Kentish Sites and Sites of Kent

A miscellany of four archaeological excavations

Human bone from the route of the Weatherlees – Margate – Broadstairs wastewater pipeline

by Jacqueline I. McKinley

Archaeological sites along the Weatherlees – Margate – Broadstairs wastewater pipeline route, arranged from north to south (= Table 2.1)

Ref. in this report	Fieldwork Area Codes	NGR	Site/features	Date	Civil parish
Foreness Point	**1–D**	638400 171400	World War II defences	Modern	Margate
Kingsgate	**D**	639277 171006	Flint	Mixed, (discussed in Bronze Age chapter)	Broadstairs and St Peter's
Broadley Road	**3**	637697 169796	Mortuary enclosure (and ring-ditch)	Neolithic (and Bronze Age)	Margate (Northdown)
Star Lane	**8**	636007 167857	Bakery - Sunken Featured Building	Early Medieval (12th-13th century)	Manston
	8	636073 167915	Vessel 'burial' – mortuary-related?	Late Bronze Age	Manston
Coldswood Road	**9**	635585 166828	Casket cremation cemetery	Late Iron Age to early Romano-British	Manston
Cottington Road	**14**	634011 164328	Dual-rite cemetery	Romano-British	Minster
	14	633997 164324	Saxon sunken-featured building	Anglo-Saxon	Minster
	14	634072 164367	Pits	Neolithic	Minster
Cottington Hill	**15**	633845 164106	Inhumation graves	Romano-British	Minster
	15	633851 163986	Ditch terminus burial	Anglo-Saxon	Minster
Ebbsfleet Lane	**16**	633372 163331	Ditches and burials	Late Iron Age to early Romano-British	Minster
Weatherlees WTW (Ebbsfleet Lane)	**Compound 16**	633325 163082 633334 163088	Ditches and burials	Late Iron Age to early Romano-British	Minster (Marshes)
	Compound 16	633360 162976	'Midden deposit'	Late Bronze Age	Minster (Marshes)
	Compound 16	633360 162976	Ebbsfleet hoards	Late Bronze Age	Minster (Marshes)

Concordance of context numbers to fieldwork area codes and fieldwork area codes to context numbers

Context numbers	Fieldwork area code	Area	Context numbers
1000 – 1926	16	1-2	7600 – 7609
2000 – 2021	Manston Airport	3	7000 – 7115
3000 – 3767	Compound 16	3	7139 – 7145
5000 – 5340	15	3	7160 – 7166
6000 – 6438	14	3	7173 – 7175
7000 – 7115	3	3	7189 – 7193
7116 – 7138	7	3	7427 – 7462
7139 – 7145	3	7	7116 – 7138
7146 – 7159	7	7	7146 – 7159
7160 – 7166	3	7	7167 – 7172
7167 – 7172	7	7	7182
7173 – 7175	3	7	7463 – 7478
7176 – 7181	8	8	7176 – 7181
7182	7	8	7183 – 7188
7183 – 7188	8	8	7194 – 7426
7189 – 7193	3	8	7479 – 7539
7194 – 7426	8	9	8000 – 8479
7427 – 7462	3	Manston Airport	2000 – 2021
7463 – 7478	7	14	6000 – 6438
7479 – 7539	8	15	5000 – 5340
7600 – 7609	1-2	16 (car park)	8700 – 8769
7700 – 7946	1-D	16	1000 – 1926
8000 – 8479	9	Compound 16	3000 – 3767
8500 – 8630	D	Compound 16 (final bit)	8900 – 8915
8700 – 8769	16 (car park)	1-D	7700 – 7946
8861 – 8899	Joss Bay	D	8500 – 8630
8900 – 8915	Compound 16 (final bit)	Joss Bay	8861 – 8899
8920 – 8923	Joss Bay	Joss Bay	8920 – 8923

Human Bone from the route of the Weatherlees – Margate – Broadstairs wastewater pipeline

Jacqueline I. McKinley
incorporating data on the unburnt bone recorded and collated by Kirsten Egging Dinwiddy

Introduction

Human remains – cremated and unburnt – were recovered from six areas, most situated towards the southern end of the pipeline route; including (from south to north) Ebbsfleet Lane, Weatherlees WTW and Cottington Hill (all unburnt bone), Cottington Road (mixed rite), Coldswood Road (cremated bone) and Broadley Road (heat-altered bone: Plate 2; Tables HB1 and HB2). The majority of 67 contexts containing human bone (34 cremated, 31 unburnt bone and two heat-altered) were dated to the Late Iron Age/Romano-British phases (34 with cremated bone and 25 with unburnt), with two Late Bronze Age deposits (heat-altered bone), four Middle/Late Iron Age and two Middle Saxon (unburnt bone).

The Late Bronze Age material (Broadley Road) was redeposited, in the locality of a Neolithic monument overlain by a Early/Middle Bronze Age barrow. The Middle/Late Iron Age bone was all redeposited in a boundary ditch fill (Ebbsfleet Lane). The Late Iron Age/Early Romano-British assemblage (13 contexts, unburnt bone; Ebbsfleet Lane, Weatherlees and Cottington Hill) included the remains of seven *in situ* inhumation burials forming a small group and singletons. The rest of the material comprised disarticulated redeposited bone from various ditch fills.

The small, 1st century Romano-British cremation cemetery at Coldswood Road (13 contexts) included the remains of seven unurned cremation burials, a minimum of two probably made in caskets. Other contexts included one deposit of redeposited pyre debris from a grave fill and material from grave fills probably derived from the related burials. The small, mixed rite Romano-British cemetery at Cottington Road included 21 cremation-related deposits and 12 deposits of unburnt bone. The former comprised the remains of a minimum of seven, 2nd century urned burials (five made in amphora), one redeposited ?urned burial, one possible cenotaph, one possible token deposit made within an inhumation grave and four grave fills containing redeposited pyre debris. Other contexts comprised redeposited material from a variety of feature types. The unburnt bone was recovered from the remains of 11 *in situ* burials (mostly made coffined); the remaining context representing redeposited bone from a grave fill. Most are likely to be mid 2nd to 4th century in date.

