

**An archaeological excavation
at Birch Pit northern extension,
Maldon Road, Colchester, Essex
June-August 2003**

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**on behalf of
Hanson Aggregates**



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1 Summary

An area of land to the north of the operational quarry at Birch Pit was excavated in advance of sand and gravel extraction. Several features were found additional to those formerly recorded during an evaluation. Conspicuous among these were the remains of a Middle Bronze Age cemetery close to the site's south boundary. This cemetery comprised three ring-ditches. Sixteen Middle Bronze Age urned and unurned cremation burials were excavated in the area between them, in addition to two pits containing urns from which cremated remains were not recovered. The urns, which apparently post-date the ring-ditches, belong to the 'Ardleigh Group', a local variant of the Deverel-Rimbury assemblage dating to the Middle Bronze Age and in use c 1400-1200 BC. No layers attributable as the remains of barrows could be identified in the ring-ditch fills.

Two other Bronze Age sites in the region, at Brightlingsea and Chitts Hill, share particular characteristics with the site at Birch Pit which include: 1) the presence of a significant number of cremations containing single urns; 2) low frequency of cremations with two urns; 3) small size of the cemetery; and 4) absence of urns buried upright.

Some features encountered during the evaluation were re-investigated. These included two large pits, F23 and F24, and a parallel pair of shallow ditches aligned approximately east-west, F1 and F3. F23 and F24 were probably quarry-pits in use in the Roman period. The ditches F1 and F3, perhaps indicative of a droveway or trackway, are probably of later prehistoric date; they may signify the further development of a largely agricultural landscape subsequent to the construction of the Deverel-Rimbury cemetery.

Located at the site's south-west corner, an almost right-angled 'enclosure' ditch, F4/F11, had an atypical profile. Elements of the structure and layout of F4/F11 compare with important parts of a Deverel-Rimbury settlement near to North Shoebury in south Essex. It is therefore possible that ditch F4/F11 enclosed a small Bronze Age settlement that was associated with the Bronze Age cemetery, located about 110m to the south-east of this feature. Alternatively, it is possible that F4/F11 defined an agricultural enclosure.

The trackway and presence of the possible enclosure F4/F11 might form part of a network of cropmarks located to the north-east (EHCR nos 11548, 11577, 11582), some 0.8km from the main site. While still undated, this cropmark complex includes trackways and fields (EHCR no 11924), as well as a large rectangular enclosure.

Eleven pits were found of which six contained charcoal and one was lined with flint. It is possible that some of these pits were pyre sites linked with the Bronze Age cemetery, although the dating of these features is problematic.

2 Introduction

The Colchester Archaeological Trust (CAT), on behalf of Hanson Aggregates, carried out the excavation. The aim was to preserve by record surviving archaeological remains in an area scheduled for mineral extraction which is to form the northern extension of Birch Pit. Work on the site was carried out from 24th June to 7th August 2003, under the supervision of Chris Lister and Nigel Rayner of CAT. While the excavated site itself had not been noted for its archaeological potential and formerly yielded only negligible finds, aerial photographs had revealed an extensive cropmark complex some 0.8km to the north-west (Essex Heritage Conservation Record or EHCR nos 11548, 11577, 11582). These indicated a large sub-rectangular enclosure, associated trackways and a system of fields, with some bisected by ditches (EHCR no 11924).

Prior archaeological investigations in the Birch district were limited, and included the excavation by CAT in 1995 of a small, probably Roman oven 0.3km to the east, perhaps used for corn-drying. Spencer and Dennis (1988) described a flint scatter about 0.8 km to the south-east. This entailed a largely Neolithic assemblage of cores, core-scrapers, scrapers and awls, but also two early Mesolithic microliths.

A fieldwalking survey by CAT of 73 ha in 1992 not only covered the south-western corner of the Birch Pit northern extension, but also adjacent land to the west. Within this area, the survey identified discrete northern and southern concentrations of Roman pottery, tile and building stone not far to the west of the present site (Crossan 1992). About 6.9 ha, which included the area containing the more southerly of the concentrations, was fieldwalked by CAT in 1997. This second phase of fieldwalking, which preceded a geophysical (magnetometry) survey and trial-trenching in 1998, produced evidence for at least two Roman structures (Crossan 1992; CAT Report 8; CAT Report 23).

The western part of the Birch Pit northern extension land formed part of a WW2 American air-base. The airfield was briefly occupied by units of the USAAF IX bomber group and then by the RAF in preparation for the invasion of the Rhine. Today, however, little remains of the buildings they occupied or the remains of the runways which lay further to the west.

In May 2001, CAT machine-cut 27 primarily 50m-long trial-trenches in order to evaluate the extent and the manner of preservation of any remaining archaeological deposits in this area. Evenly spaced and aligned on the OS grid, these trenches covered about 2.5% of the total area of the proposed northern extension of Birch Pit, and demonstrated that the north-east corner of the site contained significant archaeological features predominantly dating to the prehistoric and Roman periods. Notable archaeological remains in the north-east corner included a probable prehistoric ditch of unusual profile located in trench L1, a pair of shallow parallel ditches in trenches P1, Q1 and R1, probably later prehistoric, and a probable quarry-pit located at the eastern end of trench N2, the upper fills of which produced a small quantity of Saxon pottery.

Features elsewhere on the site were sparse, but included post-medieval or modern field-boundary ditches as well as a large modern pit (F3) cut into natural gravel. This last pit was exposed in the whole eastern half of trial-trench J3 and extended to within 10m of its west end on the southern side. This pit, which was not bottomed although at least 1.5m deep, contained material, principally corroded ironwork, apparently deposited shortly after the end of WW2 and the subsequent closure of the airfield (CAT Report 141).

3 Aims

The archaeological excavation was conducted by CAT on behalf of Hanson Aggregates to record the surviving archaeological remains on land covering the proposed northern extension to the Birch Pit (NGR TL 928 199; Fig 3). The aim was to investigate further the significant features discovered in the evaluation (CAT Report 141), and to locate and record any additional deposits and features within the area to be disrupted by quarrying.

4 Methodology

The land that was stripped (approx 15,000 sq m; Fig 3) comprised the north-eastern part of the area covered by the evaluation (CAT Report 141), encompassing the trial-trenches N1, P1, Q1, R2 and N2. These trenches had revealed the most significant archaeological deposits in the Birch Pit northern extension area.

A geophysical survey was carried out on the smooth surface, as cleared of topsoil/ploughsoil. This was an attempt to pre-empt the position of archaeological features before the excavation commenced, although many features at this stage were visible. This survey was undertaken by Dr Timothy Dennis (Department of Electrical Engineering, University of Essex), and a fluxgate gradiometer was employed to detect low-grade magnetic anomalies in the soil. This technique is useful for detecting the fillings of features such as buried pits, particularly where the organic content of the fill is proportionately higher than surrounding material. The magnetometry survey covered approximately 65% of the site and utilised a system of 30 x 30m blocks aligned on the OS grid. Individual tracks were spaced at 1m intervals in each block.

The subsequent fieldwork was conducted by CAT in accordance with a specification agreed with the Heritage Advice Management and Promotion (HAMP) group officer of the Essex County Council. A 360-degree mechanical excavator fitted with a flat-edged ditching bucket was used to remove the topsoil (L1) and subsoil (L2). Machining was terminated as soon as either archaeological layers or the uppermost natural deposits (in this case glacial gravels and till) were exposed.

The archaeological features uncovered after mechanical stripping were first cleaned and then hand-excavated. Most of the features were half sectioned and, where necessary, up to 50% of the fill was sampled. Post-holes and other structural remains, however, were fully excavated, as were ditch terminals and intersections. The amount of fill removed varied according to the sampling strategy that was considered best suited to aid investigation; eg the ring-ditches were sectioned at equal intervals, four times around their perimeter.

Parts of the machine spoil-heaps were scanned using a metal detector and the finds were recovered.

5 Results

For the most part, the images obtained from the magnetometry survey highlighted areas of modern disturbance, whereas most archaeological features were faint or were not detected at all. The most clearly defined feature was the J-shaped course of a narrow service-trench associated with the USAAF airbase. Upon subsequent excavation, this was found to contain an electrical cable covered by bricks, with the magnetometer signal detecting the cover-bricks rather than the cable itself (made of copper and lead, and therefore not magnetic).

The only other features that were imaged clearly by magnetometry were the back-filled eastern end of trial-trench R2 and, in the south-west part of the site, two sets of point features (probably modern) meeting at an angle slightly greater than 90 degrees. Trench R2 was detected because its magnetic signal had a small negative contrast, the probable effect of aeration in the comparatively unconsolidated backfilling (T Dennis, pers comm). On the magnetometry image, the particularly low magnetic signal detected accounts for the stride pattern interference and track-parallel stripes. The faint linear alignments running WSW-ENE are most likely the track-marks of the surface stripping process.

It was noted that a large proportion of the fill of many features consisted of re-worked material that formed their sides (predominantly glacial sand and clay). Such a filling would be magnetically identical, and give poor or negative contrast on geophysical data sets. Infilling over an extended period with in-washed topsoil would, by contrast, yield a higher bacteria content, and hence give a good positive magnetic anomaly (T Dennis, pers comm).

Future work under such conditions may benefit from use of alternative geophysical methods, such as resistivity. It should be stated, however, that because of the presence of ironwork in the area of the urnfield, this could not be covered by magnetometry, which should otherwise have shown strongly.

In the case of Birch Pit, the geophysical data obtained through magnetometry were deemed mostly unreliable as an indicator of the sub-surface archaeology (ie, beneath L1 and L2) in the area which the survey covered. Therefore, the location of the dig was chosen based on the evaluation results alone (above).

Mechanical stripping of the site entailed the removal of the topsoil (L1) and subsoil (L2). This exposed a number of archaeological features, the most notable being a cluster of three Bronze Age (BA) ring-ditches located close to the site's southern boundary.

Some of the features were the same as those identified in the evaluation (CAT Report 141), including two probable Roman quarry-pits (F23 and F24) exposed in trenches N2 and R1, and a parallel pair of ditches (F1 and F3), in trenches Q1, P1 and R1. However, a possible north-south ditch observed in trench R2 was not relocated. F8, a ditch section exposed in the evaluation trench L1, was directly in line with the northern arm of F4/F11, a probable enclosure ditch (below).

Other features included a number of pits and ditches. The excavation of these features revealed that the majority of these pits were of natural origin (eg tree boles). Other, possibly man-made pits, unfortunately could not be accurately dated, either because of the absence of datable finds within them or in that no finds were found.

The datable features, which in addition to the pits included a possible track-way and the aforementioned ring-ditches, are described below.

6 Subsoil and surface geology

In the Birch district, the surface geology encompasses Chalky Boulder Clay (the Springfield Till) together with underlying sand and gravel (Kesgrave Sands and Gravels). The thickness of the Boulder Clay exposure was not determined on the excavation site, but it is known to vary according to the sub-surface topography of Pleistocene gravel and sand. Eocene London Clay underlies these deposits as a rather monotonous sequence of grey silty clays and clayey silts. The Chalky Boulder Clay consists of stiff reddish to buff silty clay containing small- to medium-sized chalk fragments. The glacial material superficially forms an unconsolidated deposit, the top of which consists of a reddish-brown clayey soil. L2 is presumably comprised of this material, as is probably L1, at least in large part.

In the region of the Bronze Age cremation cemetery, L1 yielded a quantity of fragmented and abraded bone from a human adult (see section 11 below).

7 Prehistoric features (Fig 5)

In addition to the paired and parallel ditches F1 and F3 and the possible enclosure ditch F4/F11, which were encountered during the evaluation, some other prehistoric features were uncovered as a result of topsoil-stripping. Most notable among these, three Bronze Age ring-ditches (F31, F32, F36) and a related set of 16 urned and unurned cremation burials, were located in the southern portion of the area excavated. This small urnfield was located principally within the central zone between the ring-ditches, which were closely grouped. Nine of the cremations (F2, F5, F7, F8, F10, F14, F33, F34, F35) were contained within inverted Deverel-Rimbury urns. The remainder (F6, F19, F20, F21, F38, F39, F40) were unurned. F7 and F33 contained a globular urn and barrel urn respectively, but no bone was found in them.

Several pits were found in the western half of the site, with a few in the eastern half. While most are undated, some pits contained charcoal and may have served for preparing the cremations.

7.1 Ring-ditches

Three closely spaced ring-ditches (F31, F32, F36) of 6-7m diameter were uncovered close to the southern boundary of the site (Fig 4). There was a quite distinct colour difference between the ring-ditch infill and exterior natural, and they were planned on the surface before each was divided for excavation into quadrants.

7.1.1 Ring-ditch 1 (F31)

The southern part of the ring-ditch F31 was partially obstructed by a probably modern ditch that intersected the ring-ditch with an approximately north-east/south-west alignment. This is probably the east-west ditch F4, uncovered in the evaluation trench P2 to the west (CAT Report 141). For excavation, F31 was separated into quadrants. In order to avoid the modern ditch, these were positioned north-west, south-east, north-east and south-west around the ring-ditch perimeter. In each sector, a 1.25m length of ditch fill was removed.

The ring-ditch of F31 was 7m in diameter, with ditches 0.8-1.1m wide and 0.25-0.40m deep. About 10% of the fill was excavated. Sections Sx 1 and Sx 4 were approximately V-profiled and rather broad, whereas Sx 2 and Sx 3 were more U-shaped. The inner side of the ditch seen in Sx 1 sloped slightly more steeply than the outer side (Fig 8). The sides of the other three sections were inclined at between 30 to 35 degrees. With the exception of Sx 4, in which the fill was more uniform, the lower fill of ring-ditch F31 comprised a rather thick deposit of frequently mottled orange to reddish-brown silt loam with scattered small stones and patches of brown silty clay. In consistency it resembled the subsoil. A more compact reddish-brown silt loam with some stones, about 0.15m thick, succeeded this deposit, often quite indiscernibly. The gradation between the fills and uniformity of that in Sx 4 indicate that the ditch silts were undisturbed by later activity.

The finds from F31 were infrequent and included flint artefacts and a small Bronze Age sherd that exhibited a coarse flint-gritted fabric. The flints included three secondary waste flakes and one tertiary flake, as well as a scraper, the last made on the right end of a wide flake. A burnt blade core fragment was also recovered.

Prior to excavation, the area of land within ring-ditch F31 was essentially flat with no indication of a barrow mound, such as may often be shown by a slight rise in the modern ground surface (Brown 1999). A definable layer that might be considered to represent an internal barrow mound was also not detected, but because ploughing may have removed it, the former presence of a mound could not be dismissed entirely. As at Ardleigh (Brown 1999), ploughing might additionally have erased any evidence of a centrally placed burial. Most of the ring-ditches at Ardleigh similarly showed no obvious internal features, these apparently having been removed by the plough.



Plate 2 Bronze Age cremation urns, view east.

7.1.2 Ring-ditch 2 (F32)

Ring-ditches F32 and F36 were not obstructed by later features and were excavated at the east, west, north and south sectors. Ring-ditch F32 is comparable in its overall dimensions to F31, at about 7m in diameter. It also lacks any internal features, again presumably because of damage from ploughing. The four ditch sections are shallowly U-shaped in vertical profile, varying from 0.6m to 0.95m wide and 0.15m to 0.23m in depth.

The northern part of the ditch had the shallowest and most narrow section, while the eastern part was the deepest and widest. This discrepancy in size may indicate that later ploughing cut into and removed some of the upper ring-ditch fill, and on one side this reached a deeper level. Alternatively, it may be that the depth of the ditch cut varied around its perimeter.

As with F31, the ditch fill consisted of a deposit dominated by a brown to reddish silt or clay loam, but charcoal was also present and in parts of the fill it was comparatively common. Small to medium-sized stones were frequent, with some stone-rich lenses up to 0.1m wide occurring throughout the deposit. A thin (approx 0.04m) upper fill of greyish to dark-brown silt could be discerned in Sx 2. However, overall the division between the lower and upper fills in this ring-ditch was as gradational as in ring-ditch F31. Indeed in Sx 3 and Sx 4 the fill appeared uniform throughout, although the upper fill of Sx 3 was stonier.

Finds obtained from the ditch fill included a possible scraper and a broken tertiary flake.

