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A 3rd century AD cremation cemetery at Franklands Drive, near Addlestone

MICHAEL HENDERSON and ISCA HOWELL

The Middle Bronze Age pottery from Franklands Drive, Addlestone, by Jon Cotton

INTRODUCTION

An assemblage of 410 sherds of prehistoric pottery weighing 5647g was analysed. Of this, 243 sherds (2186g) were recovered during the initial evaluation conducted by Wessex Archaeology, and a further 167 sherds (3461g) during the strip/map exercise carried out by MOLA. Most of the assemblage is of Middle Bronze Age type, although a handful of small abraded sherds from the evaluation phase are more likely to belong to the later Bronze Age/Early Iron Age.

The Middle Bronze Age material was recovered from two dispersed groups of small features some 170m apart, situated to the north and south of the later Roman cremation cemetery. The later prehistoric material was widely if thinly scattered across the site and is not considered further here, although it has been incorporated in Table 2 below. Selected Middle Bronze Age vessels are catalogued and illustrated in the main text.

THE MIDDLE BRONZE AGE ASSEMBLAGE

The Middle Bronze Age assemblage comprises a minimum of just seven vessels represented by sherds of five large coarse urns and two small finer jars/bowls. The urn sherds were recovered from five separate contexts, and three pits, B[4106], A[130] and A[133], may originally have held complete or largely complete vessels. These seem to have been buried upright but were subsequently disturbed, presumably by post-medieval ploughing. Apart from a few fragments of sandstone/quartzite associated with the vessel in pit A[130], nothing further was found with them. The original arrangement of the small bossed jar or bowl from pit A[154] is uncertain due to disturbance, as is the case with small plain cup or bowl A[153], found lying on the natural ground surface, 12.3m to the north-east.

Fabrics

All of the sherds, without exception, were flint tempered, and five discrete fabric recipes could be discerned in hand specimen. Subsequent examination at x20 magnification confirmed these initial identifications, and allowed all of them to be equated with Jones fabric CALC 1 (Jones 2012, 119, table 5.1). The fabrics are defined as follows:

FLIN1: common sub-angular poorly sorted crushed burnt flint (clasts >6mm), thick-walled, hackly fracture, irregularly fired

FLIN2: sparse sub-angular crushed burnt flint (clasts <6mm), thinner-walled, hackly fracture, irregularly fired

FLIN3: common sub-angular crushed burnt flint (clasts <6mm), thinner-walled, hackly fracture, irregularly fired

FLIN4: sparse sub-angular crushed burnt flint (clasts <4mm), brittle thin-walled reduced silty matrix

FLIN5: common to frequent sub-angular crushed burnt flint (clasts <2mm), thin-walled crumbly oxidised fabric

Fabrics FLIN1–3 were utilised for the large variably coarse urns; FLIN4–5 were utilised for the smaller finer vessels. Fabric FLIN4, with its brittle reduced silty matrix, stands out from the remainder of the assemblage.

Form, surface treatment and decoration

Five of the seven vessels present in the assemblage can be characterised as large straight-sided bucket urns in variably coarse fabrics with traces of external smoothing. The three vessels from pits B[4106] (<P1>, fig 4), A[130] and A[133] (<P2>, fig 4) are each represented by substantial conjoining portions principally belonging to the base/lower wall, and presumably comprise the surviving portions of vessels originally buried right way up. With the exception of some fragments of sandstone/quartzite associated with the vessel in pit A[130] no other finds (eg cremated bone) were recorded.

Only the bucket urn from pit A[133] appears to have been decorated (<P2>, fig 4). The fingertip impressions on top of the rim, and finger impressed applied cordon at the girth fall comfortably within the standard decorative repertoire for such vessels, and can be widely paralleled, as at Oatlands Park, Walton on Thames, for example (Gardner 1924a, plate 9; vessel now in the Museum of London, ex-Corner Collection; accession no. C594). Plain rim sherds in contexts B[4105] (<P1>, fig 4) and B[4107] suggest that both of these vessels were undecorated, though that from the former context had a thickly flint-crusted base. Not enough remains of the vessel from pit A[130] to determine whether it was decorated.

The small vessel from pit A[154] (<P3>, fig 4) is a thin-walled jar or bowl with raised dimples or bosses. The bossed vessel is in a distinctive brittle silty fabric with smoothed surfaces and also appears to have had a thickly flint-crusted base; two small bosses or raised dimples are present among the surviving sherds, with a scar on a sherd suggesting the former presence of a third that has sheared off. Similar small vessels including a dimpled bowl form part of the large Middle Bronze Age domestic assemblage from Thorpe Lea Nurseries (Jones 2012, 127, fig 5.29 no. 32). A plain bowl or cup A[153] (<P4>, fig 4) in a profusely flint-tempered fabric was found on the surface of the natural ground level, 12.3m to the north-east.

Table 2 Franklands Drive, Addlestone. Summary of all prehistoric pottery (EIA = Early Iron Age; ENV = estimated number of vessels; LBA = Late Bronze Age; MBA = Middle Bronze Age; PH = prehistoric)

Site/context no	**Parent context no**	**Accession no**	**Cat no**	**No of sherds**	**Wt (g)**	**ENV**	**Date**	**Comment**
B[1610]	B[1608]	-	-	1	2	1	?LBA/EIA	thin-walled (6mm) body sherd; FLIN5; from uncertain feature seen in evaluation only
B[1901]	B[1901]	-	-	1	6	1	MBA	single flint-tempered sherd; FLIN3; from topsoil
B[4103]	B[4104]	-	-	10	34	1	MBA	shattered sherds and crumbs, traces of exterior wiping; FLIN3
B[4105]	B[4106]	-	<P1>	186	1834	1	MBA	including two plain rimsherds 10mm and 7mm thick, and six sherds of thick, flint-crusted base *c* 18mm thick, comprising the base and wall of a large, plain bucket urn, with smoothed exterior; despite its obvious size and capacity the vessel is relatively thin walled (<10mm); FLIN3
B[4107]	B[4108]	-	-	41	299	1	MBA	mainly body sherds, but including four plain rim sherds (three conjoining), of an upright bucket urn with walls 10mm thick; FLIN3
B[5004]	B[5003]	-	-	2	5	2	?LBA/EIA	two small body sherds; FLIN5 (shell and sand-tempered sherds also present)
B[6901]	B[6901]	-	-	2	6	1	?LBA/EIA	thin-walled (5mm) body sherd; FLIN5; from topsoil
A[+]	-	-	-	1	2	1	PH	single undiagnostic flint-tempered undecorated body sherd; unstratified
A[127]	A[130]	A<42>	-	50+	1393	1	MBA	multiple conjoining sherds comprising the base and lower wall of a single large flint-tempered storage jar or bucket urn; despite its obvious size and capacity, the vessel is

