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The Society records with sorrow the death on 18 July 2020 of Dr Rosemary Martin, Chairman of Council 1995–1998 and Vice-President 2013–2020.

Papers relating to the Architecture, Archaeology and History of the County, City and Neighbourhood of Chester

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Abbreviations
The abbreviations used in this volume follow the system laid down in British Standard 4148 part 2; many of the most relevant abbreviations are listed in *Signposts for archaeological publication* ed 3. London: Council for British Archaeology, 1991.

Contributions
The Society welcomes articles about the architecture, archaeology and history of the pre-1974 county of Cheshire and adjoining areas. If you are interested in contributing, please contact the Editorial Subcommittee, email chesterarchaeologicalsociety@gmail.com. For notes on the scope, presentation, content and organisation of contributions, and on house style, *see* www.chesterarchaeolsoc.org.uk/contributors.html.

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The Excavation of a Lowland Iron Age Settlement

by Kevin Cootes, Janet Axworthy, David Jordan, Matt Thomas, and Rea Carlin with contributions by Matteo Bormetti, Ian Brooks, Carole Davenport, David Dungworth, Lorne Elliott, Priscilla Lange, Charlotte O'Brien, Hannah Russ and Sarah Viner-Daniels*

Excavations on agricultural land at Poulton have revealed a late prehistoric lowland settlement of unparalleled complexity for the region, characterised by intercutting roundhouse ditches which span the eighth to first centuries BC. A diverse finds assemblage was preserved by unusually favourable geological conditions and revealed evidence for a range of activities, long-distance connections, a mixed farming economy and ritual practices. The overall character is indicative of a settlement similar to examples east of the Pennines. The topographical and geological setting further provides a template to identify similar examples, potentially illuminating Iron Age studies in north-west England and beyond.

Introduction Kevin Cootes

The site

Poulton (centred on SJ 40092 58513) is situated about eight kilometres south of Chester, on the west bank of the River Dee, and comprises a series of farming and domestic buildings surrounded by agricultural fields. One fifty-five-acre example named Chapel Field (Illus IV.1) is notable for its topographical setting, constituting a plateau overlooking the Pulford Brook and the floodplain of the River Dee.

Geologically the field is covered by glacial deposits in the form of a thick sheet of largely stone-free, slightly calcareous silty clay, resting directly upon Kinnerton Sandstone (Earp & Taylor 1986, 69). The poorly drained argillic stagnogley soils result in surface wetness that would have been a disadvantage to agriculture in later prehistory but suited to grasslands. In contrast, the floodplain beneath the plateau is characterised by nutrient-rich alluvial silts (Furness 1978, 117), which would have been appropriate for horticulture or for the cultivation of swift-growing crops that could be sown, grown and harvested between floods. Chapel Field is therefore located on the border of two distinct geomorphological zones.

The evidence for historical land use within the excavated areas of Chapel Field varies. Roman-period activity is commonly encountered, comprising linear ditches of varying

sizes, a D-shaped enclosure, and small-scale industrial features. There was also medieval ridge and furrow ploughing up to *c* 0.20m deep, which would have removed many earlier superficial deposits and shallow features. An extensive grid of nineteenth-century ceramic drains was laid out across the entire field at *c* 0.30–1.35m below present ground surface, with the cuts being consistently *c* 0.20m wide, causing extensive but often limited disturbance to archaeological features. Currently, Chapel Field is ploughed annually for the growth of a maize crop, a practice which began approximately fifteen years ago. The modern ploughing regime has removed the majority of surface features and hence precluded the use of LiDAR to estimate the extent of the archaeological landscape. Similarly, the floodplain (part of the Grosvenor Estate) is used for the growth of maize. The edge of the plateau and drop to the 'Old Pulford Brook' is, however, currently uncultivated and at the time of writing is showing evidence of regeneration.

Historical background and research

A settlement at Poulton was recorded in the Domesday Book of 1086 and became the focus of a substantial ecclesiastical presence *c* 1153–8, when it was granted to the Cistercians. A short-lived abbey left a grange and chapel. Following the Dissolution in 1544, the chapel was recorded as being in decay in 1672, with all visible remains removed by 1718 (Emery *et al* 1996, 5–9).

Excavations *c* 1892 by the antiquarian R G Williams and activities by farmers and landowners in 1922 and *c* 1962 all produced evidence of a stone structure and burials within

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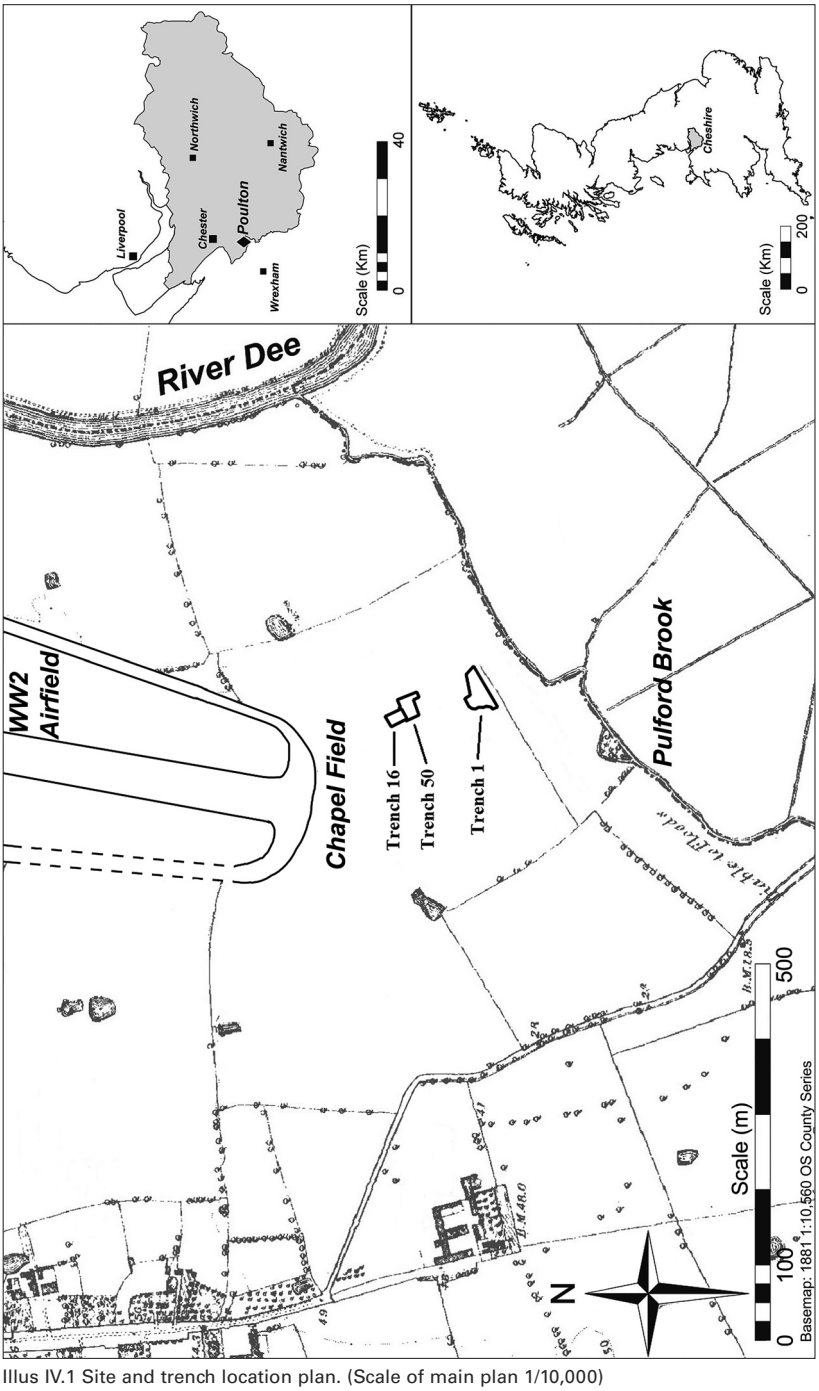


Illus IV.1 Site and trench location plan. (Scale of main plan 1/10,000)

Chapel Field, particularly in the southern area. This site became the focus for the newly formed Poulton Research Project in 1995, which organised a community- and research-orientated excavation, the primary aims of which were to investigate the structural remains and their surrounding landscape, and to identify the location of the lost abbey.

The initial excavation revealed the foundations of a medieval chapel in Trench 1 (Illus IV.1). However, the fills of adjacent graves produced an unexpected assemblage of redeposited finds ranging in date from the Mesolithic to the post-medieval period, indicating a much more varied and long-term sequence of activities at the site than attested by the documentary records.

In the early 2000s, a series of trial excavations was conducted *c* 80-100m north-north-west of Trench 1, with the aim of identifying the sources of this material (Trenches 16 and 50). Two phases of prehistoric features in Trench 16 were originally interpreted as a Neolithic henge and a succeeding Bronze Age monument, but an extensive programme of post-excavation analysis by the present author led to their reinterpretation as Iron Age roundhouses.

The 2013–17 campaign of investigation of Iron Age features Kevin Cootes

Methodology and research aims

The excavations published in this article comprise Trenches 16 and 50 (centred on SJ 40344 58461), measuring *c* 40m by 35m. The radiocarbon dates already available from Trench 16, together with the material culture, were consistent with the nature of the structural remains in suggesting that the latter were Iron Age roundhouses. Unfortunately, by this time the trenches had been partially backfilled and a timber circle had been constructed on part of the site. Lack of time and funds made wholesale re-excavation unrealistic, so a decision was made to use the available photographic record and finds assemblage for reinterpretation.

Although the western part of Trench 50 had been backfilled, the majority was left exposed. Examination of the pre-2013 records for this trench demonstrated similar recording and interpretation issues to those encountered with Trench 16, in addition to the removal of relationships between some structures. Initially, the backfilled area was stripped mechanically to expose the original limits and level of the archaeology. The trench was then cleaned by hand and the backfill removed from features to expose the original sections. All visible archaeology was recorded in plan and section, with stratified deposits being revealed *c* 0.3–0.4m beneath the present ground surface. Excavation of the area to the south of Trench 50 continues at the time of writing and has revealed parts of more Iron Age structures.

The primary aims of the 2013–17 seasons were to identify unexcavated areas and features, investigating them in detail to provide the maximum stratigraphic data with which to permit a secure reinterpretation. All excavation was conducted by hand. The extended weathering of the exposed surfaces revealed subtle differences in colour and water retention which could be used to identify features, the majority of which had previously been missed.

All exposed ditches and gullies of Iron Age date were totally excavated unless otherwise stated, with sections recorded every 1–2m. Slots were excavated where possible to establish

the relationship of intercutting features. Pits and postholes were generally half-sectioned, then the fills fully removed for finds recovery and recording. Medieval plough furrows and nineteenth-century field drains were planned on an overlay.

An extensive programme of environmental sampling was implemented, targeted on deposits from ditches. Their clay-rich nature made sieving difficult, so bulk sampling was utilised instead, taken on a judgement basis from charcoal-rich fills that were established as being undisturbed. These presented the opportunity to reconstruct the local environment and land use and to obtain a sequence of radiocarbon dates that might phase the site. Any deposits that were not bulk sampled were carefully broken up by hand to maximise finds retrieval. Although it would have been preferable to also target fills that did not appear to contain charred plant material (according to Historic England 2015a guidelines), this was not deemed practical.

The excavation Kevin Cootes

Pre-Iron Age activity

Evidence for pre-Iron Age activity comprised forty-five worked stone items recovered from residual contexts spread across the two trenches. The assemblage can be divided into forty-four lithics and an inscribed chalk plaque of probable late Neolithic date. These finds form part of a larger assemblage of 260 fragments of chert, flint and stone tools recovered from across the whole site. An extensive analysis has been published and overall spatial distributions presented in Cootes *et al* 2017.

Iron Age features in Trenches 16 and 50

The remains of a minimum of eight roundhouse structures were identified in Trenches 16 and 50, with all but Structure 1A being defined by the curving ditches that surrounded them. The intercutting nature of the features was interpreted as the product of multiple phases of occupation. Roundhouses were labelled as 'Structures' and numbered according to the order in which they were identified. No floor surfaces, hearths or occupation horizons survived. Pits and postholes that could not be assigned to specific structural phases are described separately. Two Iron Age features (6 and 7) are labelled as 'Structures' but were linear gullies. Structure 4 was removed during post-excavation analysis, when the posthole arc that defined it was reinterpreted as part of Structure 3.

Structures 1A and 1

Reappraisal of the features in Trench 16 was complicated by the loss of many of the finds and records and the unreliability of the surviving plan (Illus IV.2); as such, their interpretation relies heavily on the photographic record and remaining material assemblage. Two phases of construction were indicated. The first, Structure 1A, was represented by seven to nine postholes forming an arc with an estimated internal diameter of *c* 14m. Some of the postholes were stone lined and others existed in pairs.

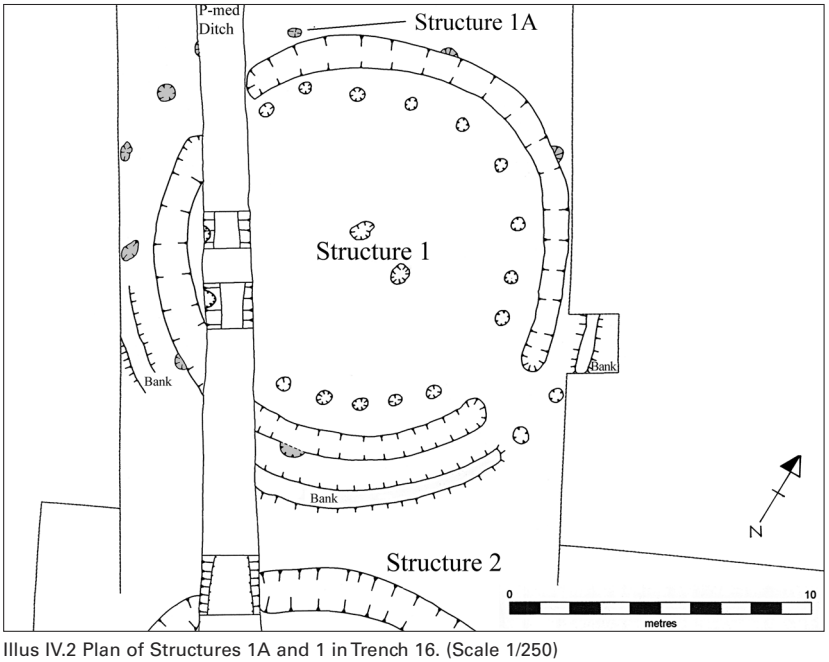
Structure 1A was replaced and truncated by Structure 1 on the same site, defined by a ring of fourteen postholes and a surrounding ditch. The internal diameter has been estimated at *c* 10.5m, possibly with a south-east facing entrance. The U-shaped ditch appears to have been dug as an eavesdrip; it varied in width between 0.78m and 0.9m and between 0.37m

and 0.6m in depth (Illus IV.2 and IV.3). The surviving plan indicates two opposing entrances. This is highly unlikely, however, as the north-west example appears to have been almost completely destroyed by a post-medieval field boundary. Another plan, recorded in the photographic archive (original missing), shows a third entrance to the south-west, again truncated by the field boundary.

The image archive shows multiple charcoal-rich fills consistent with domestic backfilling of the ditch, in addition to some natural silting episodes. A substantial material assemblage included ceramics, fire-cracked stone, and animal bone. A total of 496.7g of VCP (Cheshire briquetage) representing a single vessel was recovered from multiple contexts in Structure 1, including two postholes, with a single fragment from Structure 1A weighing 7.7g. The surviving animal bone assemblage comprised primarily domestic species; wild species were limited to two worked pieces of red deer antler. The brow tine of a naturally shed antler had been removed, with multiple incisions noted. A second item, interpreted as a cheekpiece for a horse, was made from a highly polished antler tine, with a cylindrical perforation in the centre (Illus IV.21.1).

Human remains comprising three unfused vertebrae from a very young baby or neonate were recovered from the curvilinear feature recorded as a bank outside the ditch of Structure 1. The bones are classed as missing before 2013 and hence not available for study. They possibly derive from an infant burial.

Two samples were submitted for radiocarbon dating. A charcoal sample from the fill of a partially truncated posthole from Structure 1A, (16118), gave a date of 200–10 cal BC at



Illus IV.2 Plan of Structures 1A and 1 in Trench 16. (Scale 1/250)

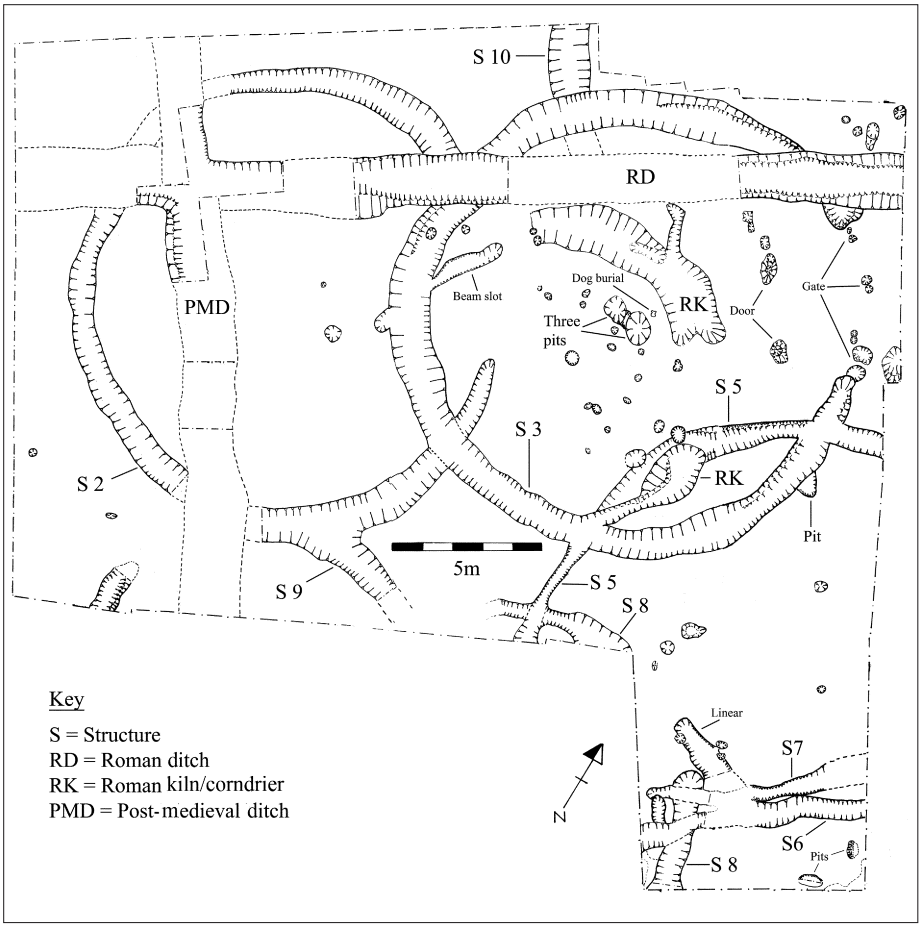
Illus IV.3 Partially excavated ditch surrounding Structure 1

95.4% probability (Beta-202349). A second charcoal sample, from the primary fill of the ditch of Structure 1 (16064) (which cut Structure 1A), gave a date of 370–30 cal BC at 95.4% probability (Beta-201398) (Table IV.1). Although the radiocarbon results for Structures 1 and 1A overlap and may be accurate, the significantly earlier date range of that for Structure 1 may be due to contamination from sampling a truncated feature. It is also possible that charcoal from the earlier structure was redeposited.

Structure 2

The remains of Structure 2 lay in Trench 50, *c* 3.5m south-east of Structure 1, and comprised a substantial curvilinear ditch with an internal diameter of *c* 13.75m and a U-shaped profile, 0.6–1.5m wide, being narrowest across the western arc (Illus IV.4 and IV.5). The depth varied between 0.28m and 0.58m, except at the eastern terminus, where it petered out. A gap between the termini measuring a minimum of 5.5m was consistent with a north-east facing entrance, but its precise size could not be ascertained because the northern terminus had been removed by a Roman ditch. The eastern arc was cut by the ditch of Structure 3, while the south-eastern arc merged with the northern ditch of Structure 9. However, the sequence of construction here could not be determined as the junction had been removed by previous excavation. It was clear, however, that the two structures could not have been occupied simultaneously.

