 (Sample 25) was dominated by oak (*Quercus* sp.) though with a significant proportion of the assemblage also identified as Pomoideae-type wood. The Pomoideae group is made up of apple (*Malus* sp.), pear (*Pyrus* sp.), rowan/whitebeam (*Sorbus* sp.) and hawthorn (*Crataegus* sp.) woods, which are indistinguishable based on microscopic wood characteristics.

Pit 698 (Sample 30) differed from the other examined samples in that it was not dominated by oak (*Quercus* sp.), or indeed any one taxa. Only 18 fragments from this sample were of a size suitable for identification, but this number should be sufficient to provide a valid sample (O'Carroll and Mitchell 2012). Oak, (cherry-type (*Prunus* sp.), willow/poplar (*Salix/Populus* sp.) and alder (*Alnus glutinosa*) were all identified to two fragments each. Birch (*Betula* sp.), beech (*Fagus sylvatica*), elm and hazel were also noted. A possible fragment of sweet chestnut (cf. *Castanea sativa*) was recorded, but very young oak can be mistaken for sweet chestnut wood as it may not yet have developed its characteristic large medullary rays. As 14 rings were visible in this fragment it was recorded as likely to be sweet chestnut, but as this species is thought to have been introduced to the British Isles by the Romans this would imply a Roman or later date for this sample. However, charred barley grains have provided a radiocarbon date in the late Bronze Age, which is also consistent with the assemblage of loomweights recovered from this pit, which would imply that the sample must be of oak.

Most of the fragments identified in this sample had very strong ring curvature, suggesting small branch wood, and indeed some of the fragments were whole or half-rounds. Unfortunately, the fragments were too small and the size of the assemblage too limited to infer whether or not any coppiced material was present. The oak fragments and one of the alder fragments were the only specimens recorded with weak ring curvature, suggesting larger wood diameters. The wide range of taxa and small diameter of most of the wood, may suggest that this assemblage was formed by *ad hoc* collection of brushwood, perhaps for kindling. The variety of taxa certainly suggests a complex woody environment with a wide breadth of plant resources available.

Pit alignment pit 718, fill 716 (Sample 31) contained a small and very abraded charcoal assemblage. Only 13 fragments from this assemblage were suitable for taxonomic identification, a more limited assemblage than those examined from the other samples. Ash (*Fraxinus excelsior*) was the dominant type identified, though oak (*Quercus* sp.) was also common. As the fragments were very small it is difficult to interpret the character of the assemblage, though it was noted that the ring curvature of the oak fragments was very weak, while in the other taxa curvature tended to be moderate or strong. This may suggest that the oak present was old stem or trunk wood while the ash and other taxa were branch or stem wood.

Summary

A wide variety of activities and habitats are indicated by the archaeobotanical assemblages recovered in the analysed samples. Cultivation and processing of cereal crops are evidenced in the cereal and weed seed assemblages from pit 674 (Sample 29) and pit 698 (Sample 30). The selection of oak wood for fuel is evidenced in the charcoal assemblages from pit 442 (Sample 21) and pit 619 (Sample 25), while the charcoal assemblage from pit 698 (Sample 30) suggests the utilisation of a wide variety of wood types from a local woodland.

Discussion

The archaeology of Harlestone Quarry is of interest because it provides a block of landscape that was utilised during the late Bronze Age to early Iron Age, roughly 1000-400BC, but thereafter saw little below ground disturbance, apart from centuries of ploughing from at