								relatively thin walled (<10mm); FLIN2
A[128]	A[130]	A<42>	-	crumbs	170	-	MBA	very large quantity of tiny sherds of flint-tempered pottery; FLIN2
A[131]	A[133]	-	<P2>	40	1384	1	MBA	heavily flint-tempered sherds, some large and conjoining and all apparently from one vessel: a large thick-walled (>17mm) bucket urn with finger-tip impressions on top of the rim, and a finger-tip impressed applied cordon at the girth; although fragments of rim, body and base suggest a single complete vessel, only part of it is represented by the surviving sherds; FLIN1
A[153]	A[153]	-	<P4>	11	68	1	MBA	part of a plain cup or small thin-walled (7mm) bowl with a crumbly oxidised and heavily flint-tempered fabric; FLIN5
A[155]	A[154]	-	<P3>	51	342	1	MBA	large number of small sherds belonging to a sparsely flint-tempered, brittle, reduced, thin-walled jar or bowl with smoothed surfaces and at least three external applied dimples or bosses; FLIN4
A[156]	A[154]	-	-	crumbs	54	-	MBA	small crumbs of flint-tempered pottery from brittle bossed jar/bowl in A[155]; FLIN4
A[157]	A[154]	-	-	14	48	-	MBA	small sherds of at least two flint-tempered vessels, similar to those from A[155], and presumably representing further fragments of the same vessels; the majority (11 sherds, wt 32g) belong to a plain cup/bowl in FLIN5 and the rest (3 sherds, wt 16g) include a sherd in the brittle reduced fabric that appears to comprise part of a base thickly crusted with crushed burnt flint in FLIN4

The iron nails from Franklands Drive, Addlestone, by Michael Marshall

INTRODUCTION

The iron nail assemblage totalled 891 fragments, 623 of which had heads and could be assigned to a type and 356 of which were complete or substantially complete. These were derived from Roman cremation burials or directly associated deposits. Most were only moderately well preserved, being encrusted with corrosion but with their general form and degree of completeness normally still appreciable. A small number were incredibly well preserved with almost no surface corrosion, presumably reflecting either variation in composition or micro-variation in their burial environment. These better-preserved nails seem to be of the same form/size as the other nails and provide a useful guide to the interpretation of their original appearance. Many of the nails showed signs of having been burnt and a few had adhering fragments of cremated bone. Given the corroded nature of the assemblage it was felt that it would be more appropriate to assign the nails to length categories (in 5mm increments) rather than to precisely measure each one. Length categories for bent or clenched nails are given as if they were straightened to maintain comparability.

QUANTIFICATION AND SUMMARY

The nails are quantified by burial number in the burial catalogue and presented in Figure 14 and Table 3. An estimate of minimum number of nails based on the number of identifiable heads may be more reliable than the total fragment count, which includes some very small shaft fragments but it too should be treated as an approximation; small numbers of nail heads may have been missed because they were damaged or obscured by corrosion or counted twice if they had laminated in a misleading fashion.

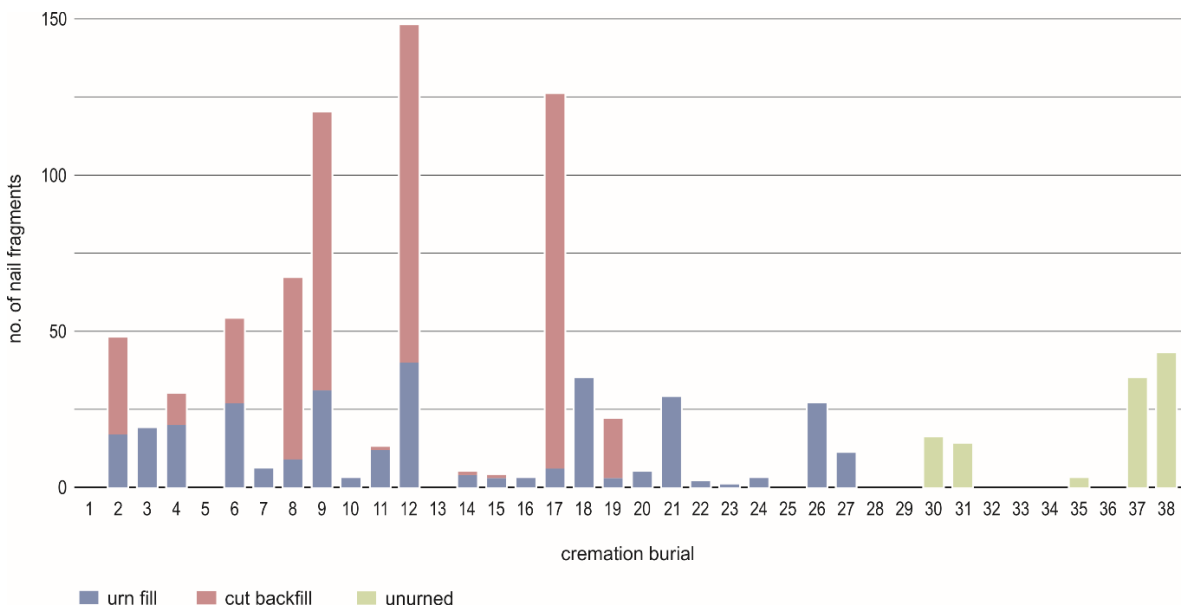

Fig 14 Franklands Drive, Addlestone. Distribution of iron nail fragments from burials. Columns for urned cremation burials are subdivided to show fragments found in the urn and fragments found in the grave backfill

Two groups were identified. Flat circular/sub-square heads were overwhelmingly the most common and were found on nails in a range of sizes, falling within the overall range of 11–75mm. These fall within Manning's type 1b (1985, 134, fig 132), the most common style

Table 3 Franklands Drive, Addlestone. Summary of iron nail fragments and estimated number of nails from burials