The only features encountered within the ditch were two postholes. Feature [50012] was located near the centre but was excavated before 2013 with limited recording apart from photography. However, finds of calcined bone and VCP in the fill indicated an Iron Age



Illus IV.4 Plan of Iron Age and later features in Trench 50. (Scale 1/250)

date. [50781] represented a small stakehole *c* 1m north-west of [50012]. The dark grey, charcoal-rich fill indicated that the stake had been burnt *in situ*, but no finds were recovered to provide a firm Iron Age date. The lack of further postholes may be accounted for by disturbance of the interior of Structure 2 by the Roman ditch and intercutting post-medieval field boundary.

Three fills were identified in the southern arc of the ditch: a primary silting, (50174), followed by (50175), then a charcoal-rich backfill, (50176), and a final sealing and levelling layer of redeposited clay, (50177) (Illus IV.6). The northern arc, [50332] contained no evidence of formal sealing, with three fills: a primary clay-silt, (50351), covered by a charcoal-rich domestic backfill, (50580), below a further silty clay backfill, (50333).

The ditch fills containing amounts of charcoal and heat-affected stones were consistent with domestic hearth waste. Ceramics comprised 755.5g of VCP, representing two vessels. The majority of the sherds originated in two contexts: backfill (50172) in the ditch terminus

Illus IV.5 Aerial view of Trench 50 after excavation

Illus IV.6 Section through southern arc of Structure 2

and context (16054) in the northern arc of the ditch. The remaining sherds were spread across the circuit. Fired clay fragments were recovered from several fills but were too fragmented to be further identified.

The animal bone assemblage was relatively small and spread across the ditch, being dominated by domestic species. A dog coprolite was recovered from (50048). Wild species comprised red deer bone and a utilised antler tine. Six litres of charcoal-rich backfill from the northern arc of the ditch, (50580), were sent for palaeoenvironmental and radiocarbon analysis. The results (Table IV.7) were consistent with domestic hearth waste, containing unburnt and calcined bone, charcoal and a diverse range of plant species. Hazel charcoal from this sample produced a radiocarbon date of 202–47 cal BC at 95.4% probability (SUERC-67757 (GU41093)) (Table IV.1).

Structure 3

Structure 3 comprised the remains of a curvilinear ditch with an internal diameter of 13.5–14m (Illus IV.4 and IV.5). It was generally U-shaped with a flat or curving base and well-defined sides, becoming V-shaped in the northern arc; its dimensions varied considerably from 0.64m to 1.49m in width and 0.5m to 0.84m in depth. Slumping of the sides was only visible in the southern portion of the circuit, indicating that the ditch may not have been open for an extended period. A 5m-wide gap in the ditch suggests an entrance facing north-east.

The ditch overlapped with that of Structure 5 to the south, but their relationship could not be established because of previous excavation. Portions of the southern arc and interior were cut by two Roman kilns/corndriers (interpreted as such because of their shape and presence of a flue). The northern circuit was cut in two places by a ditch of the same period, redepositing a significant volume of Iron Age material. Two medieval furrows crossed the trench in a north-west to south-east direction, removing the uppermost fills of the ditch and any shallow features that may have been in their path.

The remains of a single posthole were discovered at the base of the western arc, [50158]. Only the base survived, being sub-circular and 0.18m in length, 0.16m in width, and 0.11m deep, with a dark-brown silty clay fill. There was no evidence of a post pipe, and it appears that the post was removed before the ditch was filled.

An arc of three sets of double postholes extended across the entrance. These were originally recorded as Structure 4, but during post-excavation analysis it became evident that they probably represented a gate related to Structure 3 and are so marked on Illus IV.4. The northern pair were 0.28–0.29m long, 0.18–0.28m wide, and 0.11–0.17m deep with flat bases. Both contained the remains of post-packing in the form of water-worn cobbles and one was consistent in shape and fill with the post having been pulled out and the hole allowed to silt. The middle pair contained one with post-packing, whilst the other contained a charcoal-rich fill, suggesting that the post had been fired prior to insertion. The southern pair were largest, 0.62–0.74m long, 0.43–0.55m wide and 0.08–0.18m deep, with stone packing in one example. Animal bone and Cheshire VCP were also recovered from the fill of one example, supporting an Iron Age date.

Illus IV.7 Doorpost foundation [50168] for Structure 3

Illus IV.8 Section through ditch of Structure 3 near southern terminus

No internal ring of postholes could be identified, although this may be partly accounted for by the presence of Roman and medieval features. However, two stone-filled pits, [50168] and [50238], were set 2.05m apart, and *c* 2m inside the entrance. Their size, position and spacing suggest that these were the foundations for timber doorposts and that the diameter of the structure would therefore have been *c* 10.5m. Both were *c* 0.68–1m in length, 0.5–0.52m in width and 0.28–0.31m in depth and were filled by glacial river cobbles and larger stones pressed into the sidewalls, arranged in a manner that indicated structural organisation (Illus IV.7).

The character of the ditch fills varied but typically comprised silting events and backfill with domestic refuse. The final fill resulted from the levelling of the ditch by sealing any depressions with redeposited clay. A typical sequence occurred near the termini and corresponding arcs, as illustrated in Illus IV.8. The initial fill, (50125), was dark grey with brown mottling, moderate amounts of charcoal and domestic material. Immediately above (50125), and adjacent to the outer sidewall, was a mid-grey to light-brown mottled silty clay representing a silting event, (50116). Two clear backfills of domestic material were encountered, (50124) and (50126). The ditch was finally sealed with redeposited clay (50113).

Over fifty percent of all Iron Age finds were recovered from the ditch of Structure 3, primarily from charcoal-rich domestic backfills; the largest collection of fire-cracked stones was recovered from this ditch, with an estimated total of 2000 fragments. Fills (50525), (50530), (50561), (50562) and (50564) of the northern terminus in particular contained varying and often abundant quantities of ceramics, heat-affected stone and animal bone. In fact, the entire northern arc was noteworthy for the abundance and variety of finds, including metalwork, industrial waste, objects of antler and dog bones.

The pottery comprised 4600g of VCP, or forty-nine percent of the total assemblage by weight, representing between two and four vessels. Fragments were recovered from the entire ditch circuit, but the largest group, representing a single vessel, was recovered from the western arc. There were also notable concentrations at both termini and across the northern arc. The total weight may originally have been larger, as 547g of VCP was recovered from the Roman ditch where it cuts the northern arc, presumably being redeposited. Fired clay fragments were recovered from various contexts, with a combined weight of 302g out of a total assemblage of 386g. Oxidised low-fired and unfired clay was also noted in these contexts but disintegrated on contact. A ceramic spindle whorl or weight was recovered from the northern arc, (50527).

The ditch produced forty-five fragments of industrial debris: crucibles and moulds for copper-casting (including one mould possibly for a pin); copper and iron-smithing slag; two fragments of slag cake; a block tuyère probably used in copper-working; and a possible stone anvil. The industrial waste was complemented by the recovery of part of a copper alloy dress pin from the southern arc, (50139), and a complete but heavily corroded iron adze (Illus IV.19) in the primary fill of the northern arc (50527). The latter appears to have been placed on the base of the ditch, possibly as a token offering.

Three items of worked stone were recovered, two of which comprised glacial cobbles with highly polished flat surfaces, from (50131) and (50091). Their form and the red surface staining on the first indicate a use for grinding material to a fine powder. Small fragments of ochre from (50162) and (50568) may indicate that this material was being ground to make pigments. A rubbing/grinding stone was identified from (50059). In addition to these stone items, a fragment of a ring made out of highly polished jet or shale was recovered from (50042).

About sixty-five percent of the total animal bone assemblage from the site came from the ditch of Structure 3. Remains were recovered from the entire circuit but were primarily concentrated around the entrance. They were overwhelmingly from domestic species, but bones from hare, wild cat and red deer were also recovered in small amounts, plus a fragmented coprolite from a carnivore (possibly a dog (50563)). The front portion of an adult dog was found in the northern arc of the ditch, (50563). The articulated nature of the bones indicates a partial burial, although it was not recognised as such upon excavation. A second partial dog skeleton was recovered from the centre of Structure 3, although the multi-phase nature of Iron Age occupation in Trench 50 prevents secure attribution to this building.

Three antler objects were recovered from the northern arc: a near-complete toggle/ferrule and a red deer antler with intact burr, brow tine and beam.

Three fragments of human bone were recovered from the Roman ditch that cut the northern arc of Structure 3. These comprised two cranial fragments, the first from an adult aged 35–50 years from (50243), the other from a child or early adolescent from (50262). The final example comprised an unfused humeral head from a sub-adult from (50304). These remains have been interpreted as redeposited from Structure 3 on account of the lack of human bone from secure Roman contexts and their fragmentary nature being consistent with late prehistoric burial practices.

A total of 211.1 litres of charcoal-rich backfill from seven contexts was sent for paleo-environmental analysis. These were taken from the south-eastern terminus, (50124); the primary fill of the western arc, (50147); three fills of the north-western arc, (50544), (50563) and (50570); and two fills of the northern terminus, (50207) and (50210). Contexts (50544) and (50563) represented the same charcoal-rich backfill, numbered separately because of the position of an excavation slot. The combined results were consistent with those from the other structures and produced a detailed picture of the surrounding vegetation and landscape utilisation during the late Iron Age (Table IV.7).

Four radiocarbon dates were obtained from the ditch fills (Table IV.1). A fragment of *Prunus* sp charcoal from the primary fill of the western arc, (50147), provided a date of 375–195 cal BC (SUERC-49217 (GU31877)). In contrast, hazel charcoal from the primary fill in the northern arc, (50570), produced a date of 172–1 cal BC (SUERC-67756 (GU41092)). A fragment of *Prunus* sp charcoal in (50544) produced a similar date of 179–1 cal BC (SUERC-67755 (GU41901)). In comparison, charred ?hazelnut nutshell from a sealed backfill event, (50124), near the eastern terminus produced a date of 351–54 cal BC (SUERC-49216 (GU31876)). The date from (50147) may represent redeposited material, as there is no overlap with the dates obtained from (50544) and (50570).

Structure 5

The remains of Structure 5 comprised the northern and western arcs of a curvilinear ditch that would have continued beyond the eastern and southern edges of excavation (Illus IV.4 and IV.5). Most of the circuit had been damaged by a Roman kiln/corndrier and medieval plough furrow, only *c* 6m of the northern section of the arc remaining unaffected. The internal diameter of the ditch was calculated to be comparable with that of Structure 3, ie *c* 13 m. The ditch had a consistent U-shaped profile with a maximum width of 0.95m and depth of 0.45m, a flat base and well-defined sidewalls that showed no signs of slumping. No evidence for an entrance was found in the excavated area. Where the ditch crossed that of Structure 3, the relationship could not be determined, but where it crossed that of Structure 8 to the south-west it cut the latter and so was clearly later. No internal ring of posts could be identified, although individual postholes were present in what would have been the interior of the structure.

Three deposits were identified in the northern section of the ditch, the first two comprising silting episodes devoid of finds, (50321) and (50294). The ditch was then intentionally

backfilled with domestic waste, (50291), containing ceramics, charcoal and animal bone. Fired clay, probable smithing slag and ochre were also recovered.

Ceramics comprised 191.8g of VCP, representing a single vessel. The animal bone assemblage was relatively small and comprised almost all domestic species. Three worked antler pieces were recovered: two, probably intended to be used as knife handles, were found together in the upper fill of the northern arc; the third comprised a cheekpiece/toggle cut from the tip of a red deer tine, broken during the drilling of the central hole and recovered from (50291) (Illus IV.21).

A total of twenty-two litres of charcoal-rich fill was sent for paleoenvironmental analysis: ten litres from the upper fill of the northern section of the ditch, (50511), and twelve litres from a sealed backfill in the western arc, (50816). Results were consistent with domestic hearth waste, containing heat-affected stone, fragments of animal bone and plant remains; the diversity of species was notable for such a small sample (Table IV.7). *Prunus* sp charcoal from (50511) produced a radiocarbon date of 360–116 cal BC (SUERC-67754 (GU41090)) (Table IV.1).

Structures 6 and 7

The remains of two gullies, Structures 6 and 7, were discovered in the south-east portion of Trench 50, orientated in a general north-east to south-west direction (Illus IV.4 and IV.5). Both were originally labelled as roundhouse gullies and numbered accordingly. However, the lack of curvature suggests that they were instead possibly linear boundaries. The two gullies cut, and thus post-dated, the ditch defining Structure 8.

Structure 6 was exposed for 7.25m and continued into opposing edges of excavation, with a slight south-west curve. The gully varied significantly in width from 0.3m to 0.74m, with a maximum depth of 0.24m, a U-shaped profile and well-defined sidewalls that varied from flat to concave. Two fills were identified: a primary silt devoid of finds, and an upper fill containing heat-affected stones and animal bone, indicating backfilling with domestic waste.

The gully of Structure 7 crossed the trench in roughly the same direction as Structure 6, but with a distinct kink that continued into the south-eastern edge of excavation. At its south-western end it terminated 0.3m from the opposite side of the trench, suggesting that it was one side of a possible entrance. The gully varied from 0.22m to 0.48m in width, from 0.19m to 0.28m in depth, with well-defined sidewalls and a concave base. Two fills were observed, comprising an initial silt, (50388), followed by a backfilling episode, (50387), which contained ceramics, heat-affected stone, animal bone and charcoal.

An additional feature, [50600], was located near the western edge of excavation, with a north-west-south-east direction, at right-angles to and cutting Structure 7. The opposing end had been partially removed by Structure 6. The feature survived to a length of 0.82m, a maximum width of 0.36m and a depth of 0.1m, with curving sidewalls, a flat base and a single charcoal-rich backfill (50601). Heat-affected stones and VCP in the fill suggested a single episode of domestic hearth waste disposal. Its position at right-angles to the terminus

of Structure 7 presents the possibility that they combined to form an inturned entrance. Approximately 1.5m of Structures 6 and 7 were left unexcavated in the exposed area.

Nine litres of charcoal-rich backfill from Structure 6, (50657), and two litres from the feature that cut the terminus of Structure 7, (50601), were sent for paleoenvironmental analysis. Results were consistent with domestic hearth waste, containing fired clay and heat-affected stones, fragments of unburnt and calcined bone, and clinker/cinder (Table IV.7). Charred nutshell from Structure 6 (50657) produced a radiocarbon date of 196–41 cal BC (SUERC-73577 (GU44033)) (Table IV.1).

Linear feature [50372]

A linear feature, [50372], up to 0.98m wide was found running eastwards towards Structure 7 but was only partially excavated because of time constraints. It began to peter out towards its southern end so any relationship with Structure 7 is uncertain and it was not observed to continue on the southern side of Structures 6 and 7. Three postholes cut the feature. Excavation revealed a varying depth of 0.08–0.24m, with a sharp change in angle accounted for by the feature having been recut, [50374]. The fill of [50372] comprised a mid-brown silty clay, indicating the feature had been left to naturally silt before being recut. In contrast, the fill of [50374] comprised a light-grey clay silt. The latter of the two fills produced VCP, indicating an Iron Age date.

Structure 8

The remains of Structure 8 were located in the southern portion of Trench 50, comprising the eastern and northern arcs and termini of a curvilinear ditch, the majority of which was situated outside the area of excavation (Illus IV.4 and IV.5). The estimated internal diameter was *c* 14m. The ditch had a sharp U-shaped profile with a maximum width of 1.04m, a depth of 0.59m, well-defined sidewalls and a flat base. The northern arc was badly truncated by a medieval furrow, [50813], and cut by the western portion of Structure 5, [50639]. The entrance was *c* 3.6m wide and faced north. Illus IV.9 shows a clear slumping of clay back into the ditch, followed by five deposits. A typical sequence was encountered in the southern arc near the entrance, [50628]. An initial silt deposit, (50633), devoid of finds was followed by a series of three charcoal-rich backfills of domestic waste, (50634),

Illus IV.9 Section through ditch of Structure 8

(50635), and (50636), containing ceramics, abundant heat-affected stones and animal bone. The ditch then appears to have been left open as a slight depression that silted up over time. The overall depth of the ditch and abundant material assemblage is analogous to that recovered from Structure 3.

Ceramics recovered from the ditch comprised 254.5g of VCP, representing three vessels, concentrated near the entrance. Evidence for metalworking was present in the form of a single fragment of iron-smithing slag from (50654). Animal bone comprised domestic species. One hundred and twenty litres of charcoal-rich fill were sent for environmental analysis from two backfill events in the southern arc. One hundred litres were also taken from secondary fill (50654), and a further twenty litres were sampled from tertiary backfill (50809), located near the terminus. Results were consistent with domestic hearth waste, producing ceramics, a small corroded metal object, semi-vitrified fuel waste, clinker/cinder, heat-affected stones, burnt, unburnt and calcined bone, and charcoal (Table IV.7). A radiocarbon date of 255–54 cal BC (SUERC-73576 (GU44032)) was obtained from a hazel nutshell fragment from (50654) (Table IV.1).

Structure 9

The remains of Structure 9 comprised the northern arc of a curvilinear ditch, the rest continuing into the south-western edge of excavation (Illus IV.4 and IV.5). It had an estimated internal diameter of *c* 12–14m, a U-shaped profile with a maximum width of 0.98m, a depth of 0.35m and concave base. The western terminus of an entrance survived but the other had been destroyed by the post-medieval ditch and Structure 2. Three contexts were recorded within the northern arc [50581], the earliest comprising an initial silting, (50582), followed by a thin layer of charcoal-rich domestic backfill, (50583), and a final silting, (50584) (Illus IV.10).

Ceramics recovered from the ditch comprised 16.4g of VCP, representing a single vessel. Six litres of the fill, (50583), were sent for environmental analysis. Results were consistent with domestic hearth waste, producing heat-affected stone, unburnt bone, and charcoal. Tree species were limited to ash and oak (Table IV.7).

Illus IV.10 Section through ditch of Structure 9

Structure 10

The curvilinear ditch defining Structure 10 was located in the northern portion of the trench and continued beyond the edge of excavation (Illus IV.4 and IV.5). To the south it had been severely truncated by Structure 3, the Roman ditch and kiln/corndrier. The ditch had a U-shaped profile and was 0.63m wide near the base and 1.92m at the top, with a maximum depth of 0.93m, an uneven base and significant slumping of the sidewalls. There was no evidence of an entrance in the exposed section. Four fills were identified, the earliest two comprising silts devoid of finds, (50788) and (50789), which were succeeded by charcoal-rich backfills of domestic hearth material containing 40.9g of ceramics (VCP), heat-affected stone, animal and fish bone, ceramic and heat-affected stone, (50661) and (50787).

Sixty litres of charcoal-rich material from (50661) were sent for environmental analysis. Results were consistent with domestic hearth waste, including heat-affected stone, burnt, unburnt and calcined bone, and plant remains (Table IV.7). A radiocarbon date of 731–398 cal BC (SUERC-73581 (GU44034)) was obtained from (50661), making this the earliest structure in the overall sequence (Table IV.1).

Other features in Trench 50

Postholes

Forty-three postholes of probable Iron Age date were identified in Trench 50 that could not be attributed to a known structure, as shown in Illus IV.11. Twenty-four examples were located within Structure 3. The true spread was probably larger, as other examples would have been removed by medieval furrows. A possible arc of five postholes can be discerned, however, and may represent an additional structure with an estimated internal diameter of *c* 9.5m (Illus IV.12). There was a further scattering to the south-east and north, with two examples identified within Structure 2. The majority were subcircular, varying between 0.05m and 0.27m deep, and 0.19m to 0.35m wide, with concave or flat bases. Evidence for stakes being pulled out and the holes backfilled was common, but long-term disuse was also identified, with the voids silting naturally.

The postholes could be divided into two groups, with fourteen containing evidence of post-packing using water-worn stones, whilst twenty-nine did not. In two cases charcoal-rich fills indicated that the wooden posts had been fired prior to insertion or on demolition. A further two examples in the north and south of the trench showed evidence that the posts had been torn out. Five pairs of double postholes occurred within the interior of Structure 3. The spacing between the pairings was between 1m and 3m, indicating that they may belong to the same phase.

Diagnostic finds in the form of VCP occurred in fourteen postholes. Other finds comprised a grinding stone with a secondary use as post-packing in [50165] (50166), ochre in [50180] (50181), a fragment of adult human cranium in [50258] (50259), and a small amount of domestic animal bone.

Most of the postholes can be interpreted as structural, possibly representing different phases, boundaries, or internal supports. However, the tight cluster and the truncation by ploughing make discerning an overall distribution problematic, with several patterns possible.

