LATE BRONZE AGE FUNERARY PRACTICES AND SUBSEQUENT ACTIVITY AT PINDEN QUARRY, SOUTHFLEET

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This report describes the results of excavations carried out by Oxford Archaeology prior to the extension of Pinden Quarry, Southfleet. The most significant discoveries were a group of late Bronze Age pits, sixteen of which contained deposits of cremated human remains. These pits form part of an increasingly clearly evidenced pattern of later Bronze Age burial in Kent which is characterised by the deposition of often small quantities of cremated human remains in small pits. These pits usually occur either as single, isolated features or in small groups of two or three. The group of 16 such pits at Pinden Quarry is the largest so far identified, and a detailed analysis of the pits and their contents is therefore presented. The excavations also revealed parts of a late Bronze Age field system, and activity in later periods was represented by part of a Roman field system and five deneholes.

The site is situated north-east of Longfield, on the north slope of an east-west aligned ridge which forms part of the dip-slope of the North Downs (NGR TQ 5970 6985; Fig. 1). The underlying geology consists of Upper Chalk with Thanet Beds (sands) and Woolwich Beds (clays, sands and loams) outcropping to the north, and river terrace gravels to the south; extensive spreads of Clay-with-Flint overlie the Chalk on the higher parts of the Downs (BGS sheet 271).

A comprehensive account of the discoveries, including the supporting data and methodological details for the specialist reports, can be found in the full report available both in the Kent HER and as a digital download from OA’s online library (https://eprints.oxfordarchaeology.com/6286/). The archive will be deposited when a suitable depository becomes available, and the digital archive will be deposited with the Archaeological Data Service.

Archaeological background

Pinden Quarry lies to the south of an area which has been subject to a number of large archaeological projects related to developments including the HS1 Channel Tunnel Rail Link, the A2 Pepperhill to Cobham road scheme and South Thames
Development Route 4 (Booth et al. 2011; Allen et al. 2012; Wenban-Smith et al. 2020; Andrews et al. 2011) as well as numerous other smaller projects.

Mesolithic finds in the area around Pinden largely consist of small numbers of worked flint, usually in residual contexts (Wenban Smith et al. 2020; Garwood
Early Neolithic evidence includes a number of scatters of worked and burnt flint, animal bone and pottery (of which the Ebbsfleet type-site provides an example; Burchell and Piggott 1939). Evidence for the middle and late Neolithic is scarce, although a few pits associated with Grooved Ware have been found (e.g. Simmonds et al. 2011a). The Beaker period and early Bronze Age are evidenced more widely by several ring ditches (e.g. Wenban-Smith et al. 2020; Garwood 2011; Askew 2006), and pits from this period, sometimes associated with rich assemblages of Beaker pottery, have been found at a number of sites (e.g. Allen et al. 2012; Bull 2006). Middle Bronze Age ring ditches, associated with both cremation and inhumation burials, have been identified on the Eynsford to Horton Kirby pipeline (Powell and Sykes 2011) and at the A2 Activity Area (Dawkes 2010), and both these sites are also among those that have produced evidence for isolated cremation burials not associated with ring ditches (e.g. Allen et al. 2012; Powell and Sykes 2011; Wenban-Smith et al. 2020). The middle Bronze Age also marks major changes in patterns of settlement and the organisation of the landscape, with the emergence of the earliest field systems in the region (e.g. Mudd 1994; Dawkes 2010; Allen et al. 2012).

The Iron Age evidence from around Pinden Quarry is characterised by a greater number of foci of settlement (Allen et al. 2012; Philp et al. 1998; Batchelor 1990; Askew 2006). Burial evidence from the early Iron Age is scarce, but human remains have been recovered from middle Iron Age pits and ditches (Allen et al. 2012).

Small-scale rescue excavations in the 1970s immediately to the south of the site, carried out ahead of previous stages of the expansion of Pinden Quarry, uncovered late Iron Age and early Roman settlement features including enclosure ditches, pits, four-post structures and an urned cremation burial (Fawkham and Ash Archaeological Group nd). The town of Springhead (Vagniacae), on Watling Street, formed the major local centre during the Roman period (Andrews et al. 2011; Biddulph 2006). A number of villas have been identified in the local area (Andrews et al. 2011; Philp 1984) and numerous smaller settlements have been found (e.g. Askew 2006; Allen et al. 2012). Evidence for the setting out of Roman field systems, enclosures and trackways is also widespread (e.g. Askew 2006; Bull 2006).

Evidence for occupation in the Anglo-Saxon period is sparser, although Longfield and Pinden are mentioned in charters of c. AD 975. In the nineteenth century most of the landscape was arable (Whyman 2004), the hedgerow forming the southern boundary of the site corresponding to a pre-1850 parish boundary (ASE 2006).

Excavation methodology

Following several phases of archaeological investigation including landscape, hedge, and metal-detector surveys and test pitting, the excavation was carried out in two phases between June and August 2008 (Phase 1) and March and May 2011 (Phase 2; Fig. 2). In total, the excavation covered a roughly rectangular area of c.5ha, although a narrow strip between the two phases remained unexcavated for safety reasons. In the area of the main cluster of late Bronze Age pits, the Phase 1 excavation was extended 20m further to the south in order to determine whether the features continued in that direction, but only a few pits were discovered.
Fig. 2 General site plan.
The site was stripped under archaeological supervision, using a mechanical excavator with a toothless bucket to remove the topsoil and buried ploughsoil. Once the site had been stripped it was hand cleaned and all features were planned using a total station, after which the features were excavated by hand. The deneholes were excavated using a specific methodology that combined hand-excavation of the upper part of the shaft with machine-excavation of the lower part.

RESULTS OF THE EXCAVATIONS

The only evidence for activity on the site prior to the late Bronze Age was provided by probably residual sherds of early Neolithic and Beaker pottery and a few pieces of residual Mesolithic or Neolithic flint.

Late Bronze Age activity

The late Bronze Age evidence (Fig. 3) can be divided into three components, comprising the main group of 31 pits (see inset box), a small number of more scattered pits and several stretches of ditch that may have formed parts of a field system.