Burial no	**Total no of nail frags**	**Minimum no of nails (all types)**	**Minimum no of hobnails**
Late Iron Age			
Bu1	0	0	
3rd century AD			
Bu2	48	38	
Bu3	19	12	
Bu4	30	21	
Bu5	0	0	
Bu6	54	44	
Bu7	6	4	
Bu8	67	48	15
Bu9	120	87	
Bu10	3	2	
Bu11	13	6	2
Bu12	148	108	
Bu13	0	0	
Bu14	5	2	
Bu15	4	3	
Bu16	3	3	
Bu17	126	82	
Bu18	35	25	
Bu19	22	14	
Bu20	5	5	
Bu21	28	19	
Bu22	2	2	2
Bu23	1	1	
Bu24	3	3	
Bu25	0	0	

Bu26	27	16	
Bu27	11	4	
Bu28	0	0	
Bu29	0	0	
Bu30	16	11	4
Bu31	14	10	
Bu32	0	0	
Bu33	0	0	
Bu34	0	0	
Bu35	3	1	
Bu36	0	0	
Bu37	35	25	
Bu38	43	27	

of nail on most Roman sites. However, the size distribution of the complete examples at the Franklands Drive cemetery is very distinctive with a very strong concentration of small nails, perhaps better described as tacks, concentrated within the range 16–35mm. Medium sized nails (of up to 75mm) in length were much rarer and widely distributed with no obvious concentrations in any size range or particular context. Conical/facetted conical heads form the second group and these are much rarer. These nails are small hobnails, all clenched and falling within the size range 11–30mm, most falling between 16 and 25mm, which probably derive from the soles of leather shoes. The lengths of the complete nails are summarised in (table 4 and fig 15). The size of the heads and shanks of the fragmentary nails suggests that these reflect a similar range of sizes and types as the complete examples.

Table 4 Franklands Drive, Addlestone. Length distribution of measurable nails by type, n = 341

Length (mm)	0–10	11–15	16–20	21–5	26–30	31–5	36–40	41–5	46–50	51–5	56–60	61–5	66–70	71–5
Type 1b	0	5	55	109	81	35	7	5	8	6	5	1	0	1
Hobnails	0	2	10	10	1	0	0	0	0	0	0	0	0	0
Total	**0**	**7**	**65**	**119**	**82**	**35**	**7**	**5**	**8**	**6**	**5**	**1**	**0**	**1**

No clear evidence of mineral preserved wood was observed but 340 complete 1b nails were assigned to a shank condition group: 165 straight or nearly straight, 115 clenched and 40 curved. This process was quite subjective and the last group is not well defined and is not thought to be analytically useful here. While straight nails may have been either used or unused the clenched examples had definitely been used, having been hammered through a piece of wood before the tip of the shank was then bent over. They show no sign of later being extracted and the wood presumably burnt away (in the pyre) or else decayed around them without leaving mineral-preserved organic remains. The space between the back of the

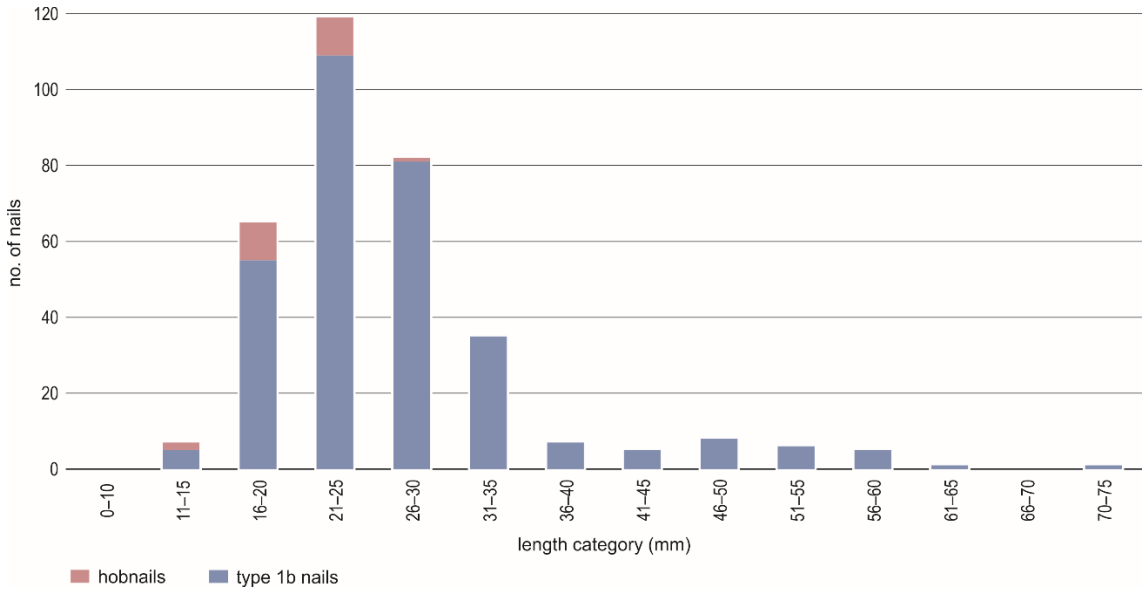

Fig 15 Franklands Drive, Addlestone. Length distribution of measurable iron nails by type, n = 341

head and the clenched tip should reflect the thickness of the wood. Given the condition of the nails and the thickness of the corrosion it was felt that it was not worth recording this systematically but there is some notable variation in some of the groups of clenched nails reflecting the use of two thicknesses of wood (see fig 9).

INTERPRETATION

The Addlestone nails are very distinctive in terms of the narrow range of types and also in the emphasis on very small types when compared to other Romano-British assemblages (fig 16). The nails can be directly associated with cremation burials and it seems likely that their distinctive character is a reflection of associated funerary practices, a suggestion supported by their similarity with the nails from urned cremations at Wallington Road, Baldock (Fitzpatrick-Matthews and Stevenson 2007), which were of comparable type and in a similar range of sizes. A very similar assemblage has been discovered, though not yet fully analysed and published, in association with an urned cremation within a circular mausoleum at Passenham Quarry, Milton Keynes that has a TPQ provided by a coin of Antoninus Pius (Hylton 2011). Mould (Cool 2004, 271–2) also describes similar patterns in the 3rd-century cremation cemetery at Brougham, Cumbria where nails were present in some quantity and again associated with predominantly urned cremations.

The hobnails, found in four cremations, are likely to derive from shoes worn by or placed with the deceased. The quantities found from individual deposits, however, are less than might be expected from even a single shoe and as such it is likely that the shoes were pyre goods, their remnants being incompletely collected from the burnt debris, rather than grave goods that decayed *in situ* (Philpott 1991, 165–5). The absence of hobnails should not therefore be taken to indicate that shoes were not present in other cremations especially as not all styles of Roman shoe require nails (van Driel Murray 2001).