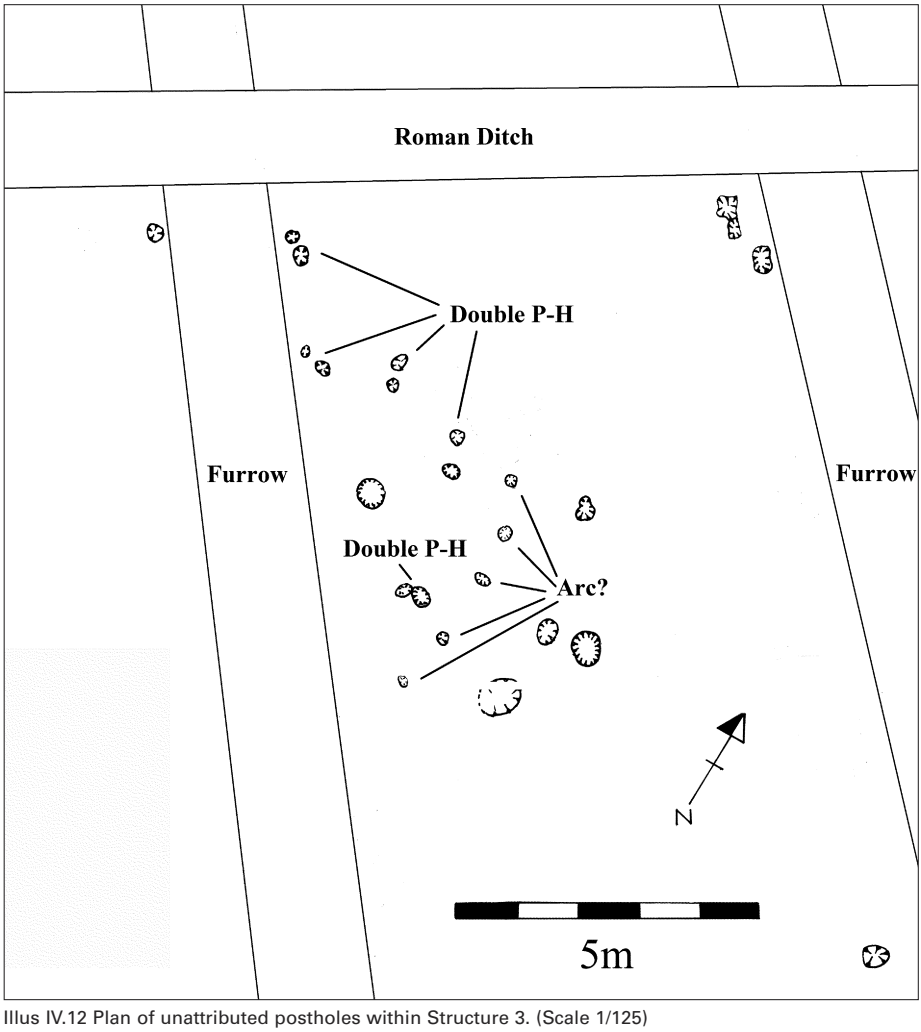
Illus IV.11 Plan of postholes in Trench 50 not attributed to structures. (Scale 1/250)

Pits

A total of six pits were spread across Trench 50, of which three intercutting and subcircular examples lay in the centre of Structure 3, [50072], [50300] and [50297]. Small amounts of calcined bone and VCP were recovered from [50072] (50073) and [50297] (50298).

Two shallow sub-rectangular pits with flat bases were encountered in the south-eastern corner of the trench, less than one metre from the edge of excavation, [50645] and [50784]. Both pits contained rare amounts of charcoal and frequent heat-affected stones.

The final pit, [50115], was located near to the eastern edge of excavation and was truncated by the south-eastern arc of the Structure 3 ditch. It survived to 0.8m in length, 0.65m in width and 0.22m in depth, with a relatively flat base, containing charcoal and heat-affected stones.



Illus IV.12 Plan of unattributed postholes within Structure 3. (Scale 1/125)

Beam slot

A north–south beam slot at least 5m long, [50230], crossed the western arc of Structure 3, but the stratigraphic relationship between the two could not be established. The original length was probably greater, as the northern section was truncated by a medieval plough furrow. The discovery of VCP in the fill supports an Iron Age date, whilst the shape and width of the feature indicated it was created to hold a horizontal timber beam.

Dog burial

The burial of a dog was located within a small pit in the centre of Structure 3, [50288], (Illus IV.13). The bones were in an extremely poor condition, but articulation was observed and indicated that the body had been buried in a supine position. The remains partially disintegrated upon lifting. Analysis indicated that the animal was between twelve and fifteen months old at death. Only the front portion was represented and may have comprised a

Illus IV.13 Dog burial in Structure 3

ritual deposition. It must be conceded, however, that the poor survival of the bones allows the possibility that the burial was originally complete.

The majority of the fill of the pit, (50289), (one litre) was sent for paleoenvironmental analysis, revealing unburnt bone, teeth, charcoal, uncharred seeds, a barley grain, nutlet fragment, ash, oak, a single sheep bone and a fragment of fired clay. Not enough charcoal was present to permit a radiocarbon date.

The positioning of the remains in the centre of the building in a small pit and associated with edible seeds is consistent with the placement of a special deposit, although the multiphase nature of the remains as a whole and the surrounding postholes makes such an interpretation speculative. The deliberate deposition of articulated or associated animal bones in pits and ditches was a fairly common phenomenon during the British Iron Age. This practice has often been seen as symbolic and structured behaviour on the basis that it differs from normal day-to-day waste management and is more akin to the treatment reserved for human remains. In this case, the identification of symbolic activity is reinforced by the burial being placed at the centre of a building. Additionally, the deposition of dogs inside dwellings, either deposed as a family member or purposefully placed as a supernatural guardian, is a recurring practice across the world throughout human history (Mazzorin & Minniti 2006).

Structural phasing and radiocarbon dating programme

The intercutting nature of the roundhouses and retrieval of eleven radiocarbon dates (Table IV.1) from eight structures has enabled a partial reconstruction of the phasing. It was not possible, however, to establish stratigraphical relationships between Structures 2 and 9, or 3 and 5, because of the problems mentioned above with earlier excavation and recording. The use of Bayesian modelling was discussed with Professor Caitlin Buck of the University of Sheffield. An initial analysis of the radiocarbon dates demonstrated that some could be refined, but not to a level which would be beneficial to the stratigraphic narrative (C Buck, pers comm).

The earliest curvilinear ditch in the sequence was Structure 10, identified as early Iron Age by the radiocarbon date of 731–398 cal BC (SUERC-73581). The remaining results indicate a cluster of activity through the middle to late Iron Age, with date ranges which often overlap. However, their stratigraphical relationship indicates that Structure 1A pre-dates Structure 1. The respective dates of 200–10 cal BC and 370–30 cal BC could indicate direct replacement or that the second date was obtained from redeposited material. Likewise, Structure 2 pre-dates Structure 3 stratigraphically; the radiocarbon date from the former is 202–47 cal BC, but the four dates from the latter span the fourth to first centuries BC; the earlier results may again represent redeposited material, and the structure is most likely to date to the last two centuries BC.

Table IV.1 Radiocarbon dates for Iron Age features

Structure	*Context*	*Sample material*	*Radiocarbon age (BP)*	$\delta^{13}C$ (‰)	*Calibrated date range (95.4% probability)*	*Lab code*	*Atmospheric calibration curve*
1A	(16118)	Single entity indet. charcoal	2090±40	-26.0	200–10 cal BC	Beta-202349	IntCal98
1	(16064)	Single entity non-oak charcoal	2140±30	-25.4	370–30 cal BC	Beta-201398	IntCal98
2	(50580)	Single entity hazel charcoal (4/5 growth rings – roundwood)	2107±30	-26.1	202–47 cal BC	SUERC-67757 (GU41093)	IntCal13
3	(50124)	Single entity charred hazel nutshell	2134±29	-25.6	351–54 cal BC	SUERC-49216 (GU31876)	IntCal09
3	(50147)	Single entity *Prunus* sp charcoal	2201±29	-25.0	375–195 cal BC	SUERC-49217 (GU31877)	IntCal09
3	(50544)	Single entity *Prunus* sp charcoal (4 growth rings – small roundwood)	2074±30	-25.0	179–1 cal BC	SUERC-67755 (GU41901)	IntCal13
3	(50570)	Single entity charred hazel nutshell	2067±30	-23.5	172–1 cal BC	SUERC-67756 (GU41092)	IntCal13
5	(50511)	Single entity *Prunus* sp charcoal	2170±30	-26.1	360–116 cal BC	SUERC-67754 (GU41090)	IntCal13
6	(50657)	Single entity charred hazel nutshell	2089±31	-25.2	196–41 cal BC	SUERC-73577 (GU44033)	IntCal13
8	(50654)	Single entity charred hazel nutshell	2144±31	-24.0	255–54 cal BC	SUERC-73576 (GU44032)	IntCal13
10	(50661)	Single entity charred hazel nutshell	2398±31	-23.9	731–398 cal BC	SUERC-73581 (GU44034)	IntCal13

Structure 8 was dated to 255–54 cal BC and was stratigraphically earlier than Structures 5, 6 and 7. As Structure 5 produced a radiocarbon result of 360–116 cal BC, it would suggest that the chronology for the latter can be refined to the third to second centuries BC. Further, Structure 7 pre-dates Structure 6, with the latter producing a radiocarbon date of 196–41 cal BC. The stratigraphic relationships support a date range for Structure 7 that falls between those of Structures 6 and 8, during the third to first centuries BC.

When the radiocarbon dates and stratigraphic relationships are combined, the evidence indicates that activity is represented through the early, middle, and late Iron Ages but with the exception of the date from Structure 10, settlement is concentrated in the last four centuries BC.

In summary, the stratigraphy and radiocarbon dating indicate that no more than three structures could have existed at any one time within the excavated area of Trenches 16 and 50. Structure 10 does not overlap chronologically with any other curvilinear ditch. Structures 1A and 1 could have existed at the same time as all other examples except 10, but not with each other. Structure 2 could have co-existed with Structures 1A, 1, 5, 6, 7, and 8, but not Structures 3, 9 or 10. Structure 3 could have co-existed with Structures 1A, 1, 6, 7, 8 and 9, but not 2, 5 or 10. Structure 5 could have existed at the same time as Structures 1A, 1, 2 and 9, but not Structures 3, 6, 7, 8 or 10. Structures 6 and 7 could have existed with all examples except each other and Structures 5 and 8. Structure 8 could have co-existed with Structures 1A, 1, 2 and 3, but not 5, 6, 7 and 9. Finally. Structure 9 could not have existed with Structures 2 and 8. It is also unlikely that it could have existed with Structure 6 if its trajectory continued, but this relationship was past the edge of excavation. The possible combinations of contemporary roundhouses are shown schematically in Illus IV.14

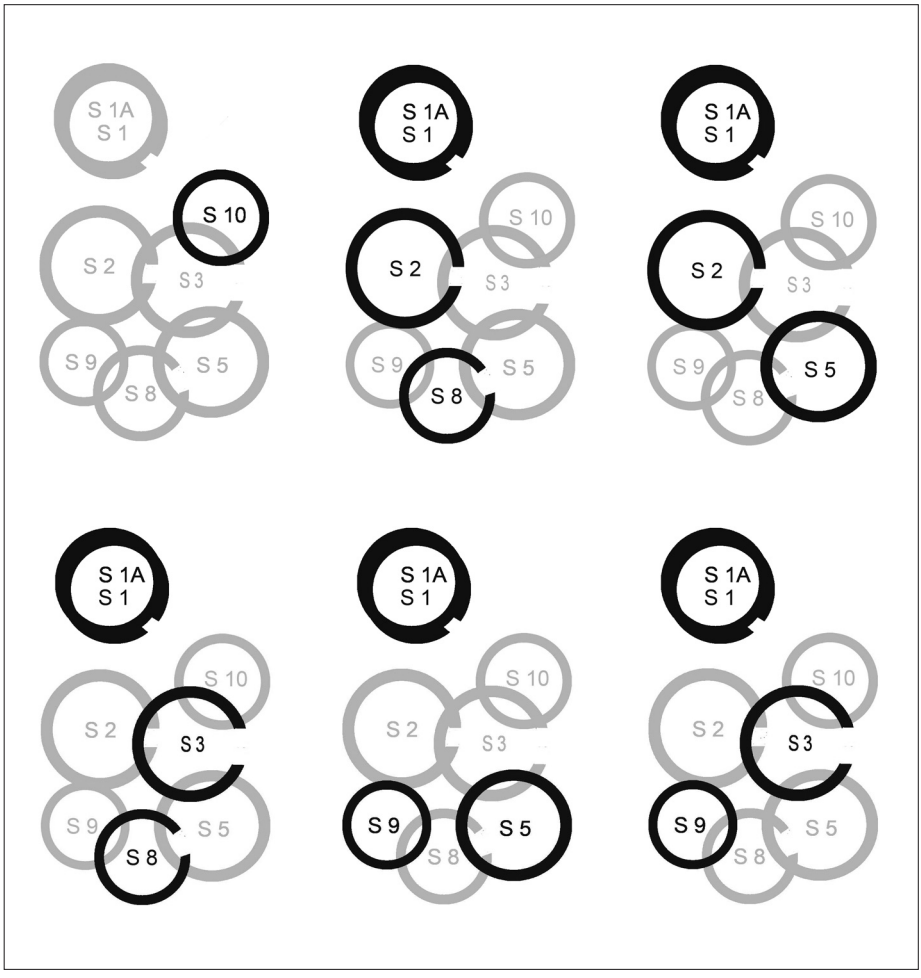
Evidence of Iron Age activity in other trenches

Evidence for Iron Age activity was not limited to Trenches 16 and 50. The recovery of 201g of VCP from the medieval chapel excavations (Trench 1) *c* 80m south of Structures 1–10 indicates that activity continued to the edge of the plateau. However, as the ceramics were redeposited in later features it is not possible to speculate on their precise source.

Geophysical survey and the wider landscape

A limited area covering 1.3ha within Chapel Field was subjected to geophysical survey in 2005 in order to provide information on the nature of the wider archaeological landscape around the Iron Age features. At this point in time, only Structures 1A, 1 and the northern portion of Structure 2 had been excavated, with the survey area being located between Trench 16 and the remains of the medieval chapel, as shown in Illus IV.15. The primary method of data collection was by resistivity survey, utilising a TR Systems Ltd Resistance Meter TRCIA 1.31 with mobile twin-probe array. Readings were taken at 1m intervals with a total of 900 per 30m x 30m grid. A magnetometry survey was also conducted over 0.72ha within the resistivity area for comparative purposes. The equipment comprised a Bartington Grad601-2 gradiometer, with data collected at 0.25m centres along traverses 1m apart, providing 3600 measurements per 30m x 30m grid (Sabin & Donaldson 2005, 1–2).

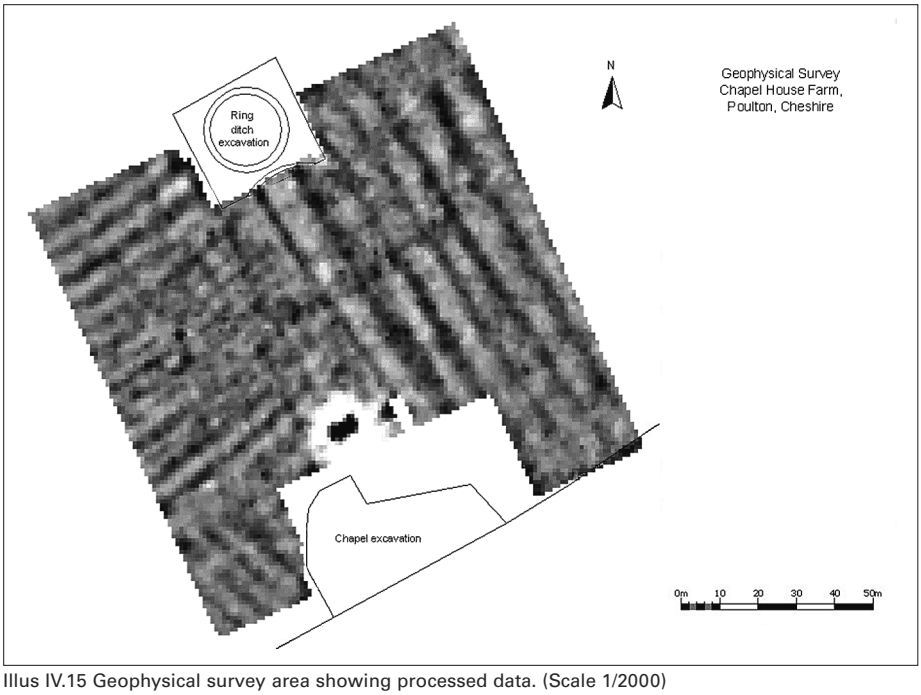
The resistivity survey revealed a complex pattern of high resistance curvilinear and linear features of probable archaeological origin, with the data extrapolation shown in Illus IV.16.



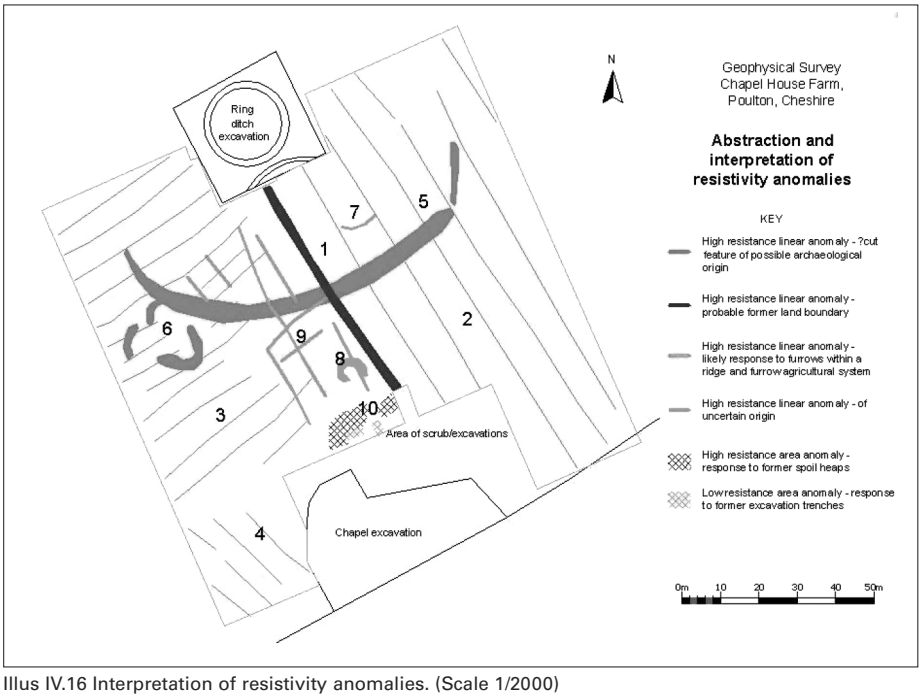
Illus IV.14 Schematic illustration of possible contemporary roundhouse combinations (Structures 6 and 7 excluded)

Numbers 1, 2, 3 and 4 were identified as being medieval/post-medieval agricultural or boundary features. By contrast, 5 has been shown through excavation to be part of an early Roman D-shaped enclosure. A further series of linear and rectilinear anomalies, 9, enclosing an area of approximately 20m by a minimum of 23m was interpreted as the possible foundations/foundation trenches of a structure. Three curvilinear features, 6, were identified near the western edge of the survey area and interpreted as possible circular ditches. Two further examples, 7 and 8, were located near the centre (Sabin & Donaldson 2005, 4-7).

In relation to the area of the geophysical survey, Trench 50 was sited to the south and east of the curvilinear ditch in Illus IV.15 (now labelled Structure 1), but within the boundaries of the arc of the later D-shaped enclosure labelled 5 in Illus IV.16.



Illus IV.15 Geophysical survey area showing processed data. (Scale 1/2000)



Illus IV.16 Interpretation of resistivity anomalies. (Scale 1/2000)

The finds

Portable artefacts

Very Coarse Pottery Kevin Cootes

A total of 3604 fragments (9462.4g) of Cheshire Very Coarse Pottery (VCP) was recovered from a variety of contexts, primarily associated with features of Iron Age date located in Trenches 16 and 50. The remainder of the assemblage was recovered from excavations in Trench 1 to the south, which contained the foundations of the medieval chapel and evidence for Roman occupation. The assemblage was analysed and sorted macroscopically, utilising a binocular microscope at x20 magnification. All identifiable fragments were weighed whatever their size.