The main group of late Bronze Age pits

The main concentration of late Bronze Age pits (Fig. 4) was distributed in a roughly Y-shaped pattern, with the tail of the Y extending east-west along the line of field system ditch 5313 and two extensions to the north-east and the south-east. All the pits were relatively small and shallow, roughly circular or oval features. Their depth never exceeded 0.30m, and the shallowest was only 0.04m deep. Their width varied slightly more, from 0.20m to 0.94m. Each pit contained only a single fill, except for pit 5120, which had two.

Finds from the pits. The categories of finds most frequently recovered from the pits were cremated human remains, charcoal and burnt, unworked flint. Aside from these categories, the numbers of finds were very small, but included a few sherds of late Bronze Age pottery, a few fragments of amorphous fired clay, and some worked flint. None of the pits showed any signs of having been burnt themselves, and the charcoal, burnt flint and cremated remains they contained thus appear to have been burnt elsewhere. Charcoal occurred in all the pit fills, burnt flint in 22 fills and cremated remains in 16. The three main categories of finds occurred in very different quantities in particular pits.

Correspondence analysis indicated that the pits could be divided into three groups, each consisting of pits in which one of the categories of finds predominates, and that although most of the pits contained more than one of the main categories, in each pit one material predominated. In addition, the analysis identified one exceptional pit (5101), which was characterised by the presence of almost equally large proportions of all three categories of finds. Overall, although it appears that many of the pits contained small quantities of ‘background’ material, the pattern of deposition suggests that the pits do not contain random assortments of material,
Fig. 3  Detailed plan of late Bronze Age features.
Fig. 4 Detailed plan of main group of late Bronze Age pits.
such as might be expected if they had been backfilled from mixed surface midden deposits. Rather, in most cases more or less specific groups of material were deposited in particular pits.

Whilst overall the quantity of cremated remains correlated with the size of the pits, there were three pits that contained much larger quantities of cremated remains for their size. It thus seems likely that these outliers consist of deliberate burials of cremated remains, whilst the other deposits consist of small, stray, residual groups of cremated remains.

There was little clear spatial patterning in the differing finds assemblages (Fig. 4). Although charcoal predominated in all of the north-eastern pits, and all but one of the south-eastern pits were dominated by flint, the rest of the group contained a mixture, in little apparent order, of all kinds of assemblages. All the deposits dominated by cremated remains lay close to ditch 5313, but they were distributed along almost its entire length. There were, however, some indications of spatial patterning in the types of charcoal recovered, those pits at the eastern end of the group producing almost entirely oak, whereas in those at the western end Pomoideae charcoal predominated, except in the pits with substantial cremated remains. Pits in the middle of the group tended to have more evenly mixed assemblages of charcoal.

**Chronology of the pits.** Ten radiocarbon dates were obtained from the main group of late Bronze Age pits (**Table 1**), six from pits containing cremated remains (5050, 5058, 5101, 5106, 5114 and 5314) and four from pits without (5112, 5118, 5321 and 5348). One result, on hazel roundwood in pit 5118, unexpectedly gave a result in

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**TABLE 1. RADIOCARBON DATES FROM THE MAIN GROUP OF LATE BRONZE AGE PITS AT PINDEN QUARRY**

<table>
<thead>
<tr>
<th>Lab. no.</th>
<th>Pit</th>
<th>Material</th>
<th>Δ13C (0/00)</th>
<th>Uncalibrated (BP)</th>
<th>Unmodelled (cal BC)</th>
<th>Modelled (cal BC)</th>
</tr>
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<tbody>
<tr>
<td>SUERC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44217</td>
<td>5114</td>
<td>Cremated human bone</td>
<td>-17.8</td>
<td>2829 ± 26</td>
<td>1020–930</td>
<td>990–930</td>
</tr>
<tr>
<td>44223</td>
<td>5058</td>
<td>Cremated human bone</td>
<td>-20.4</td>
<td>2821 ± 26</td>
<td>1010–930</td>
<td>990–930</td>
</tr>
<tr>
<td>44225</td>
<td>5106</td>
<td>Cremated human bone</td>
<td>-20.2</td>
<td>2804 ± 26</td>
<td>1000–920</td>
<td>990–930</td>
</tr>
<tr>
<td>44222</td>
<td>5314</td>
<td>Cremated human bone</td>
<td>-23.7</td>
<td>2807 ± 26</td>
<td>1000–920</td>
<td>990–930</td>
</tr>
<tr>
<td>44218</td>
<td>5050</td>
<td>Cremated human bone</td>
<td>-20.3</td>
<td>2794 ± 26</td>
<td>980–900</td>
<td>990–930</td>
</tr>
<tr>
<td>44224</td>
<td>5101</td>
<td>Cremated human bone</td>
<td>-20.0</td>
<td>2741 ± 26</td>
<td>910–840</td>
<td>920–840</td>
</tr>
<tr>
<td>44509</td>
<td>5348</td>
<td>Charred barley grain</td>
<td>-25.9</td>
<td>2964 ± 29</td>
<td>1260–1120</td>
<td>1180–1010</td>
</tr>
<tr>
<td>44508</td>
<td>5321</td>
<td>Charred wheat grain</td>
<td>-22.5</td>
<td>2880 ± 29</td>
<td>1120–1010</td>
<td>1090–1000</td>
</tr>
<tr>
<td>44510</td>
<td>5112</td>
<td>Hawthorn charcoal</td>
<td>-24.4</td>
<td>2751 ± 29</td>
<td>920–840</td>
<td>980–820</td>
</tr>
</tbody>
</table>
the early medieval period (cal ad 1010-1160 at 95.4% probability; SUERC-44514) and presumably derived from intrusive material within the pit.

An attempt has been made to refine the remaining nine dates using Bayesian statistics. The model assumes that the pits all derive from a single phase of activity, and that the dates obtained from them are distributed randomly within that phase; further details are presented in the full report. The dates fall into a quite clear pattern: those obtained on charred plant remains span a period which approximates to almost the whole of the late Bronze Age, beginning 1220-1050 cal bc (68% probability; 1350-1010 at 95% probability), and ending 970-830 cal bc (68% probability; 1020-700 cal bp at 95% probability), whereas most of the cremation deposits date from a much narrower period, five of them giving results which are identical in the model, falling in the period 990-930 cal bc (at 68% probability; 1010-920 cal bc at 95% probability). The one remaining date, from pit 5101 which has already been singled out as anomalous in its combination of finds, falls into a later range of 920-840 cal bc (68% probability; 980-820 cal bc at 95% probability).