The precise function of the type 1b nails is unclear. As urns are present in most instances, and as nails are found both without and within them (fig 14), they do not represent wooden containers holding the cremated remains. The medium-sized 1b nails could have played some role in the construction of the pyre, a bier or wooden objects used as pyre goods,

but in such small numbers might equally well be accidental inclusions, perhaps derived from reused timbers used as fuel.

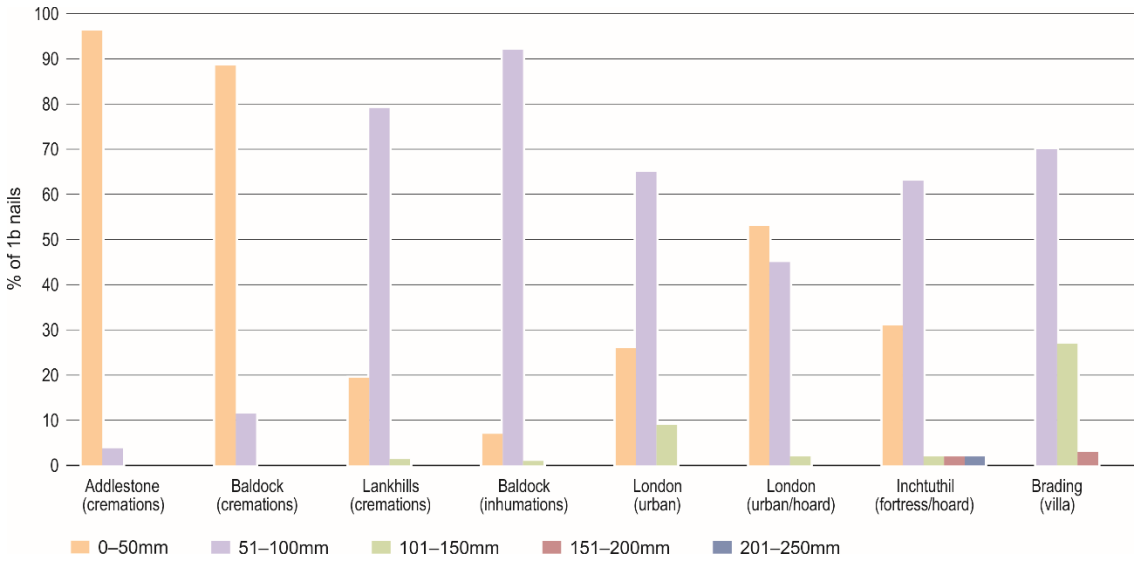

Fig 16 Franklands Drive, Addlestone. Comparison of the percentage of type 1b nails falling into different size ranges from cremation burials on the site and from selected published Romano-British nail assemblages from a variety of site types (after Rhodes 1991; Fitzpatrick-Matthews and Stevenson 2007; Powell 2010)

The smaller more numerous nails are more distinctive. The clenched examples indicate that some or all of the nails had been used but there was no sign during excavation that they represent wooden objects decayed *in situ*. The quantity is highly variable between cremations, with very small numbers found in some and when found within the urns were mixed through with the human bones. As such it seems probable that they relate to pyre furniture or pyre goods that have been burnt.

The lack of charcoal and other pyre debris indicates that these nails were deliberately collected, although perhaps not in their entirety, from among the debris along with the human remains. This suggests they were of some importance. There is no simple correlation between quantity of bone and quantity of nails in a context. In some instances they appear in quantity in the fills around the urns where there is little in the way of cremated human remains (fig 14), which implies that nails and bone were not always deposited in a uniform way after being collected.

Quita Mould (Cool 2004, 271) has suggested that the size of these nails means they must be principally decorative: ‘securing upholstery to a wooden frame, holding bone inlay in place […] or performing a decorative function in their own right’. There is no evidence for bone inlay at Addlestone or Baldock and the type of bone veneer from Brougham is actually more likely to have been inlaid or glued in place (Cool 2004, 274), but similar sized nails are indeed sometimes used to attach mounts and other fittings to boxes and furniture as at Colchester (Crummy 1983, 85–9, eg fig 90 nos 2194, 2199, 2201 etc). Mould noted several associations at Brougham with objects that could be parts of boxes or other containers (Cool 2004, 393–6). At Addlestone, however, there was no evidence for wooden objects decayed *in situ*. The sheer quantity of nails from some cremation deposits supports Mould’s suggestion that they are from objects that were upholstered or decorated with tacks. More than 1000 came from a burial at the Passenham site with more than 100 from cremation burials Bu9,

Bu12 and Bu17 at Addlestone and 97 from 'half of a cremation' at Brougham (Cool 2004, 271). These are far greater numbers than required for constructing a box.

Roman nails are under-studied and it is possible that small nails are routinely missed elsewhere but the large number of small nails here and in certain other cremation assemblages lies in contrast to their rarity on non-funerary sites and in inhumation burials and seems to indicate that this kind of nail profile is closely related to a specific cremation ritual (fig 16). The defining feature of this ritual may be the burning of an upholstered bier or another highly specific piece of wooden funerary equipment (see above). The nails might represent this burnt wooden object in a *pars pro toto* fashion. However, that nails were also chosen in their own right for use in magical and ritual purposes in the Roman world and were sometimes deliberately included as grave goods is well established (see Dungworth 1998; Alfayé 2010). They have a range of properties that could relate to a symbolic or magical function such as their sharpness, their ability to literally and symbolically fix things in place or even the jangling sound that might be made by loose groups of nails. Their purpose may have been either to protect the dead or conversely to keep them in their graves and protect the living

The burial tradition represented by the Franklands Drive, Addlestone nails seems to have been practiced during the 3rd century and perhaps earlier, and was fairly widespread geographically in Roman Britain as evidenced by similar type 1b nail assemblages described above. However, further detailed comparisons will be required to fully define its geographical and chronological spread. The well-published nails from the 4th century Roman cremations at Lankhills, Hampshire for example (Powell 2010) have a larger very different size profile (see fig 16 and fig 17), more comparable to those found in coffined inhumations and probably reflecting a different cremation tradition (perhaps emphasised by evidence for *bustum* burials at Lankhills). Until more nail assemblages from both funerary and non-funerary contexts are published in enough detail to allow comparison it will be difficult to explore these patterns further.