Table 4: The charred plant assemblages

Context	**Fill/cut**	**413/414**	**618/619**	**620/622**	**674/675**	**697/698**
	Sample	19	25	26	29	30
	Feature type	**pit**	**pit**	**pit alignment**	**pit**	**pit**
Scientific name (Common name)	**Part of plant**					
Triticum dicoccum Schubl.(emmer)	grain	–	–	–	8	2
Triticum dicoccum Schubl.(emmer)	grain	–	–	–	6	–
Triticum sp. (wheat)	glume base	1	–	–		–
Triticum spp. (wheat)	glume base		–	–	73	–
cf. *Secale cereale*	grain		–	–	1	–
Hordeum vulgare L. (6–row barley, hulled)	grain	2	–	3	4	32
Avena spp. (oat)	grain		–			4
Cerealia (cereal ind.)	grain	2	–	2	39	39
Stellaria media (L.) Vill. (common chickweed)	fruit/seed	–	–	–	2	–
Spergula arvensis L. (corn spurrey)	fruit/seed	–	–	–	11	–
Chenopodium album L. (fat hen)	fruit/seed	–	1	–	6	–
Chenopodium rubrum/glaucum (red/glaucous goosefoot)	fruit/seed	–	–	–	2	–
Chenopodium spp. (goosefoot etc)	fruit/seed	–	–	–	26	3
Atriplex sp. (orache)	fruit/seed	–	–	–	–	1
Atriplex spp. (orache)	fruit/seed	–	–	–	18	–
Malva sp. (mallow)	fruit/seed	–	–		1	–
Vicia/Lathyrus sp. (vetch/wild pea)	fruit/seed	–	–	1	–	–
Vicia/Lathyrus spp. (vetch/wild pea)	fruit/seed	–	–	–	3	4
cf. *Hydrocotyle vulgaris* L. (marsh pennywort)	fruit/seed	–	–	–	1	–
cf. *Pimpinella* sp.(marsh pennywort)	fruit/seed	–	–	–	1	–
Daucus carota L.(wild carrot)	fruit/seed	–	–	–	1	–
Apiaceae (Carrot family)	fruit/seed	–	–	–	2	–
Polygonum aviculare L. (knotgrass)	fruit/seed	–	–	–	5	–
Persicaria maculosa Gray (redshank)	fruit/seed	–	–	–	–	2
Persicaria lapathifolia (L.) Gray (pale persicaria)	fruit/seed	–	–	–	–	7
Fallopia convolvulus (L.) A. Love (pale persicaria)	fruit/seed	–	1	–	15	2
Rumex spp. (dock)	fruit/seed	–	–	–	9	
Prunella vulgaris L. (self–heal)	fruit/seed	–	–	–	2	–
Lamiaceae (mint family)	fruit/seed	–	–	–	–	1
Plantago lanceolata L. (ribwort)	fruit/seed	–	–	–	6	1
Sherardia arvensis L. (field madder)	fruit/seed	–	–	–		1
Galium sp. (bedstraw)	fruit/seed	–	–	–	1	1
Carduus/Cirsium sp. (thistles)	fruit/seed	–	–	–		1
Carex spp. (sedge)	fruit/seed	–	–	–	7	
Poaceae (graa family)	fruit/seed				46	9
Bromus sp. (bromes)	fruit/seed	1	–	–	–	–
Bromus spp. (bromes)	fruit/seed	–	–	–	6	–
Avena sp./Poaceae Large grass/oat	fruit/seed	–	–	–	2	–
Arrhenatherum elatius (L.) Beauv. (false oat–grass/onion couch)	root	1	–	–	7	–
Quantity (litres)		**30**	**?**	**40**	**20**	**40**

least the medieval period onward. In particular, there is an absence of middle to late Iron Age and Roman settlement, which would have obscured the pattern of earlier land usage.

However, while this landscape is uncluttered by later activity, the features that were present only rarely contained either datable finds or organic material suitable for radiocarbon dating, and this has made it impossible to construct a totally secure chronology for all aspects of the archaeological record. More could have been achieved through additional radiocarbon dating, but the project budget did not allow this, and it would largely have provided dates only for more of the scattered pits, as the fills of both the ditch systems in the northern part of the site and the pit alignment to the south contained few finds or carbonised remains.

The chronological sequence, as discussed below, is therefore partly a product of finds and radiocarbon dating and partly a matter of reasoned inference.

The early Bronze Age

Usage in this period was sparse. One pit with a charcoal-rich fill, but no finds, has been radiocarbon dated to the early Bronze Age, another pit with a charcoal-rich fill contained a flake from a polished stone axe, which might indicate that this pit too was of a similar, or even earlier date, perhaps even late Neolithic. Another isolated pit had a similar charcoal-rich fill, but this feature has not been formally dated.

This early usage is consistent with a pattern of isolated pits or small clusters of pits typically containing hearth debris along with small assemblages of finds, particularly pottery and flint, ranging in date from the middle Neolithic to the early Bronze Age.