The dates indicate that whilst activity occurred in the main group of pits throughout the late Bronze Age, the cremated remains appear to be the product of just two relatively brief episodes of activity. The relatively large number of cremation deposits at Pinden Quarry (compared to other sites in Kent) does not, therefore, reflect the sporadic occurrence of cremation over a long period, but rather derives from probably just two brief episodes of cremation, the later of which comprised a single pit. The dates for the other episode derive from the three largest groups of cremated remains (in pits 5314, 5106 and 5058) but also from two very small deposits (in pits 5050 and 5114). These last two pits both belong to the group of assemblages which were dominated by charcoal. In the light of the analysis of the pits presented above, it seems likely that the relatively large number of pits containing cremated remains at Pinden Quarry reflects the incorporation of small quantities of stray cremated remains from the first episode of cremation into later pit fills. It is thus the product of the fact that the cremation deposits at Pinden Quarry occurred in an area that was also used for other activities. At most, it seems that no more than five deposits (and perhaps just four) represent deliberate cremation burials.

The total quantity of cremated remains recovered from the first episode of cremation amounts to 1,603g (see specialist report below). Whilst this is lower than the total which could be obtained from the cremation of a single individual (up to 3,600g: McKinley 1993), the remains include those of an adult (probably around 25-45 years old) in pit 5314, a child (probably less than 15 years old) in pit 5106, and possibly a younger adult in pit 5058. It is worth noting that the cremated remains in two of the undated deposits (in pits 5089 and 5091) may derive from an infant or very young child, and another undated deposit in pit 5086 probably represents a child or adolescent of over five years, possibly adding a further two individuals to this total. Combined with the later burial in pit 5101, this gives a minimum total of six individuals. Whilst this still makes this group the largest collection of late Bronze Age cremation burials in Kent, it does make the difference in size much less striking than the initial figure of 16 deposits.

_Burnt spread 5330_. A spread of burnt material (5330) lay within the area of the main group of pits and consisted of an irregular deposit, 1.5m wide and 0.05m deep,
which contained small amounts of charcoal and burnt flint as well as one of the largest groups of late Bronze Age pottery recovered from the site (26 sherds/66g). As with the pits, there was no indication that this material had been burnt *in situ*.

**Other late Bronze Age pits**

Eight pits and three tree-throw holes found in other parts of the site might also have dated from the late Bronze Age. These features were widely scattered across the site, and all occurred as apparently isolated features. They were similar in size and shape to the pits in the main group, with the exception of feature 5013, which was much larger at 2.6m across and was also distinguished by the large assemblage of worked flint it contained. This feature extended beyond the western edge of the excavation and could have been a pit or the end of a ditch. The dating evidence for these features was slight; five contained pottery, but in three cases this consisted of no more than single sherds, and it is impossible to be certain that these sole items were not residual. Alongside the pottery, four of the pits contained burnt, unworked flint, which might be taken as further proof that they date from the same broad phase of activity as the main group of late Bronze Age pits.

**The late Bronze Age field system**

The only other features which probably date from the late Bronze Age were a number of ditches which may have formed part of a field system (Fig. 3). Late Bronze Age pottery was recovered from three ditches (5313, 5344 and 5230), and although the quantities were small and the material could be residual, the stratigraphic relationships of ditch 5313 with two of the pits provides further proof of its date, since it cut pit 5278 and was cut by pit 5082. Undated ditch 6023, which defined a right-angled corner at the northern edge of the Phase 2 excavation, may have formed a continuation of ditch 5313 or of Roman ditch 5312. The finds from the ditches were comparable to those from the late Bronze Age pits, consisting of small quantities of pottery, burnt flint and a few pieces of worked flint. Together, the three ditches suggest that the field system of which they formed a part was laid out on roughly east-west and north-south alignments, ditches 5230 and 5344 lying roughly at right-angles to ditch 5313. These three ditches were, however, of very different sizes, ditch 5313 being relatively narrow (up to 1.0m wide) and shallow (up to 0.3m deep), ditch 5344 being much wider (up to 2.0m) but still very shallow (up to 0.1m) and ditch 5230 being much deeper, at up to 0.7m.

**Late Iron Age/Roman activity**

The only feature which can be confidently dated to the late Iron Age/early Roman period is ditch 5312, which cut late Bronze Age ditch 5313 and appears to have defined an approximately rectangular enclosure (*Fig. 5*). A number of other ditches have been attributed to the same period on the basis of their alignments and spatial relationships, although they were not associated with any late Iron Age or Roman finds. The ditches broadly follow a similar alignment to those uncovered in the earlier excavation of the late Iron Age to early Roman settlement immediately...
Fig. 5 Plan of late Iron Age/early Roman features at Pinden Quarry.
to the south (Fawkham and Ash Archaeological Group nd), and it is likely they represent outlying enclosures or fields associated with this settlement.

The rectangular enclosure appears to have measured around 116m east-west, and around 25m north-south. A continuous ditch defined what was exposed of the northern, western and part of the southern sides of the enclosure. No continuation of this ditch was identified in the Phase 2 excavation to the south, and it therefore seems likely that it either continued below the unexcavated bund or had been truncated away. The northern side of the enclosure appears to have been extended by two further segments of ditch on the same east-west alignment (5336 and 5165). It seems likely that the gaps along the northern side of the enclosure were at least partially the product of truncation, although it is possible that an entrance originally existed at some point. The eastern end of the enclosure appears to have been defined by ditch 5334=6036, which extended for around 95m from the northern edge of the excavation before petering out, perhaps as a result of truncation, to the south. A number of short, north-south aligned ditches (5342, 5196=6035, 5052=5054 and 5016) were found along the boundary between the two phases of excavation. Although these ditches contained no chronologically diagnostic artefacts, their alignment, parallel to ditch 5334=6036, suggests that some of them, at least, might have been part of the same system. The ditches generally varied little in size and profile. All were shallow features, less than 0.5m deep, and often only around 0.2m, with rounded profiles, often with undulating bases.

Very few finds were recovered from these ditches. A total of 18 sherds (620g) of late Iron Age or early Roman pottery was recovered from enclosure ditch 5312, most dating from between 50 BC and AD 100, but also including a single sherd of possible North Kent oxidised ware, probably dating from AD 50-300. The remaining finds from the putative late Iron Age/early Roman ditches consisted of burnt unworked flint, small quantities of residual worked flint, and a single fragment of horse astragalus.