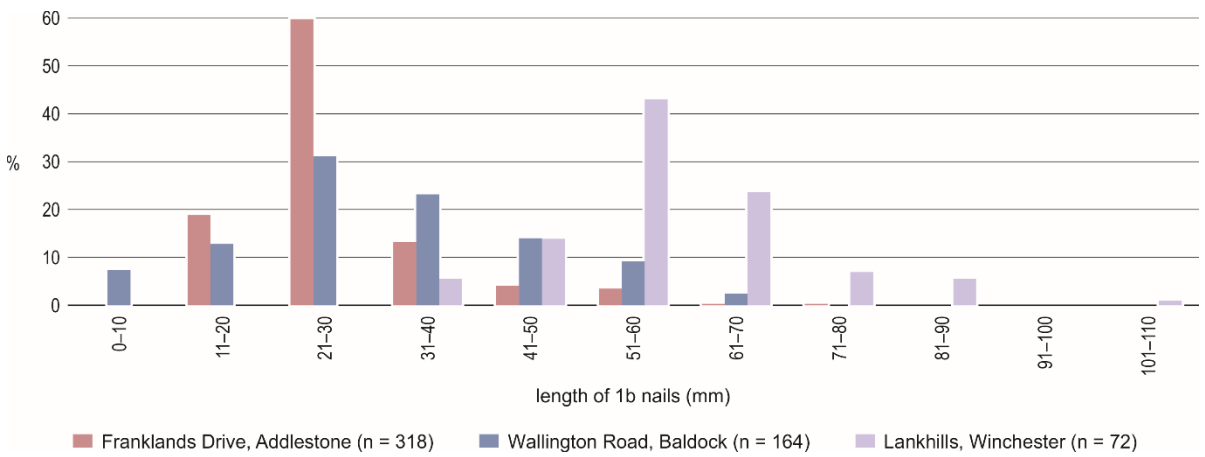

Fig 17 Franklands Drive, Addlestone. Comparison of the percentage of type 1b nails falling into different size ranges from cremation burials on the site with selected published nail assemblages from Romano-British cremation burials (after Fitzpatrick-Matthews & Stevenson 2007; Powell 2010)

The human bone from Franklands Drive, Addlestone, by Michael Henderson

INTRODUCTION

Fifty samples of cremated burnt bone were subject to full osteological analysis. A cluster of 37 individual cremation burials was identified towards the centre of the site. This included 35 excavated by MOLA in 2010 and two cremation burials excavated by Wessex archaeology in 2008–2009, one urned and one unurned (Wessex Archaeology 2009). A description of each burial can be found in the burial catalogue at the end of the printed report.

Although the Late Iron Age burial Bu1 is included in Table 5–Table 6, all statistics given here are for the 37 burials from the 3rd-century cemetery only.

METHODS

All contexts containing cremated bone underwent a process of wet sieving and sorting leaving only burnt bone deposits remaining. All subsequent analysis was conducted in accordance with established guidelines and standards (McKinley 2004a; Powers 2014).

Nine intact cremation vessels underwent excavation under laboratory conditions in a series equal spits. Each spit was then analysed separately and overall weights calculated.

Each context of burnt bone was passed through three sieve fractions with mesh measurements: 10mm, 5mm and 2mm. The total weight of burnt bone was calculated from the combined weights of each three fractions. The weight of each sieved fraction was calculated as a percentage of the total bone weight. Identifiable bone fragments were separated by skeletal area (skull, axial, upper and lower limb). The weight of bone from each skeletal area was recorded and the total weight of identifiable bone calculated from these combined weights. The weight of each skeletal area was then calculated as a percentage of the total weight of identifiable bone.

The maximum dimension of the largest bone fragment present in each context was recorded and the average fragment size estimated to the nearest 5mm.

Observations of bone preservation and fracturing patterns were noted and the percentage of colour changes within the categories: white/off white, light blue/grey, dark blue/grey and charred black estimated.

The demographic attributes of age and sex for each context were estimated when appropriate skeletal elements were present. Adult sex was determined through observations of cranial and pelvic morphology following Buikstra and Ubelaker (1994). Age at death estimates were based on observations of the auricular surface (Lovejoy *et al* 1985), epiphyseal fusion (Scheuer & Black 2000) and dental development (Gustafson & Koch 1974). The minimum number of individuals (MNI) present in each context was estimated based on the presence of repeated elements or mixed male/female, adult/subadult bone. Evidence of pathological bone changes or dental disease was recorded following Connell and Rauxloh (2007).

Any pyre debris or other intrusive elements were recorded. All data was recorded onto an Excel spreadsheet with all weights given in grams (g) and all measurements recorded in millimetres (mm).

DEMOGRAPHY

The majority of burials comprised the cremated remains of a single individual. It was possible to determine the biological sex of seven adults (7/37: 18.9%): one male (Bu4), three probable males (Bu14, Bu18 and Bu21), one female (Bu8) and two probable females (Bu6 and Bu16). In all cases these individuals were contained within a cremation urn, reflecting the better preservation and survival of elements offered by the vessel.

Sufficient diagnostic bone features survived to allow for the identification of 28 adults aged ≥18 years old (28/37: 75.7%). Observable teeth were present in nine cremation burials (8/37: 21.6%). However, ageing from dental wear was limited due to the shattering of the tooth crowns following rapid expansion in the heat of the pyre (McKinley 1989, 69). Surviving fragments of auricular surface allowed more refined age estimates for adult female Bu8 (36–45 years old) and adult Bu9 (26–35 years old).

Two urned burials contained only subadult remains (2/37: 5.4%). Immature skeletal elements from Bu19 included an unfused humeral epiphysis (elbow joint) from an individual aged <12 years. An unfused femoral metaphysis and incomplete right maxillary first molar crown from Bu24) suggested an age of 1–4 years.

Urned burials (Bu2, Bu17 and Bu18) contained evidence of intermixing and the repeated skeletal elements from multiple individuals. This suggested the cremated remains of two or more individuals placed within the same vessel. In all three burials this represented fragments of immature bone mixed with predominantly adult remains. Fragments of a subadult axis (cervical vertebrae) and unfused clavicle (collar bone) were found in Bu2 along with a quantity of animal bone. Burial Bu17 contained a subadult right zygomatic (cheek bone), and adult male remains from Bu18 were mixed with subadult cranial fragments.

PATHOLOGY

The incomplete and fragmentary nature of the majority of cremation burials hindered observations and diagnosis of pathological bone changes. Adult (Bu12) had new bone growth (osteophytes) at the margins of several vertebral bodies indicative of degenerative spinal joint disease. This may have resulted from increased stresses placed on the spine, possibly the result of activity from a young age (Rogers & Waldron 1995). Adult (Bu13) had a spur of bone at the joint margin of an interproximal phalanx (finger), possibly related to joint disease or injury. Fragments of subadult orbit (eye socket) from Bu2 had pitted bone lesions diagnostic of cribra orbitalia (Roberts & Manchester 2005, 75).