7.1.3 Ring-ditch 3 (F36)

Ring-ditch F36 was 6m in diameter. The ditch, which was roughly U-profiled, was much smaller than that of F31 and F32: 0.4m-0.6m wide and not more than 0.2m deep. The fill of this ring-ditch comprised dark, reddish brown silt loam with small to medium-sized angular stones and pebbles present particularly in the lower part of the fill. The upper fill tended to be virtually stone free and more consolidated, comparable to the upper fill of ring-ditch F31.

Silt in the bottom of the southern part of the ring-ditch (F36 Sx 4) contained a linear deposit of charcoal about 0.3m in breadth extending parallel to its sides. This enclosed six sherds of Bronze Age pottery and a burnt flint pebble. Charcoal was also observed in the base of Sx 2 which contained a small quantity of abraded and cremated human bone, described below in section 11. Other finds from this ring-ditch included flint flakes and further fragments of BA pottery. A pit containing a cremation without an urn (F21) was dug into the silt infill of the southern part of the ditch's inner edge.

As with ring-ditch F32, there was some discrepancy in size between the ditch sections, eg Sx 2 was 0.45m wide and 0.1m deep, whilst Sx 4 was 0.6m wide and 0.2m deep, and interior to the ring-ditch there was no clear indication of the presence of any features that might be contemporary. This might again be due to later plough damage.

7.1.4 Remarks

It is difficult to be categorical about the precise sequence in which the three ring-ditches at Birch Pit were added beyond noting the obvious similarity in size of the ring-ditches F31 and F32. Whilst the three formed a close-set group, F31 and F32 were set 4.1m apart and were less widely spaced from F36, which was equidistant from the former two, separated from them by about 2m. At Ardleigh, the ring-ditches that in terms of their dimensions broadly coincided with the Birch Pit ring-ditches F31 and F32 comprised a distinct set, or 'group 1' (Brown 1999, 164). The location of these seemed to respect those of a larger group of ring-ditches, 'group 2' (Brown 1999, 164). This was indicated by the infilling of the spaces between the group 1 and 2 ring-ditches by tiny 'group 4' ring-ditches, frequently only 3m in diameter. It is therefore possible that the Birch Pit ring-ditch F36 respected the positions of ring-ditches F31 and F32, and that the last two were constructed together. It is also conceivable that the smaller Birch Pit ring-ditch F36 post-dates them.

Elsewhere in north Essex, ring-ditches excavated at St Osyth, which date from the Early Bronze Age (EBA) to Middle Bronze Age (MBA), were 5 to 10m across (FAU report forthcoming), within the range of the Birch Pit examples. Additionally, ring-ditches recorded at the Bronze Age cemeteries at Chitts Hill and Brightlingsea showed diameters of 7-8m and 4-13m respectively (Crummy 1977; Clarke 1991).

Because no particular differences were noted between the lower and upper fills in any of the Birch Pit ring-ditches, it is not possible to draw any firm conclusion on the presence or nature of barrow mounds based solely on evidence from the fills.

7.2 Pits

7.2.1 Pits containing cremation burials and/or urns (Figs 6-7)

The east side of ring-ditch F32, west side of ring-ditch F31 and south side of ring-ditch F36 delimit a roughly triangular zone of 4m x 5m. By contrast to the absence of definable features inside the ring-ditches, within this area were placed 16 cremations. Inverted burial urns encased seven; ie F2, F5, F8, F10, F14, F34 and F35 (Fig 7). However, no cremated bone was observed in the filling of a globular urn in pit F7 or a barrel urn in F33 (Fig 7). Given the particularly poor condition of these vessels, the bone had probably become excessively fragmented and could not therefore be distinguished. Cremations without urns were found in pits F6, F19, F20, F21, F38, F39 and F40 (Fig 6).

With the possible exception of F33/F34, the pits were sub-circular. Pits containing urns were significantly larger than the urns themselves, with a margin of 8 to 15cm beyond the urn surfaces. The fill of cremations both with and without urns was typically of dark reddish-brown silt. This varied from being virtually stone free, as in the case of F33 and F34, to stony, as in F8. While the urns generally rested on the natural, some (eg F2) lay on a gravel and silt lining, deliberately placed to render the base of the pit flat.

Most of the burials were placed centrally between the ring-ditches. A tight, approximately circular cluster of nine pits, about 3m in width, lay immediately adjacent to and south-west of the ring-ditch F36. This includes F21, an unurned cremation; this cut the silt infill of F36 and must therefore post-date it. It is possible that the remaining pits of this cluster and all those positioned centrally between the ring-ditches may also post-date them and belong to the same period as F21. The six other pits comprise an open, somewhat linear cluster that flanks the north-western margin of the ring-ditch F31.

The cremations without urns and the pits containing barrel urns occurred in the cluster to the south-west of the ring-ditch F36 (F2; F7, F14 with barrel urns; F6, F19, F20, F21 unurned), as well as the area bordering the ring-ditch F31 (F35 with a barrel urn; F38, F40 unurned).

The only globular urn identified, with possibly a second (below), formed part of the cluster bordering the ring-ditch F31, contained in F33 and F34. In this instance, because of the similarity between the almost stone-free silt and the subsoil, it was difficult to define the edges of the pit(s) in which the urns were deposited. The absence of any detectable division in the fill between F33 and F34, and the urn's proximity, perhaps indicate that both were in a single, approximately oval pit, as indicated by a faintly defined edge of darker material surrounding them both. Pits of this type are typical of many at Ardleigh (Brown 1999).

Three bucket urns were represented (contained in F5, F8 and F10), all within the cluster adjacent to the ring-ditch F36. The bucket urns contained in pits F8 and F10 were closely spaced, about 0.25m apart, and in this they compare with F33/F34 in being possibly

deliberately placed together. The unurned cremations in pits F6 and F19 and in pits F38 and F39 may also form pairs.

It was noted that a bucket urn was placed in a pit (F10) lying almost exactly centrally between the inner boundaries of all three ring-ditches. Therefore, it is possible to suggest that the other pits were placed with regard to this central position, to the west and east.

The possibility at Birch Pit of paired associations of some of the burials is notable. It has long been appreciated that Deverel-Rimbury cemeteries often display such pairings. 'Clusters of association', eg of type or form of pot, have also been characterised. In making these associations, however, caution should be used, and the validity of this approach has been debated (Barrett *et al* 1991). However, while possibly arbitrary and without ethnographic significance, the particular relations of the pit and urn types from Birch Pit allow for comparison with other Bronze Age sites.

Most of the pits at Birch Pit were circular in plan and contained a single vessel. At Ardleigh the situation differs, as many of the pits contained two urns, and most were oval and much larger, up to 1.4m long and 1m wide (Brown 1999). Many of the pairs of urns from Ardleigh that were buried together show either 'opposed' decoration or otherwise differences of overall form (eg a bucket urn may be paired with a globular urn). This appears to reflect a deliberate choice when vessels or parts of vessels were placed together (Brown 1995, 127).

If F33 and F34 in fact do represent a single pit, this would be the only Birch Pit example of an oval pit containing two vessels. These urned cremations lie so closely placed that they can be considered paired. However, unfortunately there was no evidence for 'opposition' (*sensu* Brown 1995) between the two vessels in this case; both urns were plain, and one could not be characterised with certainty.

With the possible exception of F33 and F34, the pits did not undercut one another, even though they were closely spaced. This is also the case at Ardleigh. It has been suggested that inadvertent cutting of existing cremations was avoided by the use of some kind of surface marker, which served to show their location (Erith & Longworth 1960, 178-80).

F21 directly demonstrates that at least this burial post-dated one of the ring-ditches F36. The central location of the other burials between the ring-ditches suggests that these too belong to a later period. This would compare with the Bronze Age cemetery at Brightlingsea, where cross-cutting relationships established that the urns without enclosing ring-ditches post-date the ones inside them (Clarke 1991).

Overall, the Bronze Age cemeteries at Birch Pit, Chitts Hill and Brightlingsea are directly comparable, and differ from the cemetery at Ardleigh in the following respects: 1) many of the cremation burials were placed in groups between the ring-ditches; 2) they (the cemeteries) contained a large number of circular pits containing single urns; 3) only a few of the oval pits contained two urns; 4) they were of a small size, with comparatively few ring-ditches; and 5) there was an absence of urns buried upright.

7.2.2 Other pits

In total, 11 pits were recorded which did not contain cremated remains. Most formed a loose cluster just east of the 'enclosure' ditch F4/F11. Four small to moderate-sized pits were located to the south-east of this feature. To the east and north of F4/F11 were four other pits (F9, F12, F16, F17) containing deposits of charcoal and interpreted as having been fire pits or hearths. A fifth pit containing charcoal (F28) was situated 26m north-east of the Bronze Age cemetery, with another (F27) in between the trackway ditches F1 and F3.

Hearth or fire pit F9

F9 was a small pit containing charcoal, and it is interpreted as having been a fire pit. It was sub-circular in plan with a diameter of 0.25m. The fill of uniform brown silt loam was devoid of artefacts.

Flint-lined pit F12

This pit was located about 9m south-west of F9 and also contained charcoal. The charcoal was enclosed within a central depression, possibly the base of a shallow post-hole. Angular to sub-angular flints ranging from 1.5 to 3cm filled the base. A mixed charcoal and silt layer of 3-4cm covered the flint, with a silt deposit on the south side. No finds were recovered. The pit's southern side was steep, whereas the shallower northern side shelved off in its upper half.

Pit F13

F13 was a large sub-circular pit; about 1.5m in diameter and up to 0.3 deep, cut into Boulder Clay, lying south of the enclosure ditch F4/F11. The fill, comprising uniform reddish-brown silt which lacked stones except for a few flints, was without artefacts. While essentially flat-bottomed, F13 had a distinctive profile; the western side stepped upward to a shallow shelf inclined at approximately 5 degrees, whereas the convex eastern side was steeply inclined. Corticated flint nodules imparting a 'shagreened' effect covered much of its floor, particularly on the west side.

Hearth or fire pit F16

Closer to and east of F4/F11 was a sub-circular to ovoid pit, here interpreted as having been a fire pit or hearth, based on its charcoal content. This shallow pit, about 0.05m deep, contained a fill of stony silt loam rich in charcoal. There were no finds.

Hearth or fire pit F17

F17 was a small sub-circular basin-like pit, about 0.35m in diameter and 0.13m deep. The lower fill was a reddish-brown silt loam. A 0.04m-thick charcoal-rich layer that filled the pit's upper part and centre had a well-defined edge, suggesting that it filled a re-cut.

Large pit F25 and curved pit F18

Two distinctly curved but poorly defined pits in Chalky Boulder Clay lay respectively 22m and 35m south-east of F4/F11. These undated pits are here interpreted as natural features, probably formed under periglacial conditions in the late Pleistocene. F25, with dimensions 1.8m x 3m, had gently curved sides and a somewhat irregular base, and was filled with brown silt loam, stony towards the bottom. F18, to the west of F25, was a narrow roughly C-shaped feature with a fill of slightly stony dark reddish-brown silty loam with large stones. The fill of both features was strongly reminiscent of the Boulder Clay that formed their sides, and probably derived from this exterior material.

Large pit F22

F22 was a large pit, 1.7m wide, that lay just over 10m south-west of the probable quarry-pit F23. It was flat-bottomed and comparatively shallow (0.3m deep). This feature was of unspecified length, extending beyond the edge of the excavated area, but was at least 2m long. The primarily stone-free fill comprised a compact buff silt clay loam, probably derived from both interior and exterior. A few flint nodules and chalk fragments occurred particularly on the east side. The fill contained a rough flake core, one retouched flake and a flint waste block.

Hearth or fire pit F27

F27, 0.6m in diameter and 0.05m deep, was located about 4m north of the northern boundary of ditch F3 in the east of the excavated area. The pit contained a 0.3m-thick layer of charcoal that was sealed by largely stone-free silt loam. This produced a sherd of Bronze Age pottery. In addition to this, F27 yielded some tiny fragments of bone, possibly animal bone.

Hearth or fire pit F28

F28 was a 1.2m-wide pit located about 25m north-east of the ring-ditch F31, and therefore it may be associated with the Bronze Age cemetery. Only its northern side was excavated, its southern end being off the site's limits. This broadly U-profiled pit contained a poorly stratified fill of reddish-brown and orange clay loam with only a few stones, and was without artefacts. Distinct lumps of orange clay, apparently thermally altered, were confined mostly to the upper fill. Most of the rest of the fill was flecked with charcoal. This pit possibly represents a fire pit or hearth. It is tempting to suggest that it marked the site of a pyre.

Possible hearth F30

F30 was an undated pit, also located about 25m from the Bronze Age cemetery but to the north. It was 1.45m wide and 0.2m deep. The fill comprised a light grey to brownish silt clay loam with rare stones. A charcoal-rich lens was found, flanking its southern margin. In this instance, however, the pit had an irregular base and poorly defined edges, and was possibly natural.

7.2.3 Remarks

While none of the pits could be dated precisely, most lay within the zone of the ditch F4/F11 or the Bronze Age cremation cemetery. It is possible that F28 could have been a pyre that was associated with the cremation burials.

7.3 Ditches

7.3.1 Linear ditches F1 and F3

Portions of two linear shallow ditches, F1 (also numbered F10 and F17; CAT Report 141) and F3 (also numbered F2 and F11; CAT Report 141), were uncovered close the north edge of the site, about 85m to the north of the ring-ditches F31, F32 and F36. These extended as a parallel pair about 10m apart, aligned approximately east-west. Ditch F3, the northernmost ditch, was exposed for 34m. Sectioned in four places at intervals 7m to 9m apart (F3 Sx 1-Sx 4; Fig 8), F3 was between 1.4 and 1.7m wide, up to 0.45m deep and broadly of U-profile. Ditch F1 (Fig 8) was traced for 67m and sectioned in five places. It had a profile ranging from U-shaped to approximately V-shaped; the width of this ditch was 0.6m to 0.8m and the depth up to 0.25m.

While ditch sections of F1 were smaller than F3 overall, in both ditches the fill consisted of reddish-brown clay silt clay loam. Finds were sparse and included two Bronze Age sherds and a small flint flake from F1, whereas F3 only yielded two sherds, also probably Bronze Age in date. However, sections through F1 in the evaluation trenches P1 and Q1 (CAT Report 141: F10/F17) yielded LBA/EIA ceramics which demonstrate that it almost certainly post-dates the Bronze Age ditch F4/F11 and the ring-ditches. Certainly, the ditches were on a different alignment to the 'enclosure' ditch F4/F11.

The southernmost ditch F1 possibly intersects the northern part of the possible Roman quarry-pit F24, but the nature of this contact was not clarified.

F1 and F3 were probably constructed contemporaneously, and perhaps flanked a droveway (CAT Report 141). Their presence may signify a change in land use during the LBA/EIA relating to a wider field system.

7.3.2 Possible Bronze Age boundary ditch F26

Part of a ditch (F26) was uncovered at the north-west side of the site. Only about 4m of the ditch was traced, with the remainder beyond the northern edge of the excavated area. While mostly orientated north-west/south-east, the ditch turned slightly to the east toward the butt end and ended in a broad semi-circular terminal. The northern part, 0.85m wide and 0.25m deep, had a distinctive profile; the north side was shallow, reaching about 0.05m deep, before meeting a U-profiled part after 0.3m. The latter had a steeper southern side. The ditch became U-shaped toward the butt end, and while the depth remained consistent it widened to 1.2m. It was filled by a reddish-brown silt containing occasional stones, partly sealed by a shallow layer of grey-brown silt, mostly confined to the middle region. No finds were recovered.

Apart from its proximity and similar orientation to the ditches F1 and F3, there is no basis for relating F26 to any other feature.

7.3.3 Possible enclosure ditch F4/F11

The eastern corner of a possible enclosure ditch F4/F11 was exposed at the site's western boundary. A northern arm (F4), forming the north-east side of F4/F11, extended north-west beyond the edge of the site and was traced for about 12m. It was 1.55m wide and 0.8m deep where sectioned. The tract of ditch F4 was directly in line with a Bronze Age ditch F8, which was exposed in trench L1 of the evaluation (CAT Report 141), and assumed to be part of the feature. At the south-eastern end of F4 the ditch turned through about 90 degrees, and was traced for 12m to the south-west before abutting the western site boundary. This southern arm (F11), where sectioned at F11 Sx 1, 6m from the edge of the site, was 2.2m wide and 1.05m deep.