Introduction

Cheshire VCP is characterised by a coarse, hand-made fabric. The vessels have a narrow, flat-based cylindrical form and flaring rim and were used for the drying and transportation of salt. Their functionality and the need to break them to obtain the salt has resulted in assemblages often being characterised by undiagnostic fragments (Kinory 2012, 4). This pottery has been extensively studied, especially by Elaine Morris (1985; 1994; 1999; 2002, 2005; 2010; 2018). Petrographic analysis has indicated that the raw materials were sourced from Cheshire glacial drift in the area of Nantwich, Middlewich, or Northwich. However, Railway Farm in the Wheelock Valley *c* 4km north-east of Crewe, is currently the only production site to have been located (Fielding & Nevell 2005, 67). The date range was initially established by Morris (1985) as covering the late fifth century BC to the late first century AD. However, Kinory's amalgamation of radiocarbon dates has seen the range extend from the late Bronze Age across the entire Iron Age and into the early Roman period (2012, 4, 37). There is a wide distribution across Wales, the Marches and the Midlands, demonstrating the considerable distances that Cheshire salt was traded. Assemblages have been recovered from Anglesey, Powys (Morris 1985), Hereford and Worcester, Leicestershire, Nottinghamshire (Knight 1992; Morris 2010) and Wirral (Philpott 2010, 180–3). The presence of this material at Poulton is therefore unsurprising, as it lies within the core area of distribution.

Description of the assemblage

The quantities and provenance of the pottery are indicated in Table IV.2. There is significant diversity regarding wall thickness, colour, non-plastic inclusions and surface conditions, indicating that multiple vessels are represented. Accurate estimation of numbers, however, proved problematic because of the redeposited nature of the material within Roman features. It was therefore deemed that the analysis of rim sherds from Iron Age contexts would provide the most reliable method to determine probable vessel numbers. It has not been established whether finds from postholes, pits and other discrete features represent separate vessels. An estimated two vessels came from Structure 2 and two to four from Structure 3. However, several sherds were recovered from Structure 3 contexts which appear similar to examples from Structure 2, possibly representing redeposited fragments. The total number of vessels is therefore likely to be closer to the lower estimation. Analysis of the sherds recovered from Trench 1 indicate that a further one to two vessels are represented, combining to make a total number of thirteen to sixteen.

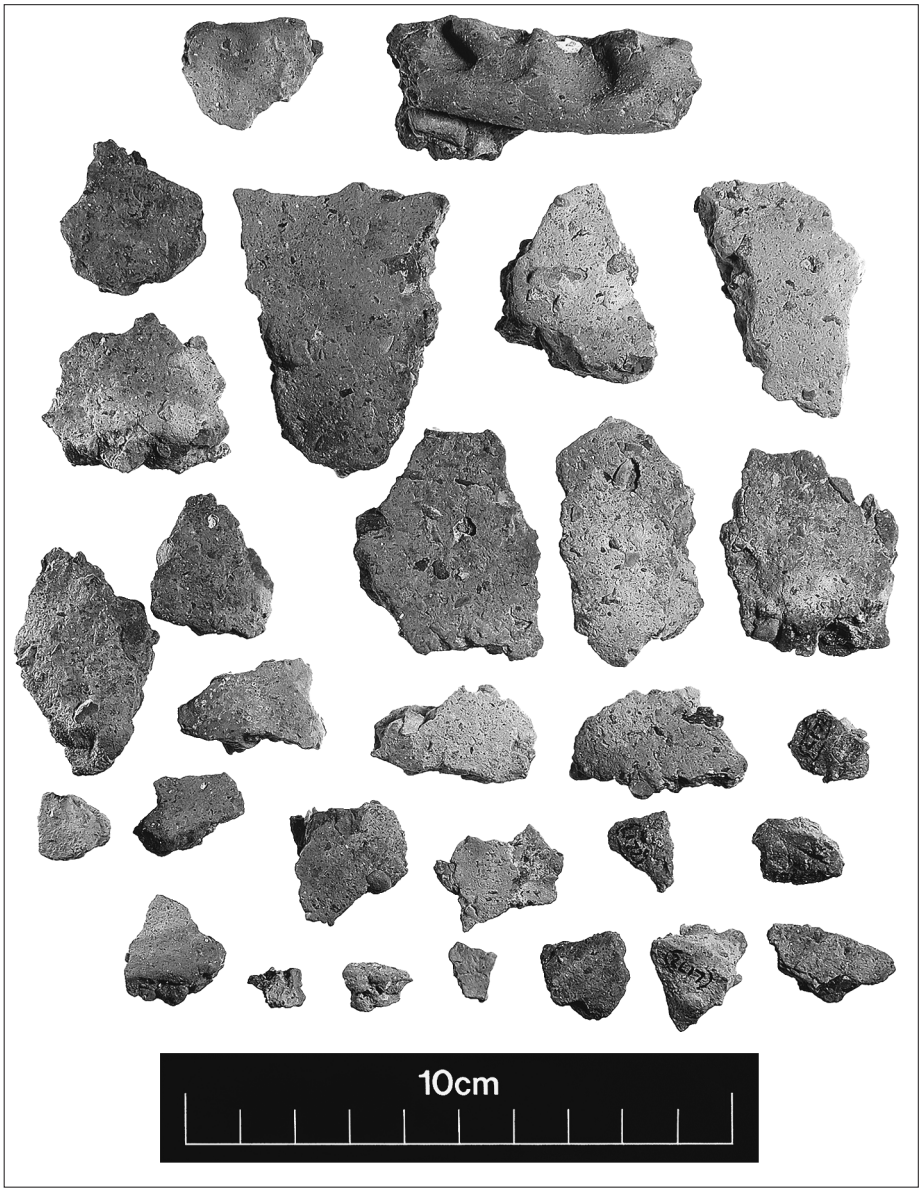
Table IV.2 VCP from Chapel Field quantified by sherd no, weight, estimated no of vessels and structure/feature

Structure/ Feature	*No sherds* Body	Rims	Bases	*Total no sherds*	*Total wt (g)*	*% total wt*	*Estimated no of vessels*
Structure 1A	1	0	0	1	7.7	0	1
Structure 1	163	6	0	169	496.7	5	1
Structure 2	227	17	0	244	755.5	8	2
Structure 3	1560	112	7	1679	4600.2	49	2–4
Structure 5	77	3	0	80	191.8	2	1
Structure 6	13	0	0	13	17.6	<1	1
Structure 7	43	2	0	45	79.8	1	1
Structure 8	118	6	0	124	254.5	3	1
Structure 9	4	0	0	4	16.4	<1	1
Structure 10	18	0	0	18	40.9	<1	1
Total from structures	2224	146	7	2377	6461.1	68	12–14
Pits/postholes	70	8	0	78	204.6	2	
Other Iron Age features	113	9	0	122	140.3	1	
Redeposited in later features	742	47	2	791	2021.8	21	
Unstratified	180	6	1	187	433.2	5	
Other trenches	42	5	1	48	201.7	2	1–2
Total	3372	221	11	3604	9462.4	100	13–16

Sixty-eight percent by weight of the total assemblage was retrieved from the curvilinear ditches defining Iron Age structures. Nearly half of the entire assemblage by weight was recovered from Structure 3; Structures 1 and 2 produced smaller assemblages, even though all three ditches were completely excavated. A significant quantity of VCP (2021.8g) was redeposited within later features, primarily of Roman date. Of this, a total of 686.8g came from the Roman ditch that cut Structures 2 and 3 and 1112.7g from the two kilns/corndriers that truncate Structures 3, 5 and 10. The majority of the redeposited assemblage (1799.5g) can therefore probably be attributed to Structures 2, 3, 5 and 10.

There is a wide range in the size and weight of the sherds, from a minimum of <1g to a maximum of 54.9g (Structure 5 (50323)), with a mean weight of only 2.63g. However, the low average disguises the presence of large and well-preserved rim and body sherds, as shown in Illus IV.17.

The fragmentary nature of the assemblage, together with colour variation within and between sherds, significantly complicated the task of vessel reconstruction. Despite these problems several joining fragments have been identified and refitted, for instance those recovered from contexts (50068), (50118), and (50077), the first two belonging to Structure 3 and the third to a Roman ditch.

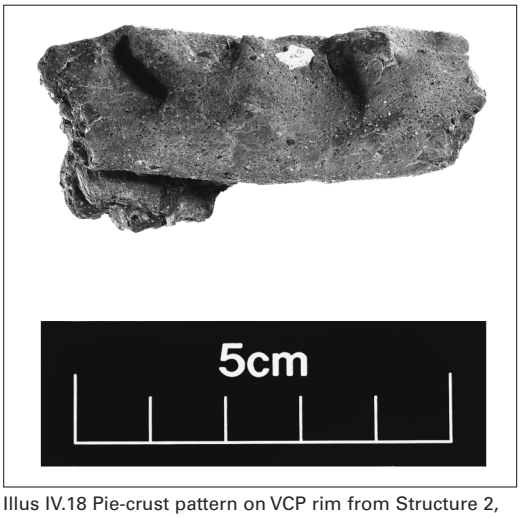


Illus.IV.17 VCP fragments from a single vessel in Structure 2 (50172)

There is significant variation in colour, with pink, orange, reddish orange, light yellow-orange, medium-dark mottled brown and pale straw yellow all represented. Some fragments demonstrate a marked colour change across the external and internal surfaces. Core reduction to a pale grey colour commonly occurs, as well as reduction of the interior of the vessel wall. Several completely reduced fragments were noted from Structure 3, (50534). Analysis of the body sherds demonstrated fracture characteristics consistent with coil-built vessels. Linear striations were identified on several sherds from Structures 2 and 3, possibly repre-

senting the smoothing of the clay body when wet with a cloth or similar item. White salt-staining indicative of brine drying was recorded on the exterior of 112 sherds from multiple features and ditches.

Multiple body sherds display a concave profile characteristic of the flaring shape of Cheshire VCP. Notable examples were recovered from Structures 2, (16054) and 3, (50059). The rim fragments are also mostly typical of this type, with rounded and folded-over examples dominating (Morris 1985, 235; Britnell 1989, fig 26). Finger-impressed, smoothed and pinched decoration were all identified on rim sherds, with the first being the most common. A less common type of decoration was identified on a rim sherd from Structure 2, (50172) and combined finger-impressed and pinched impressions to produce a pie-crust pattern (Kinory, pers comm) (Illus IV.18).



Illus IV.18 Pie-crust pattern on VCP rim from Structure 2, (50172). (Scale 1/1)

Dating

The date range of the VCP assemblage recovered from Trenches 16 and 50 has been established by the radiocarbon programme. Sherds were recovered from the earliest phase, represented by Structure 10, dated 731–398 cal BC (SUERC-73581) and therefore early Iron Age. This provides one of the earliest examples of VCP in Cheshire. Similar dates were recovered from contexts at the Wrekin hillfort, Shropshire, at *c* 400 BC (Stanford 1984, 83) and Beeston Castle, where VCP associated with the rampart was radiocarbon dated to 791–410 cal BC (Ellis ed 1993, 89; Royle & Woodward 1993, 74). The remaining ten dates from Structures 1A, 1, 2, 3, 5, 7 and 8 demonstrate continued use of VCP across structural phases covering the middle and late Iron Ages. The latest date for VCP on the site, 172–1 cal BC, comes from Structure 3 (50570), (SUERC-67756).

Regional and national interpretation

The VCP from Poulton is an exceptional collection that adds to the distribution map of this vessel class. The material is comparable to that from other Iron Age sites in Cheshire in

that it is the sole pottery type to occur in an otherwise almost aceramic region (Matthews 2001, 13). However, by weight and sherd count the assemblage is the largest to be recovered from the county, where relatively small amounts characterise most Iron Age sites. For example, the Chester Business Park produced five fragments weighing 65g (Woodward 2003, E1–E2); Brook House Farm, Bruen Stapleford produced eighty-three sherds weighing 338g (Morris 2002, 31); whilst a significant assemblage (weight and sherd count not listed) was recovered from Beeston Castle (Royle & Woodward 1993). Varley's investigations of Eddisbury hillfort during the 1950s recovered VCP associated with structures overlying the ramparts (Varley 1950, 58; Matthews 2001, 13), whilst a single, residual fragment was recorded from Abbey Green, Chester. Several large sherds were also retrieved from excavations in Handbridge (Matthews 2001, 13) and seventy-two sherds/121g came from middle Iron Age contexts sealed by the seating bank of the Chester amphitheatre (Morris 2018, 58). Further afield, the hilltop settlement at Mellor, Greater Manchester, produced twenty-one sherds/63g (Morris 2005, 40), whilst excavations at Irby on the Wirral resulted in 479 sherds weighing 2005g (Morris 2010, 122). A total of ninety sherds weighing 269.8g were recovered from Brook House Farm, Halewood (Cowell 2000, 44).

Utilising Janice Kinory's comparison of VCP assemblages, Poulton currently comprises the third largest by weight in the country, excluding production sites. Only Twyn-y-Gaer, Monmouthshire (Cheshire and Droitwich VCP) and the Collfryn hillfort, Powys (Cheshire VCP) contain greater weights (Kinory 2012, 60–1). The presence of such a large assemblage has significant ramifications for interpreting the nature of Iron Age settlement at Poulton. At the simplest level, the volume of VCP establishes the presence of long-term links with the brine industry at Middlewich/Nantwich. Further, the uses of salt in late prehistoric society were multiple and essential to existence. The large faunal assemblage and high volume of charcoal from domestic hearths suggest that the salt was primarily being used for the preservation of meat that was later consumed on site. Other activities such as the production of butter/cheese, leather-working, dyeing, medicinal antiseptics and salt licks for domesticated animals may also have contributed to the need for such a large volume of salt but are unlikely to have left any trace in the archaeological record.

The assemblage has further implications beyond that of trade and function. Kinory (2012, 116) theorises that the control of salt would have provided economic and political power. This is a view shared by Matthews (2001, 1), who postulated that salt in Cheshire was primarily under the control of an elite that traded as far as the continent through the emporium at Meols on the north Wirral coast. It is therefore plausible that the inhabitants of Iron Age Poulton possessed some affluence. They were well connected through links along the River Dee that could have reached to Meols and farther afield. It should be noted, however, that Philpott (2010a, 180–1) has postulated a contrasting model, where elite control of salt was neither necessary nor practical because of the simple technology needed for its production and the occurrence of numerous localised brine springs across Cheshire. Salt may rather have been produced as a seasonal activity, with distribution by the producers themselves.

Ceramic weight Kevin Cootes

Fragment of originally hemispherical ceramic spindle whorl or net weight; one side flattened, the other missing but possibly also originally flattened. Sandy fabric, generally oxidised light yellow-brown in colour with some reduction, indicating uneven firing conditions. Diam 12mm, flattened side width 8mm, 2mm diam hole pierced with stick or point through centre. (50527): Structure 3 ditch fill.

Fired clay Kevin Cootes

A total of eighty-eight fragments of fired clay were recovered from Trenches 16 and 50, dated stratigraphically to the Iron Age, with a combined weight of 386g. Some were recovered during wet sieving of environmental samples. An additional and significant quantity of poorly fired clay was observed in the fills of the northern arc of Structure 3, which disintegrated upon lifting and is therefore not included in the total.

Of the fired clay recovered, 366g or 95% was recovered from the ditches of Structures 1, 2, 3 and 5. The remaining 5% came from two postholes, the fill of dog burial [50288] and a door foundation, [50168], for Structure 3.

A significant proportion of the assemblage was small, weighing between 0.1g and 3.0g, and produced little information. Large fragments weighing up to 38g enabled a more detailed analysis utilising a x20 hand lens. Original surfaces were only recorded on four fragments, one of which contained a shallow linear impression consistent with wattle, indicating that it comprised wall daub. Another example had a curving profile and flat base indicative of a weight or similar item. Curving surfaces and grey cores noted on the other two examples indicated that they were possibly mould fragments.

The fired clay recovered from Trenches 16 and 50 is relatively small in quantity compared to that from sites such as Irby (Poole 2010) but is consistent with locally available sources. The presence of daub may be expected, but if low or unfired would not have survived – an explanation consistent with the material observed in the ditch of Structure 3. The identification of ceramic weights and industrial remains is tentative but provides indications of the kind of activities that may have been taking place.

Metal

Copper alloy Kevin Cootes

1 Pin. Head missing, bent after deposition. L 46mm. (50139): southern arc of ditch of Structure 3. Without the diagnostic portion of the pin it is not possible to discern the type but mid- to late Iron Age on the basis of radiocarbon dates.

Copper alloy pins are rarely recovered from Iron Age contexts in Cheshire. The closest regional parallels are three examples, of swan-neck form, recorded as surface finds at Meols (Philpott 2007, 37, nos 83–5 and 38, pl 3).

Iron David Dungworth

1 Adze head. Complete, heavily corroded. L 192mm, max W 62mm. (50527): primary fill of the north-east arc of ditch of Structure 3. Illus IV.19.

Illus IV.19 X-rays of iron adze from Structure 3 ditch fill (50527). (Scale 1/2)

The adze compares closely with Iron Age examples from Danebury hillfort, Hampshire (Cunliffe & Poole 1991, 351, fig 7.14), and Glastonbury Lake Village (Bulleid & Gray 1917, 386). The square butt on the back of the head, also seen on the Glastonbury example and on one from Hod Hill, may be an Iron Age characteristic (Manning 1972, 17, B9; Richmond 1968, 137).

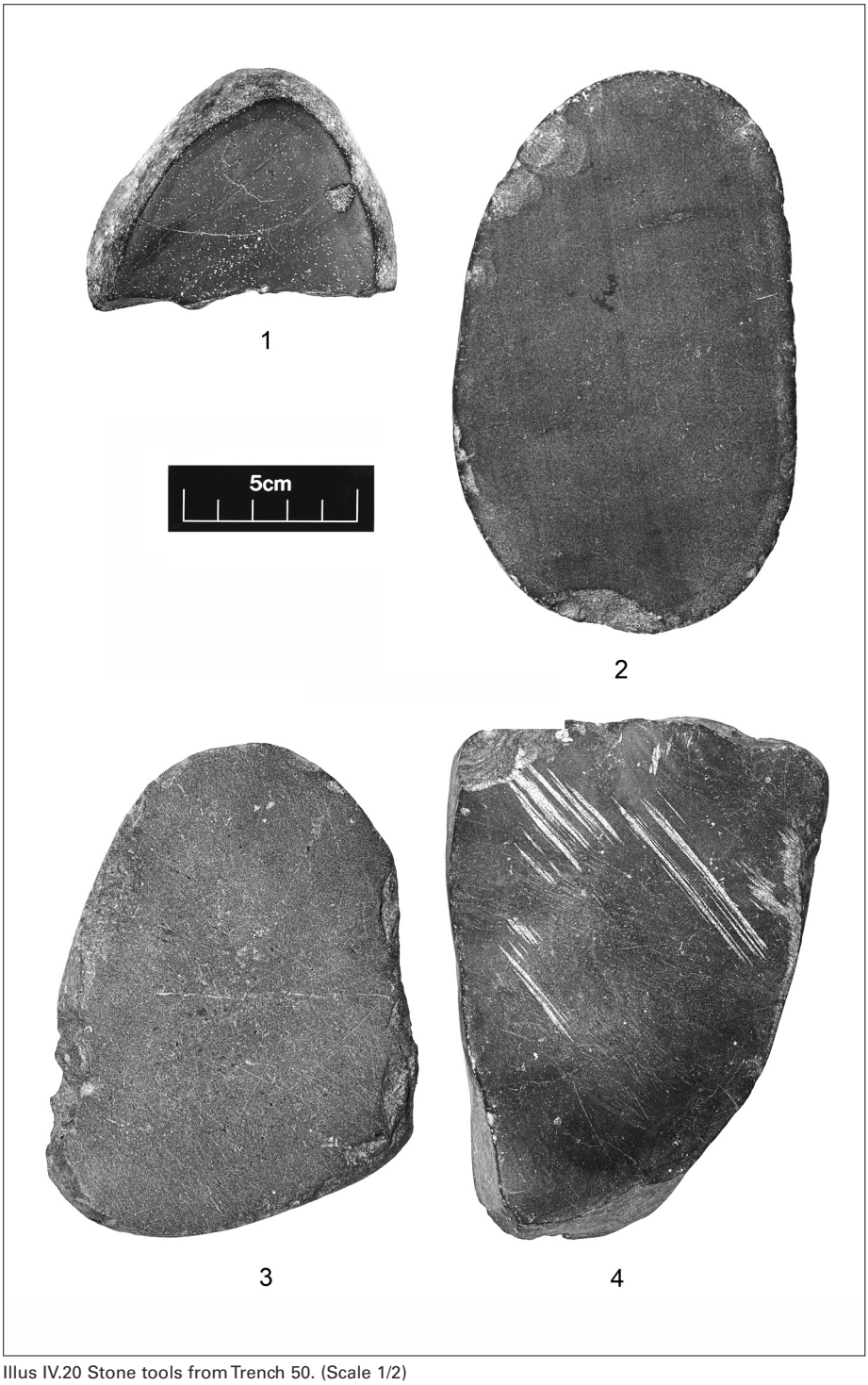
Stone objects Ian Brooks

Four stone artefacts were recovered from sealed contexts of Iron Age date in Trench 50.