They can be seen as the deliberate burial of domestic debris at temporary living sites, with these pits providing the only surviving evidence that individuals had once lived here, even if only for a matter of days or perhaps weeks, within a peripatetic life moving around their territory to exploit the seasonal changes of resources. Such pits are being found in increasing numbers as the scale and quantity of open area excavations has expanded from the 1990s onward, usually on identified sites of later dates particularly middle Iron Age to Roman settlements. Around Northampton, there have been chance discoveries of pits and cremation burials of middle Neolithic to early Bronze Age date on several sites, including Wootton Fields (Chapman and Carlyle 2012), Upton (Walker and Maull 2010) and Milton Ham (Carlyle and Chapman 2012). The broad pattern of Neolithic and early Bronze Age pit clusters across the eastern counties has been assessed by Garrow (2006).

The late Bronze Age to early Iron Age landscape

The ditched enclosure, if it was an enclosure, and the associated boundary system radiating from it, has no obvious local parallels, as there is so little evidence for the 1st millennium BC from the county. In date it is probably two to three centuries earlier than the late Bronze Age ring ditch at Thrapston, which was radiocarbon dated to 910-760 cal BC (95% confidence, BM-3113, 2630±50 BP) (Hull 2001). There is also no comparison between the large enclosure with a shallow ditch at Harlestone Quarry and the circular ring work at Thrapston, up to 120m in diameter, with a ditch up to 1.9 deep. The pottery assemblages are also quite distinct, with Thrapston producing vessels with incised geometric patterns (Hull 2001, fig 5), which are absent at Harlestone Quarry.

A better comparison is provided by an early Iron Age settlement at Gretton (Jackson and Knight 1985), where there was an area of settlement comprising scattered pits and postholes including a rectangular four-post structure and an arc of postholes possibly defining a small post-built roundhouse, which is closely comparable with the southern and north-eastern pit clusters at Harlestone Quarry.

Most of the pottery at Gretton came from the fills of an adjacent double-ditched boundary, and the assemblage includes vessels with fingertip impressions on the shoulders similar to vessels from Harlestone Quarry. However, such fingertip decoration seems to have a broad time span from the late Bronze Age and even appearing on some vessels into the middle Iron Age. However, there were more diagnostic early Iron Age vessels, with sharply carinated profiles, which are absent at Harlestone Quarry. The ditch at Gretton has been radiocarbon dated to the early Iron Age, but there is a large error factor so the derived date spans more than the entire early Iron Age (790-370 cal BC, 95% confidence, Har-3015, 2410+/-80 BP) (Chapman 2010). However, at around 50% confidence the indicated date range is 550-390 cal BC, suggesting a date towards the end of the early Iron Age, closely comparable to a pit at Harlestone Quarry also dated towards the end of the early Iron Age (535-395 cal BC).

At Harlestone Quarry we therefore have scatters of small pits and postholes that define small areas of settlement, perhaps single houses with relatively short lifetimes. The best evidence comes from the earliest phase in the late Bronze Age, probably closely related to the use of the large enclosure, which was perhaps used for stock control. A settled presence would seem to be most clearly indicated by the two pits containing loomweights, which suggest the likely presence of nearby roofed structures that left no below ground evidence. The other clusters of pits, to the east and the south probably derive from later episodes of short-term occupation on at least two other occasions within the early Iron Age, with the final usage lying towards the end of the early Iron Age, the 6th into 5th centuries BC.

The pit alignment

The pit alignment was created at some time during the early Iron Age, but not necessarily co-incident with any of the settlement pit clusters. Pit alignments are regarded as landscape and/or territorial boundaries dating to the late Bronze Age and early Iron Age, although few have been well dated as they tend to produce little datable material. What dating evidence there is suggests a span of some 400 years, 800-400BC, with some being replaced by continuous ditches in the middle Iron Age or even into the early Roman period, as at Wollaston, Northamptonshire (Meadows 1995), St Ives, Cambridgeshire (Pollard 1996) and Ferrybridge, West Yorkshire (Roberts 2005). However, at many pit alignments, as at Harlestone Quarry, the pits silted naturally and eventually were lost, and had no effect in determining later landscape boundaries.

The Harlestone Quarry pit alignment is a classic example of its type, comprising quite evenly-spaced square to rectangular pits, with the long axis along the line of alignment. The individual pits had steep sides and a flat base. As they had silted naturally, the upper walls of the pits had been subject to erosion, rendering many more circular in surface plan. As is also broadly true of pit alignments, finds and organic debris were only rarely present. What organic material was recovered appears to be residual, and certainly so in the case of the wood charcoal that gave

an early Bronze Age radiocarbon date. A date of 1060-920 Cal BC (95% confidence, Beta-419139, 2840±30 BP) is also considered to come from residual material from the late Bronze Age enclosure and pit clusters, but does at least provide a *terminus post quem* for its construction and silting.

