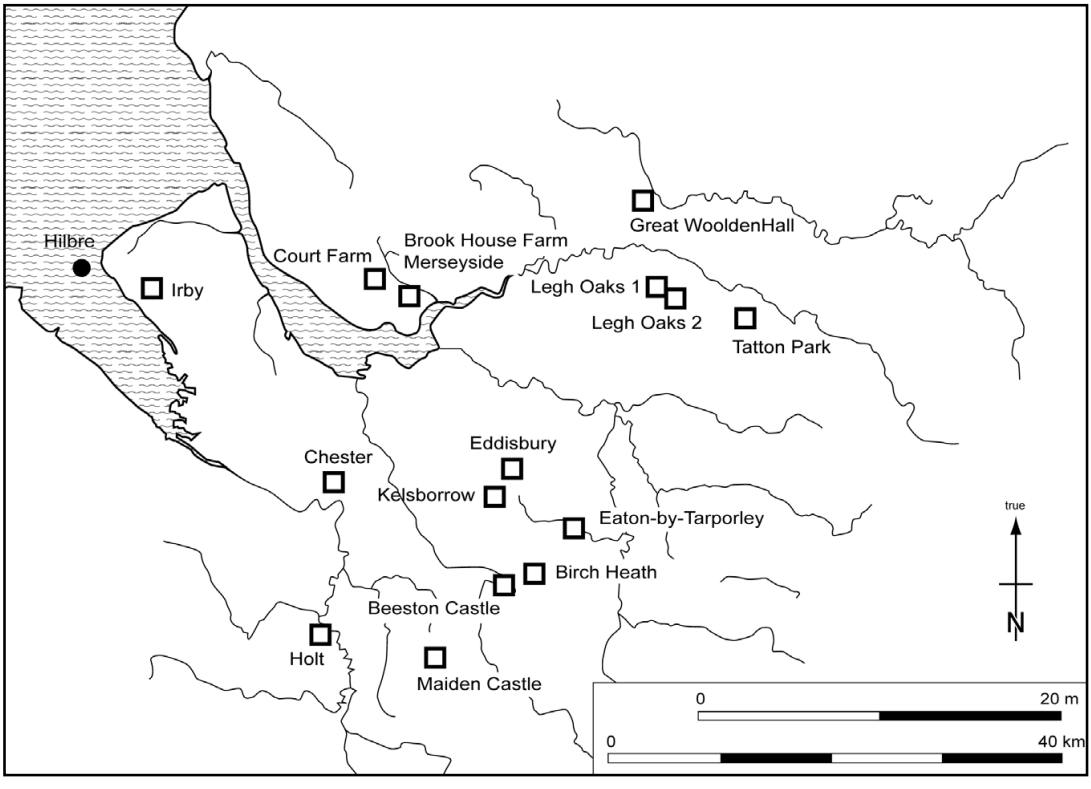


Ill III.1 Birch Heath: site location map. (Not to scale)

III: Birch Heath, Tarporley

Excavation of a Rural Romano-British Settlement

by N Fairburn BA, FSA Scot
with D Bonner BA, MIFA, W J Carruthers BSc, MSc, MIFA, G Dunn BTech, AIFA, R Gale and M Ward BA, MSc

Excavation at Birch Heath during construction of a gas pipeline revealed a small Romano-British rural settlement whose inhabitants practised mixed agriculture. The settlement consisted of three roundhouses, a possible rectangular building and boundary ditches and flourished in the second century AD. A fourth building associated with ironworking was dated to the post-Roman period.

Introduction

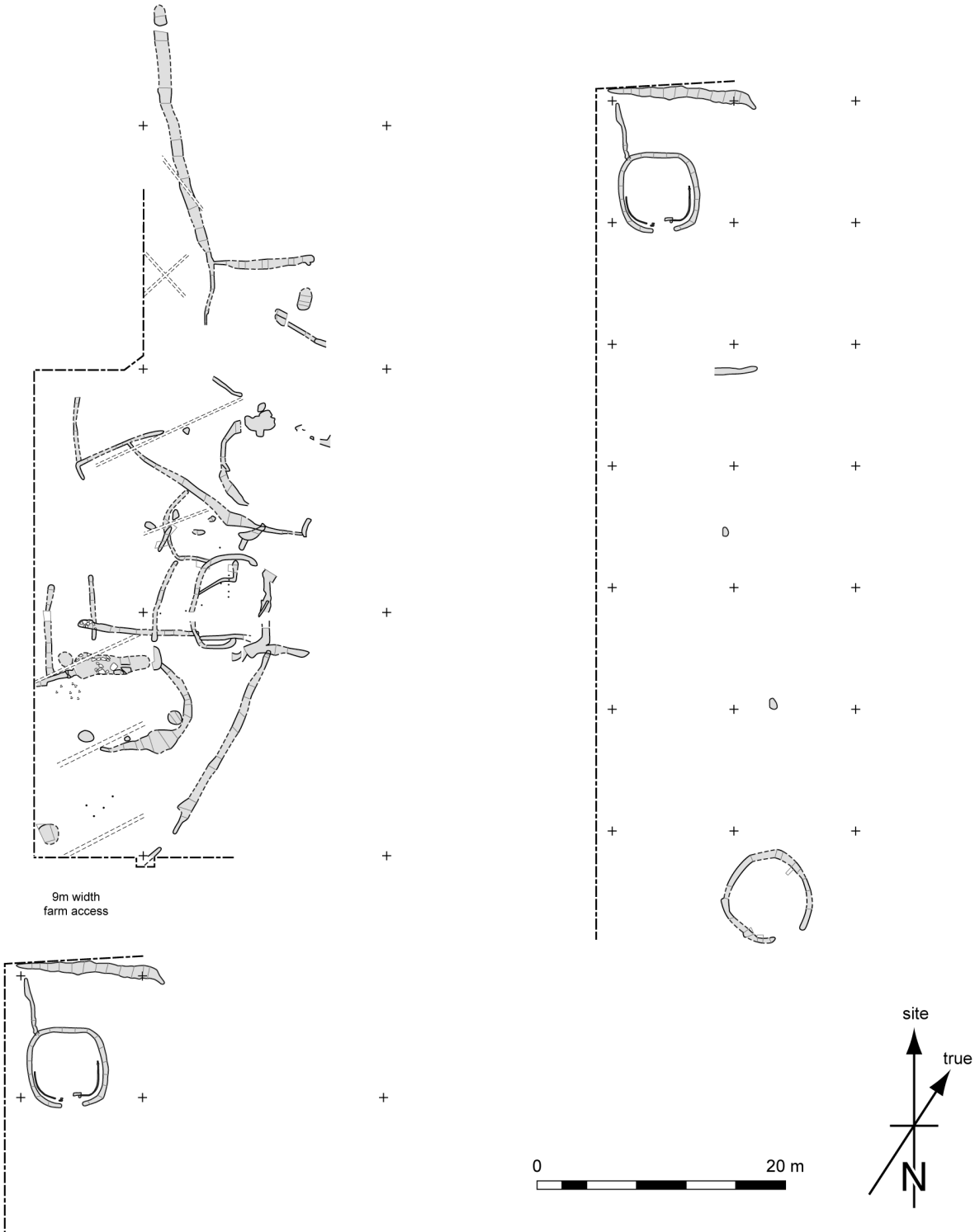
The site and project

N Fairburn *Network Archaeology*

During the construction in 2001 by Transco of a gas pipeline between Birch Heath and Mickle Trafford, a small rural Romano-British settlement was uncovered, situated close to Birch Heath (SJ53376218) (Ill III.1). Excavation showed that it was occupied from the late first century AD through to about the mid-third century. The settlement consisted of at least three structures (roundhouses), one possible rectangular building, boundary enclosures and a number of linear features and pits. A fourth structure, overlying a small section of the Roman site, had evidence of ironworking, both smelting and smithing, and with the aid of a single radiocarbon date was found to date to the Early Medieval period – a period where very little evidence has emerged in Cheshire and north-west England. Despite erosion as a result of ploughing the site has the potential to illuminate the relationship between the Romanised population of the nearby fortress of Chester and the native Britons during the early part of the Roman occupation of Britain. The excavation was carried out by Network Archaeology and funded by Transco. The archive will be deposited with the Grosvenor Museum, Chester.

Geology, soils and land use

The solid geology in the area is solely New Red Sandstone. Overlying the solid rock is a thick mantle of boulder clay (including lacustrine clay) which covers most of the pipeline route. The soils across the area reflect the underlying drift geology. The vast majority of the area around Birch Heath is covered by reddish, fine loamy soils (Salop), which are slowly permeable, prone to seasonal waterlogging and generally given over to dairying on short-term and permanent pasture, with cereals on drier slopes (Soil Survey 1983).



Ill III.2 Birch Heath: overall plan of remains (left area 0/4B; right 0/4A). (Scale 1/500)

The site was situated in field 0/4. It had been regularly ploughed, and at the time of the pipeline construction was being used for growing corn. The field had also been subjected to injections of bluish-grey fibrous paper mulch in an effort to improve the drainage. Modern field drains criss-crossed the site and cut through a number of the features. The combination of field drains, ploughing and the soil injection had severely truncated the archaeology of the site and the fills of some features had been contaminated with modern material.

Historical and archaeological background

The discovery of the site was totally unexpected, having been predicted neither by geophysical survey nor fieldwalking. There are no other known settlements in the vicinity apart from the villa at Eaton-by-Tarporley (Mason 1982 and 1983) and some Roman pottery finds from Beeston Castle (Ellis ed 1993). The present site is some two miles from the Eaton villa, but, as will be suggested below, it is possible that the two were associated. 'Native'-style Romano-British rural settlements in the North West are still largely an unknown quantity, as past research has concentrated on the larger military and civilian settlements. That at Birch Heath is the first such to be found in the hinterland of Chester and one of the few to be excavated in Cheshire. Settlements and activity in the centuries after the Romans had left Britain are even more of an unknown quantity. Evidence of habitation or ceramics in this period has not been uncovered in Cheshire, so there are no useful parallels.

The excavation

At the time of excavation the site was divided by a temporary farm access crossing, resulting in two arbitrary areas, designated A and B. It also meant that there was 9m wide x 20m area in the middle of the settlement that was not investigated (Ill III.2).

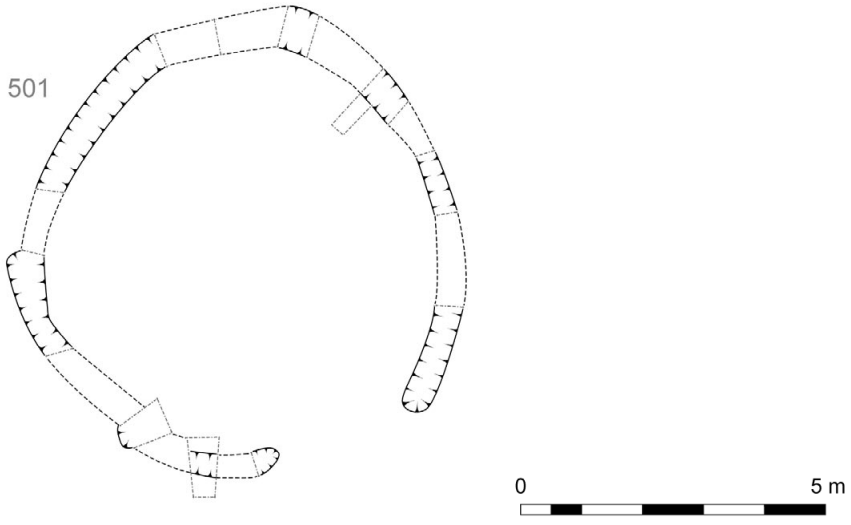
Area 0/4A

There was only a small number of features in 0/4A: these included two definite structures, three linear ditches and four pits.

Structure 1

Structure 1 was situated at the southernmost point of the site, 85m from the main group of linear features in 0/4B and 65m from Structure 2. It was represented by a circular gully (501) with butt ends (Ill III.3). The gully was *c* 7m diameter, *c* 0.13m deep and *c* 0.35m wide at the surface with a rounded profile, and had rounded termini forming an opening towards the east. The fill consisted throughout of light greyish-yellow sandy silt with flecks of charcoal.

This curvilinear gully was probably the remains of an eavesdrip belonging to a roundhouse. The floor surface and associated occupation deposits of the house had apparently been severely truncated by ploughing and also by topsoil-stripping before the site was observed. These processes appear to have destroyed any structural features such as post holes and hearths and to have removed any artefactual evidence in and immediately around the building. Without this information the building's function is unclear. However, a domestic interpretation is the most likely, especially given the presence of pottery in the nearby pit (504).



Ill III.3 Birch Heath Structure 1: plan. (Scale 1/125)

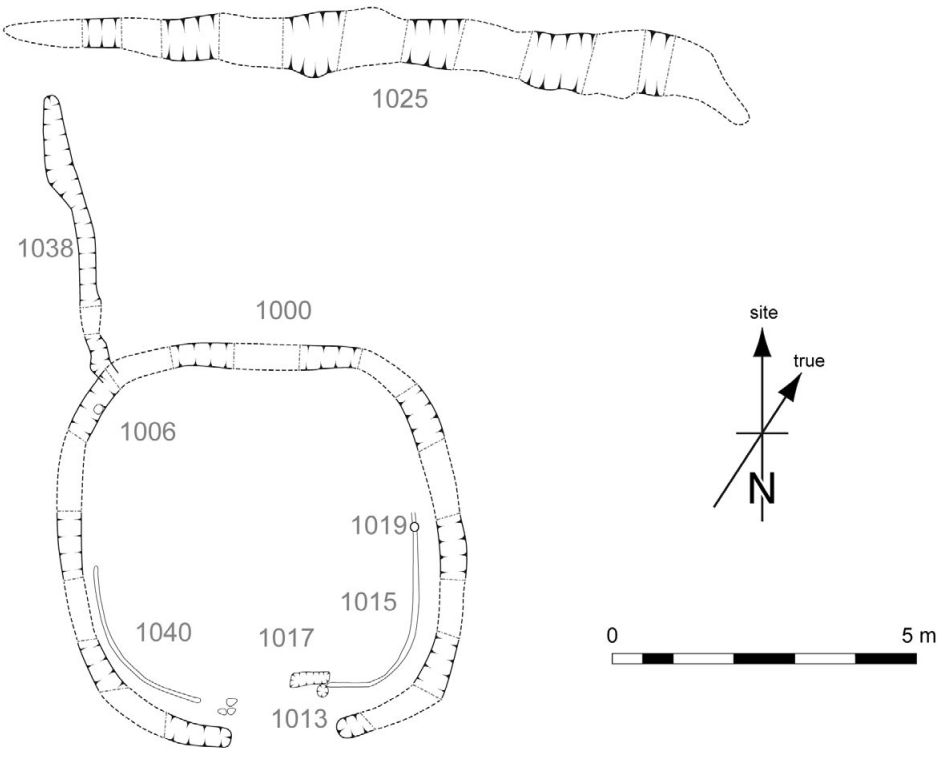
Pit (504) was the largest of the four pits found in the 0/4A area. It was oval, *c* 0.90m diameter and *c* 0.23m deep with a primary fill of dark yellowish-red sandy silt. The secondary fill, (503), contained a large amount of charcoal and a quantity of shattered potboilers mixed in with dark greyish-brown clayey silt. It also contained a few pieces of pottery in the upper part of the fill. There was no direct evidence for burning *in situ* or lining of the pit that would account for the potboilers and charcoal, so the pit is most likely to have been used for domestic waste. Unfortunately the soil sample did not contain any plant remains that might have supported this theory.

The other three oval pits were similar in size to one another, *c* 0.50m diameter, and all had similar fills, consisting of light greyish-yellow clayey silt with a few flecks of charcoal. They did not contain any artefactual evidence. Given their shape, it is suggested that two of them, (507), (509), were post holes, while the other pit, (511), was just a shallow pit or possibly a hollow. The relationship of these pits to the rest of the site is unclear.

A ditch, (513), ran east–west 11m to the south of Structure 2. It was 3.5m long, shallow at both ends, and sloped sharply in the centre, creating a small pit *c* 0.4m deep. Its function remains unclear, but its size, shape and orientation are similar to another linear feature, (524), seen in 0/4B.

Structure 2

Structure 2 was positioned much closer to the arrangement of linear features in 0/4B. Like Structure 1 it was represented by a circular gully, (1000), *c* 0.35m wide, with rounded ends forming an entrance to the east in a similar arrangement to Structure 1. There were also two narrow internal curvilinear gullies, (1015), (1040), a small pit (1017), two post holes, (1006), (1018), a number of stake holes and another linear gully, (1038) (Ill III.4). Apart



Ill III.4 Birch Heath Structure 2: plan. (Scale 1/125)

from these features nothing else was discovered in the interior of the circular gully. Again it must be assumed that the action of ploughing and topsoil stripping had removed any other internal features and severely truncated the stratigraphy. It is likely that this building was another domestic structure. The soil samples taken from the structural features were the most productive from the whole site and produced a range of diagnostic environmental material – seeds and emmer/spelt grain.