Catalogue

1 Fragment of a glacial cobble of very fine, dusky green sandstone, possibly tufaceous, with dorsal surface ground and polished flat. Around the periphery and along a crack of the polished surface there is greyish-red staining, probably the result of use rather than being post-depositional. 70 x 88 x 22.6mm. (50131): Structure 3 ditch fill. Illus IV.20.1.

2 Longitudinally split glacial cobble of an indurated, very fine-grained, greyish olive-green sandstone, with its bedding at right-angles to the polished surface; four flakes removed



Illus IV.20 Stone tools from Trench 50. (Scale 1/2)

from ventral surface, probably after deposition; ventral surface ground flat; dorsal surface slightly domed with a ground but not polished bevelling around the periphery. 155 x 95.6 x 29mm. (50091): Structure 3 ditch fill. Illus IV.20.2.

3 Split glacial cobble of medium grey fine-grained quartzite, with its bedding plane parallel with the working surface. Dorsal surface worn flat but not polished; ventral surface has a flat, conchoidal fracture which may be post-depositional. The original shape has been slightly modified with unifacial knapping along the sides, whilst the ends retain the worn surfaces. 138 x 104 x 17mm. (50059): Structure 3 ditch fill. Illus IV.20.3.

4 Glacial cobble of olive grey, very fine hard sandstone, with bedding parallel to the working surfaces. Both ventral and dorsal surfaces are slightly domed; wear extends over parts of the edges, with some small patches of polish on both surfaces that appear to be areas of more intensive use. There has been some attempt to modify the shape with a series of flakes removed from the distal end. 144 x 105 x 35mm. (50166): packing in posthole [50165]. Illus IV.20.4.

Discussion

The stone artefacts can be divided into two functional groups. Of particular interest are cat nos 1 and 2, which have unusually flat polished surfaces. These must have been ground against another flat surface and, given the quality of the polish, a fine-grained abrasive must have been used. The colour of the staining on no 1 suggests that this was a ferrous-based substance. It is therefore possible that they were used to grind pigments such as ochre to a fine powder, possibly against a metal plate, resulting in the flat polished faces. The dorsal surface of no 1 also has a highly polished surface, but this has a slightly domed profile which is more typical of being used against another stone. Thus, it is probable that this artefact was being used in more than one stage in the production of pigments.

The second group consists of cat nos 3 and 4, which are more typical rubbers or grinding stones, dating from the Mesolithic period onwards. Whilst these are more common in areas where a range of local stone resources are exploited, such as the Northern Isles of Scotland (Clarke 2006), pebbles with polished surfaces are not unusual, although not always recognised. In contrast to the first group, the grinding surface of no 4 is not flat, suggesting a different function. The link between the two groups, however, is that all these objects were made on glacial cobbles, probably collected from the Irish Sea Till. These till deposits outcrop across the Cheshire Plain and along the North Wales coast (Mackintosh 1879). There may, however, have been a select source, as all were made on cobbles of reasonable sizes, which are not common in the Irish Sea Till. This may suggest secondary geological sorting such as beach or river gravel deposits.

Shale/jet ring Kevin Cootes

A single fragment of a shale or jet ring was recovered from the upper fill of the south-western arc of Structure 3, (50042). The complete piece would have been 25mm in external diameter. The outer face is 4mm wide, and the inner face 3mm, with a variable thickness of 4–5mm. The internal and external faces were polished to a high standard, whilst the

wider internal and external sides have linear grooves across the width of both sides, demonstrating that the piece was worked by hand, rather than on a lathe. The relatively small diameter indicates that this is a finger ring.

Jet/shale objects occur on numerous British prehistoric sites from the late Neolithic (Pollard *et al* 1981) through to the Roman period (Philpott 2010b). Within Cheshire, prehistoric examples are rare but they do occur. For instance, two bracelets were recovered from the Bronze Age barrow at Woodhouse End, near Macclesfield (Rowley 1977, 19). Shale ring fragments from late Bronze and early Iron Age contexts at Beeston Castle were interpreted as bracelets and demonstrate similar smoothing and tool marks to the Poulton example (Bliss 1993, 62). Discoveries dating to the early first millennium AD have been recovered from multiple sites within the Roman fortress at Chester (Lloyd-Morgan 1981).

Numerous production sites have been located, with jet often forming a substitute for shale across northern Britain, sourced from the upper Lias exposures on the Yorkshire coast or deposits in Scotland (Cunliffe 2005, 508–9). The closest known production centre to Poulton, however, occurs in the Peak District, where working sites have been identified at the Bronze Age settlements of Swine Sty and Gardom's Edge; the probable raw material source was identified as local outcrops of the Mickley Cannel Seam (Beswick 2017). Deposits of shale occur across the Carboniferous Coal Measures in Merseyside, eastern Cheshire and in North Wales (Edwards & Trotter 1954, 58–73; Hebblethwaite 1987, 5–7) and could be the source of this item.

Heat-affected stones Kevin Cootes

Heat-affected and shattered stones were common finds within all curvilinear ditches in Trenches 16 and 50. Numerous examples also occurred in pits and as a dispersed surface spread. The assemblage comprised rounded river cobbles that were generally fist-sized, with some notable small boulders. Surface reddening, non-fatal fracture marks and shattered examples with angular breaks characterised the assemblage.

The largest collection of heat-affected stones was recovered from Structure 3, with *c* 2000 from within the excavated ditch. Examples were concentrated within areas that also contained domestic refuse in the form of ceramics, animal bone and charcoal – an association that was observed in all the ditches and gullies. The sheer volume of material indicates that the probable source was the River Dee, as the local glacial clays are relatively stone-free.

Heat-affected stones occur in Britain from the early/middle Bronze Age, often in 'burnt mounds' (Gillespie 1991, 69; Ehrenberg 1991, 41), primarily distributed across Ireland, the west coast of Britain and northern Scotland (Gillespie 1991, fig 1; for a recent local example near Sandbach, *see* Jones 2016). These features are generally thought to have been associated with the boiling of large quantities of water for cooking, although researchers have suggested other interpretations such as bathing/washing (Gillespie 1991, 69), the production of brine, bending structural timbers by exposing them to steam (Barfield 1990, 62–3), brewing, and sweat lodges (Jones 2016, 47, citing Kenney 2012). Burnt mounds are notably isolated from domestic settlements. In contrast, during the Iron Age heat-affected stone occurs within habitation sites (Barber 1990, 92–4).

Examples within Cheshire and surrounding regions that date to the Iron Age and early first millennium AD are overwhelmingly associated with cooking. Examples include Bruen Stapleford, Cheshire, where there was a marked concentration around domestic structures of Bronze Age date but also with smaller amounts around later buildings (Fairburn *et al* 2002, 51). Other similar examples occur at Brunt Boggart, Tarbock (Philpott 2000, 158–160), Irby (Philpott & Adams 2010, 114), Mellor hilltop settlement, Greater Manchester (Noble, pers comm), and Chester Business Park, Cheshire (Lightfoot 2003, 6). At Puddington Lane, Burton (Wirral), a small hearth of early Iron Age date contained animal bone, charcoal, and heat-affected stone (Gregory & Adams 2019, 8–9). The overall evidence therefore indicates that the inhabitants of Poulton were boiling water for activities such as cooking. Such an inference is supported by the domestic hearth waste, animal bone, etc of the fills from which the stones were primarily recovered.

Ochre Kevin Cootes

Seven fragments of ochre were recovered from contexts associated with Structures 3, 5, 8, and a posthole. The material is characteristically small in size, at times being little more than crumbs. There is, however, an interesting connection with the analysis of the stone tools. Brooks identified red ferrous staining on cat no 1, consistent with using a fine-grained abrasive. The presence of ochre may indicate that this was the material being ground against the stones, possibly for use as pigment.

Worked antler and waste material Priscilla Lange

Thirteen objects of antler and discarded antler waste were recovered. The finished objects are described in detail first, with parallels from other contemporary sites being cited in the discussion. The waste is then examined as to how the antlers were manipulated to create objects. Unless otherwise noted, the objects were manufactured from red deer antlers. Selected examples are shown in Illus IV.21 and IV.22. The antler terminology used in this report follows Elster (2003). Measurements of the shed antlers were taken as illustrated in Clutton-Brock (1984); other measurements taken are as described.

Catalogue

1 Cheekpiece for a bridle, cut from the tip of a tine; almost complete but broken at the top end. Pierced for suspension and highly polished on all surfaces. A thin groove demarcates a raised rim *c* 0.5mm wide at the top. Thin transverse and oblique fine cuts, unevenly scattered, across the long axis. L 108mm, max diam 19mm, diam of perforation 5.5mm, depth of perforation 11.48mm. Structure 1, unknown context. Illus IV.21.1.

2 Utilised section from the tip of a thick and large tine, cut (probably sawn) off the beam; recent breaks on the broad end. Internal cancellous tissue completely bored out and oval cross-section at thickest part. Polished on all outer surfaces. Thin transverse and oblique fine cuts, unevenly scattered, across the long axis. Tip of the tine shows signs of wear as if by pounding or grinding. Max L 110mm. (50517): primary fill of northern arc of Structure 2 ditch.

3 Two small tine fragments with half a perforation preserved in each, possibly from the same object but too much missing to be certain. The smaller piece has a rounded and

polished edge for a rim. Both are hollowed on the inside and polished on the outside. Larger piece: max L 19.5mm, W 12mm, perforation diam 3.5mm; smaller piece: L 20.5mm, W 9mm, perforation diam 4mm, rim th 2.5mm. (50175): initial silting of eastern arc of Structure 2 ditch.

4 Toggle or ferrule in the form of a cylinder sawn from a beam or base of a thick tine; probably deposited intact but now broken into four segments. Surface worked smooth and polished; both ends ground smooth and decorated with a rounded rim defined by an incised line and now more prominent at one end than the other. Between the lines are three rows of incised ring-and-dot motifs; the middle row consists of nine circles, and the top and bottom rows consist of nine half circles. H 43mm, outside diam 40.5mm, rim th 7.69mm. (50519): fill of northern arc of Structure 3. Illus IV.21.4.

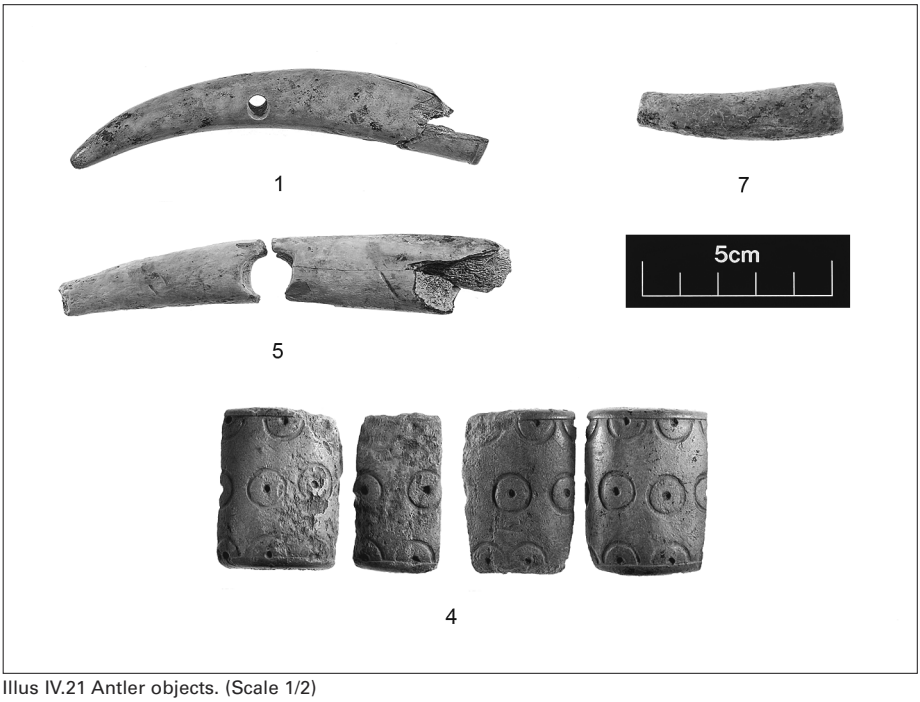
5 Cheekpiece for horse's bridle, cut from the tip of a tine with central perforation; wider end broken recently and missing, pointed tip sawn off and ground down; broken at perforation, probably during drilling. Some areas of polish towards the broken end and several oblique cuts scattered across long axis. The surface is not highly polished and was perhaps never finished. Max L 117mm, max diam 20mm, diam of perforation 10.5mm. (50291): fill of northern arch of Structure 5. Illus IV.21.5.

6 Possible butt of a knife handle, made from the tip of a tine with the wide end sawn and smoothed to form a rounded end. Polished on all surfaces with thin cut marks. A recent break towards the mid-body prevents certain identification. Max L 39mm, diam at unbroken end 16mm. (50323): Structure 5.

7 Offcut from tip of time; complete but unfinished with both ends ground smooth and polished on all surfaces. Probably a knife handle, discarded before completion. L 54mm, diam of larger end 9.5mm, diam of smaller end 4mm. (50323): Structure 5. Illus IV.21.7.

8 Basal segment of naturally shed antler rack, with burr, main beam, brow tine and base of trey tine present. There is one oblique, fine cut on the beam. The brow tine was sawn through the middle, leaving a substantial section still attached to the beam. A deep incision was started towards the base to separate this piece from the tine but was then aborted. The bez tine was sawn but not as close to the beam as in other instances, leaving the base of the bez tine still attached. Two further incisions were made at the base of the trey tine on the beam. This rack is from (minimum) Stage of 12 points stag as there would have been three tines on either side. Measurements (2) 62.64mm, (12) 272mm (preserved), breadth of coronet 55.75mm. (16054): Structure 1 ditch fill.

9 Three joining fragments of basal segment of naturally shed antler, with intact burr, brow tine and beam from rack. The bez tine was sawn off the beam, very close to the brow tine. The brow tine is complete and has three deep incisions at the base and eight fine cuts dorsally. These three sets of grooves on the brow tine may represent unsuccessful hacks to separate the brow from the tine. However, the bez tine was sawn off so grooves on the brow tine could be inadvertent marks left after sawing off the bez



Illus IV.21 Antler objects. (Scale 1/2)

tine. The tip is highly polished and worked smooth beyond natural wear. Part of the beam is slightly polished. Although at first glance it looks like a pick, there is no damage to the tip of the brow tine. This was possibly waste from the removal of selected areas for use as cheekpieces, handles, toggles etc. This rack is from (minimum) Stage of 10 points stag as there would have been five tines at either side. Br of burr 54mm, beam L (preserved) 165mm, L of brow tine 185mm, (1) 188mm, (2) 61.5mm, (3) 9.5mm, (4) 97mm, (5) 30mm, (11) 260mm, (12) (preserved) 333mm, (15) 98.92mm, (7) 86.5mm, (8) 28.5mm, (9) 137mm, (10) 48mm. (50563): Structure 3 ditch fill. Illus IV.22.9.

10 Basal segment of naturally shed antler, consisting of beam fragment with burr, brow tine and bez tine. Brow tine sawn off on two angles for the removal and/or snapping of the tine, leaving a triangular area on the beam. Although the small bez tine was sawn, there is a further chop below it. There were four further chops along the beam. This rack is from (minimum) Stage of 6 points stag as there would have been three tines on either side. This was therefore a young individual. Measurements: (1) circumference 167.18mm, (2) diam (outside burr) 55.72mm, inside burr 37.77mm, (3) base to brow 9.69mm, (4) all brow tine as preserved base L 36.01mm, W 23.42mm, circumference 95.78mm, (9) circumference estimated 116.65mm, (10) beam diam above bez tine 31.09mm, (12) total L preserved 120mm, (15) from brow to bez tine 101.32mm. (50071): feature truncating Structure 3.

11 Three refitting tines and beam towards the crown; beam and crown present with several tines sawn off. The beam was broken from the rest of the rack, which is not present. A

lateral notch has been crudely cut towards the middle of a tine but it was not detached. The tip of this tine was, however, sawn off and rounded up. Two other tines were sawn off the crown. There are nine fine cuts on the beam. The beam is quite thick so it may represent an older individual. This crown may be waste left after the removal of the crown from a rack. Further evidence of sawing may represent tines selected for use as cheekpieces, toggles etc. Measurements: greatest L of preserved antler 158.91mm, L (preserved) of tine 100.07mm; depth of rounded edged tine 29.31mm, L (as before) 32.64mm, (1) 168.63mm, (2) diam including burr 59.24mm, inside burr 42.91mm, (3) 11.12mm, (9) 115.60mm, (10) 34.2mm, (12) length of beam preserved 202mm, (13) 197.90mm, (15) 84.00mm. (50112): feature truncating Structures 3 and 10, identified as a Roman ditch.

12 Segment of thick tine from towards tip, sawn at one end from a large and thick tine. Towards the top of tine there is recent breakage; otherwise it is rough and unworked. Marks consistent with rodent gnawing. This item may represent debris sawn from the tine to remove the section with the gnaw marks. Measurements: L (preserved) 59.56mm, L (at sawn end) 34.31mm, br 23.88mm, circumference: 96.48mm. (50562): Structure 3.

13 Probable roe deer tine consisting of three pieces, with the tine removed from the beam by four chops. There is also a chop on the middle of the tine in addition to two transverse chops on the tine. The number may be an indication that the antler was still attached to the cranium, but their placement may also indicate removal from the shed burr, which is not present. The wear on the tine tip is the result of the animal rubbing against trees etc. The tine appears to be an early stage in the manufacture of an implement, since the natural pearling and gutters on the surface of the antler had not been removed. The tine appears to have been abandoned and discarded. Measurements: greatest L (preserved) 148.67mm, diam of tine: 9.77mm. (50654): Structure 8. Illus IV.22.13a and b.

Discussion

Objects

None of the imperfections or natural ridges of unworked antler are evident on the finished objects from Poulton. Most are polished to a high standard, although cat no 5 is apparently finished and only polished in certain areas. As it may have been broken during the drilling of the perforation, polishing might have been the last stage in the process. The indication is therefore that the manufacturing of cheekpieces for horses' bridles, was happening at Poulton.

The closest parallels for the toggle/ferrule (cat no 4) occur at Danebury, where both decorated and undecorated examples are found, but most of these are perforated and labelled as toggles. There is a possibility that the Poulton example may have been intended to be perforated but never was. However, the Danebury toggles are smaller, 13–14mm to 28–30mm (Sellwood 1984, 378–80, fig 7.31), as against 40.5mm diameter for the Poulton example. Those from the later excavations at Danebury appear to be larger in diameter, ranging from 22mm to 30–34mm (Cunliffe & Poole 1991, 358), but none were as large as the Poulton example, which may therefore have had another function.

Illus IV.22 Antler waste. (Scale 1/2)

Although ring-and-dot motifs are common from the Bronze Age to the Iron Age, the design continues well into the Roman period and beyond. However, as it stands, the decoration closely matches Danebury toggles 3.41–.51 (Cunliffe 1984, fig 3.71; for similar toggles from Danebury, *see* Cunliffe & Poole 1991, fig 7.30). The decoration on the Poulton ferrule/toggle is more organised, with three distinctive rows of dot-and-circle motifs, although the ones closest to the rims are half-circles. None of the Danebury examples have half-circle motifs.

Although Danebury and comparable sites in the region have the highest number of toggles/ferrules, there is a recognised wider distribution, including Glastonbury (Bulleid & Gray 1917, 463–4) and Meare Lake Village (Gray 1966, 341–3). Objects identified as toggles but looking similar to the Poulton ferrule/toggle appear in very low numbers at other sites as well. An undecorated example from Meare Village East is similar in size to the one from Poulton (Coles 1987, H123, fig 3.34). A toggle decorated with ring-and-dot motif and found at Winklebury Camp is very similar to those from Danebury and Poulton. It is, however, manufactured out of a red deer metatarsal (Smith 1977, 108, fig 39).

The Poulton find may perhaps be better described as a ferrule, or collar, as part of a spear or other composite object. Although there is significant polish and signs of wear on the outside, there are no such signs on the inside, where the cancellous tissue has been partially hollowed out.

Of the other finished, or almost finished objects from Poulton, the cheekpieces for horses' bridles were identified as such by Britnell (1976), albeit for the Bronze Age. However, the ones from Poulton differ in that they are shorter and have a single perforation. The complete example (cat no 1) finds the closest parallels in design and length at Meare Lake Village West and Glastonbury (Gray 1966, pl lx and Gray 1917, pls lxv and lxvi). Similar examples were also found at Meare Lake Village East, particularly H134, which is comparable to cat no 1 (Coles 1987, fig 3.32).