Medieval/post-medieval activity

Five deneholes (chalk extraction pits) were identified (5144, 5188, 5202, 5240 and 5306: Fig. 2), but unfortunately no clear evidence for the date of these features was recovered. Almost all of the finds, which included relatively recent material, ceramic building material, slag, and fragments of iron nails, were recovered from the upper fills, although a few scraps of probably early Neolithic pottery were recovered from a lower fill of one of the deneholes. Four of the deneholes consisted of more-or-less circular vertical shafts, varying in width from 2.8m to 4.6m and between 2.7m and 4.5m deep. The shafts of deneholes 5144 and 5188 had two lateral chambers at the base. In all cases, the lateral chambers had arched roofs and flat floors. Denehole 5202 had no clear lateral chambers, although there was a very slight niche cut into the chalk on the northern face of the base of the shaft, which was probably the very beginning of a chamber which was not taken further. Unfortunately, the section left of denehole 5240 after the upper layers of chalk were machined away collapsed before any observations or records could be made, but there was no clear indication that this denehole was associated with lateral chambers. The fifth denehole (5306) was entered through a corridor cut into
the chalk, which was c.2.4m long, 1.0m deep and 1.8m wide. A chamber continued from the end of the corridor, whilst a second extended at right-angles from the corridor to the west.

Of post-medieval date were five parallel linear features, either plough furrows or wheel ruts, that traversed the site on a north-south alignment. One produced sherds dated to 1780-1850.

FINDS

Worked flint by Michael Donnelly

A total of 276 lithics were recovered from the site, including 87 very scrappy pieces from test pits from the evaluation phase. The bulk of the assemblage comes from features dated to the late Bronze Age and includes a range of informal scrapers, piercers and miscellaneous retouched flakes typical of that period. A few pieces, including some systematic blades and two probable burins, suggest earlier activity. This earlier phase appears to have leaned heavily on Bullhead Beds flint (Dewey and Bromhead 1915, presumably sourced from Thanet) while the later prehistoric assemblage favoured the local Clay-with-Flint deposits.

The assemblage was primarily flake-based but included a small number of genuine blade forms (Fig. 6, no. 1) as well as a dozen blade-like flakes that can often be a component of blade reduction strategies but here are more likely to relate to accidental blade-like removals (Fig. 6, no. 2). Cores were rare, and two examples display a mix of blade and flake scars and appear to relate to Mesolithic or more likely early Neolithic knapping episodes. The third core displays flake scars but was fashioned from Bullhead Beds flint and may also be early. A single core rejuvenation flake also appears to be early in date. Although there is little direct evidence of the typical highly expedient flake knapping techniques of the late Bronze Age, the flake assemblage testifies to such a strategy, with very little evidence for platform edge abrasion/preparation, and a marked preference for broad, plain or cortical platforms.

The blank types indicate that a full range of reduction was practised here. Some of the inner flakes are classic examples of later prehistoric knapping with broad, unprepared plain platforms, extant platform spurs, deep bulbar pits, hard-hammer bulbs, thick squat profiles and multi-directional flaking patterns. One flake combines all this alongside a step terminal (Fig. 6, no. 3). At least three tools were formed on non-flake blanks (Fig. 7, no. 4) or display recorticated surfaces implying scavenging of earlier material (Fig. 7, no. 5). Both traits are quite common in middle-late Bronze Age assemblages (Butler 2005).

Retouch was present on 9% of all non-chips in the assemblage. A figure this high is usually only associated with domestic assemblages or assemblages in which some form of selective recovery has occurred (with the latter being likely here). Tool forms include six scrapers, four piercers, four retouched flakes and two fragments. Early retouched forms may include the two notches and certainly include the two burins and the microdenticulate/serrated blade (Fig. 6, no. 1), while a snapped flake from a polished implement is probably Neolithic in date (Fig. 7, no. 6). One of the burins is a dihedral example on a snapped side trimming flake of Bullhead...
Fig. 6  Selected pieces of worked flint, nos 1-3.
Fig. 7  Selected pieces of worked flint, nos 4-7.
Beds flint; the other is a probable multiple angle burin on a preparatory flake, also in Bullhead Beds flint. The remaining tools are likely to be of late Bronze Age date and include a set of piercers on irregular flakes and thermal fragments, several miscellaneous retouched flakes, and a group of scrapers. The scrapers include one slightly irregular thumbnail example that may date to the early Bronze Age and several larger scrapers on decortical flakes (Fig. 7, no. 7) including a recorticated pot-lid displaying uncorticated retouch scars (Fig. 7, no. 4). Other end-scrapers are present on probable scavenged earlier pieces displaying recorticated surfaces (Fig. 7, no. 5).

Pit 5013 contained the only large assemblage. Comprising 50 pieces, five of which were retouched, it consisted of 38 flakes (Fig. 6, no. 3), four blade-like flakes (Fig. 6, no. 2), two blades, four scrapers (Fig. 7, nos 4, 5 and 7) and a microdenticulate on an inner blade (Fig. 6, no. 1). Although the blades and some regular flakes suggest a degree of contamination, the bulk of the assemblage – including the scrapers – are typical of later prehistoric pit assemblages from this part of Kent.

Prehistoric pottery by David Mullen and Lisa Brown

Some 104 sherds (181g) of earlier prehistoric pottery were recovered, most of which is poorly preserved and fragmentary. The assemblage was dominated by flint-tempered sherds of late Bronze Age date, but four early Neolithic sherds and a single fragment of a late Neolithic/early Bronze Age Beaker were also recovered.

Some 70 sherds (170g) could be dated with some confidence to the late Bronze Age, and another 25g of crumb-like pieces in similar fabrics are probably of the same date. Most of the very fragmentary assemblage consisted of wall sherds of flint-tempered vessels. At least two flint fabrics were present. Some 25g (25 sherds) of very fragmented flint-tempered pottery was present in deposits in the main group of late Bronze Age pits. A single fragment of a T-shaped rim from pit 5314 was the only diagnostic sherd, but the material resembles late Bronze Age Plain Ware jars from Kent. It seems unlikely, given the size of the sherds, that the pottery represents vessels accompanying cremations. A considerable part of the small late Bronze Age group (26 sherds, 66g) came from the spread of burnt material (5330).