PYRE TECHNOLOGY

Oxidation

A variety of factors including the duration of the cremation process, the extent of heat exposure, the amount of soft tissue coverage, the position of the body on the pyre and oxygen supply can all affect whether burnt bone is fully oxidised or not fully cremated (McKinley 2000a, 404–5). The colour of the burnt bone can reflect the efficiency of the cremation process.

The majority of burnt bone within each burial was consistent with pyre temperatures reaching over 600°C and resulting in highly oxidised and calcined remains (Holden *et al* 1995a & b). Twelve burials comprised fully calcined, white/off white coloured bone (12/37: 32.4%). Dark blue/grey bone was present in over half of the burials (19/37: 51.4%) and light blue/grey bone was observed in 45.9% of contexts (17/37) (Table 5). Variations in colour were frequently observed on the inner medullary surfaces of long bone fragments. This may indicate bones that remained intact on the pyre for longer periods of time with the outer cortical surfaces exposed to greater intensities of heat.

The greatest degree of colour variation was recorded in dual cremation burial (Bu2). There was a notable difference between the colours of the lower and upper body elements of Bu22. Black charring of bone surfaces was present in 32.4% of burials (12/37) and in all cases made up only 5% of the total bone in each context. This was often recorded in the bones of the hands and feet, and may indicate elements at the extremities of the pyre or bone

Table 5 Franklands Drive, Addlestone. Colour and fragmentation patterns of burnt human bone from burials

Burial no	**Site/Context no**	**Colour**	**Fragmentation**
Late Iron Age			
Bu1	A[5]	100% off-white	transverse and spiral cracking
3rd century AD			
Bu2	A[85]	80% off-white, 10% light blue/grey, 5% dark blue/grey, 5% charred black	transverse spiral cracking, crescent shapes, warping
Bu3	A[36]	85% off-white 5% light blue/grey, 10% dark blue/grey	transverse and spiral cracking, crescent shapes, warping
Bu4	B[3406]	90% off-white 5% dark blue/grey, 5% charred black	transverse cracking
Bu5	A[16]	85% off-white 5% light blue/grey, 5% dark blue/grey, 5% charred black	transverse and spiral cracking
Bu6	A[64]	95% off-white, 5% dark blue/grey	transverse and spiral cracking, crescent shapes, warping
Bu7	A[101]	85% off-white 5% light blue/grey, 5% dark blue/grey, 5% charred black	transverse cracking, warping, crescent shapes
Bu8	A[80]	90% off-white 5% light blue/grey 5% dark blue/grey	transverse cracking, crescent shapes, warping
Bu9	A[121]	85% off-white 5% light blue/grey, 5% dark blue/grey, 5% charred black	transverse and spiral cracking, crescent shapes
Bu10	A[52]	90% off-white, 10% dark blue/grey	transverse and spiral cracking, crescent shapes
Bu11	A[32]	90% off-white 5% light blue/grey, 5% dark blue/grey	transverse cracking and warping
Bu12	A[109]	90% off-white 5% light blue/grey, 5% dark blue/grey	transverse cracking, warping
Bu13	A[10]	85% off-white, 10% light blue/grey, 5% charred black	transverse and spiral cracking, crescent shapes, warping

Bu14	A[60]	90% off-white 10% dark blue/grey	transverse and spiral cracking, crescent shapes, warping
Bu15	A[72]	95% off-white, 5% dark blue/grey	transverse cracking, warping
Bu16	A[113]	85% off-white 5% light blue/grey, 5% dark blue/grey, 5% charred black	transverse cracking, warping, crescent shapes
Bu17	A[147]	90% off-white, 5% light blue/grey, 5% charred black	transverse cracking, warping, crescent shapes
Bu18	A[117]	100% off-white	transverse cracking, warping, crescent shapes
Bu19	A[68]	90% off-white, 5% dark blue/grey, 5% charred black	transverse cracking, warping
Bu20	A[89]	90% off-white, 5% light blue/grey, 5% charred black	transverse cracking, warping
Bu21	A[12]	90% off-white, 5% light blue/grey, 5% charred black	transverse and spiral cracking, crescent shapes, warping
Bu22	A[26]	85% off-white 5% light blue/grey, 5% dark blue/grey, 5% charred black	transverse and spiral cracks, some warping
Bu23	A[105]	90% off-white 5% light blue/grey, 5% dark blue/grey	transverse cracking, warping, crescent shapes
Bu24	A[76]	95% off-white 5% light blue grey,	transverse cracking, warping, curling of skull frags
Bu25	A[151]	100% off-white	transverse cracking, warping
Bu26	A[40]	100% off-white	transverse and spiral cracking
Bu27	A[95]	100% off-white	transverse cracking
Bu28	A[56]	95% off-white, 5% dark blue/grey	transverse cracking
Bu29	A[20]	95% off white, 5% dark blue/grey	transverse cracking
Bu30	A[47]	100% off-white	transverse and spiral crackling, warping
Bu31	A[43]	100% off-white	transverse cracking
Bu32	A[1]	100% off-white	transverse and spiral cracking, crescent

			shapes
Bu33	A[23]	100% off-white	transverse cracking
Bu34	B[1611]	95 % off-white 5 % light blue/grey	transverse cracking, warping
Bu35	A[49]	100% off-white	transverse cracking
Bu36	A[29]	100% off-white	transverse cracking
Bu37	A[98]	100% off-white	transverse cracking
Bu38	A[45]	100% off-white	warping

burning at a lower temperature (200–300°C). Adult male burial (Bu4) had widespread charring to the internal aspects of the lower limb bones.

Total bone weights for burial

A total weight of 10781g of burnt bone was recovered at excavation. Each burial contained less than 1kg of burnt bone with an overall weight range of 2.6g to 907.8g (Table 6). This was much less than the minimum bone weight of 1600–2000g expected from the cremation of a modern adult (McKinley 2000b, 40). The greatest weights were recovered from urned contexts and only four burials (Bu2 , Bu3, Bu4 and Bu9) contained over 500g of burnt bone.

Nine burials consisted of less than 100g of burnt bone and three unurned contexts (Bu36, Bu37 and Bu38) contained less than 10g. These small deposits may reflect the truncation and dispersal of burnt bone from burials nearby.