It should be noted that cheekpieces and toggles/ferrules tend to occur together on the same sites and that the latter may be an item of horse gear that has yet to be correctly identified.

Antler waste

The available material suggests the collection of shed antlers. Red deer antlers were collected as a raw material after being shed in the spring. With roe deer this occurred in the autumn, although it is not possible to determine if the Poulton example (cat no 13) was shed or unshed. The sequence of working following collection resembles that described in MacGregor and Mainman (2001, 344). Although this description applies to material later than that from Poulton, it nevertheless accurately reflects how antler was worked there in the Iron Age. The action of the saw is evident in cat no 10, where the brow tine has been sawn by rotating twice and then snapping off the tine. In other shed antlers the brow tine remains intact, especially in cat no 9, where it appears to have been in the way as the bez time was being sawn off close to the beam without rotation. In the case of the latter, the entire circumference of the tine was possibly required for further manufacturing.

The hacking blows found in cat no 9 are paralleled on an antler from a Roman workshop in Apulum, Dacia (modern Romania) (Ciugudean 2001, 62, fig 1). In the Poulton specimen, it is more difficult to ascertain whether the hacks on the brow time are the result of separating the bez tine or for some other purpose. The tip displays a degree of polish which goes beyond that naturally caused by the deer during life, indicating this could comprise a finished object. Another possibility is that the tine was polished whilst attached to the beam, but never sawn off for later manufacture, although this is less likely as polishing appears to have been the last stage in the manufacturing process.

An example of evidence for the primary stage of separating the bez tine can also be seen in cat no 8, which has been sawn, leaving marks on the brow tine with less damage than that found with cat no 9. There are further hacking marks on the beam of no 8, in this case perhaps to separate the crown. Although crowns are not usually exploited because of the different tines facing several ways (McGregor & Mainman 2001, 344), the crown represented by cat no 10 has had the two tines and the tip of a third sawn off. An incision mark is also present, although the beam has now broken at this point.

Cat no 12 represents one of these types which was sawn from the top of the tine and exhibits two different sets of marks characteristic of gnawing (for examples Cáceres *et al* 2011; Hutson *et al* 2013; Pokines *et al* 2017). Presumably the antler rack from which this tine came was exposed long enough for gnawing to occur after it was shed, with cat no 12 later sawn off and discarded because of the effort required to scrape off the ridges or imperfections.

Conclusion

The collection of antlers, shed in the case of red deer and surmised for roe deer, was probably undertaken near the site. It is clear from the amount of antler waste and the evidence from the unfinished objects that antler working was conducted on site. The fact that substantial racks of antler were deposited that could have been utilised to make other objects, points to a good and plentiful supply of this raw material. There is no evidence for hunting in the form of antlers still attached to the skulls.

A variety of finished and unfinished objects and antler waste was found in the gullies of Structures 1, 2, 3, 5, and 8, including cheekpieces, handles and a decorated toggle/ferrule. The part of the site containing Structures 3, 5 and 8 had the most antler waste and unfinished or prepared objects. This suggests a focus for the working of red deer and roe deer antler racks and then for the further working of these antlers into objects that were finally deposited in the ditches.

Industrial remains David Dungworth with additions by Ian Brooks

Forty-nine industrial items were recovered from Iron Age features in Trench 50. Structure 3 produced forty-five items, with twenty-four being concentrated in the northern and north-eastern arcs (50525), (50527), (50547) and (50544). In contrast, Structure 5 produced only three examples and Structure 8 a single piece (Table IV.3). All the material submitted for evaluation was examined visually in accordance with the recommendations in Historic England 2015b, weighed and photographed.

Catalogue

Structure 3

1 Fragment of a probable stone mould made on a light grey fine sandstone, possibly from the Cheshire Ridge. Dorsal surface smoothed with a recess approximately 55mm diam, cut into the surface by 14mm; remaining sides and base only roughly shaped, with the suggestion that the base was at least facetted if not domed. 55 x 59 x 37mm. (50042): Structure 3 ditch fill. (I Brooks)

2 Granite boulder with subrectangular cross-section and pear-shaped profile; broken at top but enough survives to show heavy pitting. This is clearly the result of significant impact damage, suggesting that the boulder has been repeatedly struck with a heavy object. There is a small patch of ferrous material attached to one side of the boulder, suggesting use as an anvil for smithing ironwork; chemical analysis of the deposit would be required to confirm this assumption. 321 x 259 x 186mm. (50544): Structure 3 ditch fill. (I Brooks)

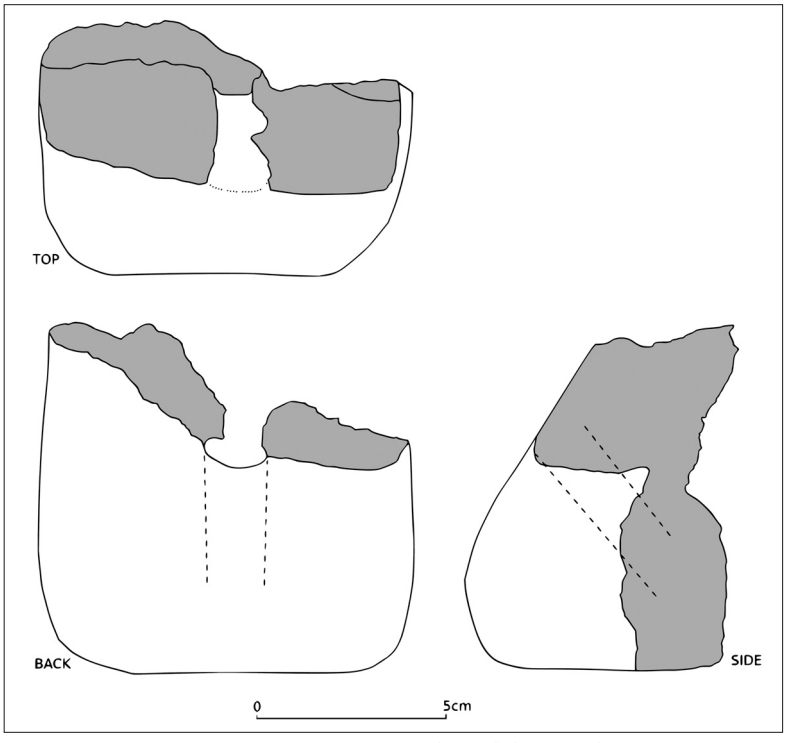
Table IV.3 Industrial remains quantified by object/material type, no of fragments and structure/context

Structure/ Context no	Crucible	Mould	Anvil	Copper slag	Iron slag	Tuyère
Structure 3						
50042		1 frag (cat no 1)			1 frag/12 g	13 frags (Cat no 3)
50049						2 frags?
50059				1 frag/1g	1 frag/122g smithing slag cake	
50102		1 frag?				
50525		1 frag? 3 frags, one for ?pin (Cat no 4)			1 frag/5g?	
50527	1 frag? 1 rim frag	1 ingate frag (Cat no 5), 13 frags (2 joining)				
50547	1 rim frag					
50554			1 item? (Cat no 2)		1 frag/103g smithing slag cake	
50568		1 frag				
Structure 5						
50563		1 ingate frag (Cat no 6)			2 frags/10g smithing slag	
Structure 8						
50564					1 frag/5g smithing slag	

3 Block tuyère; incomplete. Six joining fragments of cream to reddish-brown fired clay comprise slightly more than half of the back surface, part of the base, small proportions of the sides and some of the perforation; none of the front surface remains. Seven additional fragments from the same context appear identical to the tuyère, and there is no doubt that they formed part of it. (50042): south-western arc of Structure 3. A further two fragments probably from the tuyère came from (50049), within the western arc of Structure 3. Illus IV.23.

The loss of the front face makes it uncertain where the perforation would have emerged, but the steep angle makes it possible that it was from the base of the block rather than the front.

4 Ceramic mould for a rod-like object (pin?); incomplete. Very fine clay, outer surface black, bloated and partially vitrified, remainder orange. (50525): primary fill of northern arc of ditch.



Illus IV.23 Block tuyère from Structure 3 ditch fill (50042). (Scale 1/2)

5 Ceramic mould fragment; incomplete. The cylindrical inner surface suggests an ingate (the opening at the top of a mould through which molten metal was poured). Black or dark grey with traces of bloating to orange/buff. (50527): primary fill of northern arc of ditch.

Structure 5

6 Ceramic mould; incomplete. A semi-cylindrical impression is visible on one side, opening to a possible cone; possibly an ingate. The other original surface (probably the exterior) has traces of curved ridges which may represent fingerprints. Mostly black to dark grey but with some patches of orange-buff. Two regions of vitrification are present, but these are visible as apparent inclusions within a fracture surface. (50563): northern arc of ditch.

Discussion

The material examined falls into several categories: crucibles, moulds, copper-casting slag, iron-smithing slag, a tuyère, and a possible anvil. The identification of the crucible fragments is hampered by their small size and degree of vitrification, which often obscures the original form and fabric. All appear to be made from quartz-tempered clay, and it is likely that they were made by hand, not wheel thrown. It is possible that vitrification caused these crucibles to fail; however, it is also possible that they failed (as all crucibles will do eventually) and the fragments remained in a hearth where they continued to be subjected to high temperatures that vitrified them.

The twenty-two ceramic mould fragments have the fine texture characteristic of such materials, usually being tempered with small amounts of fine quartz. Their small size (and especially the paucity of casting surfaces) makes it impossible to identify with certainty whether they were part-moulds or lost-wax moulds. The fragments display the contrasting colours (black-grey reduced sections and orange-buff oxidised areas) that are typical of moulds used to cast copper alloys. However, the distribution of reduced and oxidised areas does not conform to the usual pattern seen on such moulds, which consistently have black (reduced) surfaces close to where the metal was cast, while the outer parts are orange (oxidised); the few casting surfaces preserved in the Poulton material are often oxidised. These fragments also display a degree of firing that is unusual for ceramic moulds, having a hardness that suggests sustained exposure to elevated temperatures (>800°C). Most moulds used to cast copper alloys were not deliberately fired; they would have been briefly exposed to temperatures a little above 1000°C when the molten copper alloy was poured into the mould, but these temperatures were not maintained long enough to significantly fire the clay. Indeed, the poor survival of ceramic moulds in the archaeological record can be linked to their friability (Spratling 1979). A few fragments of the Poulton moulds also display rather hackly fracture surfaces that are more commonly seen in highly fired ceramics. The current state of the Poulton moulds thus suggests that they were exposed to high temperatures after they ceased to be used for their original purpose. Further possible mould fragments were found among the fired clay but could not be identified with certainty.

Block tuyères are relatively rare in Britain (Tylecote 1986, 142–3); most hearths and furnaces were built, and perforations were simply left in the walls at appropriate points during their construction (Historic England 2015b, fig 11), although a few tubular tuyères are known (Tylecote 1986, 142–3). Tim Young reports an incomplete Iron Age block tuyère from Four Crosses in Powys (Young 2017, 26). This was also incomplete, but it had a flat, rectangular base 120mm wide. The top was missing but other fragments suggested a curved upper section. The association with copper ore and slag suggests that it was used to help smelt copper. Another block tuyère is known from the Roman fort at Carpow (Perthshire). This was 100mm square with a 24mm diameter perforation (Tylecote 1986, 142–3; 1999, 569). It was found in a ditch fill with abundant iron slag and so was probably used in iron working (some uncertainty exists over whether this was smelting or smithing). Block tuyères are also known from sites in the Weald, where they appear to have been used in iron smelting. Many of these are distinguished by the presence of two (merging) perforations, suggesting that two bellows were used with each tuyère.

Block tuyères are much more common in France (Orengo *et al* 2000), where the available dating evidence suggests that they were employed from the late Iron Age through the Roman period. Most appear to have been used to assist with iron smithing (the author excavated one in a blacksmith's workshop [CP11bis] from the site of Mont Beuvray; *see* also Chadron-Picault & Pernot 1999, pl 169).

Seven fragments of slag with a combined weight of 257g were almost certainly produced during the smithing of iron. Identifiable forms are consistent with these being smithing slag cakes, while the other fragments are too small to allow for certain identification. Hammerscale was not identified in the assemblage; however, heavy residues from environmental sam-

pling were not available (hammerscale is rarely recovered by hand because of its small size).

Conclusion

The presence of crucibles, moulds and copper slag suggest that copper alloys were melted and cast to shape at Poulton. It is possible that all this debris represents a single episode, although more sustained activity over time cannot be ruled out. The smithing slags show that some ironworking also took place.

The current state of the moulds (and to a lesser extent the crucibles) points to their having been subjected to further heating episodes after their original use. Moulds usually only survive in the archaeological record when they have quickly been dumped into the fill of features; this has notably occurred at Gussage All Saints (Spratling 1979) and Weelsby Avenue (Foster 1995; Sills & Kinsley 1990). In most cases, friable mould debris would have been scattered on the contemporary land surface and quickly reduced to dust. The higher firing of the Poulton moulds has made them significantly more durable than most fragments and in turn probably contributed to their survival. The exact nature and circumstance of the refiring episode(s) that the moulds have been subjected to are not immediately apparent.

Environmental remains

Human remains Carole Davenport

Four fragments of disarticulated human bone were recovered during excavation within Trench 50. It was not possible to provide specific age ranges or sex given the fragments available, and age is therefore given in the broader categories of neonate (before birth), infant (0–3 years), child (3–12 years), adolescent (12–20 years), young adult (20–35 years), middle adult (35–50 years), and mature adult (50+ years), in line with Buikstra and Ubelaker (1994).

Catalogue

1 Cranial fragment from a middle adult; portions of the right parietal and occipital, identified by the presence of the lambdoid suture ectocranially and the directionality of the meningeal grooves on the endocranial surface. (50243): fill of Roman ditch [50130] in the north-east area of Trench 50. As this feature cut through the northern arc of Structure 3, the bone has been interpreted as redeposited from Iron Age contexts.

2 Fragment of adult cranium; most probably parietal, but the absence of a suture to orientate the bone prevents the siding of this fragment. There is no distinction between the cortical and trabecular bone in this fragment, unlike the other cranial bone fragments. This could be due to this bone being older than the others, but without further testing it is not possible to confirm this. (50259): fill of posthole [50258] in south-east arc of Structure 3.

3 Cranial fragment. Given the thickness of the bone, it is likely to be from a younger individual (either child or early adolescent). Depressions on the endocranial surface, along with the coronal suture preserved along one edge, identify the fragment as from

the frontal bone. (50262): upper fill of the Roman ditch [50229] where it truncates the north-west arc of Structure 3.

4 Fragment of unfused humeral head. The head exhibits a y-depression on the interior surface which is usually present in older children and early adolescents. The size of the head, 41.70mm in length by 38.79mm in width, is consistent with those in early adolescence. (50304): fill of Roman ditch [50302] where it truncates the north-west arc of Structure 3.

Discussion

The human bone assemblage represents between two and four individuals. All the cranial fragments are very well preserved, with no taphonomic erosion present. However, the humeral head exhibits marked taphonomic changes (pitting and deep grooves) and some chipping along the edge of the unfused epiphysis. All the fragments demonstrate extensive demineralisation, consistent with a long inhumation period in a slightly acidic environment (Piepenbrink 1989), as observed in some areas of Chapel Field. A separate study by the author has provided pH values in the range of 5.3 (at surface)–7.0 (at a depth of 110cm) for this area of the site, which would be consistent with these findings (Davenport 2017). It should be noted that the fragment from (50259) exhibits a pearlised appearance on the endocranial surface that could be indicative of a longer inhumation period than that seen on the other fragments, but further observations are required to eliminate the effect of potential differences in the burial environment.

Mammal remains Sarah Viner-Daniels

Methods

Analysis of the faunal remains employed a diagnostic zones approach based on the method described by Davis (1992) and Albarella and Davis (1996). Specific parts of selected skeletal elements were chosen because of their value in taxonomic identification, ageing, sexing and biometrical investigations, and the quantified results are presented by NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals). Other specimens of interest, either because of their taxonomic identification or modification, were recorded with a description, but were not included in these quantifications.

Epiphyseal fusion is used to give an idea of relative rather than absolute age, as fusion rate can be affected by a variety of factors such as sex, castration, environmental conditions and nutrition (Reitz & Wing 1999, 75; Davis 1992). Bones have therefore been separated into earliest-, early-, intermediate- and late fusing elements following O'Connor (1988). However, the sequence is complete by the time an animal reaches adulthood and cannot provide any indication of the age after this point. Tooth wear, by contrast, continues throughout the life of an animal (notwithstanding antemortem tooth loss) and can therefore be useful in reconstructing the age of an adult population. Wear stages were attributed following the system established by Grant (1982) for cattle and Payne (1987) for sheep. Determining the state of tooth wear in equids is more difficult than for other common domestic species because of continuous eruption and wear, and so no attempt to accurately attribute age to equid teeth was attempted.

No measurements were taken of burnt or calcined bones because of the likely warping. For those contexts that produced very large amounts of unidentified, burnt or calcined bone the material was weighed.

Condition

The bone was recovered in a moderate state of preservation. However, some specimens were in particularly poor condition and little could be done to gather useable information from them. For instance, a horse tibia from Structure 1 was highly fragmented and held together by adhering soil. It was clear that cleaning would yield no extra information and the surface was therefore just lightly brushed to check for gnawing and cut marks.

Burnt bone

Multiple contexts produced small amounts of heavily burnt bone. Without exception this material was highly fragmented, with some calcined pieces and very few identifiable specimens.

Gnawing

Evidence of gnawing was relatively rare, with twelve specimens from nine contexts exhibiting canid gnawing marks. The infrequent occurrence within the assemblage is an indication that bones were quickly buried after deposition rather than left exposed.

Exposure

In addition to the rarity of gnawing there is little other evidence to suggest that bones were left exposed before deposition. Just a single specimen exhibited the longitudinal cracking and surface degradation associated with exposure to weathering, again suggesting rapid burial after deposition.

Articulation

Multiple specimens were found to articulate, indicating that they came from the same individual. This suggests that bones were deposited without being exposed and were found in primary contexts without any evidence for redeposition.

Species and taxa representation

The assemblage was dominated by the remains of domesticated animals, with cattle being the most numerous, followed by sheep/goat and pig. Small numbers of equid and dog remains were also recovered, as well as small muridae (rodent), deer, cat and hare bones. Based on their size, the equid remains were probably those of domestic horses, and given the secure date of the context, it is likely that the cat remains are from *Felis sylvestris* (wildcat) rather than *Felis catus*, which does not appear frequently in zooarchaeological assemblages until the Roman period. Because of their greater propensity for survival, teeth greatly outnumber postcranial bones. Taxa representation from all Iron Age contexts is shown in Table IV.4.

Cattle

Cattle remains comprise 404 specimens from a minimum of seventeen individuals. Although this is a relatively small collection, some interpretation is possible. The element distri-

Table IV.4 Taxa representation quantified by NISP from all Iron Age contexts

Taxa	Teeth	Bones	*Total*
Bos (cattle)	279	125	404
Ovis/Capra (sheep/goat)	218	61	279
Sus (pig)	144	53	197
Canis familiaris (dog)	14	1	15
Equid (horse family)	36	8	44
Cervus elaphus (red deer)		3	3
Lepus sp (hare)		2	2
Felis sp (cat)		2	2
Total	691	255	946

bution indicates that most parts of the skeleton are represented, with both meat-bearing and non-meat-bearing elements present. This suggests that entire animals were present on the site rather than joints of meat, with cattle being killed and butchered close by and the remains quickly buried.

Twenty-three cattle mandibles were complete enough to provide some information about the age at death. Three mandibles (two of them possibly a pair) come from young calves (about six months), and a further two from animals in their second year (about eighteen months at death). Five jaws come from animals that were youngish adults, possibly at ages when they would have been deliberately culled to provide meat. However, there is also an emphasis on mature adults (three to five animals) and elderly adults (eight to ten animals). The cattle mandibles thus suggest a mixed age population where animals could frequently reach relatively advanced age.

The evidence from epiphyseal fusion supports the results from mandibular wear. No postcranial bones from the earliest fusing category were recorded in an unfused state. However, three specimens (a partial humerus, tibia and metacarpal) were recorded as very young, probably neonatal, based on the development and porosity of the bone. All the neonatal specimens came from Structure 3.

Small numbers of early- (5%) and intermediate- (20%) fusing bones are unfused. However, the largest proportion (56%) of unfused bones come from the late-fusing category, suggesting that a high proportion of animals were killed before reaching maturity. The epiphyseal fusion data thus again suggest a mixed population with some animals surviving well into adulthood.