The Middle Saxon (radiocarbon dated) bone from Cottington Hill represents the remains of an inhumation burial and redeposited bone from the grave fill.

Methods

Osteological analysis of the cremated bone followed the writer's standard procedure (McKinley 1994a, 5-21; 2004a). Fifteen of the cremation-related contexts had been excavated as sub-contexts (two to 15; spits and/or quadrants/blocks) to enable details of their formation processes to be analysed. These divisions were maintained throughout analysis, though only the data for the overall context in each case is presented in Table HB1.

The degree of erosion to the unburnt bone was recorded using the writer's system of grading (McKinley 2004b, fig. 7.1-7). Age (cremated and unburnt bone) was assessed from the stage of tooth and skeletal development (Beek 1983; Scheuer and Black 2000), and the patterns and degree of age-related changes to the bone (Buikstra and Ubelaker 1994). Sex was ascertained from the sexually dimorphic traits of the skeleton (Bass 1987; Buikstra and Ubelaker 1994). Measurements were taken of the unburnt bone (Brothwell and Zakrzewski 2004) and skeletal indices calculated where possible (Trotter and Gleser 1952, 1958; Bass 1987). Non-metric traits were recorded in accordance with Berry and Berry (1967) and Finnegan (1978).

Results

A summary of the results is presented in Tables HB1 (cremated bone) and HB2 (unburnt bone); full details are held in the archive.

Disturbance and condition

Although some of the cremation graves had been truncated, many of the burial remains had survived undisturbed or only slightly so (Table HB1). There was some variation between the two sites from which the material derived. The graves at Coldswood Road were generally slightly shallower than those from Cottington Road, with a range of surviving depths from 0.07m to 0.38m, most being over 0.20m deep, compared with a range of 0.17-0.28m and all except one being over 0.20m. The difference between the two sites in the form of burial, unurned at Coldswood Road and urned at Cottington Road, and the resultant depth to which the remains of the burials extended above the base of the graves (lower in the former), meant that five of the seven unurned burials were totally undisturbed (Figs 34–38; Table HB1). Only one of the urned burials was fully intact, but a further five were largely so; in many cases the amphora in which the burials had been made had sagged outwards post-depositionally and collapsed (demonstrating the grave fill was not packed around the vessel on backfilling). It is highly unlikely that bone was lost from any of the graves as a result of disturbance. The single exception is the possible grave 6025, in which body sherds from a vessel lay in disarray with a few fragments of bone scattered through the fill. If this was a grave, the vessel and contents appear to have been remove and smashed before parts were returned. The recovery of some redeposited bone and other archaeological components in the fills of one inhumation grave and one pit suggest the disturbance and redeposition of at least one other cremation burial (lack of fuel ash suggests this material was not redeposited pyre debris).

A substantial proportion of the cremated bone is slightly worn and chalky in appearance, indicative of the acidic (brickearth) burial environment. The bone from the unurned burials, which were not afforded the protection offered by a ceramic vessel, were more extensively affected than the urned remains (*c*. 75% of deposits compared with *c.* 38%). Trabecular bone – articular surfaces, vertebral bodies, pelvic bones – is generally the first to be lost in acidic soil conditions, often crumbling away on being moved even if present at the time of discovery (McKinley 1997a, 245; Nielsen-Marsh *et al* 2000). Some trabecular bone was recovered from *c*. 45% of the deposits, mostly from the unurned burials, but the quantities were often small and the greatest quantities per burial were from the urned deposits. It is probably that some trabecular bone has been lost from many of the cremation burials as a result of poor preservation.

The surviving depths of the Late Iron Age/Romano-British inhumation graves varied between sites. The shallowest graves were recorded at Cottington Hill (0.19-0.30m, the immature grave having the least depth). The broadest range and greatest depth was seen at Cottington Road; 0.35-1.14m, the average depth of the adult graves being substantially greater that that of the immature individuals (0.91m compared with 0.54m). The graves at Ebbsfleet Lane and Weatherlees averaged 0.55m in depth. Intercutting between graves was limited to a single incidence at Cottington Road where grave 6093 cut the tip of grave 6049 (but not the remains of the burial). Further evidence of disturbance at the site lay in the recovery of complete elements and fragments of redeposited bone from two individuals from around the coffin in grave 6214; the remains did not derive from any of the excavated graves. Disturbance by later features was also relatively rare, with a single instance from Cottington Hill where the remains in grave 5166 were severely truncated at either end leaving only partial femora *in situ*, the other skeletal elements being recovered from the disturbed backfill. Grave 1931, cut into the western edge of boundary ditch 1028 (part of ditch 1892), had been adversely affected by the frequent water-logging and flooding associated with this feature, which lay adjacent to the Ebbsfleet. The grave fill appears to have partially slumped into the ditch, leaving the semi-articulated remains of the torso and right upper limb within the grave (not illustrated, but see location of grave in ditch in Fig. 2.19); some of the eroded remains were recovered redeposited within the ditch fill.

The grave cut (5350) for the Middle Saxon burial at Cottington Hill was not clear in excavation, having been made through the deep homogenous lower fill (*c*. 0.85m) of ditch 5143. The burial remains had been slightly disturbed by a re-cut to the ditch, some of the redeposited material being recovered from elsewhere within the ditch fill.