The Plain Ware group resembles material recovered from the A2 (Allen et al. 2012), the A2/A282/M25 Improvement Scheme (Simmonds et al. 2011a), Gravesend (Mudd 1994) and excavations along the line of the CTRL, in particular from White Horse Stone and Saltwood Tunnel (Barclay et al. 2006). This type of pottery is not particularly common in west Kent and there are few parallels, but the Pinden Quarry material compares well with late Bronze Age pottery from elsewhere in southern England (Barrett 1980) and associated material produced a radiocarbon date that sits comfortably in the late Bronze Age.

Iron Age to Roman pottery by Edward Biddulph

A total of 33 fragments (648g) of pottery were assigned to the Iron Age or Roman period. Most of the assemblage consisted of small fragments that could not be
dated very closely. Flint-tempered pottery was broadly dated to the Iron Age, while
grog-tempered pottery generally spanned the second half of the first century BC
and the first century AD. A sherd from a necked jar in glauconitic ware, considered
to originate in the Medway valley, was probably exclusively late Iron Age in date
(Pollard 1988, 31). A fragment of fine oxidised ware, possibly manufactured in
the Upchurch area of north Kent, is unlikely to have dated earlier than AD 50
(ibid., 211). Apart from the necked jar, no form was identified from rims, but grog-
tempered body sherds from ditch 5312 belonged to storage jars.

Other finds by John Cotter, Ian R. Scott, Ruth Shaffrey, Daniel Stansbie and
Lena Strid

A wide range of metalwork was recovered, mostly from the ploughsoil and subsoil,
and predominantly consists of relatively mundane items of recent date. The most
interesting finds are three coins of widely different dates, the earliest being Roman,
a Nummus of Constantine I issued in AD 313-5, recovered from the ploughsoil, and
the others a silver ‘Long Cross’ penny probably of the reign of Edward III and a
halfpenny of George III, dated 1807. Other material included 47 sherds (332g) of
post-Roman pottery, mostly of nineteenth- or twentieth-century date but with some
residual late medieval sherds, and 241 fragments (just under 3kg) of medieval and
post-medieval brick and tile. The assemblage of 108 fragments (467g) of fired clay
was mostly unidentifiable but included some structural material probably derived
from ovens or walls and the end of a possible fire bar from the ploughsoil. There
were also two tiny fragments of slate and ten small fragments of lava quern from
residual contexts and a few fragments of modern bottle and window glass. A total
of 36 fragments of animal bone were recovered, mostly from superficial or modern
contexts.

Human bone by Ceridwen Boston

Sixteen truncated pits contained cremated human remains (Table 2). This group
represents a relatively large burial assemblage, as late Bronze Age cremation
burials more commonly occur singly or in very small groups.

The weight of bone recovered from a modern adult cremation varies between
1,000 and 3,600g, depending on age, sex and build (McKinley 1993). Only
one cremation deposit at Pinden approached this weight (pit 5314, 1,115g) and
represents a high proportion of that adult, possibly male skeleton. Bone from pits
5058 and 5106 weighed more than 200g, and from pit 5101 weighed 160g, but the
remaining deposits were very small, nine weighing less than 10g. Indeed, many
of the cremated bone deposits were so tiny (1g) that species identification was
problematic, though general texture suggested that they were human.

There was no repetition of elements or marked differences in size or age at death
in any deposit to suggest that it contained more than one individual. Due to the
incompleteness of the deposits and the high degree of fragmentation, very few
anatomical landmarks were present to precisely age or sex the individuals. The
possible male in pit 5314 was sexed on the basis of general robusticity alone – not
the most accurate tool in assigning sex. Epiphyseal fusion was complete in the
bone from pits 5058, 5101, 5106 and 5314, indicating that they had attained an age greater than 15 years, and probably were adults at the time of death. Endo- and ectocranial suture fusion was absent in pit 5058, suggesting a younger adult, whilst endocranial suture closure but not ectocranial fusion had commenced in pit 5314, suggesting a slightly older age (tentatively 25–45 years). Cranial vault fragments from pits 5086, 5088 and 5090 are extremely thin in cross-section, even after taking into account the shrinkage that normally occurs in the cremation process. This tentatively suggests that these individuals were subadult. Complete tooth roots in deposit 5086 indicated that this individual had attained a minimum age of five years at death, whilst the delicate eggshell-like appearance and small dimensions of cranial vault fragments from deposits 5088 and 5090 both suggested an infant or very young child. The close proximity of pits 5088 and 5090, and the smallness of the deposit in pit 5090 (1.4g), makes it possible that the deposits within these two pits may include the remains of a single individual.
Wood charcoal and charred plant remains by Sheila Boardman

Following the assessment of forty-five bulk soil samples, twenty-three samples were selected for fuller analysis: sixteen for wood charcoal and ten for charred plant remains.

Twelve samples from late Bronze Age pits adjacent to ditch 5313 were analysed for wood charcoal. Of these, six were dominated by hawthorn group (Pomoideae) charcoal. Oak charcoal dominated five ditch group samples, while hawthorn group and oak were present in roughly equal amounts in pit 5058. *Prunus avium/padus* (wild/bird cherry), *Acer campestre* (field maple), *Corylus avellana* (hazel), *Prunus spinosa* (blackthorn/sloe), *Fraxinus excelsior* (ash) and possibly *Alnus* (alder) were present in much smaller quantities, except for *Prunus* species in pit 5095, where cherries and blackthorn together account for more than 23% of the identified material. The oak charcoal from four of the five oak-dominated samples (pits 5082, 5088, 5090 and 5106) was largely sapwood and/or roundwood.

A further four samples were analysed from pits in the north-eastern part of the main pit group, one of which contained cremated bone. All these samples were dominated (94% or more) by oak charcoal. In contrast to the samples from pits adjacent to the ditch, the majority of this was oak heartwood.

Overall, with the exception of the pits containing large deposits of cremated remains (in which oak charcoal predominates), it is generally the case that Pomoideae charcoal predominates in the western pits whilst oak predominates to the east. The dominance of oak and/or hawthorn-group charcoal seems to point to deliberate selection of particular fuel woods, despite the clear availability of a range of other tree and shrub taxa locally.