The biometrical data from the site are limited by sample size, but some comparisons with other assemblages can be made. The cattle from Iron Age contexts at Poulton are comparable in size to those from the late Iron Age sites of Langtoft and Cowbit in Lincolnshire and all fall within the range of measurements published for Elms Farm in Essex (Johnstone & Albarella 2015).

Sheep/goat

Although small, the sheep/goat assemblage contains most parts of the skeleton and gives no indication of a bias towards particular parts of the animal. Postcranial remains were recovered from at least six individual animals, and both meat-bearing and non-meat-bearing elements were recorded.

The sample of postcranial bones that provides fusion information is too small to draw firm conclusions about age at death, but some tentative interpretations can be made. Table IV.5 shows the number of fused/fusing or unfused bones from each fusion category. All the earliest- and early-fusing elements were fused or fusing, while both fused and unfused intermediate- and late-fusing elements were recorded. This suggests that only parts of the sheep population were brought to the site. However, the presence of a very young/neonate radius from Structure 1A indicates that some very young sheep/goats were present.

Table IV.5 NISP of each fusion category for sheep bones from all Iron Age contexts

Earliest		*Early*		*Intermediate*		*Late*	
Unfused	Fused	Unfused	Fused	Unfused	Fused	Unfused	Fused
0	5	0	15	4	7	3	7

Sixteen mandibles are complete enough to provide ageing information, suggesting a higher number of individuals than the estimate from postcranial remains. Both juvenile and adult are present, as attested by mandibles with immature and mature dentition. However, no extremes of age are represented. In contrast, some fifty-seven loose third molars, and twelve deciduous premolars indicate that the age of the population was more diverse than the mandibular wear would suggest.

Pig

Again, although the collection is a relatively small one, all parts of the animal are present and both meat-bearing and non-meat-bearing bones are represented. Pigs were thus most likely to have been brought to the site whole rather than jointed.

The small collection of postcranial bones suggests the presence of a mixed population with both adult and young animals. However, none of the earliest-fusing category of bones were found in an unfused state, suggesting that very young animals were perhaps absent from the site. This absence is supported by the evidence from mandibular wear. Twelve pig mandibles were complete enough to provide ageing information. Juvenile, immature, sub-adult and adults were identified, but very young and very old animals were absent. Both female and male pigs were present, as evidenced by the presence of nine female and eight male canine teeth and alveoli.

Horse

Forty-four horse specimens were recorded from several contexts. These were overwhelmingly teeth, with just eight postcranial specimens present. One of the specimens, a tibia, had cut marks indicating butchery. All the postcranial bones were fused and therefore from adult animals.

Dog

Dog remains were recovered from within the northern arc of Structure 3. Although heavily fragmented, they were probably from one individual. The remains consist of a fragmented left and right mandible, at least ten fragmented vertebrae (including atlas and axis), and portions of maxilla. The remains are consistent with *Canis familiaris*, with no evidence of modification by humans.

Modification

Apart from the heavy burning evidenced by the large amount of calcined and charred material, modification by humans was recorded relatively infrequently. Thirty-four postcranial specimens were recorded as having cut- or chop marks. These were primarily found on cattle bones (twenty-one specimens), perhaps unsurprisingly given the dominance of this species within the assemblage. Frequently these marks were found on the lower leg bones, specifically the astragali, calcanea and metapodials. This is consistent with removal of the feet in primary butchery or for removal of the hide. Cut marks were also found on pig, equid and sheep bones.

Within the assemblage, eighteen burnt, calcined or singed specimens were identified. This includes a *Cervus elaphus* (red deer) metatarsal from an immature animal. Eight cattle specimens (metatarsals and tibiae) as well as a red deer metatarsal had been burnt and broken on the mid-shaft section. Such a pattern is indicative of bone marrow extraction.

Variation by feature type

The material came from a variety of features (including Structures 1, 2, 3, 5, 6, 7, 8 and 10) as well as a number of pits and postholes (Table IV.6). The frequency of material found in each roundhouse varied greatly, with sixty-five percent of the total assemblage coming from Structure 3. Structure 10 produced only three loose pig teeth, one cattle tooth and one sheep/goat tooth and is not included in the table.

Conclusions

The Iron Age faunal remains from Poulton are an important addition to the zooarchaeological assemblage from the north-west of England, an area that is traditionally under-represented. The analysis indicates a mixed domestic economy, based on cattle and sheep/goat with pigs in smaller numbers. The cattle population was represented by animals of all ages. Very young animals were utilised, but it was possible for some to reach advanced age. Unfortunately, the assemblage is not large enough to make secure interpretations about the husbandry system in use, but it does not preclude the use of cattle for meat and secondary purposes (eg dairy and traction). The cattle are of a size comparable with other animals of the period in Britain.

Similarly, the spread of sheep/goat ages suggests that both young and adult animals were utilised. Very elderly animals were absent, perhaps suggesting slaughter before reaching advanced age. The small size of the sheep/goat collection makes a detailed interpretation of the husbandry system impossible. However, the evidence allows for the use of sheep/goats for both meat and secondary products (dairy and wool production).

Table IV.6 Taxa representation quantified by NISP and structure

	Structure 1A		Structure 2		Structure 3		Structure 5		Structure 7		Structure 8	
Taxa	Teeth	Bones	Teeth	Bones	Teeth	Bones	Teeth	Bones	Teeth	Bones	Teeth	Bones
Bos (cattle)	45		13	13	196	86	7	9	3	2	8	13
Ovis/ Capra (sheep/ goat)	6	5	27	10	136	38	16	4	9		15	2
Sus (pig)	38		7	3	71	40	5	8	3		14	2
Canis familiaris (dog)			1		13	1						
Equid (horse family)	4				29	6		1				
Felis sp (cat)						2						
Cervus elaphus (red deer)				1		2						
Lepus sp (hare)						2						
Total	93	5	48	27	445	177	28	22	15	2	37	17

Amongst the pig remains the data for age at death suggests a restricted population, with no extremes of age. The absence of both very young and very old animals is consistent with the use of pigs for meat, with animals slaughtered as they reached adulthood (ie the point at which their slaughter is most economical in terms of resources invested and meat yield returned). However, it is uncommon to find such a lack of very young animals. If animals were being raised close by, the remains of young examples would be expected because of normal neonatal and infant mortality. Therefore, it is likely that pigs were raised elsewhere and brought to the site at or before slaughter. The differential preservation of very young animals can be discounted as an explanation for the observed pattern since examples from other taxa have been found.

All parts of the carcass of the three main domesticates are represented, suggesting that animals were brought to the site whole without having been jointed. Thus, it is likely that animals were slaughtered nearby, and in the case of cattle and sheep they were probably reared adjacent to the site.

Horses were present in small numbers and the remains have indications of butchery, meaning they may have been an occasional addition to the diet. Dogs were also present, although not in large numbers. Their presence is also supported by the small number of animal bones that exhibit canid gnawing marks. Wild animals do not appear to have been used frequently. Red deer, hare and cat (probably wildcat as the record suggests domestic cats were imported to Britain during the Roman period (Robinson 1984)) occur, but not in great numbers.

Dog burial Matteo Bormetti

The burial of a dog was located within a small pit, [50288], in Structure 3. The bones were highly fragmented and partially disintegrated upon lifting. Analysis of all the retrieved fragments was carried out at the Zooarchaeology Laboratory of the University of Sheffield, utilising its reference collection.

Most specimens comprised fragments of cortical bone measuring less than 20mm on any axis. The skull, mandibles and front limbs were sufficiently preserved for anatomical identification. Several teeth, usually preserved without their roots, were identified as domestic and are consistent with the fully developed (one lower third molar is present) incomplete permanent dentition of a single individual.

Of the postcranial bones, a humerus proximal epiphysis was in the final stages of fusing with the shaft, placing the age of the animal at between twelve and fifteen months according to Barone (1976, 53), or between twelve and eighteen months in combination with the fully developed but unworn dentition (Habermehl 1961). From an autoptic assessment, the size appears to be relatively small for an Iron Age dog. None of the preserved bones showed gnawing or butchery marks, so it does not appear that the animal was eaten or its remains left in the open before burial. Some caution in this interpretation is needed, however, because of the poor preservation of the bones.

Fish remains Hannah Russ

A single fish vertebra was recovered during floatation of a bulk sample taken from fill (50661) in the ditch of Structure 10, with associated charcoal providing an AMS radiocarbon date for this context of 731–398 cal BC (95.4%) (SUERC-73581 (GU44034)). The vertebra represents a small flatfish (pleuronectiforme) specimen from the tail portion (caudal vertebra). In this case it is consistent with the righteye flounder family (pleuronectidae) and most likely represents European plaice (*Pleuronectes platessa*), common dab (*Limanda limanda*) or common flounder (*Platichthys flesus*). Unfortunately, these taxa exhibit little variation in vertebral morphology, and it is not possible to distinguish between them (Wouters *et al* 2007).

Righteye flounders are generally oceanodromous but are known to enter brackish environments (Riede 2004) and even freshwater at times (Kottelat & Freyhof 1972), as they are demersal (Muus & Nielsen 1999), following the seafloor and sometimes entering estuaries and rivers. Large individuals are more common in deep waters; the small size of the individual recovered might suggest that it was caught in shallow marine or brackish waters (Frimodt 1995).

One might expect the fish remains on the site to represent the taxa present in the River Dee. While righteye flounders have been recorded entering freshwater environments, it is unlikely that they would travel so far up the river and so in this case probably arrived as a result of human activity. Drawing conclusions from such limited evidence always presents a risk of mis- or over-interpretation. If one accepts that this fish bone results from human activity, its presence at Poulton indicates fishing activity taking place during the Iron Age. Records of Iron Age fishing activities in the United Kingdom, outside of northern Scotland and its

associated islands, are rare, so much so that fish avoidance has been hypothesised for Britain during the period (Dobney & Ervynck 2007). The fish bone from Poulton therefore probably represents a rarely observed need or desire for fish as a dietary resource during the Iron Age – one that warranted either exploitation at distance or trade between inland and more coastal communities.

Coprolites Kevin Cootes

Coprolitic material was recovered from two Iron Age contexts. A single dog coprolite was retrieved from Structure 2, (50048). The remaining examples were fragmentary and recovered from Structure 3, (50563). The material was identified using descriptions in Lawson (2000, 60). Visual analysis of these fragments with a x20 hand lens revealed the presence of a significant quantity of bone, indicating they were the product of a carnivore, quite possibly a dog.

The Poulton coprolitic material forms the sole examples from Iron Age Cheshire. In comparison, carnivore coprolites have been recovered from late prehistoric middens across other parts of the British Isles, with Potterne in north-west Wiltshire forming the classic site for this material. In this case midden deposits accumulated over the course of *c* 500 years throughout the late Bronze Age and early Iron Age. Human and dog coprolites were identified and analysed chemically, revealing a cereal-rich, omnivorous diet (Lawson 2000). The dog coprolites revealed that they primarily scavenged amongst the domestic waste for food (Scaife 2000).

The Poulton coprolite assemblage is thus small but could benefit from chemical and macrofossil analysis to provide dietary information.

Charred plant remains Charlotte O'Brien and Lorne Elliott

This report presents the results of the palaeoenvironmental assessment of bulk samples from the ditches surrounding the six roundhouses, the gullies Structures 6 and 7, and the dog burial. A combined total of 479.1 litres was processed from eighteen contexts, with the results presented in Table IV.7.

Methods

The bulk samples were manually floated and sieved through a 500μm mesh. The residues were examined for shells, fruit stones, nutshells, charcoal, small bones, pottery, flint, glass, and industrial residues, and were scanned using a magnet for ferrous fragments. The flots were examined at x60 magnification for charred and waterlogged botanical remains using a Leica MZ7.5 stereomicroscope. Identification was undertaken by comparison with modern reference material held in the Palaeoenvironmental Laboratory at Archaeological Services, Durham University. Plant nomenclature follows Stace (2010). Habitat classifications follow Preston *et al* (2002).

Selected charcoal fragments were identified to provide material suitable for radiocarbon dating. The transverse, radial and tangential sections were examined at up to x600 magnification using a Leica DMLM microscope. Identifications were assisted by the descriptions of Hather (2000), Schweingruber (1990) and modern reference material held in the laboratory.

Results

The results are presented in Tables IV.7a–d. The majority of deposits contained varying quantities of fired clay, pottery, burnt, unburnt and calcined bone and animal tooth fragments. Cattle, pig and sheep/goat were represented in the bone fragments, with a canine tooth root recovered from the fill of the dog burial (50289). A single fish vertebra was present in (50661) from Structure 10. Heat-affected stones occurred in Structures 3, 5, 6, 8, and 10, but were especially common in (50207), (50544) and (50563) of Structure 3.

Varying quantities of charcoal were present in all bulk samples, with the largest volumes recorded from Structure 3 (50207), (50210), (50544) and (50563), Structure 7 (50601), and Structure 8 (50654). Small fragments of charcoal (5mm or less) were predominant. The condition of the charcoal varied from firm and slightly vitrified to soft and friable, often containing abundant mineral inclusions. Fragments of vesicular clinker/cinder and fuel ash were common in deposit (50544) from Structure 3. A small proportion of the charcoal from this deposit was distorted and twisted, possibly due to high temperatures. The glossy cinder material noted in (50544) is an uncommon occurrence and may reflect rapid cooling by adding water. The large quantity of fire-cracked stones is presumably a result of the same process.

The assemblage indicated the use of stemwood, branchwood, and twigs, with radial cracks and slight vitrification recorded in some fragments, occurring frequently in Structure 3, (50570). Identified charcoal indicates a similar range of species across the structures, comprising frequent evidence for Maloideae (hawthorn, apple, whitebeams or rowan), ash and oak. Occasionally alder, birch, cherry species (among which blackthorn was positively identified), hazel and Salicaceae (willow or poplar) were recorded. The exception to this was (50570), which predominantly contained the remains of fruit trees (cherries and apple/hawthorn). Insect degradation was frequently noted in hazel, but also occasionally in oak and alder fragments.

Charred plant macrofossils were present in low concentrations across the site, identified in multiple ditches, but (50654) of Structure 8 produced the highest number, possibly as a result of the large volume of sediment processed. The cereal remains were spelt wheat chaff, spelt-type wheat grains and barley grains. Poorly preserved barley grains were recorded in (50289) (dog burial), (50124) and (50563) (Structure 3) and (50654) (Structure 8). A single barley rachis fragment was present but was too damaged to confirm whether six-row or two-row barley was in use. Spelt wheat was present in contexts from Structures 3 and 8, with (50124) producing a fragment of spelt wheat chaff. A possible emmer wheat glume base was also noted in (50654). The single oat grain in (50601) (Structure 7) may be from wild oats.

Weed seeds of bromes, pale persicaria, redshank, grasses, docks and vetches were occasionally present. Hazel nutshells were recorded frequently in low numbers in Structures 3, 5 and 10, but were very common in (50124) of Structure 3.

Discussion

Evidence for domestic activity occurred in all contexts, with the small fragment size and species diversity of the charcoal being typical of fuel debris from hearths. The burnt food

Table IV.7a Material from environmental samples from Trench 50, Structures 2–5 (excl charred plant remains) (+) trace; + rare; ++ occasional; +++ common; ++++ abundant.

Structure	S 2	S 3	S 3	S 3	S 3	S 3	S 3	S 3	S 5	S 5
Context	50580	50124	50147	50207	50210	50544= 50563	50563= 50544	50570	50511	50816
Vol processed (l)	6	7	0.1	20	19	80	75	10	10	12
Vol of flot (ml)	50	90	5	160	60	550	150	60	20	8
Residue contents										
Bone (burnt)				+		(+)	+			
Bone (unburnt)	++	+		++	++	+++	++	+	+	+
Bone (calcined)	+	++		+	(+)	+	+	(+)		(+)
Bone (unburnt) fish										
Charcoal	+			+	+	++	+++	+	+	
Fired clay		+		+	(+)	+	(+)			
Heat-affected stones		++		+++	+	+++	++			+
Metal object (corroded)										
Pottery (no frags)		3				1	4			
Quartz pebble										
Semi-vitrified fuel waste				(+)	(+)					
Tooth (animal)	4	1		3	3	2	6		1	
Flot matrix										
Charcoal	++	+++	+	+++	++	+++	++	++	++	(+)
Clinker/cinder		+		+		+++	+			
Coal				(+)	(+)					
Fuel ash						+				
Roots (modern)	++	+				++	++	++		(+)
Uncharred seeds										(+)

waste (animal bone, cereal remains and nutshell) demonstrates that a range of cultivated and occasionally wild-gathered plant resources were being utilised in combination with domesticated animals. The burnt waste was then disposed of in the ditches. The presence of a fish bone in Structure 10, (50661), is notably rare in domestic contexts on Iron Age sites.

The charcoal analysis indicated that the local woodland was dominated by ash, oak and Maloideae species. Birch, cherry species (including blackthorn) and hazel comprised lesser components of the mixed woodland, with alder and Salicaceae possibly favouring the damp floodplain conditions.

Most of the identified charcoal was branchwood. The identification of blackthorn charcoal comprising pith and bark with two annual growth rings indicates the collection of twigs that may have been used for kindling. A fragment of Maloideae charcoal comprising approxi-

Table IV.7b Charred plant remains from Trench 50, Structures 2–5
a arable; c cultivated; r ruderal; t tree/shrub; x wide niche.

Structure	S 2	S 3	S 3	S 3	S 3	S 3	S 3	S 3	S 5	S 5
Context	50580	50124	50147	50207	50210	50544= 50563	50563= 50544	50570	50511	50816
Vol processed (l)	6	7	0.1	20	19	80	75	10	10	12
Vol of flot (ml)	50	90	5	160	60	550	150	60	20	8
Charred remains (total count)										
(a) *Bromus* sp (bromes) caryopsis										
(c) *Avena* sp (oat species) grain										
(c) Cerealia indet grain				4						
(c) *Hordeum* sp (barley species) grain		1					1			
(c) *Hordeum* sp (barley species) rachis frag										
(c) *Triticum spelta* (spelt wheat) glume base		1								
(c) *Triticum spelta* (spelt wheat) spikelet fork					2					
(c) *Triticum cf spelta* (*cf* spelt wheat) grain				1						
(c) *Triticum cf dicoccum* (*cf* emmer wheat) glume base										
(c) *Triticum* sp (wheat species) grain										
(c) *Triticum* sp (wheat species) spikelet fork										
(r) *Persicaria lapathifolia* (pale persicaria) nutlet										
(r) *Persicaria maculosa* (redshank) nutlet				2						
(t) *Corylus avellana* (hazel) nutshell frag		42		2				1		1

Structure	S 2	S 3	S 3	S 3	S 3	S 3	S 3	S 3	S 5	S 5
Context	50580	50124	50147	50207	50210	50544= 50563	50563= 50544	50570	50511	50816
Vol processed (l)	6	7	0.1	20	19	80	75	10	10	12
Vol of flot (ml)	50	90	5	160	60	550	150	60	20	8
(x) Poaceae undiff (grass family) >1mm caryopsis		1								
(x) *Rumex* sp (docks) nutlet										
(x) *Vicia* sp (vetches) seed				✓						
Alnus glutinosa (alder)				✓					✓	
Betula sp (birches)						✓	✓			
Corylus avellana (hazel)	✓				✓	✓	✓		✓	
Corylus / *Alnus* (hazel/alder)										
Fraxinus excelsior (ash)	✓			✓		✓	✓		✓	✓
Maloideae (hawthorn, apple, whitebeams)	✓		✓		✓	✓	✓	✓	✓	
Prunus spinosa (blackthorn)		✓								
Prunus sp (cherries, blackthorn, wild and bird cherry)	✓		✓	✓						
Quercus sp (oaks)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Salicaceae (willow, poplar)							✓		✓	

mately thirty narrow growth rings was further recovered from Structure 3, possibly reflecting poor conditions for growth such as adverse climate, dense woodland or poor soil conditions.

The diversity of the tree and shrub species in the charcoal assemblages reflects the random exploitation of the local woodland for fuel use. This provides an indication of landscape clearance in the local area during the Iron Age. Insect degradation in some of the charcoal fragments is characteristic of either the long-term storage of firewood or the collection of deadwood from the woodland floor.

The results indicate the cultivation of spelt wheat and barley. While barley dates from the Neolithic period to the present, spelt wheat first appears in England during the middle to late Bronze Age and is more commonly associated with Iron Age and Romano-British sites (Greig 1991; Hall & Huntley 2007). One of the chaff fragments in Structure 8, (50654),

Table IV.7c Material from environmental samples from Trench 50, Structures 6–10 and dog burial (excl charred plant remains) (+) trace; + rare; ++ occasional; +++ common; ++++ abundant.