The ditch profile varied slightly around its circuit. F11 was strongly asymmetrical, with the upper part of its north-western side stepped, and with the part beneath steeply inclined at about 85 degrees. F4 was approximately V-shaped shaped but also asymmetrical with its south-western side inclined at an angle of about 60 degrees; further to the west (cf F8; CAT Report 141, fig 4); this side was close to vertical.

The fill sequence in F4 and F11 was broadly similar. In both, the lower fill was a dark reddish-brown silt clay loam, often manganese-rich and with some stones, the upper fills comprising paler, fairly uniform silt clay loams. The lower fill in F11 Sx 1 and F4 was

derived from the north-west and south-west sides respectively. This may indicate the rapid accumulation of silt, particularly early in the fill sequence, perhaps from a collapsing bank that flanked one side of the ditch. A rather thin (approx 0.1m) and especially dark layer in section F4 at the top of the lower fill may support this notion.

The possibility that a raised bank was present may indicate a more complex use of F4/F11 than merely as a drainage ditch. Indeed, a possible structural use for F4/F11 was proposed for the section (F8) cut in the ditch tract termed F4 further to the west during the evaluation (CAT Report 141). Based on its unusual profile, it was suggested that the ditch could even have held upright timbers. F15, a small steep-sided sub-circular feature encircled by flint pieces, here interpreted as a possible post-hole, was located 2m from the eastern corner of F4/F11. This feature may also support the suggestion that the function of the ditch was, at least in part, structural.

Finds from F4/F11 included three Bronze Age sherds and 10 flint flakes, including a secondary waste flake and two blades. These finds are supplemented by those from F8 (CAT Report 141), which produced a sherd of Deverel-Rimbury type and flintwork, including two small blades of Neolithic/Bronze Age type as well as six flakes and a worked flint nodule. Two small fire-cracked natural flints were also recovered from F8. The presence of Deverel-Rimbury pottery may indicate that F4/F11 is broadly contemporary with the Bronze Age cemetery, 110m to the south-east.

8 Roman features

Two probable Roman features were excavated. These were two especially large pits, F23 and F24. F29, a short ditch extending from F24 to the east, was apparently associated with that feature. Both F23 and F24 had been recorded in trenches during the evaluation work (CAT Report 141).

Possible Roman quarry-pits F23 and F24, and ditch F29

Topsoil-stripping of the site fully exposed two large pits that had been discovered in trenches R1 and N2 of the evaluation (CAT Report 141). Both were cut into Chalky Boulder Clay. One of these, F23 (also numbered F9; CAT Report 141), measuring approximately 21m x 14m, is close to ditch F4/F11; the second, F24 (also numbered F1; CAT Report 141), measuring 30m x 21m, is located 56m to the north-east of F23 and impinges on the southernmost of the two 'trackway' ditches, F1. The pits F23 and F24 were further investigated by cutting a single trench across their width.

The profile of F23 was distinctive, with an extensive flat bottom with a maximum a depth of 2.1m (measured from below the level of L2). Above this the north-west side was convex and gently shelving, whereas the south-eastern side was slightly concave; it stepped up by 1m before it too sloped shallowly upwards.

The fill of F23 comprised a deposit of homogeneous greyish-brown silty clay that conspicuously darkened into the upper fill. It contained charcoal flecks, small to medium-sized stones and occasional chalk lumps, presumably derived from the Chalky Boulder Clay in which it was cut.

In addition to fragments of Roman tile, a small quantity of Bronze Age pottery was recovered, although this was in a residual context.

Pit F24 is interpreted as being a second Roman quarry-pit. Sharing a similar profile to F23 (Fig 9), with an extensive flat bottom, it reaches 1.65m below the level of L2, and like F23 it had gently sloping sides. During the evaluation, this feature produced Roman pottery and prehistoric sherds, with the latter in a residual context.

The sides of F24 were convex without the 'step' seen in the F23 section. The fill was a yellowish-brown deposit of silty clay. The resemblance to F23 was striking and the two pits are no doubt contemporary. This was further evidenced by its comparable fill. Finds from F24, while sparse, included Roman tile and a secondary waste flake. Roman and prehistoric sherds and a piece of vegetable-tempered pottery of probable Saxon date (from the upper fill) were recovered from this feature during the evaluation (CAT Report 141).

The south-eastern side of pit F24 is extended for a distance of 4.5m by a 'ditch' (F29). Where it intersected the pit, this feature was 0.35m deep and 2.5m wide. F29 tapers east to a width of 1.3m at its butt end, which appears to have been roughly squared off. The brown silty clay fill of F29 was devoid of finds.

9 Post-Roman features

There was no evidence of Saxon, medieval or early modern archaeology. A single modern feature was identified (F37). This was a modern trench that contained an electrical cable sheathed in tar and lead. Interior paper insulation was dated 1943. OS maps of the site from early 1950s (1:2500 and 1:10000 scales) show the positions of some USAAF buildings probably linked by the cable. It may have just fed some lights; possible spurs show on the magnetometer image.

10 Finds

The finds are listed in the Appendix (section 17.2), which gives approximate dates for those found in a stratified context. Descriptions of the prehistoric and post-medieval pottery and the small finds are given below.

10.1 Prehistoric pottery

A total of 44.3kg of Bronze Age pottery was recovered from the Birch Pit excavation. All the urns from Birch Pit are classic examples of Deverel-Rimbury Middle Bronze Age pottery. The condition of the soil resulted in fairly poor preservation of the urns. All the urns are highly fragmented and distorted, although some have survived more fully than others.

The urns from Birch Pit seem fairly uniform in decoration, bearing finger, fingertip and fingernail impressions, a decorative style seen in 'Ardleigh Group' pottery. This is a north-east Essex variant of Deverel-Rimbury ware that was in use c 1200-1400 BC (Brown 1999).

Whilst the Birch pots are of Ardleigh group type, they differed from Ardleigh pottery in a number of respects. Finger-impressed decoration did not cover entire pots but just the area below the cordon, and they were generally plainer than those from Ardleigh. This could suggest a different source of supply; the local styles are similar but all vary slightly.

Although they are typical of their type, the urns from Birch Pit are relatively crude in construction. For example, the bucket urn (find no 66; F8) has an uneven interior surface, resulting from unsmoothed coil joins (Brown 1999). There are no examples of combed/tooth-combed patterns or incised lines. All examples were of bucket, barrel or globular form reminiscent of the Ardleigh examples.

The surviving urns, rim and base fragments that form the Birch Pit assemblage which were drawn are described below.

Fabric types after Brown (1995)

Fabric A – well-sorted flint inclusions less than 1mm diameter with 6-10 per cm sq.

Fabric B – flint inclusions ranging from less than 1mm to 2mm in diameter with 6-10 per cm sq.

Fabric C – flint inclusions ranging from less than 1mm to 2mm in diameter with occasional 3mm inclusions with 6-10 per cm sq.

Fabric E – flint and sand inclusions ranging from less than 1mm to 2mm in diameter with 6-10 per cm sq.

Fabric H – sand inclusions less than 1mm diameter with 6-10 per cm sq.

Fabric M – grog, often with some sand or flint and occasional small rounded or sub-angular voids.

Descriptions

Fig 10 no 1; Find no 64, F10.

Fabric C bucket urn. Flat-topped rim with oval (almost piecrust-like) impressions not made by a fingertip. Applied fingertip-impressed cordon. The upper 50% of the vessel survives relatively intact.

Fig 10 no 2; Find no 66, F8

Fabric C bucket urn. Flat-topped rim with dense internal small fingertip impressions and an applied finger pressed exterior. Below the rim is a patchy row of fingernail impressions. There is an applied finger-impressed cordon. Below the cordon the urn is filled with dense crude finger impressions. It is thick walled with a rough internal finish. About 60% complete.

Fig 11 no 3; Find no 4, F2

Fabric C barrel urn. Semi-rounded rim. Applied finger-impressed cordon. Below the cordon are vertical rows of finger impressions. Main body is complete but the rim and base are fragmented. The base has a slightly protruding foot.

Fig 11 no 4; Find no 67, F14

Fabric C barrel urn. Fully complete vessel, flat-topped rim slightly externally expanded. Below the rim are two rows of fingertip impressions divided by a patchy row of fingernail impressions. Finger-impressed slightly pinched cordon.

Fig 12 no 5; Find no 73, F5

Fabric M bucket urn. Only partial rim and top 15cm of urn remain. Highly fragmented. Finger impression topped rim with a slightly pinched-out cordon with finger impressions. It is also thick walled.

Fig 12 no 6; Find no 68, F7

Fabric C barrel urn. Plain non-joining rim sherds, highly fragmented, only upper 14cm survives. Dense crude finger-impressed decoration.

Fig 12 no 7; Find no 71, F34

Fabric A globular urn. Partial non-joining rim, upper 14cm survives. Devoid of decoration except for a plain 'V'-shaped shoulder cordon.

Fig 12 no 8; Find no 69, F35

Fabric B barrel urn. Only rim and upper 16cm survives intact. Finger-impression-topped rim and applied finger-impressed cordon. Slightly undulating internal walls.

Fig 12 no 9; Find no 72, F33

Small fabric H barrel/possibly globular urn. Only a few partial rim and un-joining body sherds remain. Rounded plain rim, no decoration.

Fig 12 no 10; Find no 51, L1

Fabric C body sherd fragment of possible globular urn with a plain V-shaped cordon.

Fig 12 no 11; Find no 54, L1

Fabric E base fragment with no decoration.

Fig 12 no 12; Find no 54, L1

Plain fabric E rim fragment (possibly from a globular urn).

Fig 12 no 13; Find no 54, L1

Rim fragment probably from a small fabric E barrel urn. Plain rim with partial row of fingertip impressions.



Plate 3 F10 cremation urn under excavation, view west.

10.2 Post-medieval pottery

by *Howard Brooks*

A single sherd of post-medieval pottery weighing 21g was recovered. The pottery is identified as Fabric 45M modern stoneware and is datable to the 19th and 20th centuries.

10.3 Worked Puddingstone fragment

by *N Crummy*

The principal sources for Hertfordshire Puddingstone lie within that county, but fragments are occasionally found as erratics in Essex and other adjacent counties. A conglomerate of flint pebbles in a siliceous matrix, it was used to make rotary hand-querns in the Late Iron Age and Roman periods, with stratified examples suggesting their use continued at least into the 2nd century. The stone is, however, so hard that examples would have survived in use for far longer than Roman imported lava querns. Puddingstone quern fragments were sometimes reused as building stones, and pieces are occasionally seen in the fabric of medieval churches. Erratics were also sometimes used as building stone. The fragment from Birch (context 7, unstratified) is wedge-shaped (maximum dimensions 150 x 143 x 90 mm), and all the surfaces are rough with unbroken flint pebbles apart from one, on which they have been cut and smoothed. The fragment has clearly been used as building stone, with the worked face exposed, but whether this represents primary or secondary use is uncertain.

10.4 Worked flint

Hazel Martingell identified the flints from the site. In the list that follows, each piece is referred to by its find number. This is followed by an archaeological context abbreviation and then a brief description.

- Find no 2, L1. One flake, tertiary, evidence of trimming; one tertiary fragment.
Find no 3, U/S. One blade, tertiary, butt part, edge damaged; one flake, secondary, notch on right edge; one scraper on tertiary flake from a blade core (Neolithic).
Find no 8, L1. One flint block, flaked (modern); four flakes (two secondary, two tertiary); one flake, tertiary, with slight patination.
Find no 9, F4. Two flakes, slightly cherty flint, sharp (one secondary, one tertiary); two waste flakes (one secondary, one tertiary); one blade, primary, corner off block.
Find no 13, F4. Three secondary waste flakes; one blade, tertiary, triangular in section; two tertiary flakes.
Find no 19, F11. Small secondary flake.
Find no 23, F1/F16. Small tertiary flake, sharp.
Find no 31, F22. One flake core, rough; one secondary flake, retouched; one secondary waste block; one secondary flake, cherty light grey flint.
Find no 35, F24. One blade, tertiary, with missing tip.
Find no 47, F31. Three secondary waste flakes; one tertiary flake, squat; one scraper on right end of wide squat flake, with opposite end flaked to a point, possibly for hafting.
Find no 51, L1. Secondary waste flake.
Find no 54, L1. Two tertiary flakes.
Find no 55, F32. One possible scraper, broken; tertiary flake of grey flint.
Find no 62, F36. One secondary flake, black flint; one secondary waste flake.
Find no 49, F31. One burnt blade core fragment.
Find no 77, F34. One burnt flake.

Uncatalogued burnt natural pebbles

11 Cremated bone

by *Sue Anderson*

Introduction

This report examines the cremated bone from fourteen Bronze Age/Middle Bronze Age burials associated with three ring-ditches, one assemblage from the fill of a ring-ditch, one ?Bronze Age deposit from a hearth or fire pit, and an undated group from a layer.

11.1 Methodology

Collection methods varied depending on the size and type of deposit. Seven groups of cremated bone from urns (F2, F5, F8, F10, F14, F34, F35) were collected in spits. The remainder were collected as single groups of bone. With the exception of a few fragments

which were hand-collected on site, all groups of bone (including separate spits) were wet-sieved and sorted into fractions <5mm and >5mm prior to analysis. The smaller fractions were mixed with pea-grit; fragments from the <5mm fractions of four groups were separated by hand during analysis so that the bone could be weighed. However, this task was very time-consuming, and in the remainder the amount of bone was simply estimated based on the approximate percentage of bone present (and weights supplied by CAT), and scanned for recognisable fragments.

Bone fragments were sorted into five categories: skull, axial, upper limb, lower limb, and unidentified. All fragments were weighed to the nearest 0.1g. Measurements of maximum skull and long-bone fragment sizes were also recorded. These data are listed in section 11.6.

Observations were made, where possible, concerning bone colour, age, sex, dental remains and pathology. Identifiable fragments were noted. Age of juveniles was estimated from tooth eruption and/or epiphyseal fusion where possible, and age of adults from degenerative changes. Sexing of adults was based on size and robusticity. Methods used follow the Workshop of European Anthropologists (WEA 1980) and McKinley (McKinley 1994; McKinley 2004). A catalogue of burials is included as section 11.7.

11.2 Quantification, identification, collection and survival

Table 1 shows the bone weights, percentages of identified bone from each burial, and the proportions of bone identified from the four areas of the skeleton (skull, axial, upper limb, lower limb). Expected proportions are provided in the first row.

Table 1: percentages of identified fragments out of total identified to area of skeleton (*expected proportions from McKinley 1994, 6).

Type	Feature	Total wt/g	% identified	% Skull	% Axial	% U limb	% L limb
<i>expected*</i>				18.2	20.6	23.1	38.1
Burials							
	F2	1617.3	27.9	25.0	25.8	18.4	30.8
	F5	457.0	9.0	50.1	1.2	14.3	34.4
	F6	639.3	14.3	47.4	6.9	16.6	29.1
	F8	513.6	56.0	41.0	15.7	18.9	24.5
	F10	970.3	15.6	29.8	5.8	31.3	33.2
	F14	1084.1	26.4	36.0	8.1	33.0	22.9
	F19	0.4	0.0				
	F20	166.5	4.9	48.1	16.0	9.9	25.9
	F21	734.0	27.3	56.9	1.3	18.8	23.0
	F34	224.3	2.9	51.5	0.0	24.2	24.2
	F35	1137.7	26.0	38.7	5.2	21.6	34.5
	F38	1332.5	12.6	48.2	1.6	16.9	33.2
	F39	2882.9	17.4	38.6	4.6	27.1	29.7
	F40	2617.4	19.6	36.7	4.0	30.0	29.3
Other features							
	ring-ditch F36	36.0	5.6	60.0	0.0	40.0	0.0
	hearth or fire pit F27	1.9	0.0				
	redeposited layer L1	150.0	70.9	11.0	1.2	43.8	44.0

This table shows that skull fragments are almost always over-represented amongst the identifiable material (the only exception being L1), and that occasionally other areas of the skeleton may be. For example, the proportion of axial remains is higher than expected in F2, in seven cases the upper limb is over-represented, and the lower limb only once (again in L1). It has been suggested that 'it should be possible to recognise any bias in the collection of certain areas of the body after cremation' (McKinley 1994, 6). However, there is also some bias inherent in the identification of elements. McKinley notes the ease with which even tiny fragments of skull can be recognised, and conversely the difficulty of identifying long-bone fragments. These figures can therefore provide only a rough guide to what was originally collected.