The condition of the bone from the inhumation burials – mostly made in graves cut through and backfilled with brickearth - is generally poor, most scoring grade 4-5 (degraded), though there is considerable variation within some individual deposits. There is some geographic variability, the remains from Ebbsfleet Lane and Weatherlees being in slightly better condition than that from elsewhere, probably due to the more varied and slightly organic burial matrix in these graves. The bone from graves in Cottington Road is consistently the least well preserved. The remains from grave 1931 at Ebbsfleet Lane shows longitudinally splitting and cortical flaking, probably reflective of the frequent waterlogging and drying of the burial environment in this location (see above). There is little indication that the date of a deposit was a factor in bone preservation but there is some suggestion that grave depth – at least at Cottington Road – may have been, the best preserved burials being in the deeper graves (0.93 and 1.14m deep). Poor bone preservation is the primary factor in the levels of skeletal recovery from the graves (Table HB2), with less than 50% of the skeleton being recovered from most (53%) and more than 90% from only three (17.6%). As is often observed, trabecular bone was commonly subject to preferential loss.

The redeposited bone – mostly comprising bone fragments with a few complete skeletal elements from some contexts - generally tends to be in a better state of preservation than that from the graves; *c*. 63% scoring grade 0-3. This is, once again, generally reflective of the more varied burial environments from which they derived. The Late Bronze Age material is heavily fragmented (the Bronze Age monument with which it was associated had been ploughed-out) and relatively poorly preserved, and may have been subject to more than one episode of manipulation and redeposition. Much of this bone is stained and has apparently been subject to low temperature burning (<600 degrees C) as dry bone. The skeletal elements recovered, fragments of upper and lower limb bones, are not those generally associated with selection for deliberate human manipulation (commonly skull and femur). Some of the Middle/Late Iron Age redeposited material had been subject to both human and animal manipulation. A small section of distal femur shaft was recovered from the upper fill of ditch 1127 (part of ditch 1384) at Ebbsfleet Lane. The section had clearly been cut (transversely) from the rest of the bone (Fig. HB1); the proximal end exhibits multiple striations consistent with the use of a sharp implement cutting around the shaft until the end could be broken off. The entire surface is lightly abraded and polished, most likely as a result of frequent handling rather than deliberate polishing. The bone had clearly been subject to canid gnawing prior to these changes. This suggests that either the bone had been disturbed from a grave and left exposed, or that excarnation was the mortuary rite used for disposal of the corpse, involving either direct exposure or initial burial in a shallow grave. It is widely agreed that at least part of the normal rite of disposal of the dead in the Iron Age was by excarnation (Cunliffe 1992). Whether the segment from ditch 1127 was know to have derived from a human femur and its subsequent manipulation of specific votive significance, or the fragment was found and worked in the belief it comprised animal remains, is inconclusive. The best preserved of the redeposited bone was a fragmented frontal (1088) from the base of ditch 1208. There is some suggestion that this may represent a deliberate placement.

Demographic Data

A minimum of 24 individuals were identified within the unburnt bone assemblage, the majority (54%) deriving from the Romano-British mixed-rite cemetery at Cottington Road (Tables HB2 and HB3). The cremated bone assemblage includes the remains of a minimum of 19, possibly 20 Romano-British individuals; seven from the 1st century cemetery at Coldswood Road and 12/?13 from the 2nd–4th century (cremation burials 2nd century) cemetery at Cottington Road (Table HB1).

The original location and form of mortuary deposition of the minimum of one individual represented within the small Late Bronze Age (radiocarbon dated) assemblage of redeposited bone is a matter of conjecture. The bone was recovered from within the confines of the Neolithic long barrow and Early/Middle Bronze Age round barrow, but the monument had been extensively and heavily plough damaged, and the bone could have been redeposited from another feature in the vicinity. Inhumation appears to have been the primary mode of deposition and the subsequent burning to the bone could either have been deliberate as part of a secondary rite, or incidental following disturbance of the bone and a failure to recognise it as human. Most of the surviving evidence for Late Bronze Age activity uncovered in the investigations in this area was for occupation. The number of burials of this date from Kent is relatively small (*c*. 60), with disposal by cremation or inhumation, and burial remains recovered as singletons or small groups predominantly from sites close to the east coast (e.g. O'Connor 1975; Cruse 1985; Mays and Anderson 1995; McKinley 2006a).

A minimum of two adults, one male and one probably female, were included within the small assemblage of Middle/Late Iron Age bone recovered as redeposited fragments from various ditch fills at Ebbsfleet Lane. These ditches, forming probable boundaries, were subject to recutting and replacement across a broad temporal range from the Mid-Late Iron Age to the Romano-British period, and appear to have related to a settlement or number of occupation sites situated to the west. The human remains probably derived from graves in the immediate area destroyed by later recutting or replacement of ditches. Late Iron Age/Early Romano-British graves dispersed amongst the same group of ditches are testament to a continuum in the mortuary use of the area, which probably formed a liminal or boundary zone in relation to the settlement(s) from which the dead derived. Kentish burials of Early-Middle Iron Age date are very rare, though examples of both cremation and inhumation graves have been recovered (Parfitt 2004, 16; Mays and Anderson 1995, 380-1; McKinley 2006a). Most of the known Later Iron Age/Early Romano-British burials from the county comprise cremation burials made as singletons or within small groups, with the notable exception of Mill Hill, Deal (42 inhumation burials and five cremation burials: Parfitt 2004, 16-17; Parfitt 1995; McKinley 2006a).