The circular gully (1000) contained a very large quantity of charcoal throughout the whole of its fill. Samples of this charcoal were used for radiocarbon dating and gave a date of AD 70–350 (1825 ±55 BP, AA-50088; *see* Table III.6), consistent with that of the pottery found in and around the structure. Nearly all this pottery was found within the fill of the gully; the rest came from two small hollows, (1021) and (1023), just inside the probable entrance. One post hole tapering to a blunt point at the bottom, (1006), *c* 0.14m diameter and *c* 0.15m deep, was recorded within the gully and fragments of mineralised wood were recovered from its fill.

The internal gullies of Structure 2, (1015) and (1040), both had U-shaped profiles *c* 0.05m wide and 0.1m deep with a dark grey clayey silt fill. Both of the gullies appeared to follow the profile of the exterior gully (1000), but there was no sign of their continuation into the opposite half of the interior. No other recognisable features were associated with (1040),

but (1015) contained one stake hole (1019), *c* 0.1m wide and deep. One post hole, (1013), *c* 0.17m wide and *c* 0.20m deep was positioned at the end of (1015) beside a small pit, (1017). On the opposite side the two small hollows, (1021) and (1023), which contained a loose fill of dark grey sandy clay, may have been the remains of one or two post holes.

The small rectangular pit (1017) in the entrance had a dark grey sandy clay fill which contained a lot of charcoal. Mixed in with the charcoal was a small number of emmer/spelt and barley grains which were recovered from the soil sample. The function of the pit is unclear.

The circular gully of Structure 2 was cut by a shallow ditch or drain, (1038), which led away from the structure towards a much larger ditch, (1025). The extent of this larger ditch was not clear, as it appeared to continue beneath the temporary farm access and beyond the working area of the pipeline. It is possible that it was intersected by ditch (687) extending from 0/4B. It is likely that ditch (1025) was used to channel away excess water from the site as the drain from Structure 2 led into it.

The watching brief during the construction of the pipe trench recorded in section a double ditch, (0036) and (0038), which had been completely covered by clay overburden and had remained invisible during the excavation even after additional topsoil stripping. It was positioned between Structure 2 and ditch (1025). Its relationship with the rest of the features is unclear as its full size and extent are not known, but it is possible that it may have been an early feature, perhaps part of an enclosure.

Area 0/4B

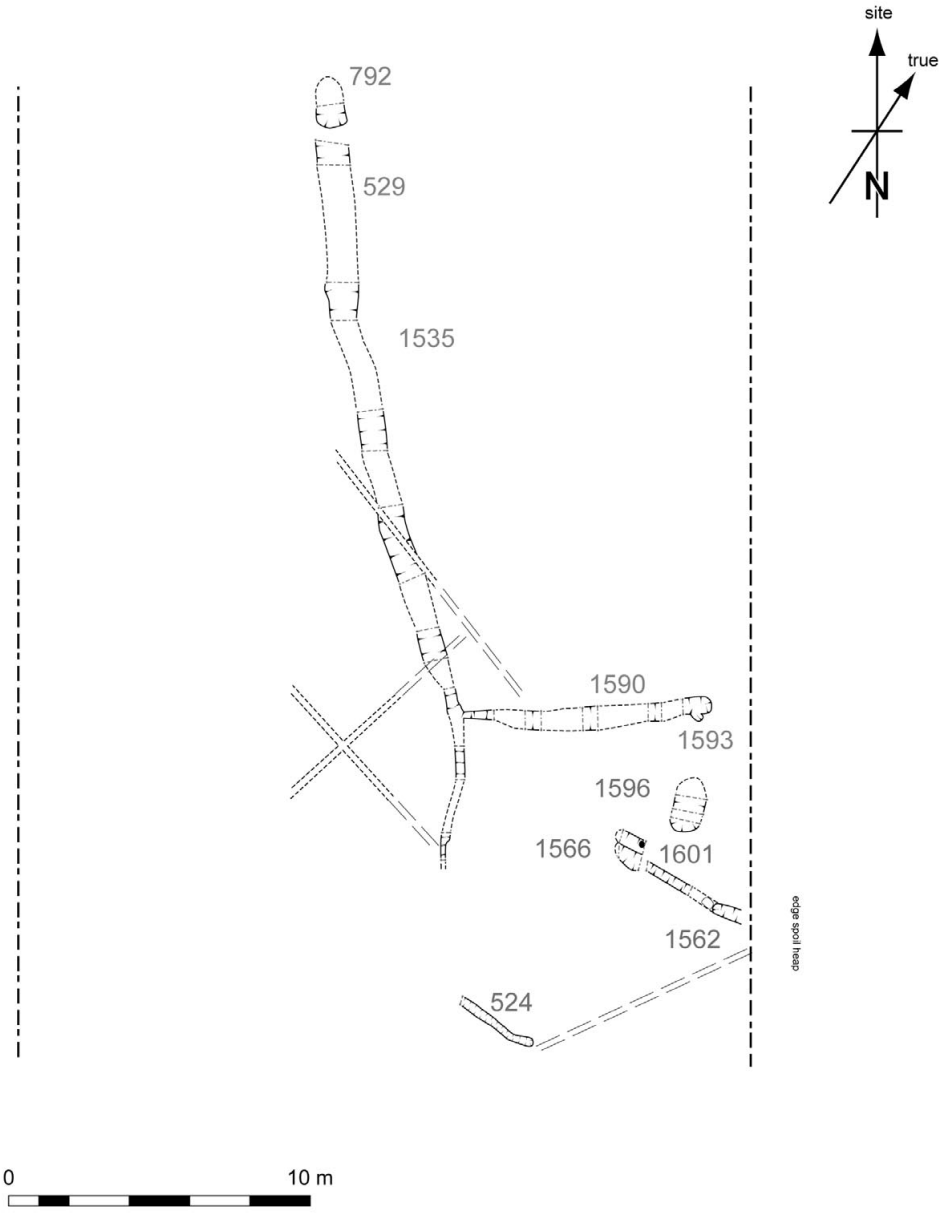
The majority of the features and artefacts from the whole excavation were found in 0/4B. In a number of cases features appeared to extend beyond the working width of the pipeline and beneath the large spoil heaps: this strongly suggests that the site may be much larger than the portion investigated and that other areas remain to be investigated in the future.

The excavation in 0/4B revealed a large number of intercutting ditches and gullies and a number of pits. Other features including tree hollows were found across the site. At least two structures with curvilinear plans are suggested with the probability of one other and the possibility of a small four-posted structure. Their fills showed that the ditches had filled up naturally, although some showed evidence of recutting.

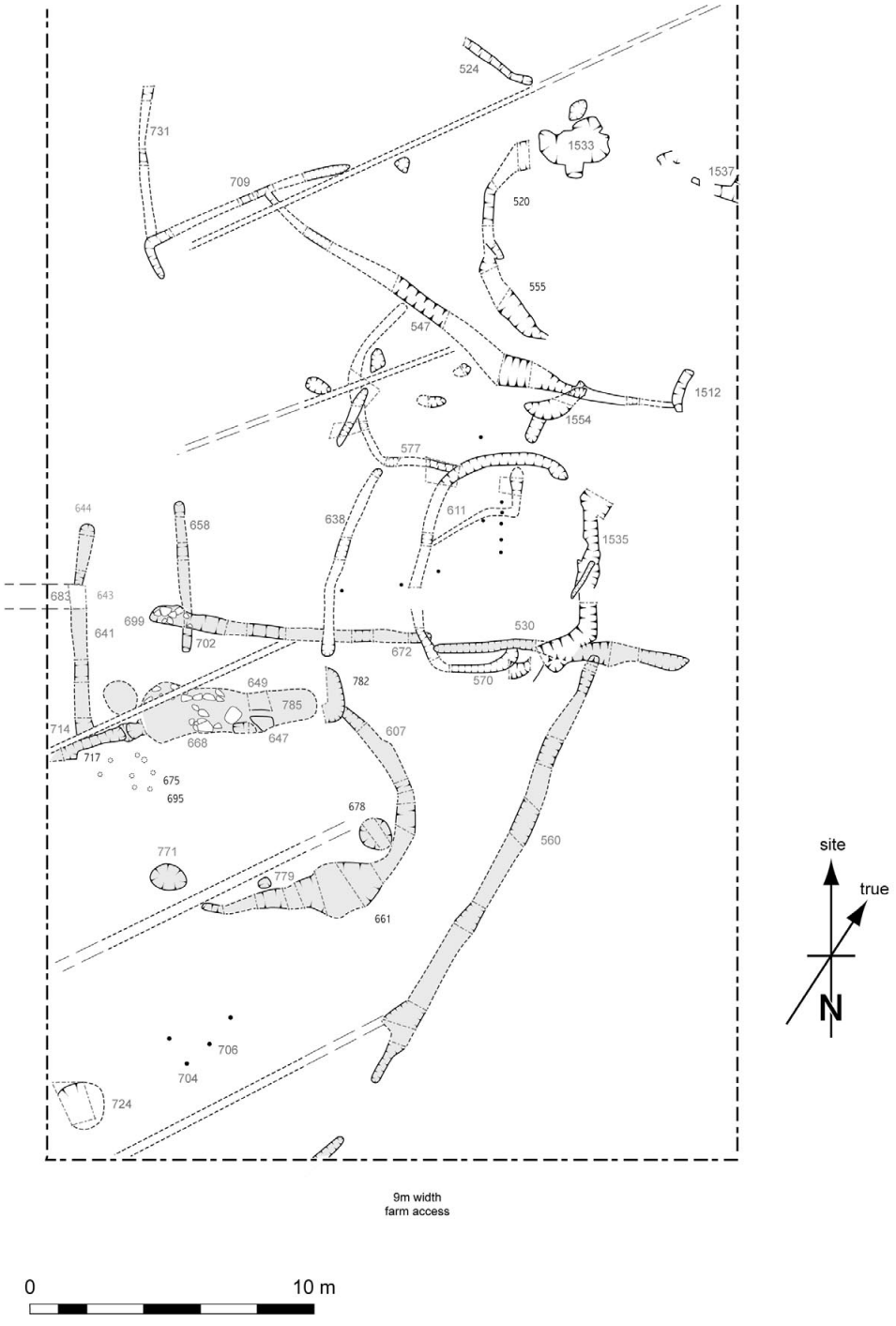
Ditches and gullies

At the north end of the site (Ill III.5) was a ditch (529) extending 24.5m in a northerly direction; this was sampled in a number of places. Just beyond the rounded end of this ditch was an unrelated oval pit, (792).

The ditch started as a narrow slot, widening to *c* 0.75m, and was *c* 0.25m deep. It was U-shaped in section with reasonably sharp profile, straight sides with slight slopes and a flat base that did not show much sign of weathering. The fill was mostly consistent throughout the excavated sections, comprising light grey soil with flecks of orange loose silty clay. Flecks of charcoal were present, as were occasional small clusters of shattered burnt stone.



III III.5 Birch Heath features in Area 0/4B (North): plan. (Scale 1/250)



Ill III.6 Birch Heath features in Area 0/4B (South): plan. (Scale 1/250)

In the deepest section, *c* 0.3m, there were two fills with orangey yellow clay overlying the light grey soil. A number of fragments of pottery were recovered, mainly from the upper level of the fills of the ditch, which pointed to second-century occupation and activity on the site.

The ditch (529) was also cut by another narrow ditch, (1590), joining it at a right- angle. A modern field drain cut the ditch at exactly the point where it is possible that there was another cut or a complete recut. Ditch (1590) extended 8.15m towards the east. It was *c* 0.5m wide at its widest point and consistently *c* 0.15m deep with a rounded section. Its fill was consistent throughout all of the excavated sections, comprising mid-grey soil with flecks of orange firm clayey silt. There was a possible post hole, (1593), of unknown purpose at the rounded eastern end of the ditch. Also at the eastern end was a layer, (1592), which contained a concentration of unidentifiable burnt bone and charcoal, together with one poorly preserved barley grain. This concentration suggests that domestic waste had been dumped in the ditch. It is possible that the two ditches, (1590) and (529), might have formed part of a small rectilinear field boundary or were simply just drains to channel away excess water.

Slightly to the south of (1590) was an unremarkable oval pit, (1596), *c* 1.85m diameter and 0.2m deep; this contained no distinguishing features or artefacts. Next to this pit was a short, narrow ditch or gully, (1562), with a recut (1566) at the western end. (1562) was relatively shallow at the end but deepened in the middle with a primary and secondary fills. At its eastern end there was a possible stone post pad, surrounded by a spread of charcoal and set quite well in the ground. Two stake holes, (1603) and (1605), were located in the bottom of (1562). Their function and chronology is not clear. A post hole, (1601), was located at one end of the recut ditch (1566). It is possible that it was associated with post hole (1593) and the possible pad stone at the opposite end of (1562). A small quantity of pottery, low-density ironworking slag and roasted haematite ore was recovered from different sections of (1562). However, (1562) was some distance from the ironworking concentrations seen in and around Structure 3, so it may represent a waste deposit.

Parallel to (1562) was a small narrow gully, (524), 2.7m long, *c* 0.25m deep in the middle and with shallow ends, which ran north-westwards. It had a similar profile to ditch (513) in 0/4A and contained the remains of at least two pottery vessels, along with large concentrations of charcoal.

Further to the south another ditch, (709), ran north-east–south-west across the site. It was 14m long. At its western end it was cut by a very shallow gully, (731), which extended for a short distance to the north before terminating abruptly (Ill III.6). A small amount of pottery and small strip of lead was found in one of the sections cut through the ditch.

Area 0/4B was almost bisected by a long ditch, (547), running east–west for 16.7m. It stopped just short of ditch (709), where its terminus has been lost to the cut of a modern field drain. Pottery was recovered from two of the sections cut across the ditch.

Possible rectangular structure

On the western side of the site was an intriguing rectilinear shallow ditch which had had a number of constructional phases. The true extent of the ditch is not known, as it

Ill III.7 Birch Heath: right-angled corner and post pad

continued beyond the pipeline easement. It is possible that it was part of a rectangular building. The earliest phase of this feature was a cut, (683), on a right-angled corner where three now separate and later ditches met, (641), (643) and (644). This suggests that there was probably an earlier right-angled ditch and that (641) and (643) were originally a single ditch. At the junction of the two ditches (641) and (643) was a large flattish stone which may have been a post pad (Ill III.7). Ditch (641) extended for *c* 5.2m before being cut by modern field drain at the point where it appears to have joined two features, (714) and (717). The drain has unfortunately destroyed any stratigraphical relationship between these features and also with (718). This appears to have been a similar feature to (683), showing early recutting. Unfortunately (714) extended beyond the excavation area, but survives for future investigation. The two ditches (717) and (643) may represent a rectilinear arrangement. If they extended for any distance into the area beyond the excavation, then they may have represented part of a rectangular building. The sharp right-angle of the ditches as they turn away from ditch (641) certainly gives them structural feel.

Ditch (717) broadened into an area that was covered by a layer of grey silty sand mixed with fine charcoal particles, (785). A two-tined iron fork and sherds of glass and pottery came from this area of the ditch. To the side of the ditch were two definite stake holes, (675) and (695), and possibly a few others. The stake holes were badly truncated as there was no definite shape to them. Their positions are marked on the plan, but no context numbers were allocated.

An enigmatic feature, (668), consisted of a cut that had been deliberately lined on one side with flattish stones set at an angle (Ill III.8). The opposite side of the cut had only one

Ill III.8 Birch Heath: feature (668) with stones exposed

stone. It is possible that there may have been more and that the plough had removed them, particularly as there were a number of similar flattish stones still within the clay nearby. The cut containing the stones was not capped. It was *c* 1.6m long, *c* 0.5m wide and *c* 0.2m deep and filled with compact dark grey clay with frequent flecks of charcoal. A few small pieces of Cheshire Plain pottery were found in the fill. A lot of pottery also came from around feature (668), plus one piece of *tegula*. The feature was not directly associated with any other features but was covered by layer (785) which had spread over a number of the surrounding features. To the east of the stone-lined cut there were three unremarkable small, shallow hollows (647), (649) and (734). Pottery and a piece of slag came from (647).