It is clear from the total weights of bone that the majority of these burials are substantially incomplete. Mays (1998, table 11.2) notes that the combusted weight of an adult skeleton has a mean of around 1500g for females and 2300g for males. Only one of the individual burials in this group, F2, is within this range. Two, F39 and F40, weigh more, but F40 certainly contained the remains of two individuals. Of those which were less than complete, five were unurned and six were urned (including three which contained more than one individual); no information on truncation was available.

11.3 The cremation burials

Urned burials

Seven Middle Bronze Age urned burials were excavated in the area between three ring-ditches. These are summarised in Table 2.

Table 2: summary of urned cremation burials.

Burial	Deposit	Age	Sex	Notes
F2	4	mature	F?	Some large fragments, well preserved; sexing based on small occipital crests; some degeneration.
F5	73	i) <12 ii) adult	Un M?	Fairly well preserved but incomplete; unerupted second molar suggests age of child; plus a few fragments of large adult bones; pitting on one fragment of skull.
F8	66	i) young ii) infant	Un Un	Well preserved but very incomplete remains of an adult showing no signs of degeneration, and a perinatal infant (age based on tooth calcification), the latter confined largely to the lowest spit excavated from the vessel.
F10	64	adult	M?	Well preserved but incomplete; sexing based on size of toe bones; epiphyses fused.
F14	22, 73	mature	Un	Well preserved, some large fragments; some degenerative change; no sexing criteria.
F34	71	child?	Un	Poor condition, small abraded fragments; age based on appearance of skull fragments.
F35	69	i) adult ii) child	M? Un	Fairly well preserved; mostly the remains of a robust adult showing no signs of degeneration; only one vertebral body fragment with unfused epiphyses was identified as juvenile; wormian bone present.

Three of these burials contained the remains of more than one individual, but only F8 can be claimed as a double burial. F5 and F35 contained only small quantities of an adult and a child respectively. These are too few to indicate a separate individual and they may well have been collected and included in error if the pyre site had been used previously.

Alternatively, they may have been included deliberately to accompany the main individual. However, as they could be fragments from one of the other individuals, the minimum number of individuals (MNI) for this group is eight. Of these, two were adult ?males, one was a mature ?female, two were unsexed adults and three were children.

Both of the mature individuals in this group showed evidence for degenerative changes. This was in the form of small osteophytes on fragments of vertebral facets and bodies.

All of these burials were excavated in spits and this allows for the relative proportions of the four main skeletal areas to be compared. Figures 1 and 2 show the results of this (based on percentages of identified fragments by weight) for F2 and F14, which had the largest quantities of identifiable bone. There is a degree of patterning in the distribution. In both cases, there is an increase in the amount of skull towards the bottom of the vessel, although the very sharp increase in proportion seen in F14 is probably due to the small quantity of identifiable bone in spit 3. In F14, there is an increase in the amount of axial bone in the centre of the vessel, and more lower limb bone towards the top. F2 shows a similar pattern, although here the arm bones are more frequently represented in the central area. Although the patterning is not particularly clear, especially in F2, there is a slight suggestion that the burnt bone was collected from the head end of the pyre first, working down to the feet.

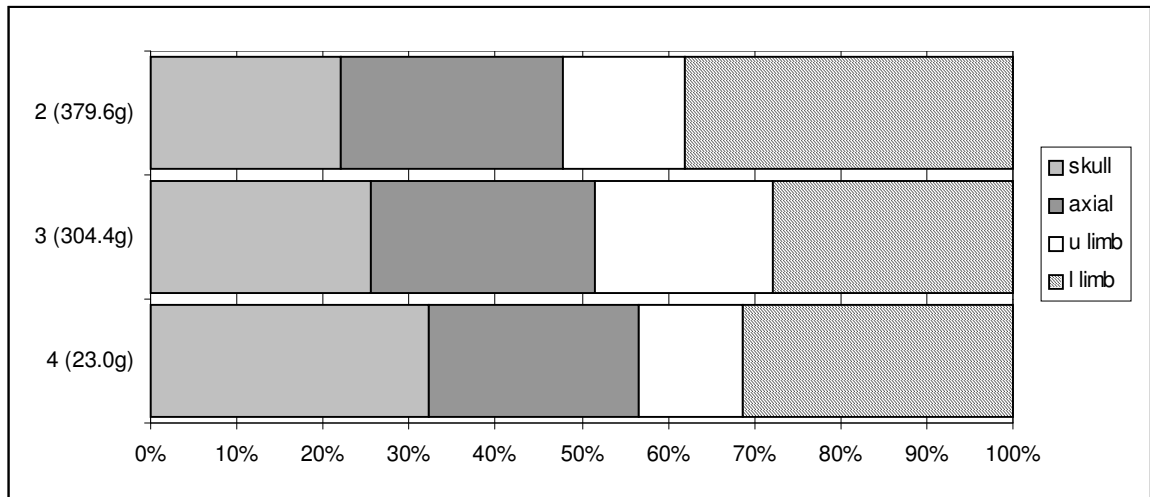


Fig 1 Proportions of skeletal area by spit from urn burial F2.

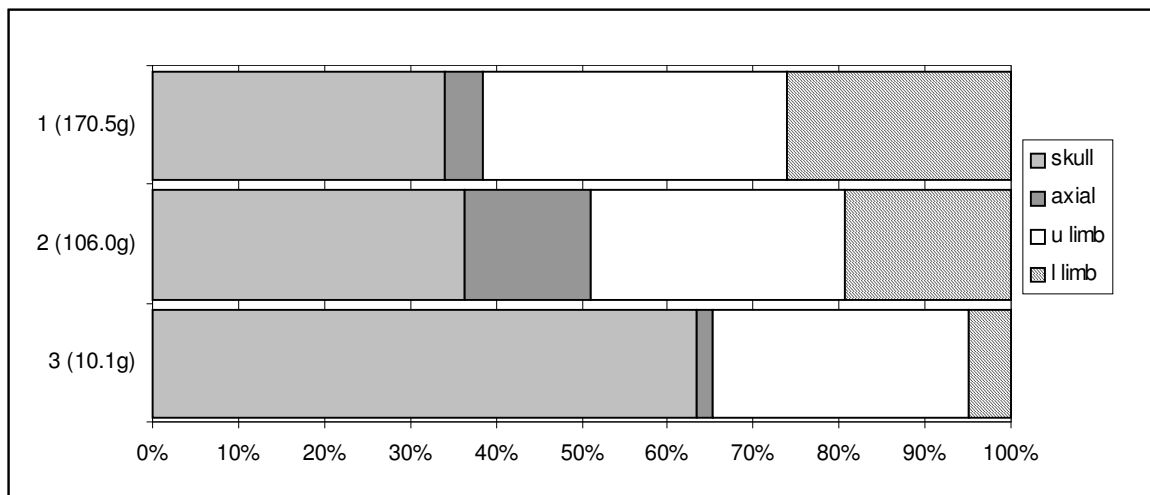


Fig 2 Proportions of skeletal area by spit from urn burial F14.

Whilst this may suggest a degree of sorting during collection in antiquity, the fact that elements from all parts of the body are represented throughout the vessels suggests that this is more likely to be due to convenience than any ritual patterning. Study of another Bronze Age site in Essex, at St Osyth (Anderson forthcoming), has shown that collection was just as likely to start from the foot end of the pyre.

The majority of bone in this group was fully oxidised and cream to white in colour, although occasionally fragments were grey, indicating incomplete oxidation. The presence of a high proportion of white bone indicates firing temperatures in excess of approximately 600°C (McKinley 2004, 11). However, at Ardleigh, Mays (1999, 159) noted that the uniformity of colour in the surviving bone may be due to poor survival of less well cremated bone. This did not appear to be the case at St Osyth, where at least one burial — based on weight and element survival — was near-complete. The colouration of these bones therefore may suggest a degree of uniformity in the firing.

Unurned burials

Seven Bronze Age cremation burials were unurned, although of course they may originally have been deposited in perishable containers. Table 3 summarises the information collected during the study of these burials.

Table 3: summary of unurned cremation burials.

Burial	Deposit	Age	Sex	Notes
F6	11	sub-adult	Un	Well preserved but incomplete; age is based on unfused iliac crest.
F19	28	unknown	Un	Less than 1g of bone.
F20	27	adult	Un	Poorly preserved, abraded and very incomplete; age based on size of bones.
F21	26	adult	Un	Fairly well preserved but incomplete; age based on tooth eruption; wormian bone present.
F38	52	mature/ old	M?	Fairly fragmented; some degeneration; size of bones suggests possible male; small osteophytes and pitting on the cranial vault.
F39	56	adult	Un	Well preserved but heavily fragmented; the weight of this burial may indicate more than one individual, but no duplication was observed; size of bones indicate an adult (and possibly a male); pitting on cranial vault.
F40	59	i) sub- adult ii) mature	Un Un	Well preserved but mostly very fragmented; several unfused epiphyses of near-adult size present, but also fully mature vertebrae with degenerative changes; wormian bone present.

Like the urned burials, the presence of a second individual in F40 does not necessarily indicate a double burial, as only a small number of bones could be identified from the mature adult. The MNI for this group is six, as the tiny quantity of bone in F19 cannot be considered as a separate individual. However, the weights (both over 2300g) of F39 and F40 may indicate that substantial amounts of two further individuals were present.

Only one individual could be sexed and was possibly male. This group contained two sub-adults, both of substantially adult size and therefore probably in the age range 16-18 years. Two of the adults showed signs of degenerative changes of the spine and were therefore categorised as mature or old.

Wormian bones, ie extra-sutural bones of the skull which may have a genetic component in their presence or which can be related to stress during development, were present in two burials (F21 and F40) as well as one of the urned burials (F35).

Two individuals (in F38 and F39) had extensive pitting over the surface of the cranial vault. This can be caused by an inflammatory response to a scalp infection, but it may also be a sign of iron deficiency anaemia (porotic hyperostosis). One fragment of skull with pitting on the outer surface was also recovered from urned burial F5.

The majority of these burials were far from complete, and even those over 2300g were not heavy enough to suggest that they represented two complete individuals. The greater proportion of the total bone weight in these burials came from the <5mm fractions, and all were heavily fragmented. The MBA burials at St Osyth were generally found to be more fragmented than some EBA cremations from the same site, perhaps suggesting a deliberate attempt to crush the bone in the later period.

Colouration for the unurned cremated bone was again fairly uniform and generally indicated full oxidation and high firing temperatures.

11.4 Other features

Three other contexts produced small quantities of burnt and calcined bone from samples, much of it chalky and abraded. Table 4 summarises the information collected for these three groups.

Table 4: cremated bone from non-burial features.

Feature	Deposit	Age	Sex	Notes
ring-ditch F36	57	child?	Un	A small quantity of fragmentary and abraded bone, possibly juvenile based on skull thickness, collected from the fill of one of the ring-ditches.
hearth or fire pit F27	43	unknown	Un	Only 1.9g of bone in tiny fragments, collected from a hearth or fire pit. May not be human, but too small to be certain.
redeposited layer L1	10	adult	Un	Fragmentary and abraded cremated bone; size suggests adult.

In all three cases (assuming that F27 is human), it is likely that the material is redeposited, and may belong to other individuals excavated from the more complete burials.

11.5 Summary and discussion

Seventeen groups of cremated bone were examined, fourteen of which were from discrete burials of Middle Bronze Age or probable Bronze Age date. The minimum number of individuals was estimated as fourteen. Several burials contained a few fragments which did not belong to the main occupant, but only one of these (F8) could be considered a double burial on the basis of the osteological evidence. Weights of two other burials may indicate that there were two further double burials (F39 and F40).

The group as a whole contained at least one infant, two children, two sub-adults, a mature ?female, two adult and one mature ?males, and one young, three adult and one mature unsexed adults. The demographic spread is not particularly unusual for the period; other MBA sites in the region, such as Bixley and Harford Farm in Norfolk (Mays 2000) and Ardleigh and St Osyth in Essex (Mays 1999; Anderson forthcoming) have yielded cremated remains of adults of both sexes and children of all ages. Double burials of adults with infants or young children have also been found at other sites; at St Osyth, for example, the remains of a child were found in a small urn deposited inside a larger one containing an adult female. It is unfortunate that the young adult in F8 could not be sexed, but it is tempting to suggest that the burial represents a young woman who died in childbirth, and her baby.

As is generally the case in cremated assemblages, there is little information on the daily stresses and strains of life which leave their mark on the skeleton. It was possible to record that a few individuals suffered from the degenerative changes which are associated with increasing age, particularly in the spine. At least two people may have suffered from iron deficiency (both unurned burials).

Some insight into the cremation ritual can be gained based on the evidence of the two more complete vessels which were excavated in spits, based on the colour of the bone and the degree of fragmentation. The spit-excavated urns provided tentative information regarding post-cremation collection practices in this population and may suggest that bone was retrieved from the head end first. However, at other sites the evidence is more equivocal and suggests no particular preference or ritual. Most of the bone from this site indicates that firing probably reached the high temperatures normally associated with cremation. There is evidence for a high degree of fragmentation, but this is particularly noticeable in the unurned burials and could simply be a result of post-depositional changes.

11.6 Quantification and measurements

Burial	Fill	Spit	Mesh	Residue Wt/g	Approx bone %	Estimated bone Wt/g	Skull Wt/g	Axial Wt/g	Up. limb Wt/g	Low. limb Wt/g	Unident Wt/g	Totals Wt/g	max skull (mm)	max long bone (mm)	
F2	(4)	2	<5mm	511.7	sorted	N/A	2.9	2.0		0.4	138.0	143.3	11	-	
			5mm+				24.5	29.7	17.7	46.6	117.8	236.3	29	39	
		3	<5mm	614.3	90	552.9	1.4					551.5	552.87	11	-
			5mm+				76.5	79.2	62.6	84.7	251.9	554.9	29	65	
		4	<5mm	477.3	20	95.5	0.8					94.3	95.46	11	-
5mm+	6.6		5.2				2.8	7.2	12.7	34.5	20	43			
Totals							112.7	116.5	83.1	138.9	1166.1	1617.3			
F5	(73)	3	<5mm	545.9	sorted	N/A	0.3				19.5	19.8	7	-	
			5mm+							4.9	1.7	6.6	-	15	
		4	<5mm	626.5	1/3 sorted	54.0	1.9		3.6			54.0	54.0	-	-
			5mm+				4.1			8.5	7.4	21.4	13	19	
		5	<5mm	588.7	50	294.4	8.6					290.3	294.4	10	-
			5mm+				0.3			0.8	12.2	21.6	21	-	
-	<5mm	-	-	-	0.3					4.5	4.8	6	8		
	5mm+				5.5	0.5	2.3			26.1	34.4	17	17		
Totals							20.7	0.5	5.9	14.2	415.7	457.0			
F6	(11)		<5mm	851	60	510.6	8.3	0.3	0.5	0.8	500.7	510.6	12	17	
			5mm+				35.0	6.0	14.7	25.8	47.2	128.7	24	21	
Totals							43.3	6.3	15.2	26.6	547.9	639.3			
F8	(66)	3	<5mm	1124.2	75	843.2	4.9	1.5				6.4	16	-	
			5mm+				92.6	40.1	54.2	69.0	222.9	478.8	32	30	
		4	<5mm	621.7	25	155.4	13.0	1.8				14.8	12	-	
			5mm+				7.3	1.6		1.5	3.2	13.6	20	21	
Totals							117.8	45.0	54.2	70.5	226.1	513.6			
F10	(64)	1	5mm+	918.7	50	459.4					1.8	1.8	-	-	
			<5mm				7.0	0.5	2.6	0.8	448.5	459.4	14	17	
		2	5mm+	875.7	33	289.0	18.9	3.0	28.0	28.1	46.3	124.3	21	34	
			<5mm				2.1	0.6		0.2	286.1	289.0	12	-	
		4	5mm+	5mm+	5mm+	17.0	4.6	16.6	21.0	34.8	94.0	25	32		
5mm+							1.9	1.9	-	-					
Totals							45.0	8.7	47.2	50.1	819.3	970.3			