Table HB3: Summary of age and sex of minimum number of individuals (MNI) from unburnt human bone assemblage by phase

	LBA	M/LIA	LIA/ERB	RB (?Late)	MSaxon	totals
			immature			
infant *c.*2-5yr.			1	4		*5*
juvenile *c* .6-8yr.				1		*1*
subadult *c.* 15-17 yr.			1			*1*
			adult			
adult *c.* 18-30 yr.		1 (M)				*1*
adult *c.* 25-35 yr.				1 (??M)		*1*
adult *c.* 30-50 yr.		1 (?F)		3 (1F, 2M)		*4*
adult *c.* 40-60 yr.			1 (M)		1 (M)	*2*
adult >45 yr.			1 (?M)	1		*2*
adult >50 yr.			3 (M)	1 (?M)		*4*
subadult/adult *c.* 15-25 yr.				2		*2*
subadult/adult >16 yr.	1					*1*
totals	**1**	**2 (1M, 1F)**	**7 (5M)**	**13 (1F, 4M)**	**1**	***24***

The remains from the 1st century Romano-British cremation cemetery at Coldswood Road all represent those of adults (one female, two ??females, one ??male; Tables HB1 and HB3) with the exception of one subadult/adult. At least one adult female was over 30 years of age, with only very broad age ranges being attributable to the rest. The remains from the 2nd century burials at Cottington Road show a broader demographic mix with a minimum of two infants, one juvenile, three or possibly four subadult/adults (one ??female) and six adults (four female, one ??female). The juvenile was represented by only a tooth crown amongst the remains of a young adult female and may indicate an intrusive fragment incorporated, for example, from an inefficiently cleared reused pyre site, or a deliberate 'token' deposit, the rest of the remains having been buried elsewhere. No other individual of this age is represented within the assemblage, however, consequently this has been included in the minimum number count. Similarly, the small amount of cremated bone recovered from the ceramic jar deposited as a grave good in inhumation grave 6049, may represent a deliberate 'token' deposit made with the inhumation burial. Similar inclusions of individual bones or very small 'token' quantities of bone from a second individual have been observed in Romano-British cremation burials elsewhere, e.g. Hyde Street Winchester (McKinley 2004c); the quantities are not sufficient to indicate dual cremations/burials, and the deliberate or incidental nature of the inclusion is generally inconclusive. The bone from 6048 is not sufficiently distinctive to be able to state with any confidence that this individual is not represented in one of the deposits from elsewhere on the site; hence the questionable inclusion of these remains within the minimum number of individuals. The redeposited bone from inhumation grave 6060 and the possible grave 6025 is likely to have derived from disturbed burials made within those immediate vicinities and each have been included in the minimum numbers. The very small amount of bone from cut 6033 is likely to be redeposited, possible from the neighbouring disturbed grave 6025.

The graves at Coldswood Road form two small neighbouring clusters which appear to be defined by a rectilinear arrangement of ditches (8236, 8455, 8459, 8465) which clearly extended to the west of the excavated area (Fig. 2.13). More cremation graves are also likely to lie to the immediate west, though it is probable that the size of the overall group would remain fairly small. The lack of immature individuals and apparently small number of adult males within the group should, consequently, be viewed with caution; the recovered assemblage may not be representation of the entire population burying their dead here. All the conclusive graves – inhumation and cremation (see below) – at Cottington Road lay within an area described by a square ditched enclosure and the small part of which fell outside the area of excavation appears likely to have been devoid of burial remains (Fig. 2. 16). A few cremation-related features lay in the northern corner of what may be part of a similar adjacent enclosure to the south-east, most of which fell external to the area of excavation. It is possible, given the dispersed distribution of the graves within the excavated enclosure, that further mortuary-related features lay to the south-east of the trench. Even were this the case, however, the numbers are again likely to be small. On the current evidence, however, there appears to be differences between the two cremation cemeteries, the later of the two, having more the appearance of a 'normal' domestic population, the earlier one, at Coldswood Road, possibly being set aside for the burial of adult females.

The small 1st century cemetery at Coldswood Road, seems to conform with most others from the county both in terms of its size and choice of mortuary rite, and the lack of immature individuals amongst its numbers (e.g. Anderson 1999; Bowden *et al* 1998; Hammond *et al* 2003). The remains of a small number of (unburnt) individuals were also recovered from six inhumation graves distributed as singletons and, in one instance, as a pair (graves 5163 and 5166; an adult male and an infant) at three sites along the southern portion of the route; the redeposited remains of one other individual being recovered from a ditch fill at Weatherlees WTW. All five of the adults identified were males, and the assemblage includes the remains of two immature individuals (28%). The numbers within both the cremated and unburnt bone assemblages for this period are small, and there are numerous factors which may slightly skew the results from the former group of material – an apparent bias in the ease of identifying females amongst cremated material and potential 'loss' of infant remains (see McKinley 2000a and 2006a) – but there appears to be some differences between the two groups which suggests that parts of the population were subject to differential mortuary treatment dependent on their age and/or sex. The apparently scarcity of immature individuals in the cremation rite compared with those disposed of by inhumation of the unburnt corpse is further highlighted by the results from Mill Hill where the assemblage included 36% immature individuals (Anderson 1995); though the provisos outlined above must be considered and the impression thus formed could be misleading.

The small, multi-rite, Romano-British cemetery at Cottington Road appears more demographically balanced within both parts of the assemblage, although the apparent imbalance between the sexed adults (male inhumed, females cremated; see above and Table HB1) noted for the earlier period remains. The cemetery reflects the national trend by which the middle part of the 2nd century saw a change in mortuary practice from cremation to burial by inhumation of an unburnt corpse. Although a higher proportion of the unburnt assemblage fell within the immature age ranges than did those within the cremated bone assemblage (38% *v.* 25%) there is no longer the suggestion that age may have affected the form of mortuary treatment as may be the case for the earlier period. The predominance of females amongst the adults from the cremation burials (five of six, one unsexed) compared with that of males amongst those from the inhumation graves (four of six, one unsexed) is odd and may reflect a temporal change in the demographic make-up of the population – presumably the occupants of one farmstead or small settlement – who buried their dead within the confines of this one square enclosure. Against this, however, must be balanced the same provisos as outlined above with regard to the potential biases in data recovery, and the possibility that further burials may survive unexcavated in the adjacent area. A similar proportion of individuals from the cremated and unburnt bone assemblages were over 30 years of age (33% and 38%), with a minimum of 17% and 15% respectively being a over 40 years; the proportion of adults of less than 25 years were also closely comparable. There is, therefore, little evidenec to suggest a variation in the death rate between the sexes, and the presence of several infants within the assemblage of later date indicates women must have been present within the later population, though apparently being buried elsewhere.