Probably the earliest recognisable feature on the site was ditch (672), apparently a field boundary ditch. It was 11m long, *c* 0.5m wide and *c* 0.2m deep, ran east–west and was cut by five different features. The western end had been cut and enlarged, (699), losing the actual terminus; it also contained a loose tumble of stones, probably from later backfilling as there was no structure to them, although it is possible that they were packing stones supporting another large post. The ditch was cut again in the middle by a shallow north–south gully, (638). At its eastern end, the ditch terminus has been cut by a ring gully, (570). A small part of the terminus survived on the other side of the gully.

Ditch (530) ran for 9m east–west and started out very shallow before becoming deeper. It was cut at the western end by the ring gully (570) (*see below*). As it deepened it was further cut by a series of interconnecting ditches. The ditch ended abruptly and did not have a shallow terminus.

A possible boundary ditch, (560), ran diagonally south-west to north-east across one corner of the site. It was probably related to ditch (672) and (530), forming part of a rectilinear enclosure. It was 17.2m long with a gap of 1.6m between the shallow termini at the south-western end. It is possible that this gap may represent a narrow entrance. The ditch continued a further 2m before disappearing beneath the temporary farm access track. There was some evidence that it continued on the other side of the track in Area 0/4A, but it is also possible that it curved away beneath the track.

The ditch was *c* 0.7m wide and *c* 0.30m deep with regular sides with a flat bottom. Close to the gap, the ditch dropped sharply and deepened to *c* 0.5m; it contained a number of large stones and fire-cracked potboilers within the mid-grey sandy silt fill, possibly from backfilling or to support a large post.

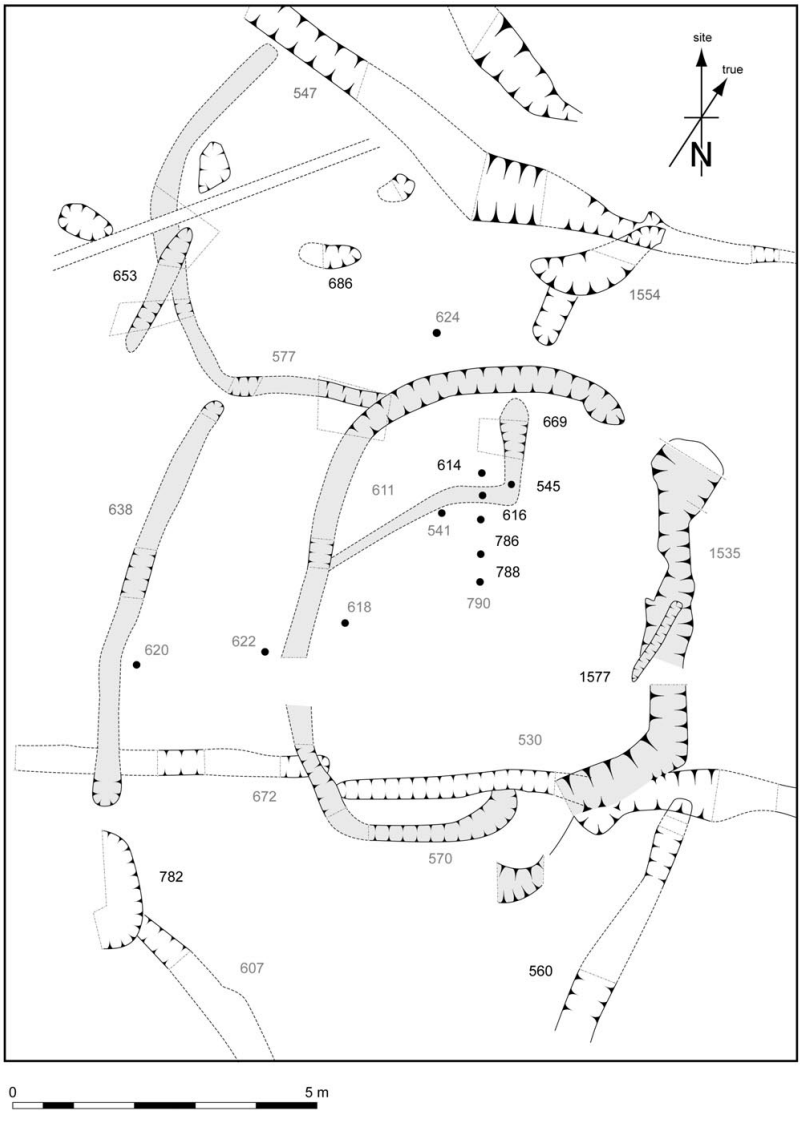
Structure 4

The largest amount of pottery and burnt bone that was recovered from the whole site came from a curvilinear ditch, (607), probably the remains of another roundhouse gully. The only burnt daub finds from the whole site came from one of the ends of this feature. The full plan of this building could not be ascertained because of extensive erosion from ploughing and topsoil stripping.

The ring gully had narrow, shallow ends and a deep central pit, (661). The majority of the pottery came from the pit, which also contained a lot of charcoal and shattered, burnt stones. The pit was environmentally productive, with a number of seeds, emmer/spelt grains and hazelnut shells being recovered from a soil sample. There was no indication that the pit was cut by the gully. A number of large flattish pieces of red sandstone were found in the side of the pit and also in the gully. These may have been part of a structural arrangement and used as pad stones or post-packers. No cuts were recorded with them. Close to the end of the gully was a small pit, (771), *c* 1m diameter and 0.45m deep, possibly to be interpreted as a large post hole, although there were no packing stones in the fill.

Inside the gully there was a shallow circular hollow, (779), which contained an unidentifiable iron object. Beyond this and also inside the gully was a larger circular pit, (678), which contained some pottery and potboilers. At the opposite end of the gully was a small curving hollow, (782), which was cut by the terminus. This may have acted as a shallow culvert from within the structure.

In the south-western corner of the site was a deep pit, (724), cut by a short, narrow gully, (739). The three fills of the pit contained a small amount of burnt stone and charcoal, with some pottery at the very bottom. To the east of pit (724) were two definite stake holes, (704) and (706), and two more possible holes. It was not clear if the latter were stake holes as there was no definite shape to them: they were very shallow small hollows in which material had collected. Their positions are marked on the plan but no context numbers were allocated. The purpose of the stake holes was unclear, but may have been the remains of small pen, perhaps for fowl.



III III.9 Birch Heath Structure 3: plan. (Scale 1/125)

Structure 3

In the centre of the site were two gullies, (570) and (1535), forming another ring gully. This ring formed the remains of a building apparently used for ironworking, as a lot of slag and charcoal was found with in the fill of the gully and associated features. As elsewhere, the floor surface and associated occupation deposits had been severely truncated by ploughing and topsoil stripping before the site was observed. Any artefactual evidence and structural features such as post holes and hearths and features like the bases of furnaces or smithing hearths had probably been destroyed by these processes.

The ring gully (1535) was very shallow, disappearing as it joined the ditch (530). Charcoal, metalworking debris and ore were compacted in one part of the gully. A very shallow, thin channel, (1577), was cut into gully (1535), possibly as a small drain from the interior. It was not clear where the entrance to this structure lay.

Running through the centre of this structure was an irregular shallow gully or drain, (611). It cut one edge of the ring gully and continued through the structure until it terminated in a shallow hollow, (669), containing (periglacial?) sand. In the sand was a dark stain of a stake hole, (545), with the possible remains of another close by. The sandy fill of the hollow contained a few fragments of iron slag and charcoal. The gully (611) contained a lot of ironworking slag, charcoal, hammerscale from smithing and slag spheres. A small piece of *Fraxinus* charcoal from the gully gave a radiocarbon date of AD 590–720 (1380 ± 40 BP, AA-50087; *see* Table III.6).

A row of five stake holes, (614), (616), (786), (788) and (790), was positioned inside the structure. One of the stake holes, (616), was cut into a narrow drainage gully (611). It is not known if these post holes were directly associated with the structure and were perhaps part of an internal partition rather than a fence.

Situated in and around Structure 3 was slightly curving arrangement of a further five shallow stake holes, (541), (618), (620), (622) and (624); their phasing is uncertain. One of the stake holes, (541), was in a small hollow, (539) filled with iron slag and charcoal. The fills of the other stake holes were light grey sandy silt with flecks of charcoal.

The ring gully (570) was also cut by another curving gully, (577). This may have been the remains of a conjoined structure associated with Structure 3. However, there was no further evidence to support this theory, although there was a small oval pit, (686), *c* 0.41m wide and *c* 0.12m deep within the confines of the gully which could have been an unpacked central post hole. No datable material was recovered to directly associate it with the gully. The gully (577) was also cut across by a short narrow channel, (653), which was similar to the narrow channel (1577) cutting across the gully (1535) of Structure 3. This may have been a drain.

On the north side of the long ditch (547) was what appeared to be another curving gully. Excavation showed that in fact it comprised two shallow gullies, (520) and (555), with a thin channel linking them. It is possible that (520) originally continued further, but as found it petered out and may have been totally removed by topsoil stripping and the plough. Just beyond where it petered out was a large tree hollow (1533); if it had continued, the gully would have overlain this. Beyond this tree hollow was another shallow gully, (1537). Its true extent and function is not known as it continued beneath a spoil heap. Two stake holes were found in the gully.

Phasing

It was difficult to phase the site because of the severe truncation, which had probably destroyed any stratigraphic relationships that once existed between features. In addition, the pottery on the one hand indicated that the site was relatively short lived but on the other

had sufficiently broad date-ranges to prevent specific features being given close dates. The pottery indicated that occupation lasted perhaps only four or five generations, from the end of the first century through the second century and into the middle of the third century AD. Firm evidence for abandonment at this time is lacking, but no material later than *c* AD 250 was recovered.

Unphased: Possible woodland clearance

A series of irregular cuts and hollows have been interpreted as probable tree hollows and root systems. It is uncertain whether these features indicate clearance in advance of the settlement or if they represent clearance of a regenerated landscape after abandonment. Such evidence as we have suggests that the area as a whole was probably still densely wooded in the Roman period, with oak providing the dominant tree canopy and with scattered settlements sited within woodland clearings.

Phase 1: Late Neolithic/ Bronze Age

Possible activity in the area was indicated by the presence of one unstratified, undiagnostic flint core, but no features were found to associate with this single find.

Phase 2: Early Romano-British agriculture

The settlement does not appear to show any evidence of beginnings in the Late Pre-Roman Iron Age, unlike the few other excavated examples of rural settlements in the region – Irby, Great Woolden Hall Farm, Urmston and Brook House Farm, Halewood. It is possible that some of the ditches represent an early agricultural phase, enclosing arable fields, before any of the domestic structures were built. However, this cannot be proved, and no finds, such as querns, directly associated with agriculture were recovered during the excavation.

Phase 3: Enclosure and the construction of Structure 4

The beginning of the main period of occupation was marked by the enclosure of part of the settlement. While the sherds of Roman pottery that were recovered from the features can provide a date-range for this phase, it is only a broad one that is found across the whole site.

The phase began with the cutting of three ditches, (672), (530) and (560), which formed two sides of a rectilinear enclosure. The other sides of the enclosure probably lie in the land adjacent to the pipeline easement. It remains a possibility that the ditches (641), (644), (658) and (717) at the end of ditch (672) were part of the enclosure and formed an entrance. A domestic building (Structure 4) – probably long-lived – was then built within the enclosure (*see* Ill III.6). This building was represented by the large ring gully (607) and the possible remnants of post pads and a single post hole, (771). The majority of the pottery from the site came from around this building.

Phase 4: The construction of additional structures (1 and 2) and ditches

The two buildings that were excavated in Area 0/4A (Structures 1 and 2) were unenclosed and appear to have been built after Structure 4. However, there is no direct evidence for this and it could be argued that the Phase 3 ?enclosure came after the building of Structures 1, 2 and 4. The same could be said for the rest of the ditches on the site, as there

is no evidence to show clearly at what stage any of the other ditches, pits or gullies were dug (with the exception of Structure 3 which was clearly later than the enclosure around Structure 4).

No pottery was associated with Structure 1, but a few scraps of second-century samian and black-burnished 1 were recovered from Structure 2. Nor was there any sign of any the late first-century Cheshire Plain pottery that was present in Structure 4, which, taken with the samian, would therefore possibly indicate a later occupation date. The fill of the shallow ring gully of Structure 2 (1000) was full of charcoal and may indicate that structure burnt down. Experimental work at Butser Farm has shown that very little of a roundhouse survives after burning (Reynolds 2000).

Phase 5: The circular arrangement of stake holes

A small circular arrangement of five stake holes appeared to lie beneath Structure 3, one of which, (541), contained iron slag in the top of its fill. Assuming that all of the stake holes were contemporary, their position outside the boundary ditch perhaps suggests a short-lived structure (there was no visible drip gully) before the construction of Structure 3.

Phase 6: The abandonment of the Roman settlement

It is not certain when this took place, only that the absence of certain types of pottery suggests that the site was actually abandoned. There might have been a short period of continued occupation after AD 250, when old pottery continued in use and replacements were not acquired: certainly the scraps of samian had been well used, judging from their abraded and burnt condition. The main east–west boundary ditch (672) was filled in at one end with large stones. This may have been part of the final stage of the abandonment or an earlier event. The burning of the roundhouse, Structure 2 may have been accidental or deliberate: it could have been the reason for the abandonment or the final act in that drama. The ring ditch of this structure was packed with charcoal and the burnt remains of plants and straw. At 65% reliability, the radiocarbon date gives a range of AD 120–260, which is consistent with the artefactual evidence.

Phase 7: The construction of the Early Medieval conjoined roundhouse (Structure 3)

The excavation of this structure did not give any indication from pottery or other material that it was anything other than a later phase of the Roman settlement. However, charcoal from the gully produced a radiocarbon date AD 590–720.

The structure appears to have been a conjoined roundhouse used for the production of iron. It did not contain any obvious signs of domestic occupation debris, although this could have been removed by ploughing. It is not clear what form of occupation took place on the site and why anybody should have chosen to carry out the production of iron in an area with no known iron ore deposits.

It is also not clear when the construction of the roundhouse took place. The structure was built over the top of the ditches (672) and (530) which enclosed the earlier Structure 4. Possibly at the same time or slightly later an extension (577) was added to Structure 3. This

may have been an open-fronted arrangement, opening towards the north, as the drip gully did not extend very far.

There was no evidence of post holes or any other structural evidence for the main building or the extension apart from the gullies (570), (1535) and (577). The short row of stake holes, (614), (616), (786), (788) and (790), through the middle of the main part of the building may have been part of an internal partition, possibly suggesting domestic as well as industrial use.

A small quantity of pottery was recovered from the associated features that made up Structure 3. All the sherds were orange wares, but were too abraded to judge definitively whether they were residual Roman or later. It is also possible that other ditch features on the site may be Early Medieval, but this could only be proved by obtaining further radiocarbon dates.

Phase 8: The abandonment of the site

It is not certain when this took place, only that the absence of known Saxon pottery forms suggests that the site was abandoned. The factors behind the abandonment of this building are uncertain.

The artefacts

Introduction

G Dunn *Chester Archaeology*

The assemblage of Roman artefacts comprised ceramic building materials, pottery, stone, glass and metalwork. The condition of the material was generally poor because of regular ploughing of the site and the nature of the soil. As it has not generally been possible to assign the artefacts to phases of activity or specific structures, the discussion focuses on broadly dating the occupation of the site, sources of production of the ceramics, their acquisition and use and the evidence they provide for interpreting the nature of the settlement. All finds have been recorded according to Chester Archaeology procedures and standards.

Building materials

Ceramic

Nine fragments of ceramic material weighing 315g were recovered. These comprised three fragments weighing 263g which were stratified, from contexts (626), (722) and (1561) and six unstratified fragments weighing 52g. The form of only one fragment could be identified – part of a weathered flange of a *tegula*, found in the subsoil over natural, (626).

The fabric of the *tegula* fragment did not appear to be typical of tiles found in Chester whose source was the legionary pottery- and tileworks at Holt, 12km south of Chester. The fragment was therefore submitted for thin-section analysis (sample no V1242) along with four other tile fragments for comparison: one from the Birch Heath–Mickle Trafford pipeline watching brief (sample V1240); a fragment of an *imbrex* from excavations in Lower Bridge Street, Chester and thought to be of typical Holt fabric (sample V1245); a fragment of tile from excavations at Ochre Brook, Tarbock (an excavation along the A5300 road corridor in Merseyside) (Cowell & Philpott 2000, 67–116) (sample V1244) and a

fragment from the Roman villa at Eaton-by-Tarporley (sample V1243) (Mason 1982; 1983). (*See below* for details of thin-section analysis).

It is unlikely that the tile was used for roofing any of the buildings excavated; it could have come from other, unexcavated, buildings in the vicinity or may be from a more distant settlement and have been dispersed through the action of manuring the fields.