Eight of the samples analysed for charred plant remains came from late Bronze Age pits, and two from late Iron Age/Roman ditches. The samples generally contained moderate amounts of charred plant remains, with up to twenty cereal grains, a few chaff fragments, occasional larger pulses, some edible wild plants and a range of smaller seeds. The latter, including possible weeds of cultivation and collected grassy material, were generally the larger component of these samples. Emmer wheat (*Triticum dicoccum*) was identified in four late Bronze Age samples and one late Iron Age/early Roman sample, and may have been the main wheat in use in this area. Some cereal chaff was identified as emmer or spelt (*Triticum spelta*), so the latter is also a possible crop. Some hulled and indeterminate barley (*Hordeum* sp.) grains provide a hint of another important prehistoric crop. A single free-threshing wheat (*Triticum* sp.) rachis fragment was recovered from late Bronze Age pit 5348, and a grain from one late Iron Age/early Roman sample. This may point to an additional crop, presumably bread wheat (*Triticum aestivum*), which would be unusual in the late Bronze Age. The oat grains in late Bronze Age pit 5134 probably represent weeds of other crops. Two peas (*Pisum sativum*) and one possible horse bean (*Vicia* cf. *faba*) were recovered, together with some large Vicieae fragments which may represent these or other legumes. Wild edible species included pignut tubers (*Conopodium majus*), sloe (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), probable blackberry (*Rubus* cf. *fruticosus*) and hazelnut (*Corylus avellana*). These remains are confined to the late Bronze Age samples.
DISCUSSION: LATE BRONZE AGE FUNERARY AND NON-FUNERARY ACTIVITY AT PINDEN QUARRY IN CONTEXT

The late Bronze Age pit cluster at Pinden Quarry represents one of the largest group of pits containing cremated human remains of this date so far identified in Kent. The association of the pits containing cremated remains with other pits is unusual. Here it will be suggested that the finds from the pits derived from a range of activities. The precise character of those activities remains obscure, although some involved heating flint and all seem to have produced charcoal. The pit group represents activity which continued throughout most of the late Bronze Age. During this period at least two episodes of funerary activity took place, involving the cremation of at least six individuals. Rather than being the product of an exceptionally large number of burials, the relatively large number of pits containing cremated remains appears to reflect the fact that the burials took place within an area where other activity occurred, and that small quantities of cremated human remains became incorporated into the fills of later pits. The deposits of cremated remains are of very differing sizes, and only one consists of a large deposit which was clearly intentionally deposited. Although there are between two and four other deposits which might also be classified as deliberate, it is difficult to make a clear distinction between deliberate and residual deposits. Whatever the case, it seems that the variation in the size of the cremation deposits reflects an absence of clear ritual procedures concerning the deposition of cremated remains and may instead demonstrate a quite casual attitude to the recovery of cremated remains from the pyre and to the burial of those remains. It is suggested below that this was related to a broader de-ritualisation of the final stages of funerary rituals which occurred in the middle and late Bronze Age.

Non-funerary activities related to the pits

The character of the activities related to most of the pits remains unclear. These activities variously left deposits of burnt unworked flint and charcoal, and occasionally charred plant remains, alongside very small quantities of other finds. In most cases they do not appear to have had any clear association with funerary rites. Whilst the range of finds associated with the pits is quite limited and suggests some coherence in the range of associated activities, the general lack of mixing of the three main categories of finds suggests that the pits were related to differing tasks (or perhaps to differing stages of a sequence of related tasks).

The suggestion of diversity in the activities related to the pits is supported by differences in the patterns of deposition. Whereas the quantity of burnt flint in each pit was correlated with the feature’s volume, there was no such correlation for the charcoal. Patterns in the distribution of differing kinds of charcoal and of charred plant remains suggest further differences in the activities related to the pits. Cereal chaff was recovered only from pits in which burnt flint occurred, whilst potentially edible species other than cereals were more common in pits in which charcoal predominated, though the dataset is small.

The use of oak for cremation is unsurprising, since it can provide the high temperatures required for thorough cremation. The predominance of Pomoideae
charcoal in many of the other pits could indicate a different function which did not require such high temperatures (although the various species of Pomoideae burn well). Whatever the case, clearly heat and fire formed an important component of much of the activity. The charred plant remains are not rich enough to suggest that the pits were related to crop drying, with the burnt flint being used to transfer moderate heat to the crops (cf. Cunliffe 2005; Beresford 1979).

Late Bronze Age funerary activity at Pinden Quarry and elsewhere in Kent

The deposits of cremated remains appear to have related to a few – perhaps just two – episodes of funerary activity, although the remains of at least six individuals were involved. Whilst the number of deposits is small, it is still larger than the number of dated deposits at other sites in Kent, where typically no more than six deposits have been identified (although not all possibly late Bronze Age deposits at other sites have been dated, and the true figures could be higher).

Radiocarbon dates have now been obtained from numerous later Bronze Age cremation burials in Kent. During the middle Bronze Age, burials were often associated with barrows or ring ditches, but from at least the fourteenth century cal BC they could also be interred as ‘flat’ burials, either at barrows or not associated with any archaeologically visible monuments (Champion 2007, 109). During the late Bronze Age, from the 11th century cal BC onwards, ‘flat’ burial predominated. The dates for the Pinden Quarry cremation deposits place them at a late stage of the late Bronze Age. The mixed deposit in pit 5101, broadly dating to the ninth century cal BC, is among the latest examples so far found in Kent. Deposits with dates similar to the other cremated deposits at Pinden Quarry, broadly in the tenth century cal BC, have been identified at sites including Dartford Football Club (Devaney and Stansbie 2011), Wrotham Quarry (Malim et al. 2014) and Pilgrims’ Way (Hayden and Stafford 2006). Following the end of the late Bronze Age, aside from exceptional burials such as that at White Horse Stone (Hayden and Stafford 2006), cremation burial remained out of fashion in Kent until the late Iron Age (Champion 2011).