With the notable exceptions of Pepper Hill (Boston and Witkin 2006) and a few other sites (Cameron 1985; Frere *et al* 1987; McKinley in prep.), most osteologically recorded Kentish burials of Romano-British date comprise singletons or small groups, similar to that recorded at Cottington Road, distributed in dispersed clusters across the northern half of the county (Mays and Anderson 1995, 381; McKinley 2006a).

The lone, Middle Saxon grave of an older adult male was recovered at some distance from other features at Cottington Hill. A prolific number of Anglo-Saxon burial sites are known of in Kent, most comprising medium-sized to relatively large groups (>25; Mays and Anderson 1995, 381-2; McKinley 2006a).

Metric and Non-Metric Data

A summary of the indices it was possible to calculate is given in Table HB4 and some non-metric traits/morphological variations are indicated in Tables HB1 and HB2, all other detail is held in the archive.

Stature could be estimated for seven adults (*c*. 50%) from the unburnt bone assemblage including four males from the Late Iron Age/Early Romano-British assemblage, one male and one female from the later Romano-British group, and the one Middle Saxon male. The male stature estimates across the temporal range are very similar, all being close to the average of 1.69m given for the Romano-British period by Roberts and Cox (2003, 163); the Middle Saxon estimate is slightly below the average of 1.72m given for the Saxon period as a whole (*ibid.* 220).

The cranial index could be calculated for only six adults including one Middle/Late Iron Age (M/LIA) male, four Late Iron Age/Early Romano-British (LIA/ERB) males and one later Romano-British (later RB) female. The platymeric index (demonstrating the degree of anterior-posterior flattening of the proximal femur) was calculated for nine adults; one M/LIA, four LIA/ERB, three later RB and one Middle Saxon (MSaxon). The platycnemic index (illustrating the degree of meso-lateral flattening of the tibia) was also calculated for nine adults including six LIA/ERB, three later RB and one MSaxon. There is a broad similarity between the ranges and categories for each index between the males in the Middle Iron Age-Early Romano-British groups suggestive of a broad homogeneity. The later Romano-British female appears to have closer affinities with the earlier groups in terms of some indices than with the contemporaneous males; the latter having readings closer to the Saxon data than the earlier Roman. While such data can only present a very broad picture, there are suggestions of a degree of homogeneity between some of the population groups from the area across the temporal range. Where both femora from one individual could be measured the reading for the rigth side was generally higher than that for the left by between 2.1 and 14 with an average of *c.* 5, suggesting a considerably greater stress on the right leg in some cases (e.g. LIA/ERB males 1111 and 5164). The variation between the left and right tibiae are far less marked (1.1 – 5, average *c.* 2) with a more even division of higher readings between the left and right sides.

Table HB4: Summary of metric data
(data derived from measurements both sides; * denotes same individual)

	female		**male**	
	range	*mean*	*range*	*mean*
Middle/Late Bronze Age (M/LBA)				
cranial index			66.5 (dolichocrany)	
platymeric index			90.4 (eurymeric)	
Late Iron Age/Early Romano-British (LIA/ERB)				
estimated stature			1.65 - 1.73m (*c.* 5' 5½" - 5' 7¾ ")	1.70m (*c.* 5' 7½")
cranial index			68.0-76.3	71.78 (SD 3.46) (dolichocrany)
platymeric index			77.1 – 95.8	85.61 (SD 6.69)
platycnemic index			67.7 – 74.1	70.23 (SD 2.16) (eurycnemic)
later Romano-British (later RB)				
estimated stature	1.54m (5' 1")		1.69m (5' 7")	
cranial index	77.7 (mesocrany)			
platymeric index	91.3-92.6*	92.05 (SD 1.06) (eurymeric)	69.2 – 81.6	76.25 (SD 5.52) (platymeric)
platycnemic index	84.5 – 86.0*	85.25 (SD 1.06) (eurycnemic)	62.1 – 66.1	64.05 (SD 1.79) (mesocnemic)
Middle Saxon (MSaxon)				
estimated stature			1.70 m (5' 7½")	
platymeric index			76.4 – 78.0*	77.2 (SD 1.13) (platymeric)
platycnemic index			66.2 – 68.2*	67.2 (SD 1.41) (mesocnemic)

Variations in skeletal morphology may indicate population diversity or homogeneity. The potential interpretative possibilities for individual traits is complex and most are not yet readily definable, particularly on a 'local' archaeological level (Tyrrell 2000). Some traits have been attributed to developmental abnormalities or mechanical modification (*ibid.* 292) e.g. *os acromialie* (non-fusion of the tip of the acromion process of the scapula), which was observed in the two LIA/ERB males from Weatherlees WTW (three of the six joints recorded; CRP 11.8%). The variant occurs in *c.* 3-6% of individuals, though there are, in some cases, indications that activity-related stress – specifically archery - may be a factor in its occurrence (Stirland 1984; Knüsel 2000, 115-6). Several other common and less frequently occurring non-metric traits were observed and recorded in analysis (Tables HB1 and HB2, and archive). Wormian bones (extra ossicles in the lambdoid suture) were observed in the unburnt remains of three adult males (one M/LIA, two LIA/ERB) and one 1st century AD cremation burial, but this trait is relatively common. Numerous tooth crown variations were recorded in several of the Romano-British dentitions from Cottington Road, two individuals buried within the NE corner of the enclosure sharing a 5-cusp variation in the third molars, though this alone is not sufficient to indicate a direct genetic link.