Analysis of the thin sections suggested that the tiles fall into two groups:

i) Samples from the Birch Heath watching brief and the Chester site, with fine-grained sedimentary rock inclusions mixed with Triassic material, of Welsh origin.

ii) Samples from Ochre Brook and Eaton-by-Tarporley, typical of the Mercian Mudstone.

The sample from the excavation at Birch Heath has characteristics of both groups and may in fact form a third, intermediate, group.

Ceramic building material thin-section analysis

All the samples have an oxidised fabric with abundant quartzose sand temper, with the majority of grains being less than 1mm across. There are slight variations in the characteristics of the samples but the character of the quartzose sand is similar in all cases.

Sample V1240 and V1245
(Birch Heath watching brief and Lower Bridge Street, Chester)
Abundant subangular quartz up to 0.5mm. Sparse rounded wind-blown quartz up to 1mm. Sparse rounded clay pellets up to 1mm across. Moderate rounded mudstone/siltstone fragments up to 1mm across. Fine-textured groundmass with few quartz inclusions and a fine scatter of TiO grains.

Sample V1242 *(Birch Heath excavation)*
Abundant subangular quartz up to 0.5mm. Sparse rounded wind-blown quartz up to 1 mm. Sparse rounded light-coloured clay pellets and lenses up to 3mm across. Sparse angular red iron ore up to 3mm across (spongy haematite). Sparse ferruginous sandstone up to 10mm across. Fine-textured groundmass with few quartz inclusions but moderate rounded opaque grains up to 0.1mm across (TiO?).

Sample V1243 *(Eaton-by-Tarporley)*
Abundant sub-angular quartz up to 0.5mm. Sparse rounded wind-blown quartz up to 1mm. Sparse muscovite up to 0.5mm. Sparse rounded light-coloured clay pellets up to 3mm across. One fragment of fossiliferous chert, containing spongy spicules, up to 2mm across. Groundmass contains moderate quartz and muscovite up to 0.1mm across.

Sample V1244 *(Ochre Brook, Tarbock)*
Abundant angular quartz up to 0.2mm. Moderate sub-angular quartz up to 0.5mm. Sparse rounded wind-blown quartz up to 0.1mm. Sparse fine-grained sandstone fragments up to 0.5mm. Sparse rounded chert up to 0.5mm. Sparse plagioclase feldspar up to 0.5mm

across. Sparse rounded light-coloured clay pellets and lenses up to 3mm across. Sparse angular feldspar up to 2mm. Sparse rounded sandstone up to 1mm. Sparse rounded opaque grains up to 1mm across (spongy haematite).

Daub

Ten fragments of burnt daub weighing 48g were recovered from (770) and were probably associated with Structure 4.

Pottery

Introduction

The total number of sherds of Roman pottery recovered was 960 weighing 5539 g (including 54 sherds weighing 654g classed as unstratified). The assemblage consisted almost entirely of coarsewares, with only eleven sherds of samian weighing 98g being recovered. Most of the pottery was very abraded so that any surface treatments such as slips and decoration had been removed. The high level of fragmentation is reflected in the low average sherd weight of 5.8g.

All the pottery has been quantified by sherd count and weight and identified to common fabric name and form where possible. Where applicable, a fabric or form number in accordance with the Chester Archaeological Service's Roman pottery reference collection has also been allocated.

Fabrics

The main ware types identified were samian, oxidised, reduced, black-burnished, white and amphorae (*see* Table III.1).

Table III.1 Birch Heath: quantification of Roman pottery by ware

Ware	*No sherds*	*%*	*weight (g)*	*%*
Samian	11	1.1	98	1.8
Grey	6	0.6	60	1.1
Orange	576	60.0	2901	52.4
White-slipped orange	3	0.3	23	0.4
Black-burnished	299	31.2	1356	24.5
White	35	3.6	70	1.2
Amphorae	30	3.2	1031	18.6
Total	960	100	5539	100

The small assemblage of samian, which was very abraded, all appears to be of Central Gaulish origin from Lezoux and dates to the Hadrianic–Antonine period. Apart from a moulded bowl of form 37, the only vessel types which were identifiable were dishes. The condition of the samian rendered it impossible to distinguish signs of wear from use even among the footrings where such traces are normally found.

More than half of the assemblage consisted of local oxidised wares, commonly known as Cheshire Plain ware. This ware is distinguished by its sandy fabric and appears to be a product of both known and currently unknown kilns in the area. Cheshire Plain fabrics are found throughout the north-west region, in north Wales and as far south as the Upper Severn Valley. The date of production of this ware extends from the late first to the late second century (Webster 1991, 13). The high proportion of orange wares to white-slipped orange ware is undoubtedly due to abrasion. Only three oxidised sherds retained evidence of a white slip, but it is likely that many more of the vessels represented would originally have had such a coating.

Less than 1% (based on sherd count) of the assemblage was made up by grey wares. This can be explained by the fact that the great majority of grey wares found at Chester seems to have consisted of locally produced, first-century forms. As the earliest type of Roman pottery to be used there, it was probably manufactured for the army and may not have been freely available – or even desirable – to the local population at large.

Of the non-local fabrics, black-burnished ware formed the largest proportion. These are coarse, hand-made vessels imported from Dorset. These vessels – primarily cooking pots, beakers, bowls and dishes, often with a burnished lattice decoration – were widespread in Britain from the early second century onwards, dominating both military and civilian markets.

There was also a small quantity of white wares. Twenty-five of the thirty-five sherds were probably from one vessel, a product of kilns in Oxfordshire. Two of the white ware sherds, however, originated from the kilns at Hartshill-Mancetter in Warwickshire.

There was also a rim sherd of a wheel-thrown jar (Cat no 3), which was not consistent with the local fabrics. Thin-sectioning suggested the use of a sand derived in part from Millstone Grit, which outcrops extensively in the north-west of England and also forms the main component of many fluvio-glacial sands in northern England. It is the main inclusion in wares produced in York. However, the high incidence of rounded grains probably indicates the inclusion of material from Triassic strata. There are many locations where detrital sands derived from these two sources might outcrop on either side of the Pennines.

The thirty sherds of amphorae were all Dressel 20 type, a common southern Spanish form used for transporting olive oil.

Forms

Jars/cooking pots were the predominant vessel form, particularly black-burnished types. Bowls and dishes were also common, particularly in oxidised fabrics. These two forms have been grouped together as it was not always possible to distinguish them (on the basis of ratio of diameter to height) because of the small sherd size. Other forms represented included flagons, beakers, cheese presses, a lid, mortaria and amphorae. Small sherd size and abrasion again made it difficult to identify some other vessel forms. For example, a small sherd from which the clay has been drawn out to a point and which shows evidence of burning, may have been part of a lid, although it would not have been possible to grip

the 'handle' very satisfactorily. Alternatively, it could have the foot from a small bowl with tripod feet similar to those from Usk (Greene 1993, fig 19, no 78) and Wroxeter (Darling 1977, fig 6.7, no 32).

Table III.2 Birch Heath: quantification of vessel forms by fabric type

	Samian	*Grey*	*Orange*	*White-slipped orange*	*Black burnished*	*White Hartshill-Mancetter*	*White Oxfordshire*	*Fabric 145*	*Total no sherds/ %*	*Wt (g) %*
Flagon			9 21g						9/ 0.9	21g/ 0.4
Beaker			1 <1g		11 147g				12/ 1.25	147g/ 2.7
Jar		4 59g	28 256g		74 404g				106/ 11	719g/ 13
Dish/ bowl	4 89g		39 322g	2 11g	34 336g				79/ 8.2	758g/ 13.7
Cheese press			21 234g						21/ 2.2	234g/ 4.2
Lid			1 12g						1/ 0.1	12g/ 0.2
Indet	7 9g	2 1g	444 1372g	1 12g	180 469g	2 3g	33 67g		669/ 69.7	1933g/ 34.9
Mortaria			33 684g						33/ 3.4	684g/ 12.3
Amphorae								30 1031g	30/ 3.1	1031g/ 18.6
Total no sherds	11	6	576	3	299	2	33	30		
%	1.1	0.6	60	0.3	31.1	0.2	3.4	3.1		
Wt (g)	98g	60g	2901g	23g	1356g	3g	67g	1031g		
%	1.8	1.1	52.4	0.4	24.5	0.1	1.2	18.6		

Twenty-one sherds in an orange ware fabric representing a minimum of four vessels and a maximum of six, plus one other possible vessel (only a small part of the rim survives and it is not possible to give a positive identification) were recovered from contexts (661), (691) and (749), associated with Structure 4. These vessels were used in the production of disc-shaped cheeses (Cat nos 13–16). It is possible that the bowl from context (668), (Cat no 9) is a bowl-shaped cheese press (cf Dannell & Wild 1987, fig 41, no 67), although this identification is based solely on the rim form as there is no evidence for perforations.

Similar vessels have been found throughout Britain including Warrington (Hinchliffe *et al* 1992, fig 73, no 462); Holt (Grimes 1930, fig 72, no 206); Usk (Greene 1993, fig 55, no 252); Eccles (Detsicas 1977, fig 3.4, no 97); Longthorpe (Dannell & Wild 1987, fig 41,

nos 65–7), Wroxeter (Bushe-Fox 1913, fig 18, no 38) and Camulodunum (Hawkes & Hull 1947, pl 68, no 199). The function of these vessels was to allow the whey to run off through the holes. Often there are concentric rings in the base of the pot on which the cheese rested.

Columella, a Roman soldier and farmer who lived in the first century AD, documented the methods of cheese manufacture in Italy in his *de Re Rustica*. Another Roman writer, Varro, writing in the first century BC, discussed in *Rerum Rusticarum* II, 11 the different kinds of milk available – sheep, goat, mare, ass and cow – and the types of cheese that could be made from them. All these animals would have been available in Cheshire, as they were in Italy. The cheese-making season ran from May to mid-July and once made the cheeses could be dried and stored. For the Romans sheep and goat's milk was more highly regarded than cow's milk (Dannell & Wild 1987, 69; Alcock 2001, 57–9). Varro referred particularly to the cheese made from sheep's milk, as did Columella.

It is not unreasonable to assume that the Italian cheese-making methods were similar to those used in Britain. White (1975) suggests that the milk for the cheese was collected in a wide-mouthed shallow bowl (*mulctrum*), in which the milk could curdle before being transferred to the presses. It is likely that some of the black burnished bowls found on the settlement were used for this process. Alcock (2001, 61) suggests that heavy, flat rounded mortaria were also suitable vessels for making cheese, as the bacteria remaining on the grits would avoid the need to add further rennet and the spout could be utilised to allow easy pouring of the whey before transferring the curd to the presses.

Date

On the basis of vessel forms and fabrics, the majority of the pottery falls within a date-range spanning the late first to the late second century, with the traded and imported wares such as samian and black-burnished wares being used alongside the locally produced pottery. The production of the local wares seems to have contracted at the end of the second century but some later activity is suggested by the presence of third-century white ware vessels from Oxfordshire and Warwickshire.

Functional composition of the assemblage

Urban and basic rural sites can be distinguished in most cases through functional analyses. Evans (2001) has shown that there are trends in the composition of assemblages and a consistent variation between forts/towns and rural sites, with villas falling between the two. Table III.3 shows the percentage of forms from Birch Heath.

These are interesting proportions, as Evans suggests that rural sites are usually much more jar-dominated than urban or military ones (2001, 28), have a low level of table wares and beakers and fairly high levels of mortaria. A figure of less than 50% jars is considered to be low for a rural site (Evans 1998, 214). When compared with the percentage of jars and bowls/dishes on other second-century northern sites (Evans 2001, 26, fig 4), the Birch Heath assemblage falls within a cluster of urban sites, which may be a reflection on the type of culinary practices being carried out, availability or simply a matter of choice.

Table III.3 Birch Heath: percentage of vessel forms by fabric based on minimum number of rims

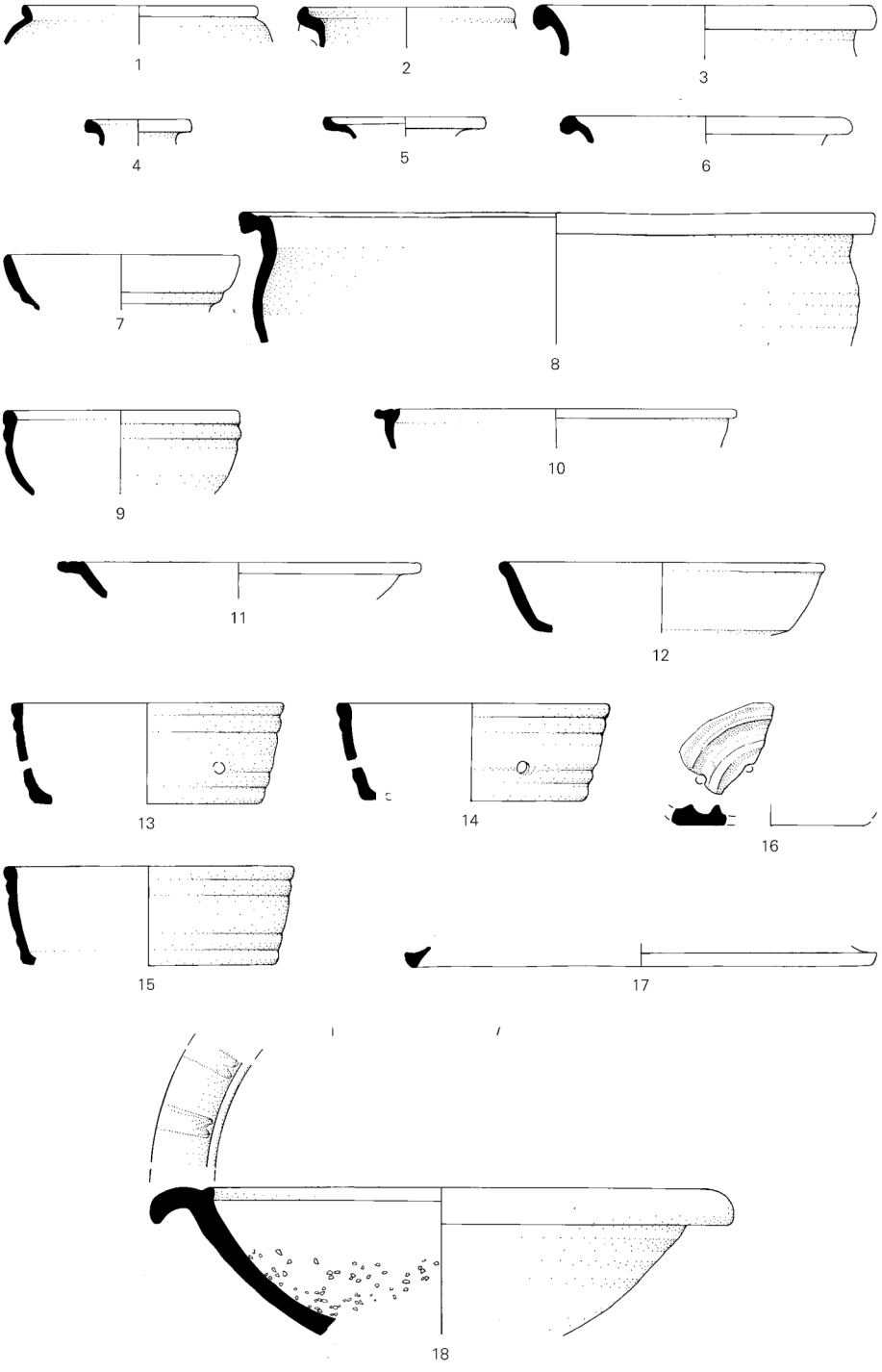
	Samian	*Grey*	*Orange*	*White-slipped orange*	*Black burnished*	*White*	*Fabric 145*	*Total*
Flagon				1.7				1.7
Beaker		1.7			1.7			3.4
Jar		3.4	8.5		22.0			33.9
Bowl/dish	1.7		23.7	1.7	13.5			40.6
Cheese press			6.8					6.8
Lid			1.7					1.7
Indet			6.8					6.8
Mortaria			5.1					5.1
Amphorae								

The preference for black-burnished ware jars/cooking pots compared to local wares (22% : 10.2% respectively) may be because the fabric of the black-burnished wares was better at withstanding thermal shock and hence more conducive to open-hearth cooking than the locally produced vessels. Alternatively, the black-burnished ware, which dominated both military and civilian markets, may have been more readily available. In contrast to this, there were more bowls/dishes in local fabrics than black-burnished ware (25.4% : 13.5% respectively).