Fragmentation and dehydration

Full oxidation and dehydration of the organic components of the bone can result in shrinkage, fissuring and warping. The distinctive pattern of these changes is determined by the shape, size and density of the individual bone elements (McKinley 2000a, 405; 1994, 339). Transverse cracking (36/37: 97.3%), warping (19/37: 51.4%), spiral cracking (13/37: 35.1%) and crescent-shaped fragments 40.5% (15/37) were all observed (Table 5). Smaller elements of the hands and feet and vertebral bodies often remained more intact.

The largest fragment sizes ranged from 18.4 to 73.4mm with an average fragment size within each burial measuring 25mm. Larger fragment sizes were recorded from the urned burials that would have protected the bone from increased breakage and helped prevent soil infiltration and further bone degradation (McKinley 1994, 342). Fragment sizes from urned burials ranged from 29.4 to 73.4mm (average 15mm) compared to unurned fragment sizes with a range of 18.4 to 63.7 (average 10mm).

The percentage of burnt bone that fell within each sieve fraction ranged from >10mm: 11.2–67.5%, >4mm: 27.8–84.3% and >2mm: 1.4–35.3%. The majority of burnt bone in each burial fell within the >4mm fraction (33/37: 89.2%) and two burials (Bu27 and Bu31) had over 80% of bone in this sieve. Urned burials (Bu2, Bu8 and Bu21) had over 50% of the total bone weight in the >10mm fraction and all with less than 10% of bone in the >2mm fraction (fig 18).

Table 6 Franklands Drive, Addlestone. Total weight and fragmentation of burnt bone from burials and distribution of identifiable bone by body area

Burial no		**Largest fragment (mm)**	**Total wt (g)**	**>10 mm (g)**	**>4 mm (g)**	**>2 mm (g)**	**Total wt of identifiable bone (g)**	**Skull (g)**	**Axial (g)**	**Upper limb (g)**	**Lower limb (g)**
	Late Iron Age										
Bu1		63.7	124.0	40.0	81.1	2.9	1.1	1.1	-	-	-
	3rd century AD										
Bu2		56.3	907.8	494.9	357.2	55.7	476.1	111.5	83.9	117.2	163.5
Bu3		58.7	618.8	223.5	324.5	70.8	180.6	27.4	20.1	77.5	55.6
Bu4		59.7	501.2	234.1	260.2	6.9	232.5	40.0	15.8	66.1	110.6
Bu5		53.4	495.8	179.0	282.8	34.0	141.4	8.7	2.6	39.9	90.2
Bu6		53.2	495.0	216.3	245.1	33.6	219.7	49.7	42.9	74.8	52.3
Bu7		42.7	494.2	223.4	240.9	29.9	144.1	31.6	-	28.4	84.1
Bu8		73.4	496.1	335.0	137.9	23.2	338.0	62.6	71.9	84.1	119.4
Bu9		63.7	510.8	237.0	254.5	19.3	309.5	34.2	61.3	95.7	118.3
Bu10		57.2.	479.9	220.7	247.8	11.4	173.3	26.6	21.5	64.4	60.8
Bu11		50.5	462.5	170.2	280.0	12.3	196.1	40.1	24.3	57.4	74.3
Bu12		42.6	434.0	177.3	231.6	25.1	184.4	17.7	28.8	29.3	108.6
Bu13		44.5	411.8	196.7	201.4	13.7	179.6	48.2	19.9	69.2	42.3
Bu14		35.5	411.8	137.8	240.1	33.9	106.5	48.3	12.5	23.8	21.9
Bu15		35.8	422.9	110.6	264.4	47.9	101.3	7.1	22.5	41.9	29.8
Bu16		63.1	312.5	125.7	174.1	12.7	82.7	40.8	9.2	21.3	11.4
Bu17		37.9	308.3	96.7	175.0	36.6	91.0	24.1	5.2	19.4	42.3

Bu18		36.1	298.4	93.2	180.9	24.3	135.6	38.3	1.6	39.4	56.3
Bu19		50.3	290.0	125.9	143.1	21.0	150.2	62.1	12.3	64.4	11.4
Bu20		45.0	256.6	62.9	164.8	28.9	74.1	28.1	3.5	16.7	25.8
Bu21		52.0	249.4	126.9	102.3	20.2	107.8	46.0	14.0	12.2	35.6
Bu22		43.2	227.9	59.0	163.6	5.3	88.1	23.4	10.7	39.2	14.8
Bu23		41.0	209.5	44.2	149.9	15.4	30.0	7.8	2.6	15.0	4.6
Bu24		39.6	177.2	84.4	79.1	13.7	112.8	68.0	20.6	14.3	9.9
Bu25		30.3	147.3	36.1	104.4	6.8	33.8	4.6	0.9	17.9	10.4
Bu26		42.3	140.9	36.6	96.4	7.9	55.0	23.3	-	15.1	16.6
Bu27		29.4	136.5	15.3	115.1	6.1	19.2	6.4	-	12.8	-
Bu28		39.2	35.2	4.6	26.7	3.9	9.0	-	-	5.4	3.6
Bu29		30.0	31.9	5.7	22.1	4.1	4.3	3.8	0.1	0.4	-
Bu30		47.7	260.7	51.3	177.6	31.8	83.7	38.4	3.9	26.0	15.4
Bu31		25.1	129.9	18.7	105.3	5.9	34.1	5.8	1.0	11.4	15.9
Bu32		38.0	93.6	28.5	61.6	3.5	17.4	-	-	4.9	12.5
Bu33		22.8	90.2	10.4	61.2	18.6	5.6	2.0	-	3.0	0.6
Bu34		36.6	78.3	24.5	52.4	1.4	26.8	5.4	0.8	10.0	10.6
Bu35		20.1	22.3	4.3	14.4	3.6	10.7	4.7	-	3.4	2.6
Bu36		19.2	8.4	1.9	5.5	1.0	1.8	0.5	-	1.3	-
Bu37		22.8	6.8	1.6	2.8	2.4	1.3	-	-	-	1.3
Bu38		18.4	2.6	0.6	1.1	0.9	0.7	-	-	-	0.7