Burial	Fill	Spit	Mesh	Residue Wt/g	Approx bone %	Estimated bone Wt/g	Skull Wt/g	Axial Wt/g	Up. limb Wt/g	Low. limb Wt/g	Unident Wt/g	Totals Wt/g	max skull (mm)	max l.b. (mm)
F14	(22) (73)	-									1.4	1.4	-	-
		1	<5mm	467.3	50	233.7	8.3	0.2	0.4	0.3	224.5	233.7	26	47
			5mm+				49.9	7.3	59.9	44.2	71.1	232.4	11	-
		2	<5mm	488.9	75	366.7	6.0	0.9	0.5		359.3	366.7	26	29
			5mm+				32.6	14.6	30.8	20.6	54.2	152.8	13	-
3		<5mm	247.3	25	61.8	1.9	0.2	0.1	0.3	59.3	61.8	17	20	
		5mm+				4.5		2.9	0.2	6.1	13.7	11	-	
4		<5mm	230.4	10	23.0					23.0	23.0	-	-	
		5mm+								0.0	0.0	-	-	
Totals							103.2	23.2	94.6	65.6	797.5	1084.1		
F19	(28)		<5mm								0.4	0.4	-	-
Totals											0.4	0.4		
F20	(27)		<5mm	313.2	50	156.6	1.8			0.1	154.7	156.6	8	-
			5mm+				2.1	1.3	0.8	2.0	3.7	9.9	14	14
Totals							3.9	1.3	0.8	2.1	158.4	166.5		
F21	(26)		<5mm	1702.5	30	510.8	17.3	0.2			493.3	510.8	11	-
			5mm+				96.8	2.5	37.7	46.1	40.1	223.2	29	31
Totals							114.1	2.7	37.7	46.1	533.4	734.0		
F27	(43)		<5mm								1.9	1.9	-	-
Totals											1.9	1.9		
F34	(71)	1	<5mm	422.8	50	211.4	0.9				210.5	211.4	11	-
			5mm+				2.5		1.6	1.6	6.6	12.3	15	16
		2	<5mm	1.4	sorted	N/A					0.6	0.6	-	-
Totals							3.4		1.6	1.6	217.7	224.3		
F35	(69)	1	<5mm	1147.3	33	378.6	3.4	0.1			375.1	378.6	11	-
			5mm+				92.6	5.0	40.1	77.4	87.3	302.4	23	44
		2	<5mm	592.8	50	296.4	2.5	0.4			293.5	296.4	10	-
			5mm+				15.9	9.6	22.9	24.5	39.0	111.9	22	26
		3	<5mm	451.8	10	45.2	0.1	0.2			44.9	45.2	10	-
		5mm+						1.0		2.2	3.2	-	19	
Totals						114.5	15.3	64.0	101.9	842.0	1137.7			

Burial	Fill	Spit	Mesh	Residue Wt/g	Approx bone %	Estimated bone Wt/g	Skull Wt/g	Axial Wt/g	Up. limb Wt/g	Low. limb Wt/g	Unident Wt/g	Totals Wt/g	max skull (mm)	max l.b. (mm)
F36	(57)		<5mm 5mm+	597.5	5	29.9	0.6 0.6		0.8		29.3 4.7	29.9 6.1	10 14	- -
Totals							1.2		0.8		34.0	36.0		
F38	(52)		<5mm 5mm+	1348.5	80	1078.8	15.4 65.3	0.3 2.4	0.1 28.2		1063.0 102.2	1078.8 253.7	11 21	- 30
Totals							80.7	2.7	28.3	55.6	1165.2	1332.5		
F39	(56)		<5mm 5mm+	2255.5	90	2030.0	23.3 170.8	1.1 22.1	1.1 135.0		2004.5 375.4	2030.0 852.9	18 34	- 40
Totals							194.1	23.2	136.1	149.6	2379.9	2882.9		
F40	(59)		<5mm 5mm+	2317.4	80	1853.9	27.2 160.7	0.3 20.3	0.9 152.6	0.8 149.0	1824.7 280.9	1853.9 763.5	12 30	- 30
Totals							187.9	20.6	153.5	149.8	2105.6	2617.4		
L1	(10)		<5mm 5mm+	547.0	80	437.6	1.8 9.9		46.6	46.8	43.6	1.8 148.2	10 25	- 32
Totals							11.7	1.3	46.6	46.8	43.6	150.0		

11.7 Catalogue

Cremation burial F2 (deposit 4): mature adult ?female

Quantification:	Total weight 1617.3g: Skull 112.7g, axial 116.5g, upper limb 83.1g, lower limb 138.9g, unidentified 1166.1g.
Description:	Urned, excavated in four spits, but no bone recovered from spit 1.
Condition:	Good, well-preserved, large fragments. One fragment stained green, suggests presence of a copper alloy object.
Determination of age:	Some degeneration.
Determination of sex:	Occipital crests not marked.
Identified elements:	Fragments of cranial vault, cervical vertebrae, ribs, pelvis, humerus shaft, femoral head, femur and tibia shafts, toe phalanges.
Measurements:	Max skull frag size 29mm, max long bone frag size 39mm.
Colours:	Mostly cream-white.
Teeth:	At least six molar root fragments, 15 other root fragments.
Pathology:	Osteophytosis of some vertebrae.

Cremation burial F5 (deposit 73): i) child, <12 years; ii) adult ?male

Quantification:	Total weight 457.0g: Skull 20.7g, axial 0.5g, upper limb 5.9g, lower limb 14.2g, unidentified 415.7g.
Description:	Urned, excavated in five spits plus some hand-collected, no bone in spits 1-2.
Condition:	Fragments are small and some show signs of abrasion.
Determination of age:	i) unerupted molar crown; ii) large bones.
Determination of sex:	ii) the size of the adult bones indicate a possible male.
Identified elements:	Skull and a few juvenile long bones.
Measurements:	Max skull frag size 21mm, max long bone frag size 19mm.
Colours:	Mostly cream-white.
Teeth:	One unerupted ?M2 crown.
Pathology:	Pitting on one fragment of skull from spit 4.

Cremation burial F6 (deposit 11): ?young adult or sub-adult

Quantification:	Total weight 639.3g: Skull 43.3g, axial 6.3g, upper limb 15.2g, lower limb 26.6g, unidentified 547.9g.
Description:	Unurned, very incomplete.
Condition:	Good, well-preserved, a few large pieces.
Determination of age:	Iliac crest unfused?
Determination of sex:	No sexing criteria.
Identified elements:	Femur, tibia, pelvis.
Measurements:	Max skull frag size 24mm, max long bone frag size 21mm
Colours:	Cream-white.
Teeth:	Three fragments of tooth root in <5mm fraction.
Pathology:	Nothing observed.

Cremation burial F8 (deposit 66): i) ?young adult; ii) perinatal infant

Quantification:	Total weight 513.6g: Skull 117.8g, axial 45.0g, upper limb 54.2g, lower limb 70.5g, unidentified 226.1g.
Description:	Urned, excavated in four spits, but no bone in spits 1-2. Most of the bone in the lowest spit is probably juvenile.
Condition:	Good, well-preserved, a few large pieces.
Determination of age:	i) no signs of degeneration; ii) calcification of unerupted teeth.
Identified elements:	Cranial vault, cervical vertebrae, ribs, pelvis, humerus shaft, femur and tibia shaft.
Measurements:	Max skull frag size 32mm, max long bone frag size 30mm
Colours:	Cream-white.
Teeth:	i) Fragments of 16 adult tooth roots; ii) crown of unerupted deciduous upper mesial incisor and two molar crown fragments.
Pathology:	None observed.

Cremation burial F10 (deposit 64): adult ?male

Quantification:	Total weight 970.3g: Skull 45.0g, axial 8.7g, upper limb 47.2g, lower limb 50.1g), unidentified 819.3g.
Description:	Urned, excavated in four spits.
Condition:	Fairly well-preserved, a few large fragments, abrasion of fragments from spit 1.
Determination of age:	Epiphyses fused, size.
Determination of sex:	Large toes!
Identified elements:	Fragments of vertebrae and ribs, arm bones, femur and tibia shaft fragments, toes.

Measurements: Max skull frag size 33mm, max long bone frag size 30mm.
Colours: Cream-white.
Teeth: Four root fragments in <5mm fraction.
Pathology: Nothing observed.

Cremation burial F14 (deposits 22 and 73): mature adult

Quantification: Total weight 1084.1g: Skull 103.2g, axial 23.2g, upper limb 94.6g, lower limb 65.6g, unidentified 797.5g.
Description: Urned, excavated in four spits.
Condition: Good, well-preserved, some large fragments.
Determination of age: Slight degeneration.
Determination of sex: No sexing criteria.
Identified elements: Fragments of cranial vault, petrous temporal, mandible, vertebrae, humeri, hands, ribs, femur and tibia shafts, toes.
Measurements: Max skull frag size 26mm, max long bone frag size 47mm.
Colours: Mostly cream-white.
Teeth: 34 tooth root fragments present, including three incisors, a premolar and four molars.
Pathology: Very small osteophytes on some vertebral facets.

Cremation burial F19 (deposit 28): unknown

Quantification: Total weight 0.4g: unidentified 0.4g.
Description: Unurned.
Condition: Very fragmented.
Determination of age: No ageing criteria.
Determination of sex: No sexing criteria.
Identified elements: None.
Measurements: None.
Colours: White.
Teeth: None.
Pathology: Nothing observed.

Cremation burial F20 (deposit 27): unsexed adult

Quantification: Total weight 166.5g: Skull 3.9g, axial 1.3g, upper limb 0.8g, lower limb 2.1g, unidentified 158.4g.
Description: Unurned.
Condition: Abraded, poor.
Determination of age: Size of bones.
Determination of sex: No sexing criteria.
Identified elements: Cranial vault, toes.
Measurements: Max skull frag size 14mm, max long bone frag size 14mm.
Colours: Mostly white.
Teeth: Three fragments of tooth root in <5mm fraction.
Pathology: Nothing observed.

Cremation burial F21 (deposit 26): unsexed adult

Quantification: Total weight 734.0g: Skull 114.1g, axial 2.7g, upper limb 37.7g, lower limb 46.1g, unidentified 533.4g.
Description: Unurned.
Condition: Fairly well-preserved, a few large fragments.
Determination of age: Tooth eruption.
Determination of sex: No sexing criteria.
Identified elements: Fragments of cranial vault, one finger phalange, ribs, vertebrae, femur and tibia shafts.
Measurements: Max skull frag size 29mm, max long bone frag size 31mm.
Colours: Cream-white.
Teeth: Six root fragments.
Pathology: Wormian bone present.

Feature F27 (deposit 43): unknown

Quantification: Total weight 1.9g: unidentified 1.9g.
Description: Hearth or fire pit.
Condition: A few tiny pieces.
Determination of age: No ageing criteria.
Determination of sex: No sexing criteria.
Identified elements: None.
Measurements: None.

Colours: White.
Teeth: None.
Pathology: Nothing observed.

Cremation burial F34 (deposit 71): child?

Quantification: Total weight 224.3g: Skull 3.4g, upper limb 1.6g, lower limb 1.6g, unidentified 217.7g.
Description: Urned, excavated in two spits.
Condition: Poor, mostly small fragments.
Determination of age: Very thin skull fragments.
Determination of sex: No sexing criteria.
Identified elements: Cranial vault.
Measurements: Max skull frag size 15mm, max long bone frag size 16mm.
Colours: Cream-white.
Teeth: None.
Pathology: None observed.

Cremation burial F35 (deposit 69): i) adult male?, ii) child

Quantification: Total weight 1137.7g: Skull 114.5g, axial 15.3g, upper limb 64.0g, lower limb 101.9g, unidentified 842.0g.
Description: Urned, excavated in three spits, but very little bone in spit 3.
Condition: Fairly well-preserved, a few large fragments.
Determination of age: i) epiphyses fused but no obvious degeneration.
ii) only one juvenile vertebra identified, epiphyses unfused.
Determination of sex: i) large linea aspera.
ii) no sexing criteria.
Identified elements: Fragments of cranial vault, vertebrae, scapula, ribs, humerus, hamate, fingers, femur, tibia, metatarsals, toes.
Measurements: Max skull frag size 23mm, max long bone frag size 44mm.
Colours: Cream-white.
Teeth: 27 small root fragments, including at least two premolars.
Pathology: Small wormian bone.

Ring-ditch F36 (deposit 57): child?

Quantification: Total weight 36.0g: Skull 1.2g, upper limb 0.8g, unidentified 34.0.
Description: From ring-ditch fill.
Condition: Very fragmented and abraded.
Determination of age: Skull thickness.
Determination of sex: No sexing criteria.
Identified elements: Cranial vault, finger.
Measurements: Max skull frag size 14mm.
Colours: White.
Teeth: None.
Pathology: Nothing observed.

Cremation burial F38 (deposit 52): mature/old ?male

Quantification: Total weight 1332.5g: Skull 80.7g, axial 2.7g, upper limb 28.3, lower limb 55.6g, unidentified 1165.2g.
Description: Unurned.
Condition: Fairly fragmented, a few large pieces.
Determination of age: Some degeneration.
Determination of sex: Cortical bone very thick, may be male, but no good sexing criteria.
Identified elements: Cranial vault, cervical vertebrae, ribs, humerus, femur.
Measurements: Max skull frag size 21mm, max long bone frag size 30mm.
Colours: Cream-white.
Teeth: Sixteen tooth root fragments, including three premolars and a molar.
Pathology: Slight pitting on some cranial vault fragments. Slight osteophytes to some vertebral joints.

Cremation burial F39 (deposit 56): unsexed adult

Quantification: Total weight 2882.9g: Skull 194.1g, axial 23.2g, upper limb 136.1g, lower limb 149.6g, unidentified 2379.9g.
Description: Unurned.
Condition: Well-preserved, some large pieces.
Determination of age: Size of bones.
Determination of sex: Bones appear large, but no particular sexing characteristics apparent.

Identified elements:	Cranial vault, mandible, vertebrae, ribs, humerus, ulna, femoral shafts, tibia and fibula fragments, a few wrist and finger bones, toes.
Measurements:	Max skull frag size 34mm, max long bone frag size 40mm.
Colours:	Cream-white.
Teeth:	Roots of two premolars, four molars, seven anterior teeth, 28 other fragments. Fragments of mandible:
Pathology:	Pitting on cranial vault.
Cremation burial F40 (deposit 59): i) sub-adult; ii) mature adult	
Quantification:	Total weight 2617.4g: Skull 187.9g, axial 20.6g, upper limb 153.5g, lower limb 149.8g, unidentified 2105.6g.
Description:	Unurned.
Condition:	A few large fragments.
Determination of age:	i) Unfused epiphyses, near-adult sized, especially proximal phalanges and femur head. ii) A few fully mature vertebrae and other bones with signs of degeneration.
Determination of sex:	No sexing criteria.
Identified elements:	Cranial vault, mandible and maxilla, ribs, vertebrae, humerus, femoral head and shaft, tibia shaft, fingers and toes.
Measurements:	Max skull frag size 30mm, max long bone frag size 30mm.
Colours:	Cream-buff.
Teeth:	Ten molar root fragments, 22 single root teeth fragments, at least 36 other fragments in <5mm fraction – possibly from two individuals.
Pathology:	Wormian bone present. Fragment of lumbar vertebra with osteophyte.

Layer L1 (deposit 10): unsexed adult

Quantification:	Total weight 150.0g: Skull 11.7g, axial 1.3g, upper limb 46.6g, lower limb 46.8g, unidentified 43.6g.
Description:	Unurned.
Condition:	Some large fragments, but abraded.
Determination of age:	Size.
Determination of sex:	No sexing criteria.
Identified elements:	Cranial vault, humerus, femur, tibia shafts.
Measurements:	Max skull frag size 25mm, max long bone frag size 32mm.
Colours:	Mostly white/cream/buff.
Teeth:	None.
Pathology:	Nothing observed.

12 Discussion

The archaeology of Birch Pit is typical of that recorded on other gravel areas in Essex (eg Wallis & Waughman 1998), in that the earliest finds produced were Neolithic, with the recovery of an unstratified blade and a flake assignable to this period. Whilst this fragmentary evidence is hard to interpret, it may nevertheless indicate that the Birch district was perhaps the site of intermittent occupation, or at least was often visited in the Neolithic period, as was apparently the case also in other east Essex sites (Holgate 1996).