Variation in the deposits of cremated human remains

The quantities of finds in the pits at Pinden Quarry suggest a contrast between a small number of relatively large deposits of cremated human remains, and a larger number of small deposits. There are also indications of differences in the way in which the large deposits of cremated remains were deposited. Most noticeable is the contrast between the mixed assemblage in pit 5101 and the other pits that contained large groups of cremated remains. Whereas the later, mixed assemblage in pit 5101 contained considerable quantities of burnt flint and charcoal (weighing more than the cremated remains), the earlier deposits were associated with much smaller quantities of charcoal and (although with more variation) burnt flint. The largest deposit of cremated remains in pit 5314 was associated with no burnt flint and only very small quantities of charcoal (relative to the quantity of cremated remains). This variation suggests that there was corresponding variation in the care with which cremated remains were recovered from the pyre.
The ages of the individuals represented by the cremated remains further complicate the interpretation of the patterns of deposition. The largest deposit represented an adult of 25 to 45 years, and the second and third largest a younger adult and an adolescent of over 15 years. These three deposits all dated from the period 1010-910 cal BC and represent the remains of at least two but more probably three individuals (since the ageing of the younger adult and the adolescent is not sufficiently clear to exclude the possibility that they were the same individual). There were, however, also much smaller deposits from the same period, which derive from infants or young children and a child or adolescent of more than five years and which thus represent at least one, and possibly two more individuals. Whilst it could be argued that the small size of the deposits representing children simply reflects age-related differences of size, it remains the case that certain individuals are represented only by small, partial deposits of cremated remains. Further confirmation of this is provided by the later cremation burial in pit 5101, the remains in which derive from an adult but weigh only 160g.

The variation in the size of the deposits of cremated remains at Pinden Quarry is generally similar to that found more widely in Kent, although Pinden has a higher proportion of very small deposits than is present at most sites. Few dated pits at other sites contained deposits of comparable size to the largest deposit at Pinden Quarry, though an example from Pilgrims’ Way contained 1,235g of cremated remains from an adult (Hayden and Stafford 2006; Witkin 2006). The remaining dated deposits include a number of examples of intermediate size from around 100g to just over 400g, which correspond to the deposits at Pinden Quarry that may have been deliberate deposits, as well as several examples of less than 50g, and some very small deposits of less than 10g, which have usually been interpreted as residual. The sites with these small deposits include some – such as Beechbrook Wood (Brady 2006; Witkin 2006) and the A2/A282 (Simmonds et al. 2011a) – where no larger deposits were recovered.

At Pinden it has been suggested that the contrast between large and small deposits could be explained in terms of a distinction between deliberate and residual deposits. The absence of any large deposits at Beechbrook Wood and on the A2/A282 makes it more difficult to support such an interpretation. Overall, however, it is difficult to see any consistent patterns. This could be taken to imply that late Bronze Age burial rites involved complex differences of treatment of the dead, the rules governing which cannot yet be discerned in the archaeological evidence. Alternatively, as will be suggested below, the tradition may not have followed strictly defined ritual procedures, but rather involved a somewhat casual attitude to the treatment of human remains. This casual attitude perhaps involved only the final stages of the funerary rite – the cremation itself appears to have remained as thorough as in earlier periods.

The de-ritualisation of funerary ritual in the late Bronze Age

Overall, then, it is difficult to see any consistent patterning in the way in which the cremated remains were deposited, or to make a clear distinction between deliberate deposits and residual accumulations of cremated remains. Rather than trying to make sense of this variation in terms of differing burial rites (which could
perhaps be related to age, sex or other aspects of an individual’s social persona or the circumstance of their death), it is perhaps better to assume an absence of strictly defined ritual procedures and, indeed, of a rather casual approach to the way in which cremated human remains were treated. This could imply differing degrees of care in recovering cremated remains from the pyre or in then burying the remains (or that cremated remains were used or treated in some other way which has not yet been detected). Whatever the case, the suggestion that the smallest deposits were residual implies that cremated remains were left on the surface and could thus become incorporated as residual material into unrelated features. This would account for the large number of small residual deposits at Pinden Quarry and seems consistent with the similar evidence at other sites (cf. Brudenell and Cooper 2008).

This interpretation is also consistent with the abandonment of barrows as a location for burial. The burials at other sites in Kent were all placed in small, generally shallow pits, similar in size to those at Pinden Quarry. Whilst the initial stages of cremation appear to have continued to be observed – the individuals were still as well cremated as they were in the middle Bronze Age – the later stages, involving the construction of barrows or burial in or near them, appear to have been abandoned. It is worth noting that in Van Gennep’s (1960) tripartite scheme for rites of transition, it is the middle stage, the *rites de marge*, which are usually longest and most elaborate. Archaeological evidence usually relates to the final resting place of the remains, and thus only to the very final stages of the rite. Changes in the earlier phases of the rite are largely archaeologically invisible.

Nonetheless, it is worth noting two changes in the context of burials which were involved in the abandonment of barrows as a location for burial. The first involves the association of burials with other structures, and field system ditches in particular. The pits at Pinden Quarry are unusual for the late Bronze Age in having been located in an area where similar pits were cut for apparently other purposes. Although it is difficult to distinguish between deliberate and residual deposits, it has been suggested that the large number of pits containing cremated remains at Pinden Quarry simply reflects the fact that the area was used for other activity which involved digging pits, rather than the presence of a very large number of burials. Elsewhere, burials usually appear as isolated features without similar associations. Previously (Allen et al. 2013), a distinction has been made between later Bronze Age burials in isolated contexts and those apparently associated with field system ditches (although excavation has rarely been extensive enough to show that the ditches did form parts of field systems rather than other types of enclosures). The evidence from Pinden Quarry suggests that this distinction may have less relevance than was thought. Many of the pits lie close to a late Bronze Age ditch that may have formed part of a field system. This ditch cut one of the pits but was cut by another. It thus seems that the ditch was cut during the period over which the group of pits formed. A group of initially isolated pits thus came to be associated with a field system ditch. At none of the other sites where cremation burials were associated with field systems is the chronology of the field boundaries sufficiently precise to demonstrate their chronological relationship with the burials.

It has been suggested above that the deposits in the pits at Pinden derive from a range of activities, some of which were not directly related to funerary activity.
All of the activities appear to have involved fire, and it is possible that the site was used as a location for cremation because of this association. The wider evidence from Kent does not suggest that this was a more general pattern, though there are difficulties in assessing this evidence. Often, pits such as those at Pinden which contain only burnt flint and charcoal remain undated, and many reports draw a sharp distinction between pits containing cremated remains and those without, which may obscure the possible relationships between features. At many sites, however, cremation burials genuinely appear to be isolated features which lie in areas without any other features.