Smooth bony continuity between the vertebral bodies and dorsal portions of the 6-7th cervical vertebrae from 3122, with a slight reduction in the height of at least the C6, is likely to represent a case of Klippel-Feil syndrome (congenital shortened neck; Aufderheide and Rodríguez-Martín 1998, 60). The 2nd-3rd cervical vertebrae from 3309 are incomplete but appear likely to represent a second case of the same condition. The two individuals, buried in close proximity to one another at Weatherlees WTW also share the anomaly of *os acromiale* (see above); the duplication of this second rare morphological anomaly suggests a probable genetic link between the individuals.

Pathology

Pathological changes were observed in 18 of the 24 individuals from the unburnt bone assemblage and six of the 19 individuals from the cremated bone assemblage. The smaller proportion within the latter group is a reflection of factors associated with the mode of disposal rather than the presence/absence of pathological conditions in the living individual (e.g. McKinley 2000a; 2006a). Tables HB1 and HB2 contain summaries of the pathological lesions observed and the bones affected. All the rates shown below refer only to remains from the unburnt assemblage.

Dental disease

All or parts of 14 erupted permanent dentitions were recovered, most (57%) from the later Romano-British assemblage at Cottington Road (Table HB5).

Dental calculus (calcified plaque/tartar) was observed in all except one (later RB) of the permanent erupted dentitions. Slight-mild deposits were most commonly observed, with moderate-heavy deposits on the molar crowns of the two LIA/ERB older adult males from Weatherlees WTW. Deposits appeared to be slightly more common on the maxillary molars and mandibular canines-premolars than on other teeth, but both the distribution and severity could be misleading since calculus deposits are commonly disturbed and lost during excavation and post-excavation processing.

Periodontal disease (gingivitis) may lead to bone resorption with consequent loosening of the teeth and exposure of the tooth roots. Slight-moderate lesions reflective of the condition were observed in five dentitions (*c*. 36%) including two of the LIA/ERB older adult males (50%), two of the later RB 30-40 yr. adults (one male and one female; 25%) and the MSaxon male (scoring according with Ogden 2005). Lesions were generally associated with one or more molar/premolar socket, the mandibular dentition being slightly more commonly affected than the maxillary.

Table HB5: Summary of permanent erupted dentitions by sex and phase

	teeth	socket positions	*ante mortem* tooth loss	caries	abscesses
Middle/Late Iron Age (M/LIA)					
male (1 dentition)	9	16			
Late Iron Age/Early Romano-British (LIA/ERB)					
male (4 dentitions)	78	121	36 (29.7%)	14 (17.9%)	7 (5.8%)
later Romano-British (later RB)					
male (4 dentitions)	78	69	6 (8.7%)	4 (5.1%)	7 (10.1%)
female (1 dentition)	24	28	4 (14.3%)	8 (33.3%)	2 (7.1%)
total (inc. 3 unsexed dentitions)	148	111	10 (9.0%)	18 (12.2%)	9 (8.1%)
Middle Saxon (MSaxon)					
male (1 dentition)	31	32			

The *ante mortem* loss of between two and 13 teeth was recorded in eight dentitions including all four of the LIA/ERB male dentitions, three of the four later RB male dentitions and the one female dentition. A considerably higher proportion of maxillary teeth were subject to loss compared with mandibular (29.4% *v*. 5.8%). The right 1st molars and other maxillary molars were most frequently affected, though all the maxillary teeth had been subject to some loss. The highest rates were recorded in the males >50 years of age and there is a clear age-related link in frequency; the higher overall rate for the LIA/ERB compared with that for the later RB largely reflects the fact that all the individuals in the former group were over 40 years of age. The overall rate for the later Romano-British group (Table HB5) is below that of 14.1% given by Roberts and Cox for their Romano-British sample (29 sites; 2003, table 3.12), though several sites in the sample show a similar rate.

Dental caries, resulting from destruction of the tooth by acids produced by oral bacteria present in dental plaque, was recorded in between one and eight teeth in nine dentitions including five male (three LIA/ERB, two later RB), one later RB female and three unsexed later RB individuals (Table HB5). A slightly higher proportion of maxillary (13.8%) compared with mandibular teeth (10.7%) have carious lesions. The majority (*c*. 72%) are in the molar teeth and most of the rest in the premolars (18.7%), with three incisors also being affected. The origin of most lesions (55%) is in the contact area, with equal proportions of others (11%) in the occlusal fissures or cervical areas; the remaining 22% of lesions had resulted in total destruction of the tooth crown. Although there is some indication of an age-related link to frequency, the highest number of lesions were seen in the later RB female dentition (30-40 yr.). The rates (Table HB5) are higher than the 7.5% given by Roberts and Cox for the Romano-British period as a whole (2003, table 3.10). As observed above with reference to *ante mortem* tooth loss, the higher rates for the LIA/ERB groups (Table HB5) is probably largely reflective of their comparably more advanced age. Most of the individuals who had suffered *ante mortem* tooth loss also had carious lesions and it is probable that the conditions were associated.

Between one and four lesions indicative of dental abscesses were recorded in seven dentitions (three LIA/ERB and four later RB). The highest frequency was seen in the same two individuals (1111 and 6171) who had the greatest numbers of carious teeth. The link between the two conditions was clear in over half the cases observed, the carious damage having exposed the supportive structure to infection. Two of the lesions, both in anterior teeth with no other associated dental lesions, may have developed in response to injury to the teeth with subsequent formation of a periapical cysts rather than to infection. In the case of one LIA/ERB adult male, a dental abscess in a maxillary molar appears to have tracked superiorly into the antrum resulting in secondary sinusitis. The abscess rate (Table HB5) is greater than the mean of 3.9% from Roberts' and Cox's Romano-British sample (2003, table 3.13).