Close to Birch Pit, settlement of this kind is perhaps indicated by an assemblage of Neolithic flintwork recovered from ploughsoil in the vicinity of Birch Park, about 1.5km to the south-east (Spencer & Dennis 1988). At this location, much earlier activity was indicated by two Early Mesolithic microliths (Spencer & Dennis 1988, fig 2, 9-10) suggesting the potential of earlier finds being found at Birch Pit. In spite of this evidence for earlier activity, the majority of the archaeological remains at Birch Pit related to the Bronze Age cremation cemetery.

Elsewhere in north-east Essex, the cremation cemeteries at Brightlingsea, St Osyth and Chitts Hill are much smaller in size than that at Ardleigh, containing only up to about 30 ring-ditches. They are thus more comparable to Birch Pit than Ardleigh. At Brightlingsea and St Osyth, most of the cremation burials occurred in between rather than within the ring-ditches, and mainly in groups (Clarke 1991; Germany forthcoming). A comparable layout is indicated at Chitts Hill (Brown 1999; Crummy 1977). At Brightlingsea, three of the ring-ditches contained a centrally placed cremation contained in Ardleigh-style urns. This was probably also the case at Birch Pit.

The plans of the cemeteries at Birch Pit, Chitts Hill and Brightlingsea would therefore appear at least outwardly to differ in significant respects from the Bronze Age cemetery at Ardleigh, particularly in terms of scale. This perhaps reflected local differences in ritual

patterning and/or demography. The Ardleigh group of Bronze Age cremation cemeteries (Birch Pit included), however, would appear to comprise a definite and integral group in north-east Essex. South of the county, tight clusters of ring-ditches and their associated burials are not represented, or at least have not been recorded to date (Milton 1987).

The pottery from the Birch Pit cemetery belongs to the Ardleigh Group, a regional type of ceramic of the Early/Middle Bronze Age in north-east Essex and south-east Suffolk of the Deverel-Rimbury culture (Ellison 1980). The copious use of fingertip rustication and complex motifs distinguishes the Deverel-Rimbury vessels from Ardleigh from those from southern Essex, of which only a few examples exhibit this decorative method (Brown 1995). This southern group, which is confined to the Chelmer/Blackwater river system and along the Thames, has been linked with a regional 'Lower Thames Group' of Ellison (1980).

It is notable that while at Birch Pit the main urn types are present (barrel, bucket, globular), there are some differences by a comparison with Deverel-Rimbury ceramics from Ardleigh. These include the absence of 'horseshoe handles' and of fingertip patterns above the cordon on the Birch Pit vessels. Pots with 'horseshoe handles' were apparently also absent from the Deverel-Rimbury assemblage at Chitts Hill, but this could be due to the comparatively low number of pots recovered (Crummy 1977). Similarly, at the St Osyth cemetery, only bucket urns and collared urns were found which date from the MBA and EBA respectively (Germany forthcoming). While this potential form of bias could apply to Birch Pit, the differences in decoration might be enough to suggest that the Birch Pit pottery is an Ardleigh Group variant, perhaps local to the district.

It is possible at Birch Pit that the Bronze Age cemetery and the 'enclosure' ditch F4/F11 (encompassing also F8 of the evaluation) were contemporary constructions. Deverel-Rimbury sherds from F8 of trench L1 (CAT Report 141, 2), with the addition of Bronze Age pottery from F11, indicate a Middle Bronze Age date for this feature.

Two large ditches have been excavated at Ardleigh (Brown 1999) which, as with F4/F11 at Birch Pit, lie in the vicinity of a Bronze Age cemetery. The Ardleigh ditches appear to have respected the edge of a plateau in their alignment: one, with a radiocarbon date of 1310-840 cal BC, extends north of the cemetery, orientated roughly north-east/south-west; the second, with a radiocarbon date of 1495-1100 cal BC, lies south of it, extending east-west. Based on cropmark evidence, these ditches may be part of long rectilinear enclosures. The extensive north-west arm and right-angled bend suggests that while there is no obvious connection with local geomorphology, this may have also been the case for F4/F11 at Birch Pit.

Even though its full extent is unknown, the limited evidence for a structural use for F4/F11 makes it plausible that this ditch enclosed a small settlement, and this could be associated with the Bronze Age cemetery in terms of the short distance between them.

In Essex, the most extensively excavated Deverel-Rimbury settlement is that at North Shoebury (Wymer & Brown 1995). This comprised a series of fragmentary rectangular enclosures bounded on their north and east sides by V-profiled ditches up to 2m wide and 0.8m deep. They are thus very comparable to F4/F11. Additionally, while pit groups lay in the western part of the enclosures, the eastern areas were largely devoid of features. This was the case in the eastern portion of F4/F11 that was exposed after the stripping of topsoil.

Two unurned cremation burials were recovered, 250m south-east and 400m south respectively of the main North Shoebury settlement, with the latter lying close to two cropmark ring-ditches. In southern England, this spatial relationship between a Deverel-Rimbury cemetery and a settlement area has been shown to be typical (Bradley 1981). This pattern fits F4/F11 if it enclosed a settlement; the distance between F4/F11 and the Birch Pit cemetery, which also lies to the south-east, is 110m.

It is notable that a group of four hearths or fire pits (F9, F12, F16, F17) lie between 7m and 21m from F4/F11 (see above).

If F4/F11 instead enclosed agricultural land, a fragmentary complex of ditches recorded at Mucking in Essex, probably also of MBA date, would be comparable. These delineated a group of rectangular fields (Bond 1988).

The possibility of contemporaneity between the linear trackway ditches F1 and F3 (F10/F17 and F2/F11 of the evaluation; CAT Report 141) and the cremation cemetery at Birch Pit is essentially ruled out by the absence from the cemetery of post-Deverel-Rimbury plainware. However, F1 and F3 may still be contemporary with other features,

such as the ditch F26. The ditches F1 and F3 can, therefore, with some confidence, be used to indicate that a change in land use took place in the local district, perhaps related to a further development of the wider landscape. There is, nevertheless, some evidence to show that the Birch Pit cemetery could have been constructed relatively late in the MBA.

It is notable that by a comparison with the number of urned cremations at Birch Pit, unurned burials are quite common in respect to other sites. It has been suggested that unaccompanied cremations became more prevalent in the LBA (Butterworth & Lobb 1992); this may implicate a later date for the Birch Pit burials. This may also apply to some of the Birch Pit pottery and to burial practices. While the Ardleigh Group distinguishes the MBA (Burgess 1974), Deverel-Rimbury pottery was apparently made at least until the 1st millennium BC (O'Connor 1980). Barrow construction at Ardleigh may have also continued until the LBA, thus to an extent refuting claims for the virtual absence of burial practices evident in the LBA (Needham 1995).

However, the rather limited typographical variety of the Birch Pit pottery suggests a limited chronological range. In addition, the small overall size of the cemetery perhaps indicates use over a comparatively shorter time than, for example, at Ardleigh. Moreover, in spite of these observations, given the striking similarity of its plan to that at Brightlingsea, an earlier construction of the Birch Pit cemetery is more likely. A cremation from a Deverel-Rimbury urn at Brightlingsea provided a radiocarbon date of 2200-1510 cal BC (Brown 1995).

The present investigation provided little additional evidence to confirm the function of two large pits, F23 (F9 of CAT Report 141) and F24/F29 (F1 of CAT Report 141). These features, probable quarry-pits of Roman date, were located in the western and north-eastern parts of the site respectively. During the excavation, Roman roof-tile was recovered from both features. Its presence may connect the pits to the remains of at least two Roman structures, excavated by CAT on land about 300m to the west (Crossan 1992; CAT Report 8; CAT Report 23).

Chalky Boulder Clay formed the lower part of the sides of pits F23 and F24, which may therefore have been for clay extraction.

Evidence for the period from Saxon to early modern was slight. F23 produced a probable Saxon sherd during the evaluation, but this was probably in a residual context (F9; CAT Report 141). It is possible that the worked Hertfordshire Puddingstone fragment may derive from a medieval building (above).

In the area of the excavated site, a cable-trench that crossed much of the site, looping to the south and south-west, was the most conspicuous of the surviving remains from the WW2 American Air Force base and the modern period.

13 Conclusions

Two lithic artefacts attest to the Neolithic period as the earliest recorded phase of activity at Birch Pit.

The main archaeological phase dates from the Middle to Late Bronze Age, possibly extending into the Late Iron Age. During this period, a small Middle Bronze Age cremation cemetery was constructed. The cemetery ring-ditches are likely to pre-date cremation burials that were placed centrally between them. It is unknown at what time the ring-ditch barrows (if present) were levelled, or for what purpose.

While evidence for MBA settlement sites in Essex has often proved elusive (Brown 1996), the unusual ditch F4/F11 may have enclosed a small Deverel-Rimbury settlement of Middle Bronze Age date. This ditch is likely to be broadly contemporaneous with the Middle Bronze Age cemetery.

Some pits on the site containing charcoal may be the remains of pyres connected with the Bronze Age cemetery. The purpose of others is unknown, and two proved to be natural features.

During the Late Bronze Age or Early Iron Age, two linear and parallel ditches (F1 and F3) were constructed, the lines of which cross the northern part of the site roughly from west to east. Their presence may be associated with a further development of the prehistoric field system in the local area.

Two large Roman pits appear to represent quarry-pits for the extraction of Boulder Clay. They are perhaps associated with Roman remains, not far to the west of Birch Pit.

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15 Acknowledgements

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16 Archive deposition

The paper and digital archive is held by the Colchester Archaeological Trust at 12 Lexden Road, Colchester, Essex CO3 3NF, but will be permanently deposited with Colchester Museums together with the finds under accession code 2003.160.

17 Appendices

17.1 Context list of excavated features and layers

Context	Description	Context date
L1	Cover loam	?
L2	Ploughsoil	post-medieval?
F1	Ditch	Bronze Age or Iron Age
F2	Urned cremation burial	Bronze Age
F3	Ditch	Bronze Age or Iron Age
F4	Ditch	Bronze Age
F5	Urned cremation burial	Bronze Age
F6	Unurned cremation burial	Bronze Age
F7	Urn in pit with charcoal, possible cremation burial	Bronze Age
F8	Urned cremation burial	Bronze Age
F9	Hearth or fire pit	Bronze Age?
F10	Urned cremation burial	Bronze Age
F11	Ditch	Bronze Age
F12	Flint-lined hearth or fire pit with post-hole	Bronze Age?
F13	Pit	
F14	Urned cremation burial	Bronze Age
F15	Post-hole	Bronze Age?
F16	Hearth or fire pit	Bronze Age?
F17	Hearth or fire pit	Bronze Age?
F18	Pit – natural feature	
F19	Unurned cremation burial	Bronze Age
F20	Unurned cremation burial	Bronze Age
F21	Unurned cremation burial	Bronze Age
F22	Large pit	

F23	Quarry-pit	Roman
F24	Quarry-pit	Roman
F25	Large pit	
F26	Ditch	Bronze Age
F27	Hearth or fire pit	Bronze Age?
F28	Hearth or fire pit	Bronze Age?
F29	Ditch projecting from F24	Roman?
F30	Tree bole or hearth	
F31	Ring-ditch	Bronze Age
F32	Ring-ditch	Bronze Age
F33	Urn in pit, possible cremation burial	Bronze Age
F34	Urned cremation burial	Bronze Age
F35	Urned cremation burial	Bronze Age
F36	Ring-ditch	Bronze Age
F37	Ditch	undated
F38	Unurned cremation burial	Bronze Age
F39	Unurned cremation burial	Bronze Age
F40	Unurned cremation burial	Bronze Age

17.2 Finds

Find no	Context	Description	Context	Weight (g)
3	U/S	flint flakes	Unstratified	32
35	F24	flint flakes	Quarry-pit (Roman)	4
54	L1	flint flakes	Subsoil	11
55	F32	flint flakes	Ring-ditch	8
2	L1	flint flakes	Subsoil	3
23	F1	flint flakes	Trackway ditch	3
62	F36	flint flakes	Ring-ditch	34
31	F22	flint flakes	Pit	81
8	L1	flint flakes	Subsoil	166
19	F11	flint flakes	Enclosure ditch	3
13	F4	flint flakes	Enclosure ditch	28
9	F4	flint flakes	Enclosure ditch	63
51	L1	flint flakes	Subsoil	4
47	F31	flint flakes	Ring-ditch	49
79	F35	flint flakes	Pit containing urn	12
30	F17	flint flakes	Hearth?	9
14	F9	flint flakes	Hearth?	22
44	F27	flint flakes	Hearth?	19
37	F25	flint flakes	Pit	37
40	F28	flint flakes	Hearth?	34
49	F31	flint flakes	Ring-ditch	11
77	F34	flint flakes	Pit containing urn	15
45	F24	Roman tile	Quarry-pit	411
33	F23	Roman tile	Quarry-pit	73
7	U/S	Puddingstone quern	Unstratified	2,000
60	F37	post-medieval pot	Modern service-trench	21
73	F5	Bronze Age pottery urn		4,753
4	F2	Bronze Age pottery urn		7,114
64	F10	Bronze Age pottery urn		8,437
69	F35	Bronze Age pottery urn		4,894
66	F8	Bronze Age pottery urn		10,006
67	F14	Bronze Age pottery urn		1,783
54	L1	Bronze Age pottery	Subsoil	2,300
73	F33	Bronze Age pottery	Pit (possible cremation)	707

68	F7	Bronze Age pottery	Pit containing urn	1,399
71	F34	Bronze Age pottery	Pit containing urn	823
18	F10	Bronze Age pottery	Pit containing urn	104
61	F36	Bronze Age pottery	Ring-ditch	240
23	F5	Bronze Age pottery	Pit containing urn	901
9	F4	Bronze Age pottery	Enclosure ditch	4
21	F11	Bronze Age pottery	Enclosure ditch	3
37	F5	Bronze Age pottery	Pit containing urn	17
19	F11	Bronze Age pottery	Enclosure ditch	11
30	F17	Bronze Age pottery	Pit containing urn?	3
65	F10	Bronze Age pottery	Pit containing urn	60
70	F5	Bronze Age pottery	Pit containing urn	11
77	F34	Bronze Age pottery	Pit containing urn	28
8	L1	Bronze Age pottery	Subsoil	47
34	F23	Bronze Age pottery	Quarry-pit (Roman)	3
2	L1	Bronze Age pottery	Subsoil	8
10	F7	Bronze Age pottery	Pit containing urn	17
6	F2	Bronze Age pottery	Pit containing urn	87
74	F5	Bronze Age pottery	Pit containing urn	146
49	F31	Bronze Age pottery	Ring-ditch	8
57	F36	Bronze Age pottery	Ring-ditch	22
70	F35	Bronze Age pottery	Pit containing urn	60
51	L1	Bronze Age pottery	Subsoil	82
32	F1	Bronze Age pottery	Trackway ditch	12
44	F27	Bronze Age pottery	Fire pit	7
1	F1	Bronze Age pottery	Trackway ditch	28
38	F3	Bronze Age pottery	Trackway ditch	6
39	F3	Bronze Age pottery	Trackway ditch	5
17	F8	Bronze Age pottery	Pit containing urn	10
5	F2	Bronze Age pottery	Pit containing urn	23
36	F26	Bronze Age pottery	Ditch terminal	12