The Harlestone pit alignment runs west-north-west to east-south-east in a straight but slightly wavering line. One explanation of such slight changes in alignment and also the occasional smaller pit or wider spacing, has been to suggest that they may be the junctions between lengths dug by separate work gangs. Similar changes of alignment have been noted at excavated sites in Northamptonshire; Briar Hill, Northampton (Jackson 1974), while at Gayhurst Quarry, Newport Pagnell, Buckinghamshire, there were multiple abrupt changes in alignment that were quite clearly deliberate and not the product of chance (Chapman 2007).

It has also been suggested that pit alignments were situated along distinct boundaries in surface geology and there soil types, as at Warth Park, Raunds, Northamptonshire, which roughly followed a boundary between cornbrash and marl clay (McAree 2006). At Harlestone Quarry, the pit alignment may have been following a boundary between the permeable sands and shattered ironstone to the north, and the clays and silty clays of the mudstones to the south.

While many aspects of the chronology, creation, function, use and significance of pits alignments remain uncertain, a broad role in demarcating land divisions, perhaps land-use rather than territorial boundaries, now seems quite firmly established.

Numerous lengths of pit alignments have been excavated in Northamptonshire, but what we are lacking are the ends of these alignments. Do they stop at natural barriers such as streams and rivers, or do they relate to even earlier boundary systems. Recent excavations at Pineham, Northampton have shown two pit alignments beginning at a boundary ditch, but analysis and dating of these features is still in progress (Simmonds pers comm). It is also possible that the linear ditch boundary is the primary system with the pit alignment subdivisions introduced only a little later, so that they are in fact differing aspects of what is really a single system of land boundary.

In this respect, perhaps the most interesting aspect of the Harlestone Quarry pit alignment lies to the east of the quarry and east of the A428, where aerial photography has recorded the pit alignment running towards a triple-ditched boundary system aligned near north to south, but not seen further to the east (Fig 3). The triple-ditch system runs for in excess of 1km along the western margin of Harlestone Heath (Fig 1, MN129778). These triple-ditch boundaries are far less common than pit alignments, but are no less enigmatic in terms of their date and function.

The juxtaposition of the Harlestone pit alignment and the triple ditch system had previously been noted by Deegan and Foard (2007, fig 64) with further similar examples noted at Pitsford (ib id, fig 65) and also at Ketton, Rutland (ib id, fig 6.7).

A triple-ditch system forming part of a long-used landscape at Cambridge Road, Bedford (Chapman and Chapman 2017), has been extensively excavated, but as at Harlestone dating was problematic. A system of shallow linear boundary ditches post-dated an early Bronze Age ring ditch, and were related to a water hole that was filled in at the late Bronze Age/early Iron Age transition. This system was thus broadly contemporary with the early ditches and many of the pits at Harlestone. However, at Bedford the triple-ditched system was a later addition, perhaps in the early Iron Age, although much of the ditch system was still extant in the middle Iron Age and even in the early Roman period, when pottery from an adjacent settlement was entering the fills of at least one of the three ditches.

In contrast to the Bedford site, at Harlestone, the juxtaposition suggests that the triple-ditch system was the earlier boundary, with the pit alignment a later addition. If this area was ever developed, it should be a priority for excavation in order to explore the relationship and, hopefully, the chronology of both the triple-ditch system and the pit alignment, although finding material both suitable for radiocarbon dating and securely related to the origin of the landscape feature would be a rare achievement.

For the time being, we can only suggest that continuous triple-ditch boundary systems, as at Harlestone and at Bedford, were primary land divisions being established as early as the late Bronze Age in some instances but perhaps also throughout the early Iron Age as well. Pit alignments may well be closely contemporary, perhaps forming a secondary level of landscape sub-division, as indicated at Pineham, where pit alignments branch from a linear ditch, and at Harlestone apparently branching from a triple-ditch system. Only further excavation and further radiocarbon dating can flesh out this current loose model of land boundary forms utilised prior to the explosion of settlement that occurred in the middle Iron Age, starting around 450-400BC.