Structure	S6 6	S 7	S 7	S 8	S 8	S 9	S 10	Dog burial
Context	50657	50397	50601	50654	50809	50583	50661	50289
Vol processed (l)	9	42	2	100	20	6	60	1
Vol of flot (ml)	30	130	20	450	25	20	50	1
Residue contents								
Bone (burnt)				+				
Bone (unburnt)	+	++	+	+++	++	(+)	++	(+)
Bone (calcined)	(+)	(+)	(+)	+	(+)		+	
Bone (unburnt) fish							(+)	
Charcoal			(+)	++			(+)	
Fired clay	(+)	+	+	+	+			+
Heat-affected stones	+	+++	+	+++	++	+	+	
Metal object (corroded)				1				
Pottery (no frags)				4				
Quartz pebble				1				
Semivitrified fuel waste				+				
Tooth (animal)				8	1			2
Flot matrix								
Charcoal	+	++	++	+++	+	+	+	(+)
Clinker/cinder			+	+				
Coal	+	(+)		(+)				
Fuel ash								
Roots (modern)	+	+	(+)		(+)	+	++	
Uncharred seeds			+					(+)

resembled emmer wheat, although the identification is uncertain; if present, it was only a minor component growing amongst the other crops.

The small weed flora is dominated by weeds of cultivation. Brome grass is frequently associated with spelt wheat cultivation (Godwin 1975), and its large seeds can be difficult to remove from the cereal crop during winnowing or sieving. Redshank favours nutrient-enriched soils (Preston *et al* 2002), which may indicate that the crops were manured in arable fields or alternatively grown on the floodplain below Chapel Field.

Charred fragments of hazel nutshell indicate that wild-gathered foods were utilised, and because of the local conditions at the site the preservation of many of the charred plant remains (particularly the nutshell) was very good.

Table IV.7d Charred plant remains from Trench 50, Structures 6–10 and dog burial
a arable; c cultivated; r ruderal; t tree/shrub; x wide niche.

Structure	S 6	S 7	S 7	S 8	S 8	S 9	S 10	Dog burial
Context	50657	50397	50601	50654	50809	50583	50661	50289
Vol processed (l)	9	42	2	100	20	6	60	1
Vol of flot (ml)	30	130	20	450	25	20	50	1
Charred remains (total count)								
(a) *Bromus* sp (bromes) caryopsis				3				
(c) *Avena* sp (oat species) grain			1					
(c) Cerealia indet grain				7	1			
(c) *Hordeum* sp (barley species) grain				3				1
(c) *Hordeum* sp (barley species) rachis frag				1				
(c) *Triticum spelta* (spelt wheat) glume base				6				
(c) *Triticum spelta* (spelt wheat) spikelet fork				1				
(c) *Triticum cf spelta (cf* spelt wheat) grain				3				
(c) *Triticum cf dicoccum (cf* emmer wheat) glume base				1				
(c) *Triticum* sp (wheat species) grain				10				
(c) *Triticum* sp (wheat species) spikelet fork				1				
(r) *Persicaria lapathifolia* (pale persicaria) nutlet								1
(r) *Persicaria maculosa* (redshank) nutlet	1			2				

Structure	S 6	S 7	S 7	S 8	S 8	S 9	S 10	Dog burial
Context	50657	50397	50601	50654	50809	50583	50661	50289
Vol processed (l)	9	42	2	100	20	6	60	1
Vol of flot (ml)	30	130	20	450	25	20	50	1
(t) *Corylus avellana* (hazel) nutshell frag	1			8			1	
(x) Poaceae undiff (grass family) >1mm caryopsis				3				
(x) *Rumex* sp (docks) nutlet								
(x) *Vicia* sp (vetches) seed				1				
Alnus glutinosa (alder)								
Betula sp (birches)								
Corylus avellana (hazel)				✓				
Corylus / *Alnus* (hazel/alder)		✓						
Fraxinus excelsior (ash)	✓			✓		✓	✓	✓
Maloideae (hawthorn, apple, whitebeams)	✓	✓	✓	✓				
Prunus spinosa (blackthorn)		✓	✓	✓				
Prunus sp (cherries, blackthorn, wild and bird cherry)					✓			
Quercus sp (oaks)	✓	✓		✓	✓	✓	✓	✓
Salicaceae (willow, poplar)								

The consistency of results across the eight structures is notable and may indicate a long-term landscape strategy. This trend is exemplified in the case of Structure 5, where ten litres from (50511) produced a similar range of species diversity to (50563) from Structure 3, where 155 litres were taken.

The assessment has shown that the site offers the opportunity to address some of the key priorities cited in the regional archaeological research framework, concerning the nature of subsistence economies and exploitation of resources during the Iron Age.

Palaeoenvironmental information for the prehistoric period is extremely limited in the North-West and few analyses of stratified material derived from excavations have been undertaken in the region. This is particularly true of charcoal studies (Hodgson & Brennand 2007; Huntley 2010), with the exception of the investigation of the Cheshire hillforts (Carrott *et al* 2016) and the sampling of Iron Age settlement remains beneath the seating bank of Chester amphitheatre (Pelling 2018). It should also be noted that the preservation of the charred plant remains indicates that other features at the site have the potential to supplement the current state of knowledge regarding the exploitation of fuel resources, diet and crop husbandry practices.

Discussion Kevin Cootes

Chronology

The excavations have produced extensive evidence for late prehistoric settlement activity. Vertical stratigraphy survived in the form of curvilinear ditches, gullies, pits, multiple postholes and a beam slot. The intercutting nature of the structural remains and the radiocarbon dating programme have revealed that the site was occupied throughout the Iron Age, with intense activity during the last three centuries BC. There was a single example of probable demolition and rebuilding on the same location, represented by Structures 1A and 1. In contrast, the remaining roundhouses appear to bear little reference to their predecessors.

The primary practical reason for the location of this long-term settlement (which continued into and throughout the Roman period and became archaeologically visible again in the late Saxon period) was surely its topographical position. The site is situated adjacent to the River Dee on a plateau that overlooks the floodplain. The Iron Age inhabitants would have had ready access to fresh water, raw materials, riverine trade routes, and a gentle slope for beaching boats. The contrasting geologies would have further proved ideal for the pursuit of a mixed farming economy, providing grasslands for fodder and settlement, with nutrient-rich soils for crop growth on the floodplain below. These factors may well provide a key to unlocking lowland Iron Age settlement elsewhere in north-west England.

At present, the only other comparable lowland site in Cheshire is Brook House Farm, Bruen Stapleford, where several elements of the settlement parallel those at Chapel Field. The site occupied a plateau of high ground gently sloping to the River Gowy, with long-term settlement attested by six roundhouses spanning the middle Bronze Age through to the late Iron Age/early Roman period. However, it lacks the density of occupation and favourable conditions for preservation seen at Poulton.

Structures

The substantial curvilinear ditches have so far been assumed to enclose roundhouses. However, this assumption needs to be examined. Structures 1A and 1 consisted of rings of postholes, in the case of Structure 1 surrounded by an eavesdrop gully 0.37m–0.6m deep. The gap in the ditch of Structure 3 was marked by postholes that are plausibly interpreted as being for gateposts, while another two stone-filled pits may have been for a door; however, the line of the latter was not continued by a ring of posts. No postholes suggestive of wall lines were associated with the other structures.

A summary of Iron Age roundhouse construction methods in the area has recently been published by Garner (2018, 65). Two post-built roundhouses were found at Irby (Philpott & Adams 2010, 20–1, Structures 32 and 33) and one at Beeston Castle (Ellis ed 1993, 36–7, Building 6). At Brook House farm, Bruen Stapleford, Structures 1 and 5 were marked by curvilinear gullies 0.23–0.45m wide by 0.15–0.5m deep; there were no rings of posts (Fairburn *et al* 2002). Likewise, the roundhouse on the site of the Chester amphitheatre was attested by a single curvilinear gully 0.32m wide by 0.15m deep. More recently, at Puddington Lane, Burton, two successive roundhouses were attested by single gullies 0.3–1.0m wide by 0.05–0.5m deep (Gregory & Adams 2019, 9–10). These gullies are considered to be examples of the 'ring-groove' construction type and to have served as bedding trenches for the outer walls. In terms of dimensions, the ditches of Structures 2, 5, and 8–10 (as well as of Structure 3) at Poulton were rather larger, at 0.6–1.9m wide by 0.45–0.93m deep (the ditch of Structure 9 was unusually shallow at only 0.35m). They could have held wall posts, but the fact that their backfill comprised multiple layers, often with domestic rubbish above initial silting, argues in favour of their having been eavesdrips/boundary ditches; if they had held wall posts one would expect the backfilling to have been a single event attested by more uniformity. The absence of any signs of walls could be explained by truncation or a surfaced-based method of construction, eg cob walling. The internal diameter of the ditches at Poulton was remarkably consistent, in the region of 13–14m. Bruen Stapleford Structure 1 was 12.5m in diameter and the roundhouses at Puddington Lane, Burton *c* 13m; the other examples cited did not exceed 8m.

Elements of the structural archaeology at Poulton find parallels with Iron Age settlements on a national basis, for instance regarding entrance orientation. The classic model that roundhouses were constructed with entrances facing south-east towards the sunrise (Parker Pearson & Richards 1994, 47–54) is consistent with Structure 1. The overall national distribution, however, is more complicated, varying within the south-south-east to north-east range, as found in Structures 2 and 3. A small number have been noted as facing north (Parker Pearson *et al* 2001, 127), as in Structure 8. The double postholes found within Structure 3 at Poulton are a common occurrence elsewhere, for example at Gravelly Guy, Oxfordshire, where they were interpreted as supports for an upper floor, storage or internal partitions (Lambrick & Allen 2004, 135–6).

Agriculture and cooking

The population at Poulton practised a mixed farming strategy, based on crop rearing and animal husbandry. Spelt wheat, barley, and possibly emmer wheat were cultivated. Various weeds of cultivation were identified, with redshank indicating manuring or growth on the nutrient-rich floodplain. Diet was supplemented by wild-gathered foods of hazelnut and oats.

The limited (but growing) number of excavated settlements in lowland north-west England complements the data from Chapel Field, indicating that a mixed farming strategy with domestic animals and cultivated cereal crops was the norm, supplemented through the collection of wild-gathered foods. The analyses of charred plant remains at Bruen Stapleford (Carruthers 2002), Beeston Castle (Jones & Moss 1993, 80), Chester amphitheatre (Pelling 2018), and Irby (Huntley 2010) comprise the primary examples.

Cattle and sheep/goat formed the primary species utilised for meat and secondary products, with a full range of ages represented, suggesting that they were reared near the site. In contrast, the absence of neonate pig bones is characteristic of animals brought to the area for slaughter. The representation of meat- and non-meat-bearing carcass parts with multiple bone articulation provides evidence for on-site slaughter and butchery, as well as possible communal meals (within Structure 3), followed by rapid burial. Deer, horse, dog, hare and wildcat were represented in lower numbers, with the first two showing evidence of butchery. The presence of dog coprolites and gnaw marks on bone was also attested. The recovery of a single flatfish vertebra from Structure 10 indicates that riverine foods may have comprised a minor element of the early Iron Age diet. Naturally shed red- and roe deer antler was used to make a range of items such as toggles and handles.

The domination of the faunal assemblage by domesticates such as cattle, sheep, pig, horse and dog is consistent with patterns across Britain. Within these species, cattle and sheep were most commonly eaten. The majority of large assemblages, however, occur in central southern England: the Wessex chalklands and Thames Valley gravels. Danebury provides the largest single collection, with nearly a quarter of a million individual bones (Maltby 1996, 17–20). In contrast, many assemblages consist of less than 1000 fragments, with larger collections in western England, the east Midlands and East Anglia being scarce (*ibid*, 20–4). Poulton therefore adds a complementary and so far regionally unique assemblage to the national picture. Perhaps the most enigmatic component, however, comprises the fish bone recovered from Structure 10. Nationally, such remains are so rare during the Iron Age outside northern Scotland that intentional avoidance has been hypothesised. This example is unlikely to have been brought to Poulton by non-anthropogenic processes, but without the identification of further examples little more can be stated.

The surrounding woodland was randomly exploited for fuel, with insect degradation indicating the collection of deadwood. Analysis revealed a diverse range of species, with Maloideae (hawthorn, apple, whitebeams or rowan), ash and oak being dominant. Alder, birch, cherry species (blackthorn positively identified), hazel and Salicaceae (willow or poplar) were represented in lower numbers.

Several thousand heat-affected stones indicated that the boiling of water was an important activity, probably for cooking. Additionally, the presence of nearly 10kg of VCP attests to the long-term use of imported salt, possibly for use in meat preservation.

Artefacts, manufacture and exchange

Industrial activity in the form of iron smithing and copper alloy casting/smelting was attested by the presence of ceramic and stone moulds, crucibles, waste, a partial block tuyère and an anvil. Copper alloy pins were cast on site, whilst a jet ring provides a glimpse of personal adornment.

The evidence of metalworking is significant in the regional context, but the discovery of the block tuyère is particularly rare for Iron Age Britain. One of the few comparable finds comes from only *c* 45km from Poulton, at Four Crosses in Powys. The clay fabric of the Poulton example is consistent with the local geology, suggesting that the technology was

widely known and that the item was made locally rather than imported; more examples may await recovery in the North-West.

The presence of large quantities of VCP demonstrates an established trading relationship with the inland salt industry of the Middlewich/Nantwich area, *c* 30km from the site.

Ritual and status

The recovery of fragmentary human bone provides tentative evidence for the differential treatment of such remains. The three vertebrae from a neonate associated with Structure 1 may indicate a formal burial, whilst an adult cranial fragment within a posthole may represent accidental incorporation or a token offering. Other examples appear to have been redeposited in Roman times, possibly from Iron Age structural or domestic contexts.

The presence of fragmentary human bones discarded within domestic refuse can be paralleled with examples from hillforts and settlements across southern England, Yorkshire and Wales (Davis 2017, 61–2; Lambrick & Allen 2004, 221). Such practices have traditionally been interpreted as evidence for excarnation followed by deposition of the remains in the 'Pit Ritual Tradition' (Harding 2016, 95).

The ritual disposal of dogs, as possibly in the central pit and in the northern arc of the ditch of Structure 3, is an established Iron Age practice within central and southern England (Lambrick & Allen 2004, 221–38; Wait 1985, 51–82). Their close relationship with humans as guards and hunting partners appears to have been manifest in their 'special' treatment as sacrificial deposits (Grant 1984, 221–7; Hill 1995, 11–17; Harding 2016, 242; Smith 2006, 1–3; Wait 1985, 51). Direct parallels occur at Gravelly Guy, Oxfordshire, where complete and partial animals were placed in pits (Lambrick & Allen 2004, 117, 155). A further example is found at Danebury, where dogs were deposited in reused storage pits and mixed with those of other animals in domestic refuse (Cunliffe 1992, 74–5).

Similarly, the deposition of a complete iron adze, again in the northern arc of the ditch of Structure 3, is part of a common practice nationally. At Danebury single iron objects recovered from storage pits were interpreted as 'special' deposits (Hingley 2006, 218–31). In the middle Iron Age settlement at South Shields, Tyne and Wear, iron items (including an intentionally broken adze) were placed in pits near a roundhouse entrance (Hodgson *et al* 2001, 101).

Close examination of Structure 3 suggests a special significance for this building. The dog burials and deposition of the adze have been mentioned above. With the exception of Structure 10, the encircling ditch was the deepest of all those excavated, and it was the only roundhouse to exhibit postholes for a gate between the ditch terminals and stone-filled pits for a door to the building itself. The finds assemblage accounted for approximately fifty percent of the site total, with several aspects consistent with the remains of a celebration: over two-thirds of cattle bones from the site – meat-bearing and non-meat bearing – came from its ditch. Other finds such as the large volume of VCP and presence of many of the antler items, industrial waste, anvil, dress pin and jet ring support the interpretation that Structure 3 was a focus for 'special' activity within the settlement. The combined evidence

could therefore be taken as the signature of a large communal feast, in which valuable items and favoured animals were ritually deposited to mark a specific event, possibly for the closing of the roundhouse (Stokes 2000).

Poulton in its regional and national context

The Iron Age structural features and material assemblage in Chapel Field are exceptional in diversity and quantity for lowland north-west England, and their interpretation therefore has significant ramifications on a regional and national level. The extent and overall character of the settlement have not yet been established, so parallels must take this into account, but a great deal can already be stated about the settlement and its population.

At its basic level, the location fits well within the expanding dataset of known Iron Age/Romano-British sites in rural Cheshire, supporting Collens' (1998, 39) model that late prehistoric habitation tends to be located on gently sloping ground overlooking streams and along river valleys. Several excavations over the past twenty years conform to this hypothesis: for instance, at Chester amphitheatre (Garner 2018, 68–71), Bruen Stapleford (Fairburn *et al* 2002), Brook House Farm, Halewood, Merseyside (Cowell 2000) and Great Woolden Hall Farm, on the Cheshire/Salford border (Nevell 1998, 48).

The variety and abundance of the material assemblage from Chapel Field could indicate that the residents of Poulton were relatively high-status. Kinory (2012, 116) theorised that the control of salt provided economic and political power. Support for this hypothesis is provided by several diagnostic items within the material assemblage which indicate wide-ranging contacts. The evidence for iron- and copper working, a rare form of tuyère, an iron adze, and an imported jet/shale ring contribute to the impression of affluence. Similar interpretations of status were forwarded for the inhabitants of Beeston Castle, where shale rings, a swan-neck dress pin, copper alloy rim and handle for a leather vessel, La Tène II weapons, and industrial materials were recovered (Ellis ed 1993, 41–53).

When the Iron Age structural remains and finds assemblage in Chapel Field are considered in their entirety, the closest parallels are with settlements in eastern England, where habitation tends to cluster in river valleys on clay subsoils next to floodplains (Hill 2007, 21). Such sites commonly produce large and variable material assemblages and evidence for a mixed farming economy, with deep ditches surrounding roundhouses. Examples are widespread, for instance Blagdon Park 1 in Northumberland, East and West Brunton in Newcastle upon Tyne (Hodgson *et al* 2012), and Beaumont Lees and Humberstone in Leicestershire (Thomas 2011, 8). This relationship has already been noted by Garner (2016, 266). The closest parallel, however, occurs *c* 47km south of Poulton, at Collfryn in the upper Severn valley. This enclosed site was situated on a boulder clay scarp on the boundary of stagnogley soils and more easily worked brown earths. The inhabitants practised a mixed farming economy, with small-scale metalworking and acquired large quantities of VCP. Animal bone was rare, but when recovered demonstrated the collection of naturally shed red deer antler. The site was interpreted as being relatively high status and appropriate in size for a small family group (Britnell 1989, 89–124). Collfryn further fits into a wider distribution across the Welsh Marches of small settlement enclosures (Wigley 2007, 172). The similarities between Chapel Field and Collfryn therefore provide initial evidence to postulate

that a similar distribution to sites east of the Pennines may exist in the north-west of England and farther south into Wales.

Preservation and site visibility

The recovery of such a large and diverse finds assemblage, currently unique in lowland Cheshire and the North-West in general, raises the question: why is Poulton different?

There are undoubtedly aspects of site that indicate that it was special in some way, eg the large volume of heat-affected stones and the depth of the ditches surrounding many of the structures. However, three taphonomic factors have been crucial. Firstly, the generally neutral soils are relatively rare within lowland north-west England but are vital for the survival of bone and antler. Secondly, the unusual depth of the ditches that surrounded the structures would have provided a protective environment for the material assemblage from activities such as ploughing. It was noticed during excavation that animal bones in the uppermost levels of ditch fill were not as well preserved as those more deeply buried. Thirdly, the area of the settlement has never been subject to machine ploughing, unlike the majority of Chapel Field. The abundance and variety of the Poulton assemblage thus confirm that the perceived paucity in the region's material record is at least partially due to the generally acidic soils rather than a reflection of a lack of material culture; when conditions are favourable, a large and variable array of material culture can be seen to exist.

The Iron Age settlement at Poulton also gives an important warning regarding site visibility in Cheshire. Essentially, it was discovered by accident, as a result of the recovery of recognisable prehistoric and Roman objects during excavation of the medieval graveyard; no cropmarks or surface remains were observed. The excavation of identified cropmarks may partly remedy this situation, but it is highly likely that many more will continue to lie unrecognised, even when preservation conditions are good.

Conclusion

The extensive Iron Age structural and material evidence in Chapel Field, Poulton, addresses many of the priority questions posed in the regional research agenda (Hodgson & Brennand 2007). When the density and longevity of occupation are placed within the context of an abundant and diverse assemblage, the overall picture contradicts models of a sparsely populated region with a lack of material culture. The evidence clearly indicates a settlement that was well connected both regionally and farther afield through land and riverine trade routes. Continuing excavation will doubtless add to this picture.

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