Another vessel type considered to be a good indicator of site type is amphorae, with military sites having a higher percentage than urban. Military and urban sites are also distinguishable from rural sites. Less than 1%, based on sherd count, is the usual proportion of amphorae on rural sites. The high percentage of amphorae based on sherd count from Birch Heath (3.1%) appears to be unusual and more typical of military sites (Evans 2001, 33, fig 11). However, it is probable that all the sherds were from the same vessel, probably reused, as they were found concentrated around Structure 4.

Although the pottery assemblage thus showed similarities to northern military and urban sites in the proportions of jars/cooking pots, bowls, mortaria and amphorae, it also shared characteristics with those found on rural sites: for example, the finewares made up less than 2%. The low average sherd weight (5.8g) is also indicative of a rural assemblage compared to military, urban and villa sites where the average sherd weight ranges from 10g to 30g (Evans 1998, 216), although this presumably reflects on the depositional history of the pottery after breakage rather than its use.

Although we can make general statements as to what these differing proportions of vessel type mean, it is also becoming clear that there were regional trends in the functional composition of assemblages, as is evident, for example, among sites in the Severn Valley area (Evans 2000, 30). This highlights the need for more comparable data from broadly contemporary sites in the North West.



Ill III.10 Birch Heath: Roman pottery cat nos 1–18. (Scale 1/4)

Catalogue

Because of the difficulty in phasing the site the catalogue is ordered by context within ware type

Grey wares

1 Beaker; abraded; Fabric 193; Form 1132. (U/S); SF 29. Late first century.

2 Lid-seated handled jar; only the scar of the handle is present; Fabric 193; Form 1331. (661); SF 28; *cf* Hartley & Webster 1973, fig 5 no 38: late first century.

3 Jar. Hard, well-fired fabric with quartz inclusions. Fabric no 771; Form no 1343. (668); SF 23. *Thin section report on Sample V1241.* Wheel-thrown fabric tempered with a quartzose sand with grains mainly less than 1mm across. Most of the grains are rounded quartz, including metamorphic quartz grains, but also include chert, altered feldspar, plagioclase feldspar and a sandstone composed of overgrown quartz grains with kaolinite cement. The groundmass contains sparse muscovite and angular quartz grains up to 1mm across.

Orange wares

4 Flagon; very abraded; Fabric 194; Form 1333. (503); SF 5. *Cf* Grimes 1930, fig 67, no 115: late first-/early second century.

5 Flagon or lid-seated jar; very abraded; Fabric 194; Form 1342. (1503); SF 10.

6 Lid-seated jar; abraded; Fabric 194; Form 1335. (750); SF 9.

7 Plain-rimmed bowl; two grooves beneath rim. Abraded; Fabric 194; Form 1339. (694); SF 32. Late first/second century.

8 Bowl with reeded rim; very soft and abraded; Fabric 194; Form 1341. (U/S); SF 18.

9 Bowl in a white-slipped orange fabric; two grooves beneath rim, very soft and abraded; Fabric no 199; Form no 1338. (668); SF 17. *Cf* Grimes 1930, fig 66, no 96: late first/second century.

10 Dish/bowl with a reeded rim; very abraded; Fabric 194; Form 102. (769); SF 7.

11 Dish with reeded rim; very abraded; Fabric 194; Form 1340. (673); SF 8.

12 Plain-rimmed dish imitating samian form Drag 18/31; signs of ?burning on broken edge; Fabric 194; Form 1334. (661); SF 6. Late first/second century.

13 Cheese press; six joining sherds. Evidence for a drainage hole in the lower wall and possibly one in the base though very little of the base remains; Fabric 194; Form 1336; (749); SF 12. Second century.

14 Cheese press; three joining sherds in a fine fabric. Two parallel grooves just below the rim and just above the junction of the wall and base. Drainage hole in lower half of the wall and evidence for another in the base; H 54 mm, diam of drainage hole *c* 5 mm; Fabric 194; Form 1336. (661); SF 4. *Cf* Hinchliffe *et al* 1992, fig 73, no 462; Grimes 1930, fig 72, no 106: second century.

15 Cheese press; one sherd showing complete profile of vessel. No drainage holes are present but the form is similar to cat nos 12 and13; Fabric no 194; Form no 1336. (749); SF 11. Second century.

16 Cheese press; one sherd of base only. Two basal ridges between which there is part of a drainage hole; Fabric 194; Form 1337; (691); SF 31. *Cf* Hinchliffe *et al* 1992, fig 33, no 270: second century.

17 Lid; very abraded; Fabric 194; Form 103. (780); SF 16. *Cf* Webster 1992, fig 27, no 154: second century.

18 Mortarium; Wilderspool type with hooked rim, surfaces very abraded. Stone trituration grits. Herringbone borders of a potter's stamp visible but potter's name illegible; Fabric 527; Form 931; (770); SF 15. *Cf* Hartley & Webster 1973, fig 11, no 104: second century.

19 Mortarium; hooked rim, surfaces very abraded, ?Wilderspool type; Fabric 198; Form?312 1554); SF 14: second century.

20 Roundel; two joining fragments of an incomplete pierced ceramic roundel. Slightly convex and abraded, hole slightly off centre. Probably a counter, maybe for a board game or a reckoning counter; diam 42 mm, max thickness 4 mm, diam of hole *c* 5 mm, weight 5 g. (750); SF 1.

Black-burnished ware

21 Beaker; surfaces very abraded; Fabric 19; Form 28. (524); SF 20. *Cf* Gillam 1976, no 24: early- to mid-second century.

22 Jar/cooking pot; abraded; Fabric 19; Form 355. (574); SF 26. *Cf* Gillam 1976, no 16: early- to mid-second century.

23 Jar/cooking pot; hard fabric probably due to overfiring which has produced a grey/orange sandwich core and brown surface which is abraded; Fabric 19; Form 355. (749); SF 27. *Cf* Gillam 1976, no 16: early- to mid-second century.

24 Jar/cooking pot; Fabric no19; Form no 45. (749); SF 24. *Cf* Gillam 1976, no 3: mid- to late second century.

25 Dish; abraded; Fabric 19; Form 47. (574); SF 25. *Cf* Gillam 1976, no 52: mid- to late second century.

26 Plain-rimmed dish; Fabric 19; Form 1104. (1548); SF 21. *Cf* Gillam 1976, no 76: mid- to late second century.

Stone

27 Flint flake core with large, irregular flake scars; U/S. Not particularly diagnostic, but probably Late Neolithic / Bronze Age.

28 Pounder; a quartzite glacial erratic Typical 'flat-iron' shape. Probable origin Dunham conglomerate, originally Brittany. (764); SF 30.

Glass

Three fragments of Roman vessel glass were recovered. Specific dates cannot be suggested because the exact vessel forms could not be identified. The blue/green colour of the glass was common throughout the first to third centuries AD.

Catalogue

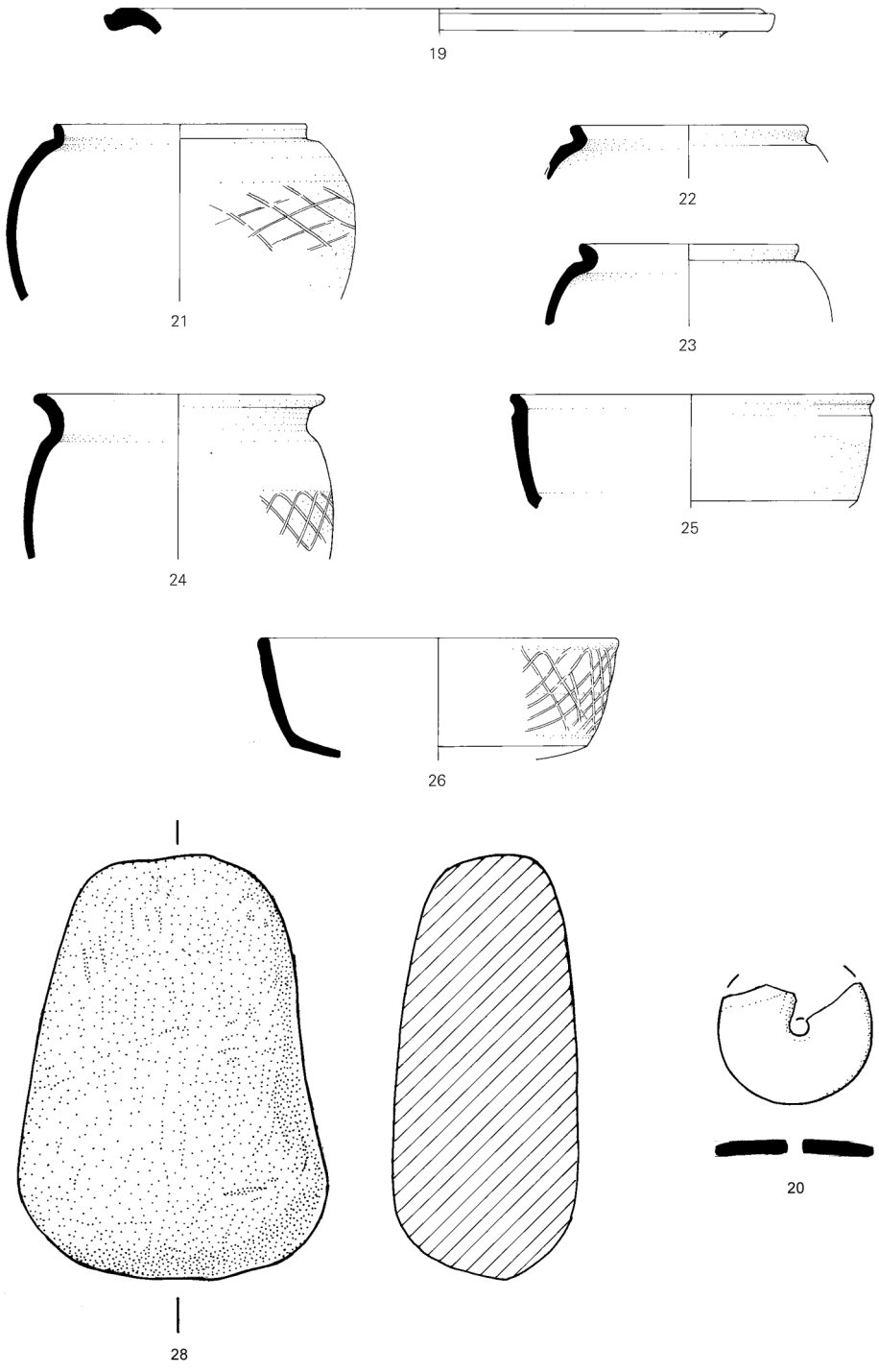
29 Fragment of blue/green glass. Two of the three broken edges are smooth, possibly the result of deliberately working the fragment to a point, or the result of abrasion through ploughing; (659).

30 Fragment of blue/green glass, probably from the neck of a flagon, flask or unguent bottle; (720).

31 Fragment of blue/green glass, probably from a bottle; (1583).

Coin

Only one coin was recovered during the excavation, from context (750). It is probably an *as* or *dupondius* but no surface features survive.



Ill III.11 Birch Heath: Roman pottery and other finds cat nos 19–28. (Nos 19, 21–26 scale1/4; nos 20, 28 scale 1/2)

Metal

Iron

There were eleven fragments representing nine nails, including a type with a wide discoidal head, possibly used for decoration, from (780), and a possible hobnail from (1005).

There was also a heavily corroded pitchfork from context (720). It was a two-tined fork with a tang. One tine is complete but broken and the other has the tip missing. The tang, which is rectangular in section, is also broken. The tines are rectangular in section at the base but square in section towards the tip. There are thirty other fragments of iron associated with it, of which one piece is probably the tip of the broken tine. It is *c* 215mm in length. *Cf* Manning 1976, 31, fig 19 no 87 and White 1967, 107–9.

Lead

A small strip of corroded lead weighing 89g was recovered from ditch context (709). It is unremarkable and contains no hint of its function.

Discussion

It is clear from the pottery found on the site that the inhabitants had access to local markets and were acquiring the 'standard' range of wares available in the north-west in the late first and second centuries. These were mainly local wares but the presence of black-burnished ware from Dorset, samian and amphorae indicates access to larger-scale supply mechanisms. There is a strong emphasis on utilitarian vessels and very few of what may be termed 'high status'. The small amount of samian and absence of other fine tablewares suggests that they were either not as readily available as the coarsewares, that they could not be afforded, or that there was no cultural preference for them. Even so, it should be noted that some Roman culinary practices, such as the use of flagons and mortaria, had been absorbed. The lack of evidence for repairs to any of the vessels suggests that overall the supply of pottery was able to meet demand. It is also possible that leather and wooden vessels would have continued to be used for food preparation and consumption, as they presumably were in the pre-Roman Iron Age, but have not survived.

Although the inhabitants of the settlement had to some extent become 'Romanised' in their way of life, this appears to have been limited to their use of pottery, as there were no other typically 'Roman' artefacts, such as brooches or other fine metalwork or bone objects, and there was only a small quantity of glass. Although this may in part be due to the soil conditions, which were not conducive to the preservation of bone and metal, it is a fairly typical pattern found on Romano-British rural sites in the north-west of England.

Excavations at Beeston Castle produced a small amount of badly abraded Roman pottery and a small fragmentary group of building material. As at Birch Heath, there was a small quantity of samian and amphorae but also some second-century black colour-coated ware from Gaul or the Rhineland, once again suggesting a population somewhat Romanised in its tastes and in touch with the main arteries of trade (Carrington 1993, M1:E13). Sites recently excavated in Merseyside also provide scope for comparison and for placing Birch Heath in a regional context (Cowell & Philpott 2000). The finds assemblage from the site at Ochre Brook, Tarbock, a small enclosed settlement, was dominated by pottery, with few metal and glass

artefacts. The pottery predominantly dated to the second century, but the settlement may have been inhabited for less than a century (Jones 2000, 89). The presence of new pottery fabrics, tile, wasters and probable kiln debris, which provided the first evidence for Roman pottery production in Merseyside, led to the suggestion that the settlement may have been established by an incomer to the region, possibly a legionary veteran, who may have been involved with tile manufacture. Brunt Boggart, also in Tarbock, produced a smaller assemblage of pottery but the range of forms appeared to be more 'traditional', as some of the more common 'Romanised' forms such as flagons and mortaria were absent (Jones 2000, 139).

Industrial remains

N Fairburn

Two types of metallurgical industrial waste were recovered on the site, ironworking waste and leadworking waste. The ironworking residues form the largest part of the metallurgical residue assemblage: only one piece of lead slag was uncovered and this was unstratified.

The ironworking residues were recovered from a number of contexts, but were particularly concentrated around Structure 3. They were diagnostic of both smelting and primary smithing.

Ironworking

A total about 8.5kg of material associated with ironworking (ore, slags and vitrified clay lining) was recovered from the excavation – a very small amount of material for a production site. Experimental work has shown that the smelting process to produce a bloom, followed by smithing, could be expected to produce a lot more waste – at least 7kg of slag waste per episode (Crew 1991). The Birch Heath material probably represents no more than two periods of activity, attested by pieces of vitrified clay lining which show evidence of repair or relining. New clay had been laid over an already-vitrified surface which itself then became vitrified from another episode of high-temperature activity.

The manufacture of an iron artefact from iron ore can be separated into three distinct processes: the smelting of the ore in a furnace, which will produce a bloom of iron as well as fayalitic slag residues; the primary smithing to consolidate the iron bloom into a billet; and, thirdly, secondary smithing, the shaping of the billet into an object.The evidence recovered from Birch Heath suggests that all of these processes were being carried out on the site.

The material from Structure 3 can be classified into seven different categories: roasted ore, bloomery slag, smithing slag, hammer scale, low-density slag, vitrified lining and amorphous slags.

Roasted ore

The ore was identified as haematite, one of the commonest iron ores. The source unknown, but the nearest known locations are in Lancashire. The ore that was recovered may not be representative of the ores actually smelted as it may have been discarded as of poor quality.

Bloomery slag

The bloomery slag constituted the largest amount of material recovered by weight. It was typical of furnace slag described by Tylecote (1986), containing partially reduced ore and

charcoal. None of the slag that was recovered was tapped, suggesting that the Roman ironworking practices that produced tapped slags were no longer being used here.

Smithing slag

Amongst the recovered material were fayalitic slag lumps and pieces of plano-convex bottoms (PCBs) that are diagnostic of smithing, representing residues that consolidated in the bottom of the hearth as PCBs. The first are similar in composition to furnace slags but are distinguishable by their shape. Their production is still poorly understood.

Hammer scale

Smithing produces hammer scale when a hot iron object is struck. It is usually found in the area where the smithing was carried out.