Bibliography

Badal, E, Carrión, Y, Macias, M, and Ntinou, M, (eds) 2012 *Sagvntvm: Wood and charcoal. Evidences for human and natural history*, Departament de Prehistoria i Arqueologia, Univerisitat de Valencia, Valencia

Boessneck, J, *Osteological Differences between Sheep (Ovis aries Linne) and Goat (Capra hircus Linne)*

Boardman, S, and Jones, G, 1990 Experiments on the effects of charring on cereal plant components, *Journal of Archaeological Science*, **17**, 1-11

Brown, L, 1984 Objects of Stone, in B Cunliffe 1984, 407-425

Butler, A, Fisher, I, and Walford, J, 2012 *Archaeological Geophysical Evaluation for the Dallington Gateway, Northampton*, Northamptonshire Archaeology report, **12/98**

Cappers, T J, Bekker, R M, & Jans, J E A, 2006 *Digitale zadenatlas van Nederland*, Groningen

Carlyle, S, and Chapman, A, 2012 Neolithic cremation burials at Milton Ham, Northampton, *Northamptonshire Archaeology*, **37**, 29-35

Chapman, A, 2006 The Iron Age pottery, in L Field and A Chapman 2006, 6-7 & plate 6

Chapman, A, 2007 *A Bronze Age barrow cemetery and later boundaries, pit alignments and enclosures at Gayhurst Quarry, Newport Pagnell, Buckinghamshire*, Records of Buckinghamshire, **42.2**, 81-211

Chapman, A, 2010 Radiocarbon dates, in D Jackson 2010, 161

Chapman, A, and Carlyle, S, 2012 A Bronze Age pit deposit and round barrows near Wootton, Northampton, *Northamptonshire Archaeology*, **37**, 89-101

Chapman, A, Foard, A, and Clarke, J, 2015 *Excavation of a Bronze Age and early Iron Age landscape at Harlestone Quarry Northamptonshire 2007-2014*, MOLA Northampton report, **15/111**

Chapman, A, and Chapman, P, 2017 *Bronze Age Monuments and Bronze Age, Iron Age, Roman and Anglo-Saxon Landscapes at Cambridge Road, Bedford*, Archaeopress Archaeology

Chinnock, C, and Muldowney, M, 2016 *Archaeological mitigation at Dallington Gateway, Harlestone Road, Northampton: August to October 2014*, MOLA Northampton report, **16/6**

CIfA 2014a *Standards and guidance for archaeological field evaluation*, Chartered Institute for Archaeologists

CIfA 2014b *Code of Conduct*, Chartered Institute for Archaeologists

Cunliffe, B, 1984, *Danebury: an Iron Age Hillfort in Hampshire. Volume 2: The excavations 1969-1978 - The finds*, Council for British Archaeology (CBA) monog

Cunliffe, B, 2005 *Iron Age Communities in Britain (4th edition),* Routledge

Dawson, M, 2001 *Land at Harlestone Quarry, Northamptonshire*, Samuel Rose report

Dawson, M, 2006 *A Project Design for Archaeological Investigation, Harlestone Quarry, Northamptonshire*, CgMs Consulting report

Deegan, A, and Foard, G, 2007 *Mapping Ancient Landscapes in Northamptonshire*, English Heritage

Driesch, A von den, 1976 *A guide to the measurements of animal bones from archaeological sites*, Peabody Museum Bulleti*n*, **1**, Cambridge, Ma, USA, Harvard University

Feher Gyorgy 1976 *Haziallatok funkcionalis anatomiaja*

Field, L, and Chapman, A, 2006 *Archaeological Excavation at Harlestone Quarry, Northamptonshire,* Northamptonshire Archaeology report, **06/173**

Garrow, D, 2006 *Pits, settlement and deposition during the Neolithic and Early Bronze Age in East Anglia*, British Archaeological Reports, British Series, **414**

Hall, D, 1995 *The Open Fields of Northamptonshire*, Northamptonshire Record Society

Hallam, T, Lloyd, R, and Yates, A, 2003 *Pitsford Quarry, Archaeological recording: Sheep Dale Field: Assessment and Update Project Design,* Northamptonshire Archaeology report, **3421**

Hather, J G, 2000 *The Identification of the Northern European Woods: A guide for archaeologists and conservators*, Archetype Publications, London

Hillson, S, 2002 *Dental Anthropology. Cambridge*, Cambridge University Press

Hull, G, 2001 A Late Bronze Age ringwork, pits and later features at Thrapston, Northamptonshire, *Northamptonshire Archaeology*, **29**, 73–92