Slight dental hypoplasia (developmental defects in the tooth enamel reflective of periods of illness or nutritional stress in the immature individual; Hillson 1979) was observed in 11 dentitions including the one M/LIA (44.4%), three of the LIA/ERB (32%), six of the later RB (including two deciduous dentitions; 12.8% permanent teeth) and the one Saxon dentition (26%). Lesions presented as faint lines or pits in the tooth crowns, the canines and 2nd premolars being most commonly affected. The majority of cases indicate periods of stress between 3-4 years of age, with a few at 4-5 years and one at 12-14 years (LIA/ERB); three individuals appear to have experienced repeated periods of stress.

Trauma

Evidence for fractures were recorded in the remains of two individuals, both adult males within the LIA/ERB assemblage. A well-healed fracture to the left half of the nasal bone was observed in 3122; the inferior-lateral portion of the bone has shifted medially, with slight depression of the superior portion and an upward shift in the lateral-inferior portion (Fig. HB 2). The changes suggest a blow to the left side of the nose, possibly accidental but more likely deliberate using a blunt implement. Facial fractures are uncommon in the archaeological record, though accidental and deliberate blows to the face must have occurred. Poor skeletal survival is likely to be the main reason; the facial bones in general tend to be relatively thin and fragile, and are particularly prone to damage and loss whilst in the burial environment. A healed fracture at the isthmus of the neural arch in the 5th lumbar vertebra from 1111 had fully united with slight bony callusing on the right side and closely spaced non-union on the left side; there is slight deviation to the right side of the spinal processes. The location of the lesion is characteristic of a case of spondylolysis, which may result from a stress fracture in the immature individual (Adams 1986, 224-5). The same individual has a well-healed slightly depressed fracture to the lateral side of a left central rib which probably resulted from a fall against a hard object.

A short (8.6mm long), shallow, transverse linear feature on the lateral shaft of the left proximal humerus from the Middle Saxon burial 5135 may represent the largely healed remnants of a sharp weapon trauma. The bone is slightly eroded and the lesion unclear, but if it was the result of a trauma the weapon is unlikely to have been anything heavy such as an axe or a sword, but something more akin to a long knife or seax.

Infections

Infection of the periosteal membrane covering bone may lead to the formation of periosteal new bone. Infection may be introduced directly as a result of trauma, develop in response to an adjacent soft tissue infection, or spread via the blood stream from foci elsewhere in the body. It is often difficult to detect the causative factors involved in individual cases and the lesions are commonly classified as indicative of a non-specific infection. Three individuals, two of the LIA/ERB older adult males and the later RB adult female have lesions indicative of periosteal infection.

Coarse grained patchy lamellar new bone on the right anterior surface of the L5 and S1 body surfaces from 1111 suggest the presence of an infection within the adjacent soft tissues. The left anterior maxillary teeth from 3309 had all been subject *ante mortem* tooth loss with extensive reduction in alveolar height to palatial level. The narrowed surface between the left alveolar margin and the nasal margin had been remodelled with flattening of the surface and uneven lamellar new bone. The lesions suggest gross infection of the anterior teeth with possible abscess formation leading to infection in the nasal-maxillary area which had subsequently healed. The same individual has extensive, mostly lamellar periosteal new bone over most of the tibiae shafts and the distal end of the left fibula shaft, with some woven new bone at the distal ends of the tibiae. Such lesions in the leg may result from a variety of conditions including ulcerations, varicose veins or the spread of infection from a foci elsewhere within the body. Fine grained woven new bone on the visceral surfaces of the dorsal portions of the left 3rd-9th rib shafts from 6171 is indicative of some form of pulmonary infection within the left lung. Such conditions can include pleurisy, bronchitis or tuberculosis.

Metabolic conditions

Cribra orbitalia (manifest as pitting in the orbital roof) is believed to result from a metabolic disorder associated with childhood iron deficiency anaemia, though other contributory factors are also recognised (Molleson 1993; Roberts and Manchester 1995, 166-9). Slight lesions were observed in both orbits of one late RB adult male (10% orbits).

Joint disease

Joint diseases represent the most commonly recorded conditions in archaeological skeletal material. Similar lesions – osteophytes and other forms of new bone development, and micro- and macro-pitting – may form in response to one of several different disease processes, some also occurring as lone lesions largely reflective of age-related wear-and-tear. Many of the conditions increase in frequency and severity with age, though factors other than the age of the individual are frequently involved and the aetiology of some conditions is not clearly understood.

All or parts of 12 subadult/adult spines were recovered including six from the LIA/ERB assemblage (five male, one unsexed), six from the later Romano-British (three males, one female and one unsexed subadult/adult) and one from the Middle Saxon assemblage (Table HB6). Extra-spinal joints were recorded from 12 individuals; one M/LIA male, four LIA/ERB males and one unsexed individual, four later RB males and one female, and the one MSaxon male. The low numbers of vertebrae and joint surfaces recorded, particularly within the later Romano-British assemblage, are a reflection of poor bone survival and the preferential destruction of trabecular bone (see above). Consequently, the following figures may give an unrepresentative impression of the health of the populations represented.

Schmorl's nodes (a pressure defect resulting from a rupture in the intervertebral disc; Rogers and Waldron 1995, 27; Roberts and Manchester 1997, 107) commonly affect young adult spines. Shallow, generally linear lesions were observed in four males spines from the LIA/ERB assemblage. No lesions were recorded above T7 and T12 was most commonly affected (3:4). The rate (Table HB6) is above the average of 17.7% for the Romano-British period given by Roberts and Cox (2003, table 3.21).