Low-density fluxed lining slags

Low-density fluxed lining slag is usually described as fuel ash, but in fact it is clay which has melted and dropped away from the rest of the lining. It is a low-density vitreous, vesicular material that is very friable and easily fragmented. The fragmentary nature of the slag would account for the low quantity that was recovered. This slag is not diagnostic of any particular process, as it can result from any high-temperature activity, including smelting and smithing.

Vitrified lining

This material consists of clay that has been vitrified on one side in the high temperature area of the furnace or the smithing hearth. Vitrified lining is produced by a high-temperature reaction between the clay lining and the alkaline fuel ashes or slag. It can be difficult to identify if pieces of vitrified clay come from a furnace or a hearth structure. Smelting sites usually produce significantly larger quantities than smithing sites, because of the difference in the size of the structures. None of the pieces that were recovered were diagnostic of either furnace or smithing activities, as the clay from both of these activities would have similar characteristics. None of the pieces showed any sign of curvature.

The lining appears to have been made from the local clay and had oxidised to a purple-red colour. Where one face of this lining was exposed to high temperatures, it had started to vitrify to a slightly vesicular vitreous material. This vitrified surface varied in colour on different fragments from black through to olive green, reflecting the varying temperatures.

Some of the pieces show evidence of repairs, where a black vitrified surface had been covered with more clay, which in turn had vitrified again to a glassy black surface. This indicates two episodes of activity.

Amorphous slags

As with most assemblages there was a quantity of material that is difficult to classify, and this represented the largest proportion of the material recovered. These slags did not have any distinguishing characteristics and were amorphous in shape and were often small.

They could have been from either the smelting or the smithing process, but it is more likely, as no smelting slag or ore was found, that they were from the smithing process. This does not mean that smelting may have been taking place in the vicinity.

Leadworking

Only one piece of black glassy leadworking slag was found on the site and this was unstratified, so it cannot be stated for certain that leadworking was taking place on the site. However, it would not be unreasonable to suggest that the settlement may have had some contact elsewhere with a lead production site (possibly the north-east Wales sites) and this is possibly where the slag had originated.

The environmental remains

The animal bone **M Ward**

A small quantity of bone fragments was recovered from ten contexts. All of the material showed obvious indications of burning. Both teeth and bone were highly fragmented which might have been a result of exposure to heat. No other taphonomic processes can be readily discerned.

Only four items were identifiable: a fragment of pig molar from (534); three fragments of sheep/goat proximal ulna from (661); fragments of cow molar from (661); and a fragmented sheep/goat lower right P4 from (673).

The bone was found in greatest quantities in pit (749), ditch (1592) and roundhouse gulley (661), and this may be significant. Contexts (749) and (661) were close to each other and probably had a shared event or process in the bone accumulation: probably deliberate dumping of waste material or accidental burning. However, deposition of a ritual nature should not be discounted. Enclosure ditch (1592) was fairly isolated and the quantity of bone there in comparison with other similar features does suggest some significance, although it is most likely that this material was general waste, as is commonly found in Roman ditches.

The faunal remains were too few and fragmented to comment on husbandry, and it would be unwise to suggest any agricultural or economic practices other than the actual presence of the domestic animals noted above.

The fact that all the material had been burnt suggests little of food preparation, only because insufficient identifications can be made. A heuristic approach to the burnt material would be more suitable for a large assemblage where the bones are less fragmented. The possible purposes of intentional burning can be summarised as cooking, waste disposal, fuel and cremation (usually for human remains); the last can probably be discounted in this case. Although accidental burning has also been discounted, it is possible that material could have been burnt when a roundhouse caught fire. Such an event would probably have a good supply of fuel and air and may cause bone to calcine.

Plant remains — **Wendy J Carruthers**

Introduction

Fifty environmental samples were taken from a variety of deposits, including ironworking features, ditches, pits and post holes. In some cases the samples were not large, but a total of *c* 400 litres of soil was processed and assessed. On the basis of the assessment, recommendations were made that twenty-three samples should be sent to a charcoal specialist for analysis (*see* Gale, *this volume*) and seventeen samples should be analysed fully for charred plant remains. This report discusses the results of analysing eleven samples from the second roundhouse in area 0/4A, and six samples from ditches in area 0/4B. It is thought that the second roundhouse burnt down, as it produced large quantities of charcoal. Because of this, and because some of the samples from this structure were relatively productive, a few less-productive samples were also examined from this building because of their group value.

Methods

Flots from the seventeen samples were fully sorted under a binocular microscope. The charred plant remains recovered are listed in Table III.4. The results from the assessment have been added to the totals in the last column of the table, which gives the total number of samples in which each taxon occurred. Nomenclature and much of the habitat information follow Stace (1991).

It was noted during sample processing that much of the charred material did not float to the surface but was suspended just above the residue. Large quantities of charcoal were often still present in the residues, and many of the charred remains appeared to be impregnated with silt. Jones and Moss (1993) found that flotation was not an effective method of recovery at nearby Beeston Castle and sorted subsamples of residues in order to reduce bias in the results. In the light of Jones's observations, two residues from two of the most productive samples (17030 and 18006) were fully sorted. For sample 17030 this resulted in the recovery of more charred plant macrofossils than had been recovered by flotation (twenty-one compared to thirteen recovered by flotation). These were mainly fragments of charred hazelnut shell. The failure of this dense material to float has been noted by many authors, from sites on a range of soil types. A few, poorly preserved cereals were also recovered, but it was very difficult to spot these because they were often so encrusted with silt. Residue 18006 produced only three remains, compared to twenty recovered by floatation, although some remains could have been missed because they were so encrusted with silt.

Although additional charred remains were recovered by sorting these two residues, it did not produce additional types of remains. Microscopic sorting of the residues was very time-consuming, very difficult, and probably not very effective because of the silt impregnation. It was therefore decided that, for this unproductive site, further sorting of the residues was not worthwhile. However, these problems should be taken into account on other sites with similar soils (mostly fine loamy, slowly permeable soils over New Red Sandstone), and processing methods should be altered accordingly. Jones's (Jones & Moss 1993) method of sorting subsamples of the >1mm residues is likely to be worthwhile where remains are easier to spot and where the samples are more productive.

Discussion

Only small numbers of fruits and seeds were recovered from the Roman samples, but this in itself may be significant, as discussed below. The charred assemblages were fairly similar to one another in character, being composed mainly of a few cereal grains and occasional chaff fragments and weed seeds. They probably represent background domestic waste, as the concentrations of remains were low in all of the samples (c one to four fragments per litre of soil processed). No concentrations of crop processing waste or stored clean crops were found.

Cereals

The cereals identified included bread-type wheat (*Triticum aestivum*-type), spelt (*T spelta*), cf emmer (*T* cf *dicoccum*) and a little hulled barley (*Hordeum* sp). The oat/chess (*Avena* sp/*Bromus* sp) grains and single possible rye grain (cf *Secale cereale*) were probably weeds, as there is little definite evidence that they were cultivated as a crop prior to the Saxon period (Greig 1991). Although the information is scant from these samples, spelt wheat was probably the dominant cereal consumed, followed by bread-type wheat. The dominance of spelt wheat is typical of most sites of the period, at a time when emmer cultivation was decreasing and bread-type wheat was increasing. The relatively high occurrence of bread-type wheat, however, is of interest, since the importance of this crop in Roman Britain is not fully understood. Few Roman sites have produced large quantities of bread-type wheat, but one site in northern England that is of note is the Roman granary at South Shields (van der Veen 1988), where roughly equal quantities of spelt and bread-type wheat were present. Because so few grains as a whole were recovered from Birch Heath, too much emphasis should not be placed on these results. However, the fact that this 'innovative' cereal was available to the occupants of this small farming settlement could be related to the proximity of the legionary fortress at Chester.

Weeds

The few arable/cultivated ground weed seeds present provided little information about the type of soils cultivated or crop husbandry regimes, as they all grow in a wide range of disturbed habitats, eg cleavers (*Galium aparine*) and redshank/pale persicaria (*Persicaria maculosa/lapathifolia*). Some of the taxa are particularly frequent in nutrient-rich soils, eg common chickweed (*Stellaria media*) and docks (*Rumex* sp). If they were growing as arable weeds, rather than having been burnt in another type of waste, manuring may have been taking place.

Several of the weed taxa are common in grassland habitats, such as buttercups *(Ranunculus repens/acris/bulbosus)* and ribwort plantain (*Plantago lanceolata*). Since grass-type stem (culm) fragments and/or grass seeds (Poaceae) were present in nine of the eleven 0/4A samples and two of the six 0/4B samples it seems likely that hay or turves had been burnt. The bulbous bases of stems (eg onion couch grass: *Arrhenatherum elatius* var *bulbosum*) and several types of tuber (including some from sedges: Cyperaceae), were also preserved, suggesting that in these cases at least it was turves rather than hay that had been burnt. In area 0/4A these remains might provide evidence of the surrounding vegetation that existed when Structure 2 was burnt to the ground. Remains from the 0/4B ditches could represent burnt fodder, dung or tinder from fires. This type of burnt waste would have been a

Table III.4 Birch Heath: summary of charred plant remains

Key R = residue sorted ; [ ] = remains from residue ; * = includes assessment samples
Habitat preferences A = arable; C = cultivated; D = disturbed/waste; E = heath; G = grassland; H = hedgerow; M = marsh/bog; R = rivers/ditches/ponds; S = scrub; W = woods; Y = waysides/hedgerows
Soil preferences a = acidic soils; c = calcareous soils; n = nutrient-rich soils; o = open ground; d = damp soils"

Sample no	17004	17024	17026	17030	17034	17052	18000	18001	18002	18003	18004	18006	18007	18008	18009	18013	18014	*No*
Context	(523)	(592)	(594)	(661R)	(673)	(1592)	(1001)	(1002)	(1003)	(1004)	(1005)	(1008R)	(1009)	(1010)	(1011)	(1020)	(1018)	*samples**
Taxa																		
Cereals																		
Triticum aestivum-type (bread-type free-threshing wheat grain)	1			[1]			1						1	2	2			6
Triticum dicoccum/ spelta (emmer/spelt wheat grain)		2		2	1		1		1		1	7	3	8	1		1	11
Triticum sp (wheat grain)							1					1					1	3
Hordeum sp (hulled barley grain)			1[3]		1													4
Avena/Bromus sp (oat/chess grain)				1			1											2
Cf *Secale cereale* L (Cf rye grain)							1											1
Indeterminate cereals		1	22[3]		1		2	1	1			3[2]	3	2				13
Chaff																		
Triticum aestivum-type (bread-type wheat rachis frag)								1					2				1	3

Triticum spelta L (spelt glume base)		1										1		1				4
Triticum Cf dicoccum (*Cf* emmer glume base)																	1	1
Triticum dicoccum / spelta (emmer/spelt glume base)		2		1			1									1	1	6
Triticum dicoccum / spelta (emmer/spelt spikelet fork)			1															2
Hordeum sp (barley rachis frag)					1													1
Weeds																		
Ranunculus repens/ acris/bulbosus (buttercup embryo) DG	1							1			1		1				1	7
Corylus avellana L (hazel nut shell frag) HSW				3[13]								[1]					1	2
Stellaria media (L) Villars (common chickweed seed) CD												1						1
Persicaria maculosa/ lapathifolia (redshank/pale persicaria) CD	1					1			1						1		1	7
Polygonum aviculare L (knotgrass achene) CD														1				1
Rumex sp (dock achene) CDG			1						9		3	3		7	3			7
Erica sp/Calluna vulgaris (heather fruit) E					1													1

Trifolium/Lotus sp (clover/trefoil) DG							1											2
Vicia/Lathyrus sp (small seeded weed vetch/tare) CDG	1	1		1[1]														3
Galium aparine L (cleavers) CDH			1										2					2
Plantago laceolata L(ribwort plantain) Go									2				2			1		3
Odontites verna/ Euphrasia sp (red bartsia/eyebright) CD																	1	1
Carex sp (sedgenutlet) MPD														2		1		2
Bromus sect *Bromus* (chess caryopsis) ADG			1	3			3		1			3	1	3	1	1	1	10
Arrhenatherum elatius (seeded grass caryopsis) CDG										1								1
Poaceae (small)	1					1			5	1			2	4		1		7
Poaceae culm fragment	1								10		3	1		4			2	7
Poaceae culm node							2							1				2
Poaceae culm bases																		2
Cf Cyperaceae tubers	1				3													3
Indeterminate tubers	6	4	1		3										2			9
Total	13	11	8	13[21]	10	3	14	3	30	2	8	20[3]	17	35	10	5	12	50
Sample size (litres)	4	16	12	8	8	4	12	6	10	11	11	11	20	24	19	4	28	
Fragments per litre	3.3	0.7	0.7	1.6	1.3	0.8	1.2	0.5	3	0.2	0.7	1.8	0.9	1.5	0.5	1.3	0.4	

valuable source of potash if spread on the fields, whether they were being used for pasture or arable crops.

Hazelnut shell (*Corylus avellana*) was present in three samples, but, as noted above, it may be underrepresented in the flots because of a problem with flotation. Hazelnuts, collected from open woods and hedgerows, are likely to have been a valued supplement to the diet of the occupants of the settlement. Gale (this volume) suggests that the region was probably still densely wooded in Roman times, so woodland fruits and nuts would have been readily available. Apart from cereals and hazelnuts, no other evidence of food plants was recovered, but this is not uncommon in charred assemblages because of the biases in preservation.

A single ericaceous fruit (including heather and heaths, *Calluna vulgaris*, *Erica sp*) was recovered from sample 17034. This sample was the only one fully analysed to produce ericaceous charcoal (Gale, *this volume*), although sample 17052 from ditch (1590) (not analysed by Gale) also contained twiggy fragments characteristic of Ericaceae. Heather remains are often associated with ovens and hearths, as they burn rapidly to produce intense heat. For metalworking, however, high temperatures must be sustained, and Gale notes that charcoal would have been used for this purpose, primarily from oak heartwood.

Comparisons with other sites

There are no obvious differences between the Roman plant assemblages from these excavations at Birch Heath and those from Brook House Farm, Bruen Stapleford (Carruthers, *this volume*). Emmer/spelt, bread-type wheat and barley were present on both sites and a similar range of weed taxa was recovered.

Evidence from pollen analysis carried out in the Mersey–Dee basin (Cowell & Philpott 2000) indicates that there was an increase in clearance for both cereal cultivation and the creation of grassland through the Romano-British period. Charred plant remains from the Romano-British farmstead at Ochre Brook (Huntley & Daniell 2000) produced no chaff fragments and frequent evidence of grassland taxa. The predominant cereals were barley with some spelt, and this was said to be typical of the period for northern England. Although the lack of chaff could be due to preservational factors, it is tempting to suggest that this farmstead placed a much greater emphasis on livestock farming than arable cultivation, so that processing waste had not been widely distributed around the site, as at Birch Heath. However, at Birch Heath emmer/spelt was much more frequent than barley, and bread-type wheat was important.

Conclusions

The samples from the Birch Heath excavation produced remarkably few charred cereal remains, particularly in comparison with other sites of this period. The use of negative evidence to argue a point is always dangerous, particularly since, in this case, recovery of the charred remains was problematic. In addition to the recovery problems, charred plant remains could have been sparse because:

- the excavations missed the charred plant macrofossil-rich areas;
- the waste chaff and cereals had been fed to livestock or used for other purposes, rather than having been burnt;
- production was so small-scale that cereals were highly valued and not spread around the site as waste

With regards to the recovery problems outlined above, the checks made on two residues indicated that, although seed numbers may have been reduced to some extent because of the soil conditions, whole categories of remains were not being lost. Even with twice as many cereal grains, as in sample 17030, the samples would still have been considered to be fairly unproductive for the Roman period.

Only seventeen chaff fragments (glume bases, spikelet forks and rachis fragments) were recovered. These are fairly robust and easily recognisable as charred remains and are commonly recovered from Roman samples. There was no indication that these remains were being lost in the residues. As suggested above, it is possible that chaff may have been used as fodder rather than being burnt. It is also possible that a crop-processing area existed in an area of the site that was not sampled. Even so, if crop-processing had been taking place on a large scale, chaff would have been abundant enough to have been used as tinder and fuel and it would have become spread around the site amongst the general background waste.

It is possible that cereals were purchased and brought onto the site, but it is unlikely that this took place on a large scale or for a long period of time. It is generally considered that in wet climates, such as in Britain, hulled wheats would have been stored in spikelet form (Hillman 1981). Thus, even on consumer sites, chaff and weed seeds would be present from the final stages in cereal processing, when grain was freed from the spikelets (eg glume bases, spikelet forks and some weed seeds).