Jackson, J, and Knight, D, 1985 An Early Iron Age and Beaker site near Gretton, Northamptonshire, *Northamptonshire Archaeology*, **20**, 67–86

Jackson, D, 1974 Two new pit alignments and a hoard of currency bars from Northamptonshire, *Northamptonshire Archaeology,* **9**, 13-45

Jackson, D, 2010 *Dennis Jackson: A Northamptonshire Archaeologist*, Northamptonshire Archaeological Society

Laws, G, 2007 *Dallington Grange, Northamptonshire: Archaeological Evaluation report*, Oxford Archaeology

Lewis, B, 2004 *Archaeological watching brief at Harlestone Quarry extension, near Northampton, January 2004*, Northamptonshire Archaeology report, **3650**

Maull, A, 2002 *Archaeological Watching Brief, Harlestone Quarry Extension, Northampton*, Northamptonshire Archaeology report, **3205**

McAree, D, 2005 A pit alignment at Warth Park, Raunds, *Northamptonshire Archaeology*, **33**, 9-18

Meadows, I, 1995 Wollaston, *South Midlands Archaeology,* **25**, 41-45

MOLA 2014 *Archaeological Fieldwork Manual*, MOLA Northampton

NA 2006 *Harlestone Quarry Extension, Harlestone, Northamptonshire, Project Design for Archaeological Investigation*, Northamptonshire Archaeology

O'Carroll, E, and Mitchell, F J C, 2012 Charcoal sample guidelines: New methodological approaches towards the quantification and identification of charcoal samples retrieved from archaeological sites, in E Badal *et al* 2012

Parrington, M, 1978 Small Finds, in M Parrington 1978a, 78-83

Parrington, M, 1978a *The excavation of an Iron Age settlement, Bronze Age ring-ditches and Roman features at Ashville trading Estate, Abingdon, Oxfordshire 1974-76*, CBA Research Rep, **28**

Pollard, J, 1996 Iron Age Riverside Pit Alignments at St Ives, Cambridgeshire, *Proceedings of the Prehistoric Society,* **62**, 93-115

RCHME 1981 *An inventory of the historical monuments in the county of Northampton: Archaeological sites in north-west Northamptonshire*, **3**, Royal Commission on Historical Monuments (England), Her Majesty's Stationery Office

Roberts, I, (ed) 2005 *Ferrybridge Henge: The Ritual Landscape. Archaeological Investigations at the Site of the Holmfield Interchange of the A1 Motorway,* Archaeological Services WYAS, Yorkshire Archaeology, **10**

Schoch, W, Heller, I, Schweingruber, F H, Kienast, F, 2004 *Wood anatomy of central European Species,* Online version: www.woodanatomy.ch. [viewed Aug 2014]

Schmid, E, 1972 *Atlas of Animal Bones: For Prehistorians, Archaeologists and Quaternary Geologists,* Elsevier Science

Stace, C, 1991 *New Flora of the British Isles*, Cambridge University Press

Stace, C, 1997 *New Flora of the British Isle* (2nd edition), Cambridge University Press

Taylor, E, and Fisher, I, 2003 *Reconnaissance Survey and Fieldwalking Survey at Harlestone Quarry Extension, Northampton,* Northamptonshire Archaeology report

Upson-Smith, T, and Maull, A, 2004 *Archaeological Evaluation at Harlestone Quarry, near Northampton, October 2004*, Northamptonshire Archaeology report

Walker, C, and Maull, A, 2010 Iron Age and Roman settlement at Upton, Northampton, *Northamptonshire Archaeology*, **36,** 9-52

Walker, C and Wolframm-Murray, Y 2012 *Archaeological Trial trench Evaluation on land at Dallington Gateway, Harlestone Road, Northampton*, Northamptonshire Archaeology report, **12/167**

Walton Rogers, P, 1997 *Textile Production at 16-22 Coppergate*, The Archaeology of York, **17/11**

Maps

British Geological Survey reprint 1997 Solid and Drift Edition enhanced 1:50000

Websites

BGS 2009 http://www.bgs.ac.uk/geoindex/home.html British Geological Survey website

http://archaeologydataservice.ac.uk/archsearch/record.jsf?titleId=1041688 [viewed July 2013]

InsideWood. 2004-onwards http://insidewood.lib.ncsu.edu/search [viewed Aug 2014]