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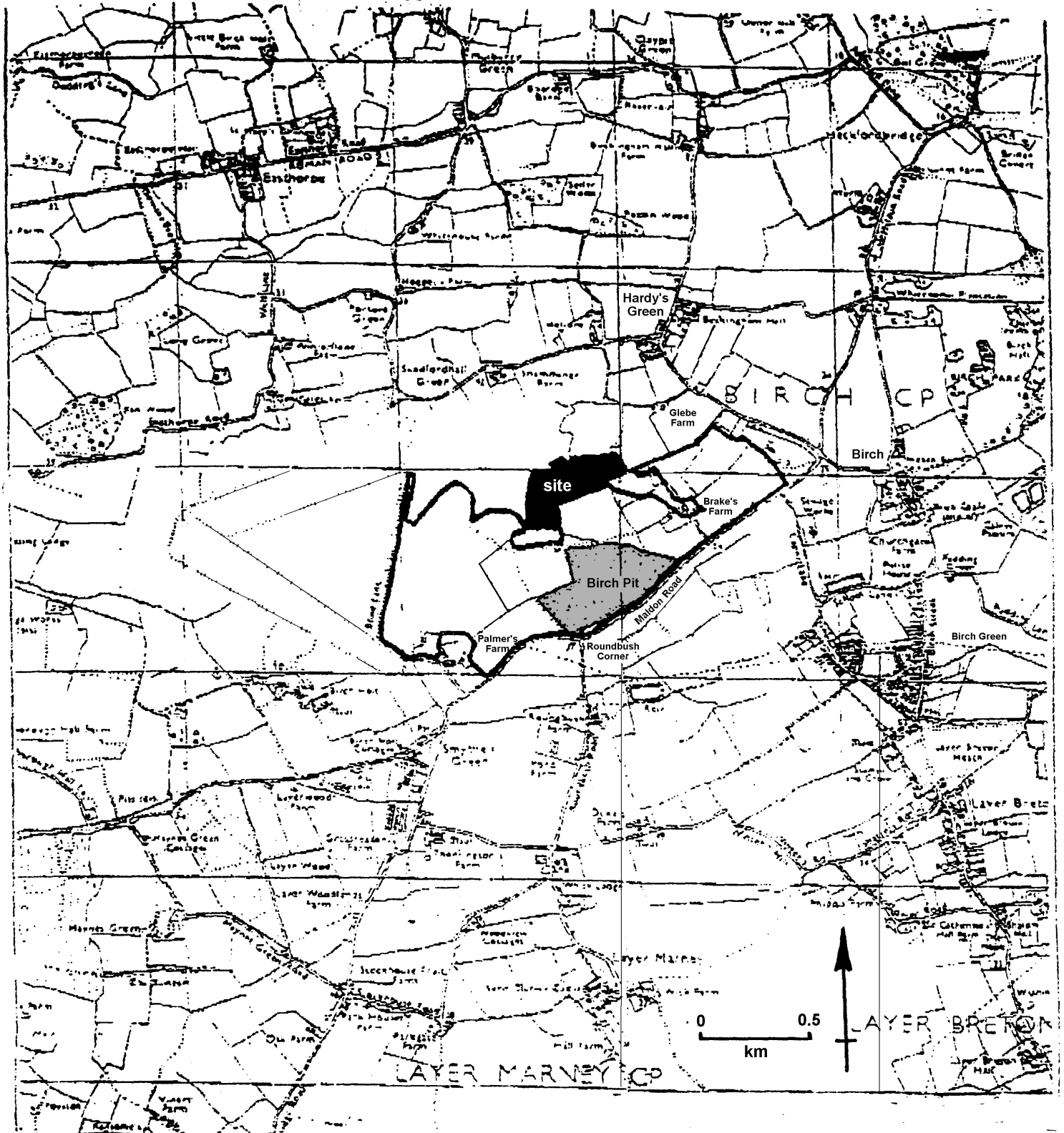


Fig 3 Birch Pit, northern extension: site location.

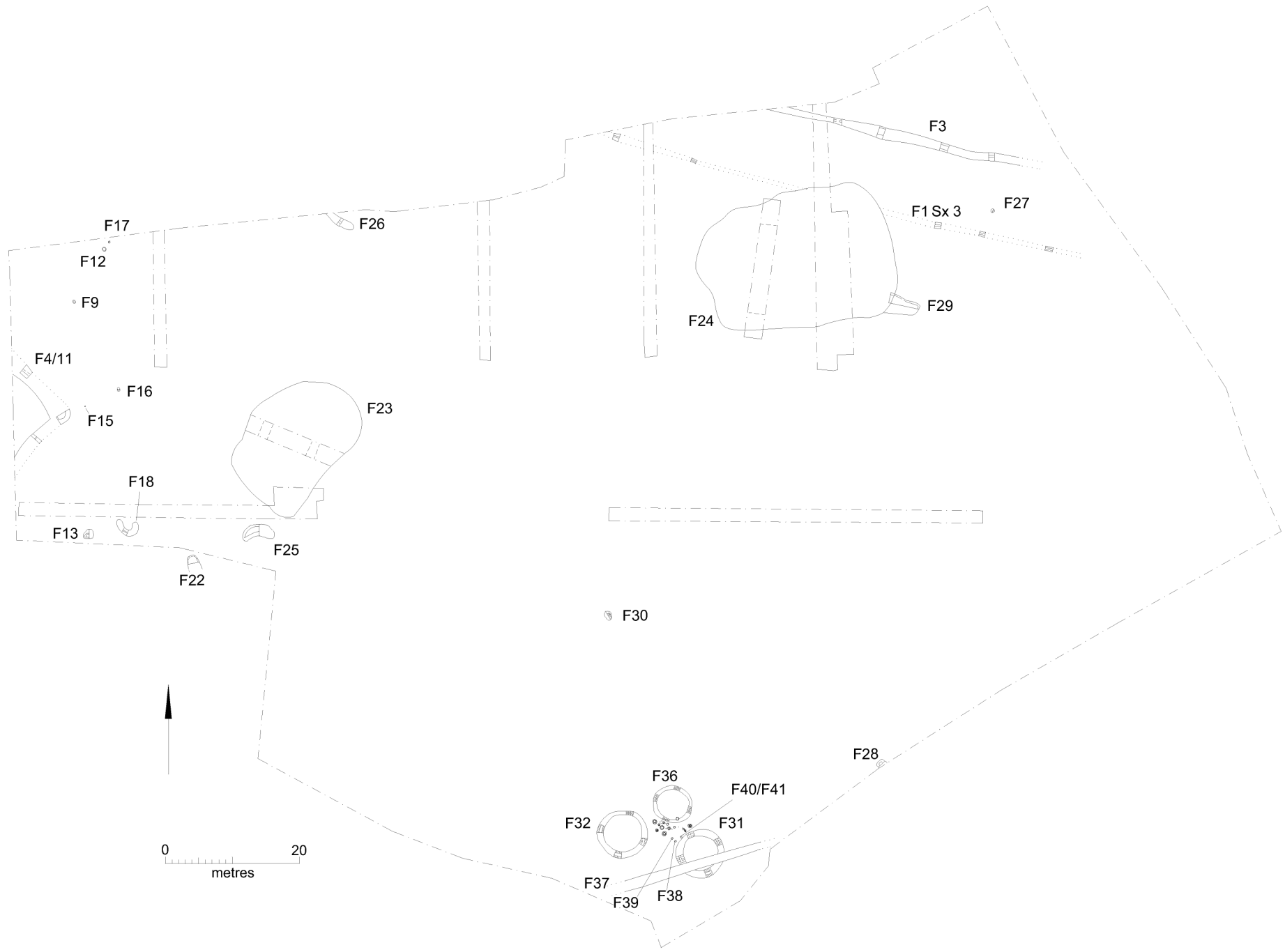


Fig 4 Site plan.

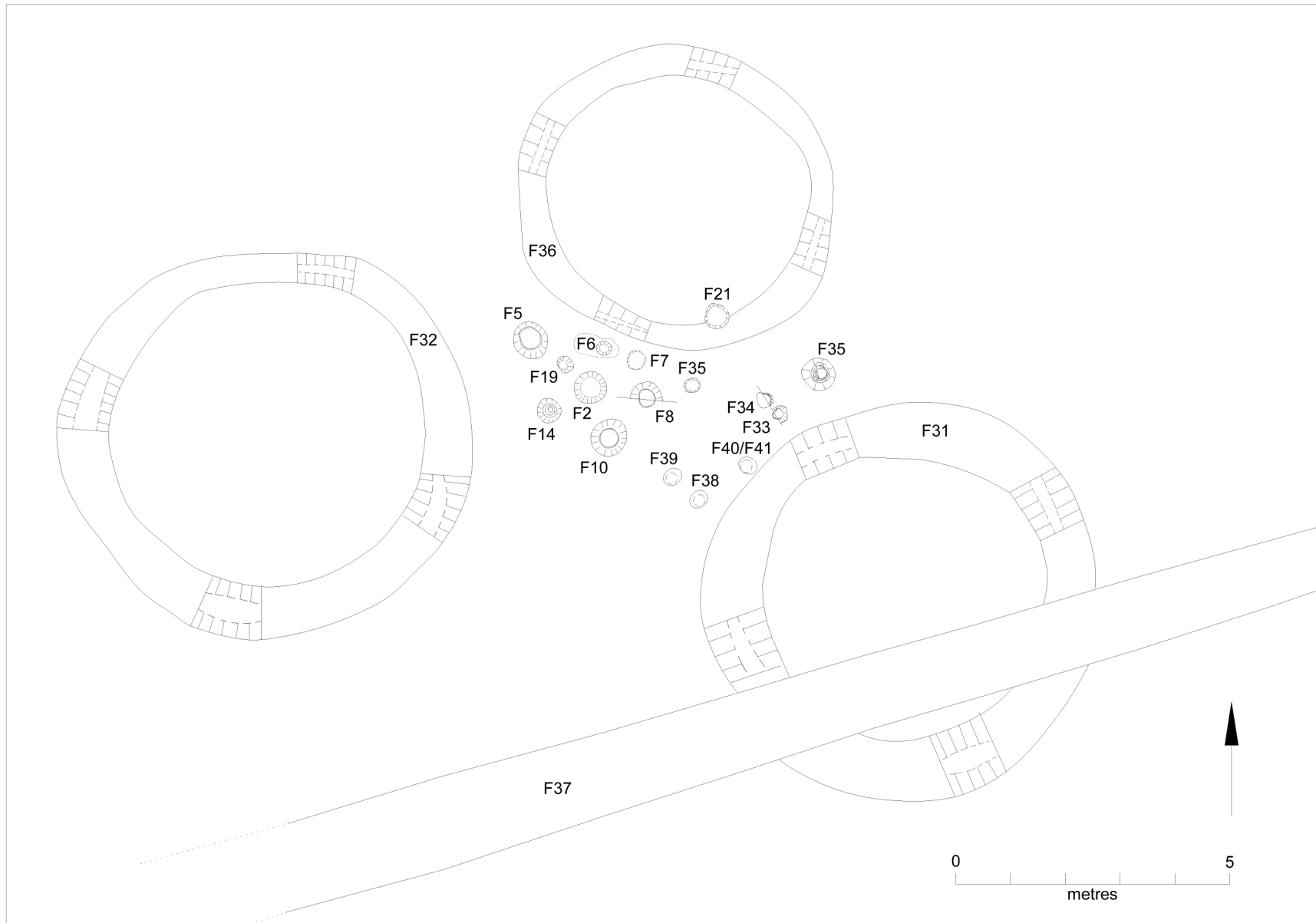


Fig 5 Ring-ditches and small features: plan.

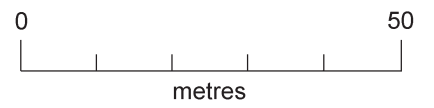
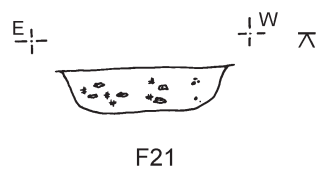
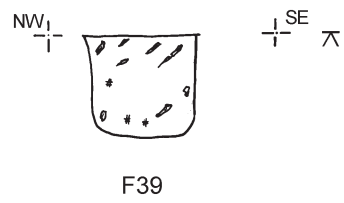
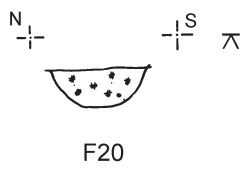
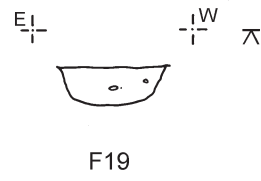
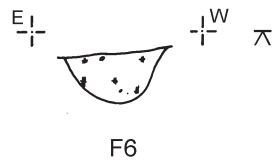


Fig 6 Unurned cremation pits: sections.

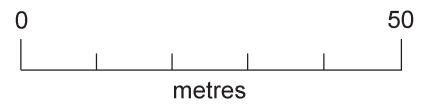
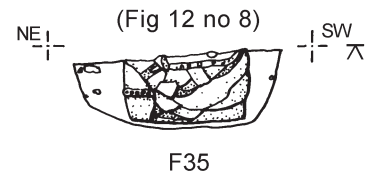
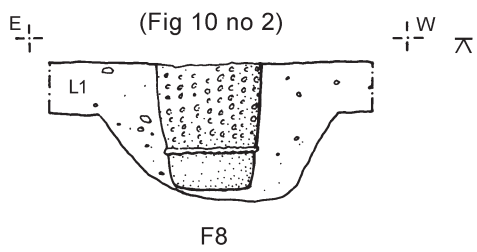
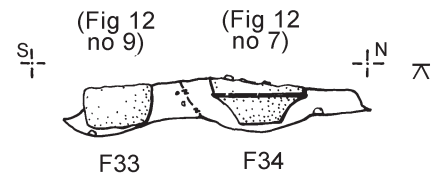
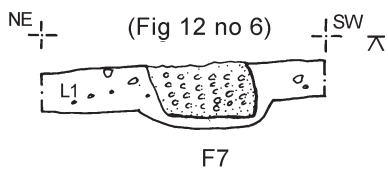
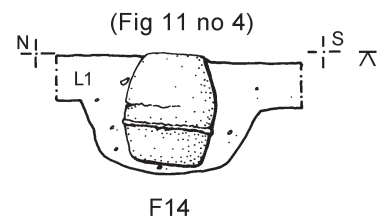
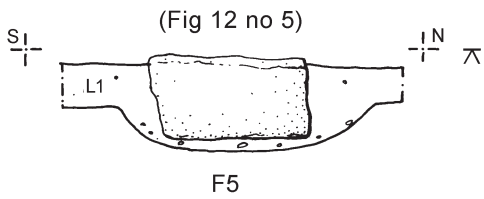
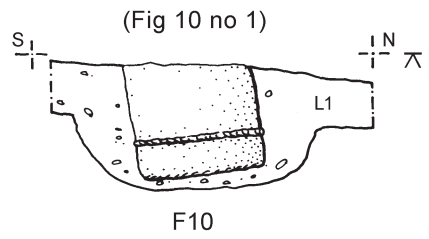
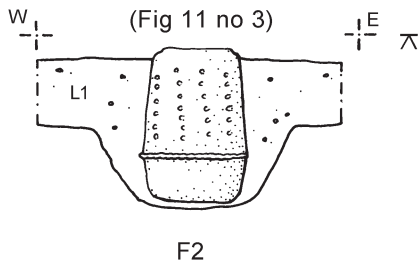
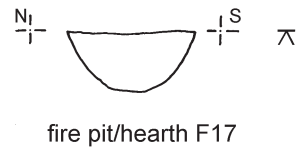


Fig 7 Urned cremation pits: sections.

profiles



representative sections

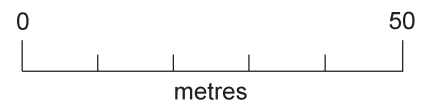
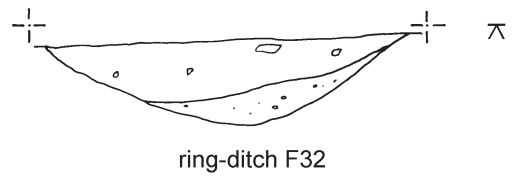
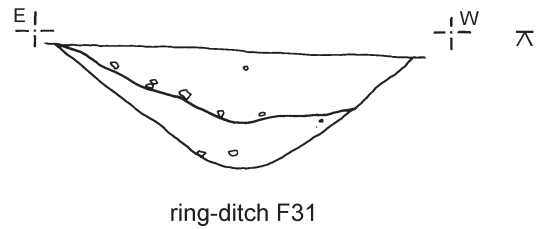
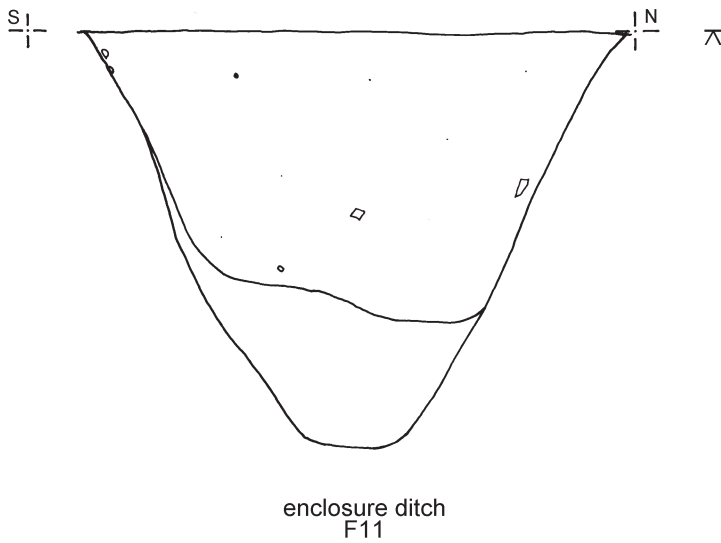
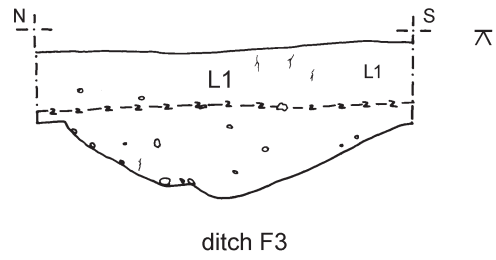
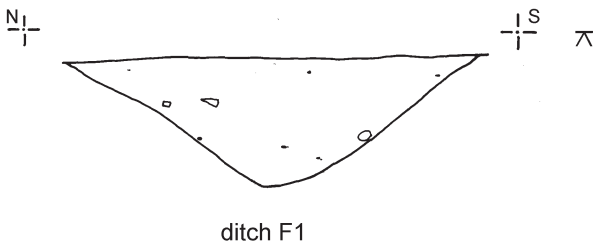


Fig 8 Profiles and representative sections.