The sparse charred assemblages from this site, containing almost as much evidence for grassland as for cereals, appear to suggest that pastoral farming was more important than arable cultivation or the consumption of arable crops. It is interesting to note that pottery presses for cheese-making were more numerous on this site than usual, demonstrating that dairy produce was in surplus. Fairburn suggests that cheeses may have been produced for sale in the Chester *canabae* or for the military. Perhaps these were traded for goods such as pottery and bread-type wheat. Since bread wheat is a free-threshing cereal, it would have been traded as naked grain and would leave little trace in the charred plant record because contact with fire would be unnecessary. Well dated pollen sequences from the locality are now needed to clarify the picture, particularly since the soils are generally too acidic to preserve bone and molluscs, so these lines of environmental evidence are unavailable.

Charcoal — **Rowena Gale**

Introduction

Charcoal (sometimes in comparatively large amounts) was recovered from several of the environmental samples collected during excavation. Twelve of these were selected for full

analysis from areas 0/4A (Roundhouses 1 and 2 and pits) and 0/4B (Roundhouse 3 and metalworking areas). Archaeological evidence from Roundhouse 2 was consistent with its destruction by fire. The examination of associated charcoal therefore provided the opportunity to study the burnt structural remains of this roundhouse and compare these to domestic and industrial fuel deposits from Roundhouses 1 and 3. The study also enabled an assessment of the local woodland environment.

Methods

The charcoal was generally rather poorly preserved, although slightly less affected by silt impregnation than samples from the Iron Age settlement at Brook House Farm, Bruen Stapleford (Gale, *this volume*). Samples were prepared for examination using standard methods (Gale & Cutler 2000). The fragments were supported in washed sand and examined using a Nikon Labophot-2 microscope at magnifications up to x400. The anatomical structures were matched to prepared reference slides. When possible, the maturity of the wood was assessed (ie heartwood/sapwood).

Results

The charcoal analysis is summarised in Table III.5 and discussed below. Classification follows that of *Flora Europaea* (Tutin *et al* 1964–80). Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level, for example, members of the Pomoideae (*Crataegus, Malus, Pyrus* and *Sorbus*). Where a genus is represented by a single species in the British flora this is named as the most likely origin of the wood, given the provenance and period, but it should be noted that it is rarely possible to name individual species from wood features, and exotic species of trees and shrubs were introduced to Britain from an early period (Godwin 1956; Mitchell 1974).

The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa:

Betulaceae:	*Alnus glutinosa* (L) Gaertner, common alder; *Betula* sp, birch
Corylaceae:	*Corylus avellana* L, hazel
Ericaceae:	*Erica* sp and *Calluna vulgaris*, heathers and ling. Many members of the heather family are anatomically similar.
Fagaceae:	*Quercus* sp, oak
Oleaceae:	*Fraxinus excelsior* L, ash
Rosaceae:	Subfamilies:
	Pomoideae which include *Crataegus* spp, hawthorn; *Malus* sp, apple;
	Pyrus sp, pear; *Sorbus* spp, rowan, service tree and whitebeam. These taxa are anatomically similar.
	Prunoideae which include *P avium* (L) L, cherry; *P padus* L, bird cherry, and *P spinosa* L, blackthorn. In this instance the broad heterocellular rays suggest *P spinosa* as the more likely.

Area 0/4A

Two samples were examined from a large charcoal-rich pit, context (503), possibly associated with roundhouse Structure 1 – one from the middle and one from an unspecified location. The former consisted entirely of oak (*Quercus* sp) heartwood, while the latter included a wider range of species: blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), birch (Betula sp), hazel (*Corylus avellana*), the hawthorn/*Sorbus* group (Pomoideae) but predominantly oak (*Quercus* sp) heartwood. Although it is possible that all the fuel originated from domestic use, the differences in species between the samples suggests that the pit may also have been used as a depository for rubbish from other sources: it is feasible that the oak layer (middle location) derived from some other, perhaps non-domestic, use of the fuel.

Six samples (18004, 18005, 18006, 18009, 18013 and 18014) were examined from roundhouse Structure 2, which is thought to have been destroyed by fire. These samples included very large quantities of charcoal, sometimes with fragments measuring as much as 20mm3. Oak (*Quercus* sp), particularly heartwood, dominated throughout, and in samples 18005 and 18013, from the fills of stakeholes (1007) and (1020), the charcoal was exclusively oak, suggesting an origin in the remains of the burnt timbers. Contexts (1005), (1008) and (1011) from the fill of the roundhouse contained traces of other species including birch (*Betula* sp), hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and blackthorn (*Prunus spinosa*); and the fill of pit (1018), at the entrance to the roundhouse included alder (*Alnus glutinosa*).

Area 0/4B

The greatest density of features occurred in the northern part of the site and incorporated roundhouses and a metalworking area. Charcoal samples 17048, from gully (1579) of Structure 3, and 17045 from an adjacent metalworking area, (1534), consisted of oak (*Quercus* sp) heartwood. Both contexts produced lumps of slaggy material. A similar deposit of industrial refuse was recovered from gully (610); associated fuel debris, sample 17032, consisted almost entirely of oak (*Quercus* sp), although a small amount of ash (*Fraxinus excelsior*) was also recorded.

A further sample of charcoal, 17034, was examined from an enclosure ditch fill (673), located south-east of the ironworking site. There was no evidence of metalworking debris here and the deposit, which appeared to be more domestic in character, also included pot sherds, burnt bone, charred grain and also an ericaceous fruit (Carruthers, *this volume*). The charcoal consisted of oak (*Quercus* sp), ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), *cf* birch (*Betula* sp) and ericaceous stems.

Discussion

At the present time no comparable sites have been found in the region, and thus environmental and economic data arising from this study provide an initial understanding of local sites and their management, and will form a baseline for future excavations.

Structural evidence

The unusually high concentration of charcoal within roundhouse Structure 2 was consistent with a major burning event which probably resulted in its destruction. On this assumption,

Table III.5 Birch Heath: analysis of charcoal fragments

Sample	*Context*	*Description*	*Alnus*	*Betula*	*Corylus*	*Ericaceae*	*Fraxinus*	*Pomoideae*	*Prunus*	*Quercus*
Area 0/4A										
18004	(1005)	Fill of RH 2	-	-	3	-	-	-	-	81h
18005	(1007)	Fill of stake hole, RH 2	-	-	-	-	-	-	-	cf 49
18006	(1008)	Fill of RH 2	-	-	1	-	-	-	-	92h, 3r
18009	(1011)	Fill of RH 2	-	2	5	-	2r	-	1	63h, 8r
18013	(1020)	Fill of stake hole, RH 2	-	-	-	-	-	-	-	88h, 2s
18014	(1018)	Fill of pit, entrance RH 2	4	-	-	-	-	-	-	95h, 2s
17001	(503)	Charcoaly pit	-	-	-	-	-	-	-	59h
		Charcoaly pit	-	5	3	-	1r	1	2	67h
Area 0/4B										
17032	(610)	Metalworking gully	-	-	-	-	1s	-	-	34h, 1s
17034	(673)	Ditch fill	-	*cf* 2	2	6r	1	-	-	14h, 6s, 1r
17045	(1534)	Metalworking area	-	-	-	-	-	-	-	37h
17048	(157)	Gully, RH 3	-	-	-	-	-	-	-	64h

Key: h = heartwood; r = roundwood (diam <20mm); s = sapwood
The number of fragments identified is indicated; *denotes charcoal suitable for radiocarbon dating

the high frequency of oak (*Quercus* sp) heartwood in the charcoal (Table III.5) suggests that oak poles or trunks provided the main components of the house structure. This suggestion is supported by the large and exclusive deposits of oak (*Quercus* sp) charcoal in the fills of stake holes (1007) and (1020). Oak heartwood is extremely durable, hard and strong and (when available) has formed the basic structural elements for most large buildings from prehistoric times until its relatively recent replacement by metal or concrete (Edlin 1949).

Other contexts within the roundhouse, (1005), (1008) and (1011), were also dominated by oak, although here small quantities from other wood species were recorded, eg birch (*Betula* sp), hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and blackthorn (*Prunus spinosa*), and pit (1018), sited at the entrance to the roundhouse, included alder (*Alnus glutinosa*). These last species could have resulted from burnt artefactual elements such as wattle-work, basketry or utensils, but is also possible that some of the charcoal (including oak) did, in fact, derive from domestic fuel debris left from the final use of the hearth or on the floor of the roundhouse at the time the structure collapsed. Some of these species may have been used as roofing spars or timbers but, apart from the birch (as brushwood), it is unlikely that any would have been used as thatch. It is interesting that while heather and/or ling (Ericaceae) was available on the site (as indicated from charred remains in enclosure ditch (673)) it does not appear to have been used for thatching, despite its traditional use for such (together with gorse, *Ulex* sp: Lucas 1960) in some parts of Britain (Edlin 1949).

Fuel and fuel resources

The fills of gullies/ditches (610), (1534) and (1579), associated with the post-Roman Roundhouse 3 in the metalworking area in Area 0/4B, included large quantities of charcoal together with slag. It therefore seems fairly safe to suggest that the charcoal represents industrial waste, probably from both smelting and smithing. By far the greater proportion of the charcoal was identified as oak (*Quercus* sp) heartwood. In the Roman and post-Roman periods charcoal would have been used as a fuel in preference to firewood, since only charcoal could sustain the necessary high temperatures in a reducing atmosphere (Hodges 1964; Horne 1982). Evidence from earlier, Roman, sites in other parts of the country shows that oak was generally the preferred fuel for ironworking, although often used in conjunction with other species. Examples include the Romano-British site at Blakeney, Gloucestershire, where fuels mostly consisted of oak and hazel (*Corylus avellana*) but also included maple (*Acer campestre*), alder (*Alnus glutinosa*), blackthorn (*Prunus spinosa*) and gorse (*Ulex* sp) or broom (*Cytisus* sp) (Gale 2000a); the first-century Roman site at Pomeroy, Devon, where oak predominated over maple, alder, birch, hazel, ash, blackthorn, willow/ poplar, elm (*Ulmus* sp) and gorse (*Ulex* sp) (Gale 1999); and the second–fourth-century Roman site at Woolaston, Gloucestershire where fuel mostly consisted of oak and hazel, but also contained maple, alder, birch, spindle (*Euonymus*), ash, holly (*Ilex aquifolium*) hawthorn/*Sorbus* group (Pomoideae), blackthorn, willow (*Salix* sp) or poplar (*Populus* sp), elm, *Viburnum* and ?chestnut (*Castanea* sp) (Figueiral 1992). The monospecific use of oak seems to have been relatively rare but was recorded, for example, at the Iron Age site at Quidney Farm, Saham Tony, Norfolk (Gale 2000b), and the Roman sites at Scole, East Anglia (Gale *forthcoming*).

It is probable that regional practices or customs influenced the use of a given species and also the form/size of the fuel used (eg narrow roundwood or billets of wood), although

species selection would ultimately have been determined by local availability and woodland management practices. As yet, there is little archaeological evidence to indicate that smelting fuels differed in character from smithing fuels but this is mainly due to the difficulty in obtaining samples with secure associations – especially since fuel debris from both was probably disposed of in the same pit or dump. The high ratio of oak heartwood in most samples from the above Roman sites suggests that (in common with the use at Birch Heath) charcoal fuel was prepared from fairly mature wood, eg cordwood or fairly wide poles. It may be relevant that Percy (1864) noted that the use of large pieces of charcoal for metallurgy enabled high even temperature to be sustained over a long period. In contrast, however, at Woolaston (*see above*) fuel consisted of narrow roundwood (Figueiral 1992).

It seems probable that deposits from the charcoal-rich pit (503) (middle layer) associated with the roundhouse Structure 1 and the fill of the enclosure ditch (673) represent dumped domestic fuel debris (or possibly debris from some other unkown activity). Although these still included a high proportion of oak (*Quercus* sp), they differed significantly from those from the metalworking area in that a wide range of other species was represented: birch (*Betula* sp), hazel (*Corylus avellana*), heather/ ling (Ericaceae) ash (*Fraxinus excelsior*), the hawthorn/*Sorbus* group (Pomoideae) and blackthorn (*Prunus spinosa*). Domestic firewood therefore seems to have been gathered from a much broader spectrum of trees and shrubs than the industrial fuel (which would have been carbonised before use). Thus the diversity of wood species used for domestic firewood, including heather, stands in contrast to the preference for oak heartwood for industrial use.

There was no evidence from the charcoal examined to indicate the use of young coppiced stems. The extensive use of oak heartwood suggests that fuel was sourced either from wide poles (probably at least twenty-five years old) or from cordwood or trunkwood from trees in woodland or hedgerows. Wood from other species was probably gathered randomly from the environment. Carruthers (*this volume*) suggests that the paucity of cereal macrofossils at the site could imply a mainly pastoral landscape with little agricultural clearance. Woodland may therefore have been sufficiently abundant to provision the settlement without the need for widescale woodland management, although for purposes such as hurdle-making and basketry, coppiced rods would have been preferable to free-grown stems.

There is some evidence from the plant macrofossils to suggest that turves or peat may also have been burnt in non-industrial contexts (Carruthers *this volume*). Domestic hearths are likely to have incorporated any flammable material to hand, especially for kindling or tinder, eg cereal waste or dried grasses.

Environmental evidence

A regional description of the environment is included in the charcoal section for the Brook House Farm settlement (*this volume*). With the exception of heather/ling and birch, the range of taxa identified from charcoal deposits from this site (alder, birch, hazel, heather/ ling, ash, the hawthorn group, blackthorn and oak) was comparable to that from the Iron Age settlement further north on the pipeline, although the latter also included holly and

probably willow/ poplar. At the Birch Heath settlement, oak (*Quercus* sp) woodland appears to have formed the dominant tree cover, with other large woodland species such as ash (*Fraxinus excelsior*) much less in evidence. The apparent frequency of oak may, however, be enhanced or misrepresented by its evident selection for industrial fuel and (probably) structural work, and consequently its abundance in the charcoal deposits. But without sampling charcoal from a much wider range of contexts from this and other local sites and in the absence of pollen samples to indicate the distribution of arboreal species at the site, we must regard the present analysis as, at least, providing evidence of the ready availability of oak in the locality. In view of the potential for ironworking, it is possible that the post-Roman settlement was sited here because of the oak woodlands. The presence of birch (*Betula* sp) and ericaceous species suggests access to heathland or patches of impoverished acid soils.

The results from the current study are consistent with those obtained from pollen cores from another local site, at Brook House Farm, Halewood, where oak (*Quercus* sp), alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) appear to have formed the dominant tree cover, with non-tree and shrub pollen reaching only 30 per cent of the total (Huntley & Daniell 2000); the frequency of ivy (*Hedera helix*) was suggested as indicative of the presence of older trees or possibly masonry. Although charcoal was used for radiocarbon dating the species present were not published.

Pollen records from cores taken from two sites in the valley at Ditton Brook (Innes 2000), north of Brook House Farm, Halewood, relate to much earlier deposits (late Mesolithic to late Neolithic/Early Bronze Age) and are therefore not directly comparable to the present study. During this phase the arboreal species identified were predominantly oak (*Quercus* sp), hazel (*Corylus avellana*), alder (*Alnus glutinosa*), elm (*Ulmus* sp) and pine (*Pinus* sp), and there was no evidence to implicate human activity in the region.

Such evidence as we have therefore suggests that the region as a whole was probably still densely wooded by the Roman period, with oak providing the dominant tree canopy, and with scattered settlements sited within woodland clearings.

Conclusions

The charcoal analysis has provided valuable data on the woodland environment during the Roman occupation, in a region for which few comparable data currently exist. It seems probable that oak (*Quercus* sp) woodlands formed an intrinsic and major part of the landscape, thereby supplying abundant fuel and timber to the economy of the settlement. These rich reserves of wood were exploited for domestic hearths (evidence from the charcoal suggests that other wood species were used to supplement the oak firewood), by the post-Roman iron industry for smelting and smithing, and for construction. Apart from the tentative suggestion of the use of oak poles, there was no conclusive evidence of coppiced species.

The lack of pollen at the site prevented direct comparison of the natural environment with species selected for on-site activity. The wood taxa identified from the charcoal, however, paralleled those recorded from charcoal deposits from the Iron Age Bruen Stapleford site

(Gale, *this volume*) and from pollen cores from Late Iron Age/ Romano-British contexts at Brook House Farm, Halewood (Huntley & Daniell 2000).

Radiocarbon determinations

Two radiocarbon dates were obtained for the site; one for Structure 2 and one from metalworking material in Structure 3.