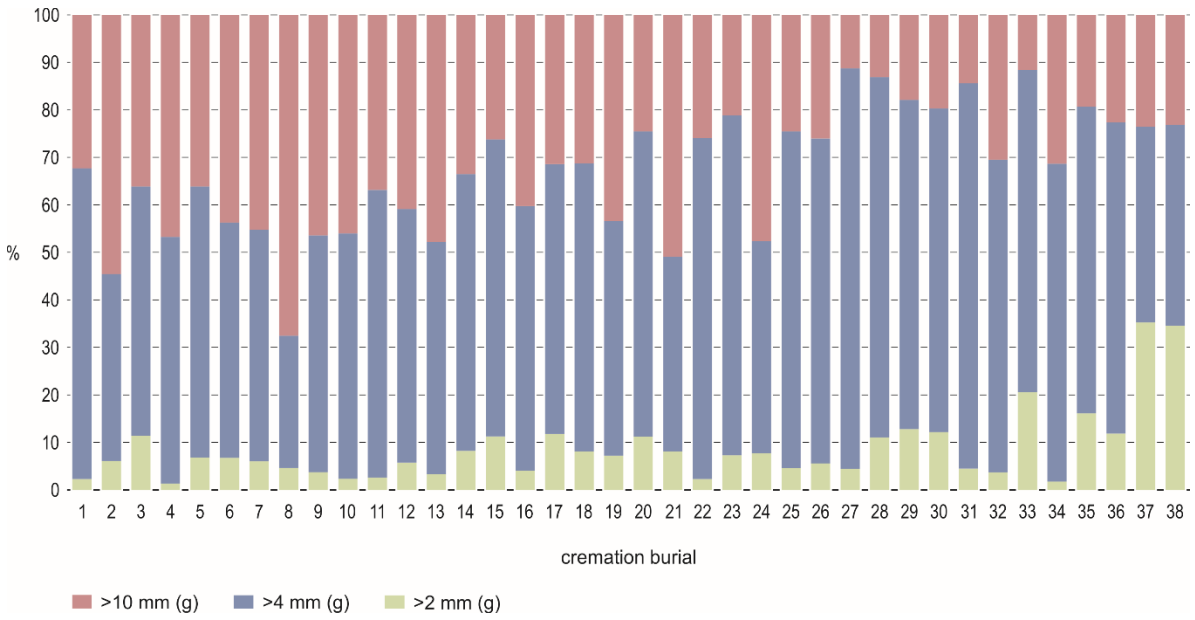

Fig 18 Franklands Drive, Addlestone. Bone fractions as a percentage of total weight of bone

Nine burials contained burnt bone from both a vessel and the backfill of a cut for vessel. In each case the burnt bone from the pit fill was more highly fragmented, with fewer identifiable elements and of a much lower weight than the bone protected within in the urn.

Identifiable bone fragments

The majority of bone was found in a moderately well preserved condition. There was a high survival of outer cortical surfaces, inner spongy trabecular and subchondral (joint surfaces) bone. Limited evidence of weathering or erosion suggested that the bone was interred shortly after burial and not left exposed on the pyre.

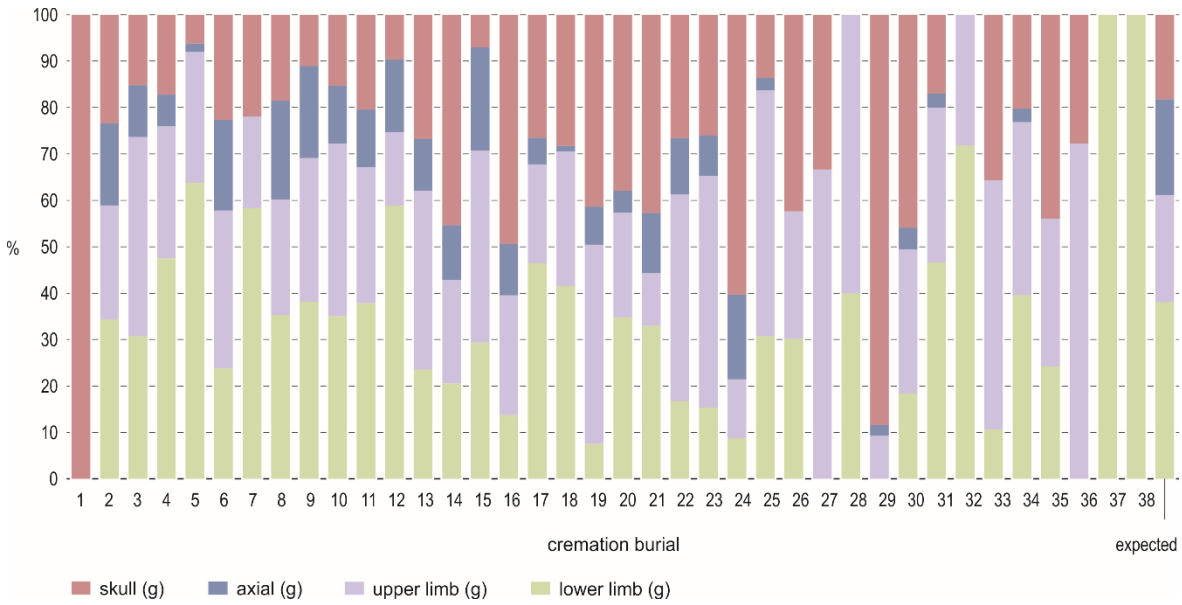

Fig 19 Franklands Drive, Addlestone. Percentage of identifiable bone by weight

The percentage of identifiable bone fragments for each burial ranged from 0.9 to 68.1%. One unurned burials (Bu33) contained less than 10% identifiable fragments (1/37: 2.7%). The greatest percentages of identified bone were found in the urned burials. Five contained over 50% identified bone (5/37: 13.5%): Bu2 (52%), Bu8 (68.1%) and Bu9 (60.6%), Bu19 (51.8%) and Bu24 (63.7%).

The expected percentage weights of anatomical areas from a complete skeleton are estimated as 18.2% (skull), 20.6% (axial), 23.1% (upper limb) and 38.1% (lower limb) (McKinley 1994). Identifiable body elements ranged from 0.0 to 22.0% (axial), 0.0 to 72.0% (upper limb) 0.0 to 100% (lower limb) and 0.0 to 100% (skull). The majority of the identified bone comprised cranial and lower limb fragments reflecting the more obvious morphology and markings of these elements (McKinley 2000a, 415). Four burials contained no skull fragments (4/37: 10.8%). There was an overall under-representation of vertebral and rib elements with nine burials (9/37: 24.3%) containing no fragments from the axial skeleton (fig 19).

There was no evidence for the deliberate collection or selection of skeletal elements or body areas for burial. Excavation of the nine intact cremation vessels showed the bone to be well distributed throughout, with no order to the placement of bone in the urn. The survival of several large elements and broken fragments that could be rejoined suggested that many bones retained a degree of completeness during the cremation process.