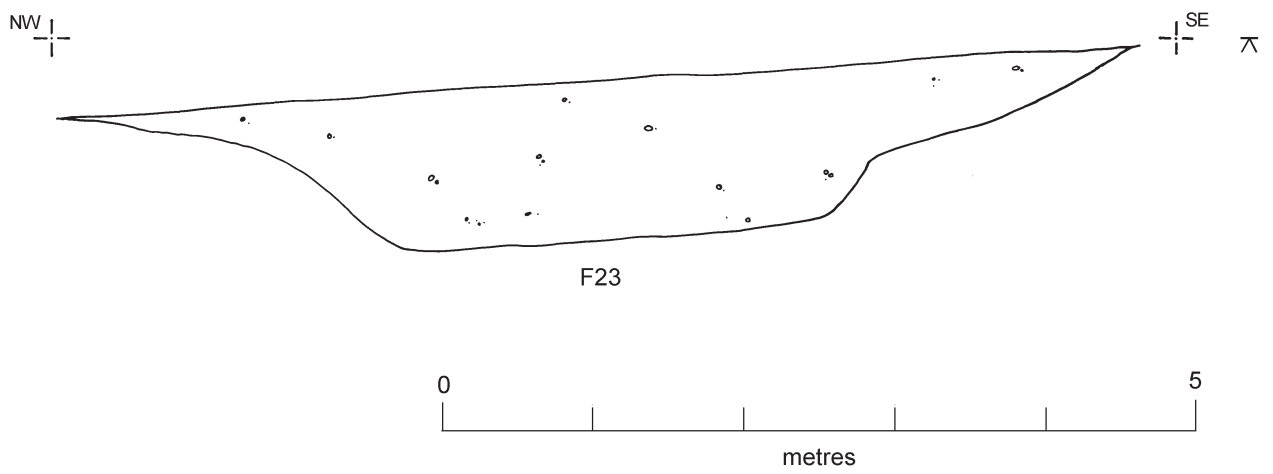


Fig 9 Roman quarry-pit F23: section.

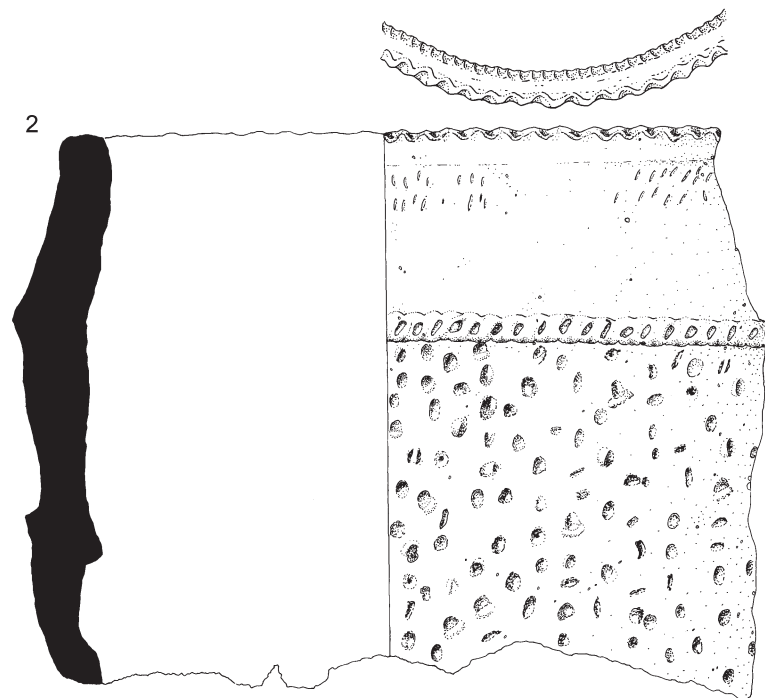
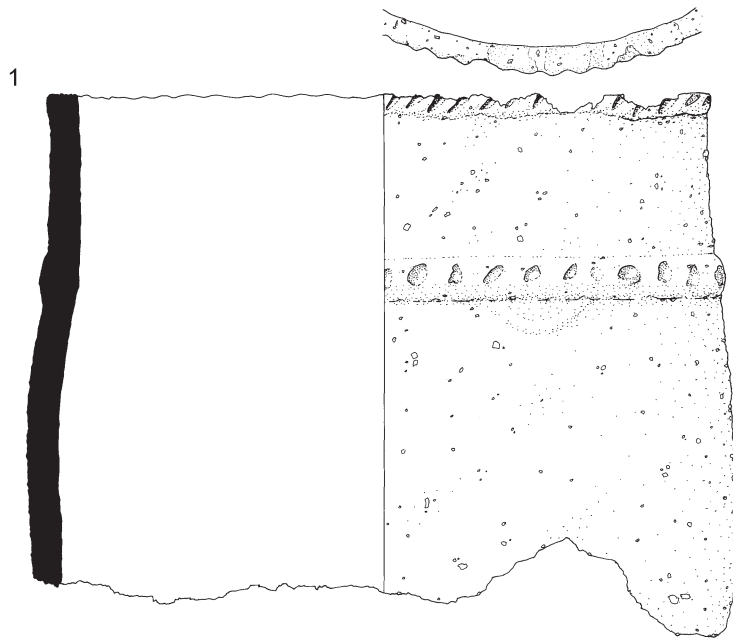


Fig10 Bronze Age pottery (nos 1-2); scale 1:4.

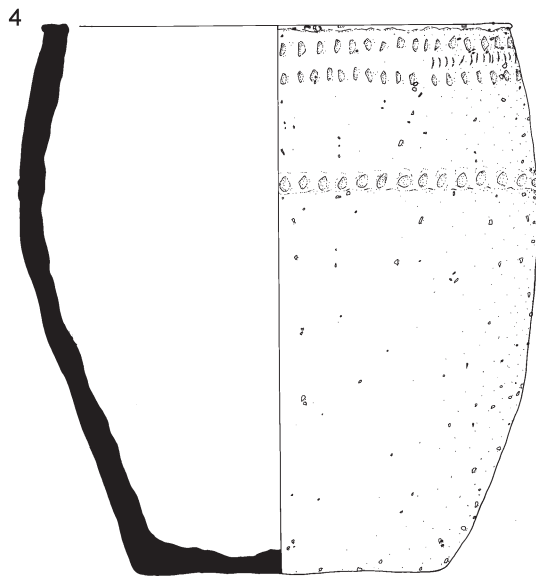
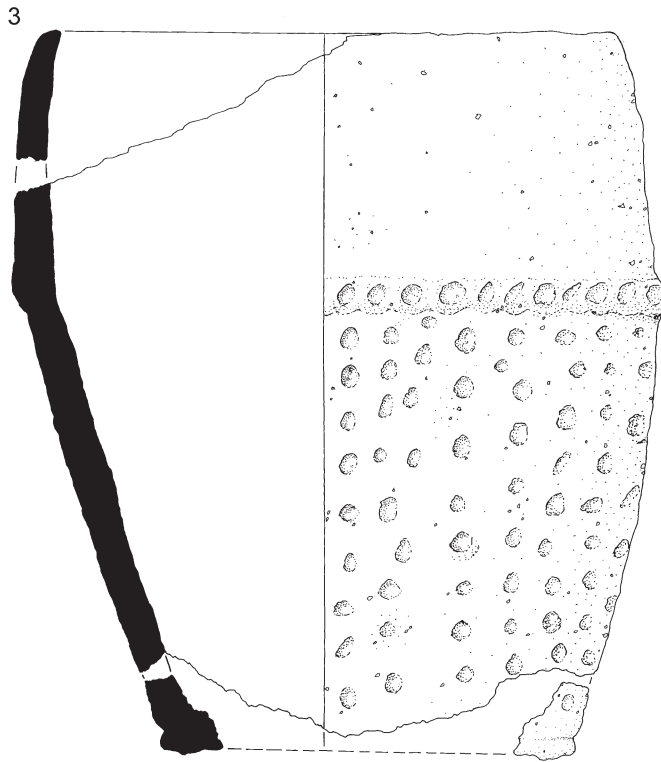


Fig 11 Bronze Age pottery (nos 3-4); scale 1:4.

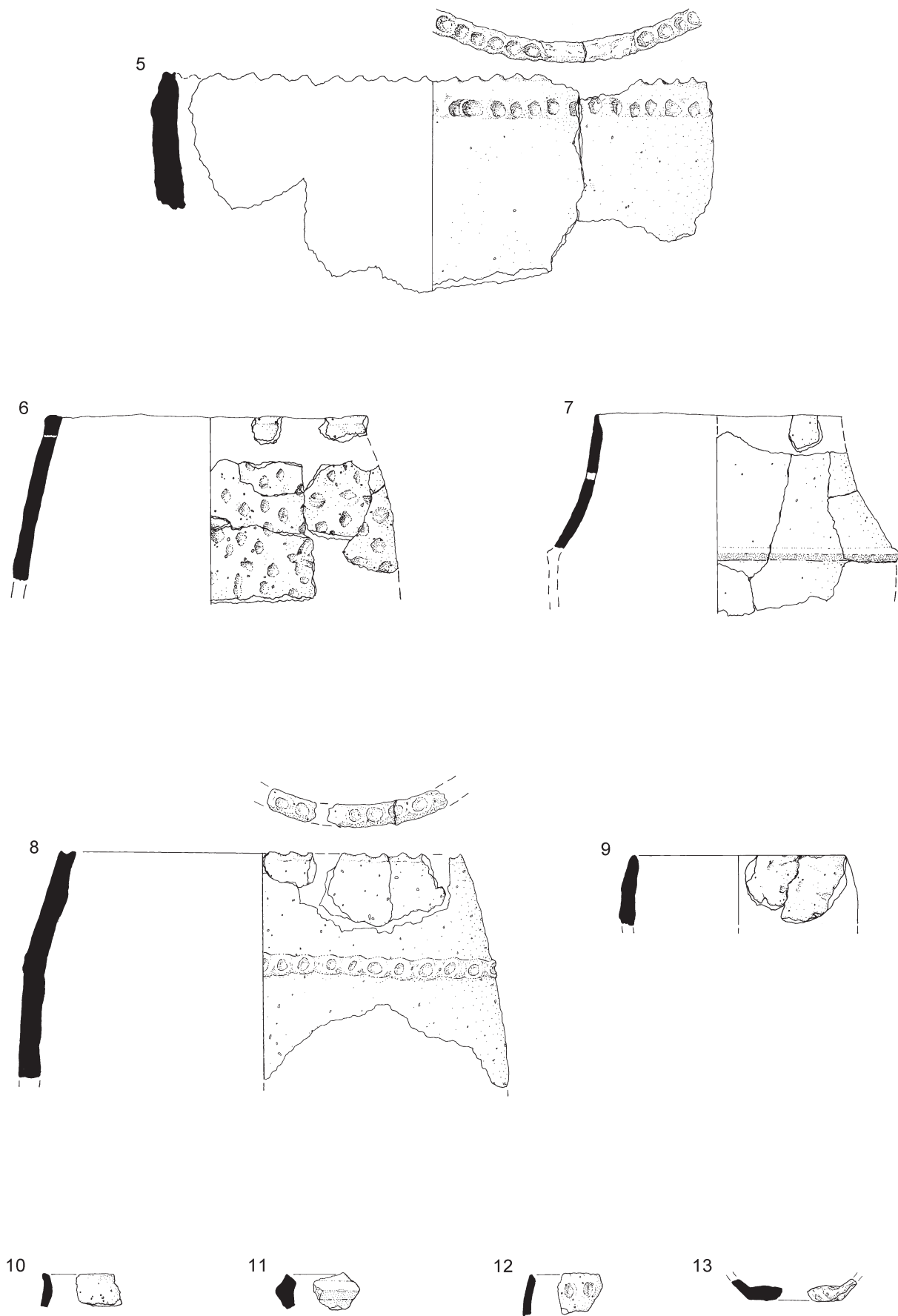


Fig 12 Bronze Age pottery (nos 5-13); scale 1:4.

Essex Heritage Conservation Record/ Essex Archaeology and History

Summary sheet

Site address: Birch Pit northern extension, Maldon Road, Colchester, Essex	
Parish: Birch	District: Colchester
NGR: TL 8583 2886	Site code: BIBP03
Type of work: Excavation	Site director/group: Colchester Archaeological Trust
Date of work: July-August 2003	Size of area investigated: 25m square
Location of finds/curating museum: Colchester Museums	Funding source: Developer
Further seasons anticipated? No	Related EHCR nos: 11548, 11577, 11582, 11924
Final report: CAT Report 289 and EAH	
Periods represented: Bronze Age and Roman	
<p>Summary of fieldwork results:</p> <p>An area of land to the north of the operational quarry at Birch Pit was excavated in advance of sand and gravel extraction. Several features were found additional to those formerly recorded during an evaluation. Conspicuous among these were the remains of a Middle Bronze Age cemetery close to the site's south boundary. This cemetery comprised three ring-ditches. Sixteen Middle Bronze Age urned and unurned cremation burials were excavated in the area between them, in addition to two pits containing urns from which cremated remains were not recovered. The urns, which apparently post-date the ring-ditches, belong to the 'Ardleigh Group', a local variant of the Deverel-Rimbury assemblage dating to the Middle Bronze Age and in use c 1400-1200 BC. No layers attributable as the remains of barrows could be identified in the ring-ditch fills.</p> <p>Two other Bronze Age sites in the region, at Brightlingsea and Chitts Hill, share particular characteristics with the site at Birch Pit which include: 1) the presence of a significant number of cremations containing single urns; 2) low frequency of cremations with two urns; 3) small size of the cemetery; and 4) absence of urns buried upright.</p> <p>Some features encountered during the evaluation were re-investigated. These included two large pits, F23 and F24, and a parallel pair of shallow ditches aligned approximately east-west, F1 and F3. F23 and F24 were probably quarry-pits in use in the Roman period. The ditches F1 and F3, perhaps indicative of a driveway or trackway, are probably of later prehistoric date; they may signify the further development of a largely agricultural landscape subsequent to the construction of the Deverel-Rimbury cemetery.</p> <p>Located at the site's south-west corner, an almost right-angled 'enclosure' ditch, F4/F11, had an atypical profile. Elements of the structure and layout of F4/F11 compare with important parts of a Deverel-Rimbury settlement near to North Shoebury in south Essex. It is therefore possible that ditch F4/F11 enclosed a small Bronze Age settlement that was associated with the Bronze Age cemetery, located about 110m to the south-east of this feature. Alternatively, it is possible that F4/F11 defined an agricultural enclosure.</p> <p>The trackway and presence of the possible enclosure F4/F11 might form part of a network of cropmarks located to the north-east (EHCR nos 11548, 11577, 11582), some 0.8km from the main site. While still undated, this cropmark complex includes trackways and fields (EHCR no 11924), as well as a large rectangular enclosure.</p> <p>Eleven pits were found of which six contained charcoal and one was lined with flint. It is possible that some of these pits were pyre sites linked with the Bronze Age cemetery, although the dating of these features is problematic.</p>	
Previous summaries/reports: Crossan 1992; Crossan 1997; CAT Report 141	
Author of summary: Ben Holloway	Date of summary: March 2005