The second change in the context of burials involves their relationship with other burials. The number of burials associated with excavated middle Bronze Age barrows and flat cemeteries in Britain varies widely. While over half of the excavated cemeteries contain fewer than five burials, there is a significant number of much larger cemeteries, some with fifty or more burials (Caswell and Roberts 2018). Large cemeteries in Kent include the example from Kingsborough, with 32 burials (Allen et al. 2008). By contrast, few of the late Bronze Age cremation burials in Kent occur in groups of more than two or three, although six deposits were identified at Wrotham Quarry (Malim et al. 2014).

In the discussion of the later Bronze Age cremation burials found along the A2, it was suggested that, like the foci of settlement (which appear to have shifted, perhaps with each generation: Brück 1999), the location of burial was also quite mobile, with the result that no substantial cemeteries formed over time. This pattern may have been characteristic generally of late Bronze Age burial in Kent. For those sites where radiocarbon dates have been obtained from more than one cremation burial, the dates typically suggest that the burials could have been contemporaneous. An exception is the three burials at Dartford Football Club, which were distributed at distances of around 30-40m from each other.

Thus, the general pattern is for single or very small numbers of burials to be deposited at a particular location, over an apparently brief period. The number at Pinden Quarry is slightly larger than appears to have generally occurred elsewhere, and it is unusual that a later burial was made in the same area, but still, most of the burials appear to date from a quite brief period.

The wider context of the de-ritualisation of burial in the late Bronze Age

It is worth concluding by looking briefly at the possible wider relationships of this de-ritualisation of the later phases of funerary rites with other changes. It is worth repeating, however, that the Pinden burials date from the end of this process and do not, therefore, provide the most relevant evidence for its development. Furthermore, any interpretation of this process must take the wider evidence for changes in the later Bronze Age into account. A detailed treatment of these issues is beyond the scope of this discussion. The broad character of the changes occurring in these periods – such as the appearance of field systems and the more frequent representation of settlements in the archaeological record, usually characterised by the presence of roundhouses, sometimes with four-post structures, and the decline in the construction of, and burials associated with, round barrows – have been well known for some time (e.g. Bradley 1984; Yates 2007; Thomas 1997). Here, the aim
is to focus upon how changes in burial practices may have been related to these wider developments.

Funerary rituals of course involve some means of disposing of or preserving the bodies of the dead, but they may also play a role in expressing, creating or subverting the status, roles, and relations of the dead and living (Metcalf and Huntington 1979). Most immediately, however, funerary rituals are a form of conventional activity – just as today a funeral may follow a form set out in a prayer book, so too in prehistory may funerals have been directed according to conventional forms, perhaps lead by ritual specialists. It is the faithful transmission of such forms of ritual which probably produces much of the consistency in the archaeological evidence for burial. As Humphrey and Laidlaw (1994) and Bloch (2005) note, the form of rituals cannot be explained as the spontaneous result of the intentions of the actors involved. Instead, their meaning is deferred to the funerary specialists, the prayer book, or the sources of inspiration behind them (such as the ancestors). As in other rituals, the people acting out funerary rites may be unaware of the ritual’s meaning, whilst still maintaining that it is significant. The role of ritual specialists depends upon their authority and credibility in relation to the ritual.

From this perspective, a change in ritual may reflect a change in the status or credibility of funerary specialists, which in turn may have been related to wider developments. The contexts in which metalwork has been found may mark out, in two ways, some aspects of these wider changes. The first is the deposition of an increasing proportion of metalwork in the lower reaches of the Thames and its estuary (compared to other regions), suggesting broad shifts in the centres of power and of exchange networks towards that region (Yates 2007, 112-16). The second is the change in the contexts in which metalwork was deposited, away from burial contexts in the early Bronze Age to deposition in hoards and watery contexts from the middle Bronze Age onwards (Bradley 1984, 100-4). This latter shift is the most directly related to the changes in burial practices at issue here, but also partially predates it. It may nonetheless provide an index of the kinds of changes in social hierarchy and the distribution of power which contributed to a decline in the authority of the earlier forms of funerary ritual (ibid., 104). Another indication of these changes in the distribution of power in society, and in particular their movement away from certain kinds of contexts related to ritual (and funerary monuments in particular), is provided by the appearance of aggrandised enclosures containing roundhouses (Yates 2007; Bradley 1984, 120-1). The nearest examples of such sites to Pinden are the ringworks across the Thames estuary at Mucking and South Hornchurch (Yates 2007; Bond 1988; Guttmann and Last 2000), although a large circular earthwork east of Wrotham Road, Meopham, has been identified as another possible example (Allen et al. 2012, 4).

All of these disparate developments involved potentially ‘high-status’ items shifting away from ritual – and often specifically funerary – contexts, and may thus reflect or have contributed to undermining the authority of funerary ritual and any specialists who may have been involved. The underlying reasons for the change may lie in rights to land. The widespread appearance of field systems from the middle Bronze Age onwards (Yates 2007; possibly beginning in Kent in the early Bronze Age: Barclay et al. 2011) is the clearest indication of changes in the organisation of the landscape, and perhaps in systems of land tenure. There is a
striking contrast between the imposition of apparently more permanent boundaries on the landscape and the fact that, at the same time, the site chosen as the locations for burial appear to have become less fixed.

It has been suggested above that the changes from the middle Bronze Age onwards involved the disappearance of cemeteries. Burials seems thus to have no longer been used to reinforce, create or modify genealogical or other relationships in the same ways. Indeed, the inconspicuous, casual disposal of remains in the later Bronze Age suggests that not much importance was attached to the substantial remains of the dead at all. Such changes could even be seen as a deliberate attempt to remove any traces of the dead – in stark contrast to the funerary monuments of earlier periods, which made the dead an observable presence to the living. This downplaying of the dead may, initially, have been part of a deliberate attempt to subvert one form of claim to rights in land (whilst other developments were establishing claims in another way). If that were the case, it is perhaps not surprising that the process appears to have operated at differing times in differing places. Any such change is unlikely to have benefited everyone equally, and it seems likely that it would not have proceeded without a certain degree of resistance. It may be for this reason that the last dates for burials associated with barrows overlap those without such associations.

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