Table III.6 Birch Heath: radiocarbon determinations

Area	*Context*	*Description*	*Material*	*Radiocarbon age*	*Calibrated date range 95% confidence*	*Lab ref*
0/4 A	1005	Ring gully Structure 2	*Corylus* charcoal	1825 ±55 BP	AD 70–350	AA-50088 (GU-10112)
0/4 B	610	Drainage gully Structure 3	*Fraxinus* charcoal	1380 ±40 BP	AD 590–720	AA-50087 (GU-10111)

Discussion

N Fairburn

Romano-British settlement in the North West

The apparent lack of rural Romano-British settlements in north-west England and particularly Cheshire has recently been commented upon (Philpott 1994). This is partly because research has tended to concentrate on larger sites, like the fortress at Chester. Theories as to their possible whereabouts have been put forward (Matthews 1998). Occupation debris (mainly pottery and metal detected finds) has been found throughout western Cheshire and may point to the existence of settlements, but the concentrations of material are small and the areas around them have not yet been investigated.

In the past decade a few sites have begun to emerge outside Cheshire and have been excavated, such as Irby, Wirral (Philpott & Adams 1998) and Brook House Farm, Halewood (Cowell & Philpott 2000). However, both of these had Late Iron Age origins. Other possible Romano-British enclosures have at last began to be spotted in the north-west landscape through persistent aerial reconnaissance and photographing, including a few in Cheshire (Philpott 1994; Collens 1994 and 1998).

The Birch Heath settlement was unexpected, as it was not visible from the air and was not picked up during the geophysical survey of the pipeline route. There was no evidence on the ground or in the locality to suggest a Romano-British presence. There is a possible enclosure with Romano-British connections nearby at Waverton, while the only other possible Roman buildings in the area are at Tattenhall and also the villa at Eaton-by-Tarporley, two miles away. This invisibility to normal techniques suggests that, although there may be rural Romano-British sites in the Cheshire landscape, they are going to be very difficult to detect.

The archaeological evidence from Birch Heath suggests that the settlement did not have any Iron Age origins, unlike other examples in the North West. This could imply that the

settlement only came into existence at the beginning of the Roman occupation, either as part of the exploitation of the *prata legionis* (this is discussed further below; *see also* Mason 1988) or as a result of economic intensification caused by that occupation; both would explain the construction of the settlement about the end of the first century AD. The *prata legionis* was an area of land under the direct control of the legion which would have included agricultural land.

Settlement layout

As there are not enough comparable sites in the North West, it is difficult to know if the Birch Heath settlement is a typical site in terms of its layout, particularly as the full extent of the site is not known. The digging of ditches as animal pens or for other agricultural purposes is typical of Romano-British farmsteads in the south of Britain in first and second centuries AD.

Only the settlement at Lousher's Lane, Wilderspool, shows comparable features to Birch Heath. There, the first phase enclosed a round structure (Hinchliffe *et al* 1992, 100–3), similar to the Phase 3 construction of a rectilinear enclosure around a Structure 4 at Birch Heath. However, it is not clear if the early phase at Lousher's Lane was agricultural. Further building work on a much larger scale than on Area 0/4 at Birch Heath continued at Lousher's Lane, with the site expanding in the middle of the second century AD with more structures (rectilinear and round), enclosures and a trackway.

The structures: construction and function

In total four structures were recorded on the site and there was also the possibility of a rectangular building. All four structures are thought to be the remains of roundhouses. Three were probably used primarily for domestic purposes and possibly for storage, while Structure 3, from the post-Roman period, was probably used as a workshop for ironworking and maybe for storage.

The lack of vertical stratification and of closely datable pottery makes the precise interpretation of the site as a whole difficult, while the absence of hearths and other occupational evidence leaves the functions of most buildings uncertain. However, the cutting and positioning of certain key ditches allows a relative chronology to be attempted, and the quantity of domestic pottery from around at least two of the structures suggests human occupation rather than an agricultural purpose. Also, pot boilers or heat-shattered stones were found in a number of features in and around all of the structures, indicating another a domestic activity, probably associated with cooking.

The only directly comparable contemporary circular structures are again from the industrial complex at Lousher's Lane, Wilderspool (Hinchliffe *et al* 1992). Other circular structures at Irby (Philpott & Adams 1998), Great Woolden Hall (Nevell 1998), Beeston Castle (Ellis ed 1993, 39) and Legh Oaks (Nevell 1987) have similarities but have all been dated to the first millennium BC. There were no structures from the other known settlement with a Romano-British phase, Brook House Farm, Halewood, that could be confidently associated with the recovered Romano-British pottery, although it was tentatively thought that one rectilinear building may be from this phase (Cowell & Philpott 2000, 63).

Three of the Birch Heath structures were defined by circular gullies. However, two of these circular structures (2 and 3) could be described as sub-circular, almost having corners. In fact, none of the gullies of the structures was truly circular. Structure 1 was probably the roundest, while Structure 4 was represented by a large semi-circular drip gully. However, the dimensions and regularity of all of the gullies allow them to be compared with the eavesdrip gullies of other sites and confirm them as part of the structural arrangement.

No large post holes were associated with any of the structures, although some did have a few stake holes. There seemed to be a general lack of suitable stones for post packing around the site, possibly due to plough action. Some stones were found in the fill of the gully of Structure 4, with the possibility that these flattish stones had been used as post pads.

None of the structures were found to contain hearths and may therefore have performed some different function other than occupation, possibly storage, although again there is no evidence for this. However, it must be admitted that none of the contemporary interior ground surfaces survived, again primarily because of plough action. Nor did the ring gullies appear to enclose any other visible contemporary internal features, although if posts had been removed and backfilled with the clay, the post holes might have been invisible, a factor which was also recognised at Irby (Philpott & Adams 1998, 65).

Structure 1

Structure 1 was *c* 7m in diameter and had no visible features except for the circular ring gully. It is thought that the butt-ended terminals of the gully marked the opening of the doorway, which faced towards the east (*see* Ill III.3).

Structure 2

Structure 2 was *c* 6.5m in diameter with a sub-circular gully. Only one post hole was found by the entrance; there were also the remains of a number of smaller stake holes on the opposite side (*see* Ill III.4).

Structure 2 had two narrow gullies in the interior which are interpreted as the remains of a wall. Only one stake hole was found in this gully, probably representing a more deeply set stake. A similar but rounder example was recorded in the Phase 1 structure at Lousher's Lane, Wilderspool and was interpreted as an eroded foundation trench for a timber or wattle wall (Hinchliffe *et al* 1992, 103).

Charcoal analysis of samples taken from the ring gully has shown that the structure used oak for the posts but was inconclusive about the roofing material. This is discussed further below.

Structure 3

Structure 3 was probably the last building to be built on the site, as it was the only one to cut across a number of features. It also was sub-circular and was *c* 5.5m in diameter, with a possible conjoined structure or annexe attached which is discussed below (*see* Ill III.7). The volume of metalworking debris that was recovered from inside and around the structure suggests that it was used primarily and possibly exclusively for ironworking. The main

building was probably used for the production of iron, as it is now known that buildings with furnaces would certainly have been roofed to create a dark environment to enable the craftsman to judge the colour of the flame and to keep the furnace and fuel dry. The annexe may have been a store as very little metalworking debris was recovered from its features.

There were only two features within the structure and no post holes. There was no sign in the ground of any remains of furnaces or smithing hearths, probably again because of plough action. Running through the middle of the building was an irregular gully, which was probably an internal drain. This feature contained slag and smithing debris including hammer scale. The other feature was a line of stake holes which may represent a different building phase, as one cuts into the drainage gully. However, it is more likely that they represented an internal partition within Structure 3, perhaps marking out a domestic area.

Conjoined structures

There is little or no evidence of any conjoined structures from the Roman period in England and no parallels at all from the post-Roman period. The enclosed upland settlement sites of north-west Wales which have some evidence of conjoined structures are undated, although it is thought that they may have Iron Age origins which stretch into the Romano-British period (Smith 1977). There is some evidence of conjoined roundhouses in the Iron Age, for example at Pilson Pen, Dorset and Hod Hill (Bradley 1984, 140); these may suggest some organisation of internal space, perhaps connected with social relationships or political centralisation. Conjoined houses are also found at some Iron Age sites in south-west Wales, at Knock Rath (Crossley 1979), Woodside and Dan y Coed (Williams & Mytum 1998). Williams and Mytum also suggested that the conjoined structures at Knock Rath should be seen as indicating some form of social centralisation. However, both the conjoined structures at Woodside and Dan y Coed and at Knock Rath date to a period of reduced nucleation of settlement and so possibly suggest a family group or an amalgamation of a community. This could be the case with Structure 3 at Birch Heath, although the interpretation as a workshop with an open-fronted extension, possibly for storage, is more likely.

Structure 4

Structure 4 was probably *c* 6m in diameter. It had a semicircular gully with a large pit. These features contained a lot of domestic refuse: broken pottery, burnt stones, charcoal and burnt bone. There was no evidence to show that the pit was a later addition, but this remains a strong possibility. Also within the ring gully were a number of flattish pieces of sandstone. These may have been used as post pads, or possibly had just been discarded in the gully. However, as so few large stones were noticed in the ground during topsoil stripping along the whole of the pipeline it is likely that they had been used as part of the structure. It is possible that ploughing may have removed other large stones. Ploughing had certainly damaged the nearby arrangement of stones (668), which may also have been part of Structure 4, but this was not proved by excavation.

Rectangular structure

The possibility of a rectangular building exists as the ditch (641) had two other shallow ditches forming right-angled turns. There was also a large flat stone at the corner of one

of the ditches, and this has been interpreted as a possible post pad for a building support. Unfortunately all of these ditches continued beyond the pipeline easement so further investigation was not carried out. However, the possibility of a rectangular structure is raised for any future investigative work before the site is totally lost to the plough.

Rectangular buildings on Romano-British settlement sites have been recorded in the region at Plas Coch, Wrexham, and Wilderspool, Warrington and also tentatively at Brook House Farm, Halewood.

Roofing materials

One certain piece of tile (*tegula*) was found on the site, along with a number of possible fragments. However, none of the known Birch Heath structures seems to have been capable of utilising tiles, and it is reasonable to assume that they were thatched with straw, reed or some other organic material. It is possible that another building that did use tiles awaits discovery close by and that most of the tiles from it had been robbed and reused elsewhere in antiquity. However, this seems unlikely. The few pieces that were found may have been brought from another site to be used for a function other than roofing, or even as a status symbol.

The fabric of the tiles was not the same as that of those manufactured in great numbers at the nearby legionary works at Holt. Further, petrological examination and comparison of the tiles from Birch Heath and Eaton-by-Tarporley suggest that they came from the same, as yet unknown, source and hints at a link between the two sites.

Function and economy

At the moment it seems probable that the settlement was occupied by a single family, or an extended nucleated family, as there were so few buildings, although obviously this view would change if more buildings were discovered beyond the limits of the excavation. The small number and the type of buildings probably indicate a low social and economic status, as they were not constructed of stone after the Roman fashion (Hingley 1991, 76).

The settlement probably had the mixed pastoral and arable economy which seems to have been typical of the period in the north-west of England. As is generally the case throughout the region, the acidic soil conditions of the site meant that very little bone survived. About 130 fragments of burnt bone were recovered during the excavations, but most of them were too small to be identified. The identifiable fragments consisted mainly of teeth from pig and cattle, with some fragments from sheep or goat, which again support the picture of a pastoral economy. The pastoral side of the economy is also attested by the ceramic cheese-presses; the evidence for the arable side is weaker, and it is even possible that bread wheat was bought for consumption on the site.

Even if the settlement lay outside the *prata legionis*, it is to be expected that the fortress at Chester would have had a significant impact on the surrounding landscape, with demands on the local resources, such as foodstuffs, animals and wood. Mason (2001, 112) believes that the area around Chester was quite capable of supplying the legion with meat, dairy products and vegetables, but that grain would have had to be imported by sea.

The scale of the farming carried on at Birch Heath is uncertain. Pastoral and agricultural land can only support a limited number of people, with surpluses for trading, without increasing the travelling distance from a settlement beyond a practical limit. As yet there is no reliable method for accurately determining the amount of land that would have been required to support a given size of settlement in this period. However, the number of cheese-presses found suggests that the settlement was producing cheeses for sale at the Chester *canabae* or for the Roman military directly. This implies that enough animals were kept to support this small industry and in turn suggests that some of the ditches might represent animal enclosures.

The close proximity of the legionary fortress at Chester, together with small towns such as Northwich, Middlewich and Nantwich, connected by a dense road network, meant that manufactured goods would have been readily available in the area, and despite their apparently low status the inhabitants of the Birch Heath settlement traded agricultural produce – cheese in particular, but possibly also fodder, hides and timber – in return for these goods. This produce may also have served as a way of paying taxes. During fluctuations in the size of the garrison at Chester during the second century the local demand for agricultural produce is likely to have reduced but taxation, either in kind or in money, would have continued. If this was the case, then cheese would have been an ideal product as it could have been dried, stored and transported: converting milk to cheese is a good way of turning a milk surplus into a marketable commodity.

The mixture of pottery found on the site is a good indicator that the inhabitants were producing enough produce to feed themselves, with a surplus to participate in commercial activities. However, no coins were found on the site, as is the case on the other sites in the region. This lack is surprising given the range of pottery found on the site; it could indicate that the inhabitants bartered goods or were very good at looking after their money. There is, of course, the possibility that the Roman tax system absorbed any surplus coinage. An exception to this rule is provided by Plas Coch, Wrexham. There, a large number of coins was found, but that appears to have been a wealthier, generally more Romanised and much larger farmstead than Birch Heath and other sites in the region, with a greater quantity and variety of pottery, and it has been suggested that the site may have had some official character (*pers comm* Karina Kucharski, Wrexham County Borough Archaeologist).

Occupation and abandonment of the settlement

The Birch Heath settlement seems to follow the pattern set by other sites in the region, having origins in the late first century AD and then declining and being abandoned in the third century, as happened at Great Woolden Hall (Nevell 1998), Brook House Farm, Halewood, (Cowell & Philpott 2000) and Wilderspool (Hinchliffe *et al* 1992, 172). The reasons behind the abandonment of the site are unclear, as are those for the selective abandonment of settlements throughout north-west England, north-east Wales and the Marches at around the same time.

There is also the possibility of an impact on the Birch Heath site by the villa at nearby Eaton-by-Tarporley. The villa may have been the centre of an agricultural estate with a number of dependent farms supplying food to the nearby Roman towns and the fortress at

Chester, although equally it could simply have been the residence of a retired military officer or other wealthy person – one of the social elite of west Cheshire, perhaps the descendants of the Iron Age elite. According to Mason (1982 and 1983) the timber phase of the villa probably dated to the middle of the second century, with the stone villa being constructed towards the end of that century. Occupation continued on the site into the late fourth century, as there were finds of the shell-tempered pottery fabrics from the East Midlands. The Birch Heath settlement may have lain on the villa estate and have ultimately been abandoned in favour of occupation closer to the villa.

Industrial activity in the early medieval period (Seventh century)

The radiocarbon date for Structure 3 was surprising, as all the other evidence suggested a short-lived Roman site. The Early Medieval period has produced very little evidence to suggest great centres of smelting comparable with the Roman occupation, even in the Weald (Cleere & Crossley 1986, 87), and not even documentary evidence provides much insight into the iron industry in this period.

The evidence generally suggests that Roman techniques for iron-smelting did not survive and that the native population returned to a pre-Roman Iron Age tradition of producing iron, using non-slag-tapping furnaces (Tylecote 1986, 179). The Birch Heath evidence supports this picture. The two possible explanations Tylecote gives for this reversal are that the old techniques were reintroduced by the migration of peoples from north-west Europe or, more likely, economic conditions not longer warranted the same large-scale production.

The amount of ironworking residue that was recovered indicated a very short period and/or small-scale production – perhaps only one or two episodes of work to meet the needs of the site – based on the repairs seen on a few of the pieces of the vitrified lining. The question clearly arises as to why a small site should bother with such production in an area where iron ore deposits are not known. It is conceivable that ironwork was urgently needed and it was easier to produce the necessary items on site rather than travel to any trading sites. This would at least explain why there was only a short episode of metalworking. However, the effort to transport ore and other raw materials does not make commercial sense.

Conclusions

As the full extent of the site is not known, key stratigraphical relationships that could have given more clarity to the sequence of occupation may be missing. The finds were in poor condition, very abraded and included a limited range of diagnostic fragments. The broad date-ranges assigned to the majority of these finds again made it difficult to identify structural phases. However, some valuable results have been obtained which provide new insights into the Roman period in the North West. As a purely native site, the settlement can now act as benchmark for future excavations and has the potential to begin to clarify the relationships between the Romans at the nearby fortress of Chester and the native population.

The evidence for Early Medieval occupation is based on the result of one radiocarbon date and shows some positive evidence of settlement activity taking place in this period within the Cheshire landscape.

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