Table HB6: Summary of number and rates of Romano-British spinal lesions

	Total no. vertebrae	**osteoarthritis**	**Schmorl's nodes**	**degenerative disc disease**	**lone osteophytes**
LIA/ERB					
male	99 88.4% total	30 (30%)	24 (24.2%)	30 (30.3%)	36 (36.4%)
unsexed	13 11.6% total				5 (38.5%)
total	112	30 (26.8%)	24 (21.4%)	30 (26.8%)	41 (36.6%)
later RB					
female	24 34.8% total				5 (20.8%)
male	45 65.2% total				
total	69				5 (7.2%)
MSaxon					
total (male)	25				

Degenerative disc disease, resulting from the breakdown of the intervertebral disc and reflecting age-related wear-and-tear (Rogers and Waldron 1995, 27), was recorded in four male and one unsexed adult spines within the LIA/ERB assemblage. Although lesions were observed in all areas of the spine they were most common in the cervical area (C4-6), where extensive moderate-severe lesions were recorded.

Lesions indicative of osteoarthritis (Rogers and Waldron 1995, 43-44) were recorded at between one and 15 sites in the remains of four LIA/ERB adult males and three later RB adults (two males, one female). Spinal lesions were recorded in most parts of the spine from 1111 (Table HB6); extra-spinal lesions were seen in *c*. 6.1% of LIA/ERB joint surfaces and 3.1% of later RB joint surfaces. The affected joints in the LIA/ERB group include the costo-vertebral joints (41%), the pelvis (22%), the wrist (20%), shoulder and knee joints (12.5%). A slightly different distribution was observed in the later RB assemblage where affected joints included the pelvis (57%) and metatarsal-phalangeal joints (50%). Most changes were slight to moderate, but several of the affected joints from 3309 showed severe changes, including extensive eburnation, particularly in the right knee and shoulder joints.

Although the fusion is not continuous between the L3-S1, with a skip between L4 and 5, the smooth bony ankylosis via thick 'flowing' new bone extending over the right side of the vertebral bodies from skeleton 3309 has the characteristics of diffuse idiopathic skeletal hyperostosis (DISH; Rogers and Waldron 1995, 47-54; Aufderheide and Rodríguez-Martín 1998, 97-9). The lesions indicate ossification of the anterior longitudinal ligament of the spine, with slight left lateral collapse of the vertebrae and loss of disc space (possibly some osteoporosis). There is a general tendency to hyperostosis elsewhere in the body with extensive osteophyte and enthesophytes formation at over 50 different sites (though not all can be conclusively stated to relate to the condition in this elderly male). Symptoms of the disease are generally minimal other than understandable stiffness and some aches/pains. It is predominantly seen in older males and, although the aetiology is unknown, there are indications of a link with diabetes and obesity (Rogers and Waldron 1995, 47-54; Aufderheide and Rodríguez-Martín 1998, 97-9).

Lone osteophytes were recorded in the remains of nine individuals including all five of the LIA/ERB adult males, three later Romano-British (two males and one female) and the MSaxon male. The range and number of sites affected, and the severity of lesions were greater in the LIA/ERB remains than in the later material (Table HB2), to a large extent reflecting the more advanced age of the individuals from the former, though there may be a link with specific conditions in some cases (see above). The causative factors of enthesophytes (bony growths at tendon and ligament insertions) can include advancing age, traumatic stress, or various diseases (Rogers and Waldron 1994, 24-25) and it is not always possible to be conclusive with respect to the aetiology of particular lesions. Lesions were observed at between one and seven sites in the remains of three LIA/ERB males, one LIA female and the one Saxon male (Table HB2), the posterior surface of calcanea being the most common location (reflecting activity related stress).

Two cases of osteoarthritis were observed in the cremated bone assemblages (spinal and extra-spinal sites), with lone osteophytes recorded at between one and two sites in the remains of three individuals and enthesophytes in one (Table HB1).

Miscellaneous conditions

Hyperporosity observed in the parietals and upper part of the occipital from 5135 may have resulted from the persistent scratching linked to an infestation of head lice; lice tend to congregate in the occipital area due to the blood supply in that region (L. Capasso Palaeopathology Association Conference, Durham 2004). Similar lesions observed in fragments of occipital and distal parietal vault from cremation burial 6024 probably have a similar aetiology.

As with other forms of new bone (see *osteophytes* and *exostoses* above), there may be a variety of triggers to the calcification/ossification of cartilaginous material within the body, including bone forming diseases such as DISH and a predisposition to hyperostosis. In most cases, however, advancing age is the major factor, both in terms of the degree and extent of calcification. Fragments of calcified thyroid and rib cartilage were recovered with the remains of the older adult male 3122; the condition is likely to be age related in this instance.

The temporally and geographically dispersed nature of these small burial groups, together with the generally poor bone preservation, render it difficult to make any conclusive meaningful overall comment on health and potential status, the most one can deduce is a general impression. There are indications that the Late Iron Age/Early Romano-British individuals had a more physically stressful lifestyle than their later counterparts in the area, possibly with a poorer diet containing less meat protein. It should, however, be stressed that many of the increased rates of various conditions seen in the earlier group could be related to the comparatively more advanced age of the individuals in this part of the overall assemblage.

Pyre technology and cremation ritual

Oxidation

Most of the bone is white in colour, indicating a high level of oxidation (Holden *et al* 1995a and b). Some incompletely oxidised bone (blue or grey in colour) was, however, recovered from approximately half the graves within both burial groups. In the material from the 1st century cemetery variations were seen in one or more fragments of a single skeletal element, with individual cases involving either the femur shaft, skull vault, humerus shaft or a tarsal bone. The material from the later cemetery was more extensively affected with variations in one or more fragments of a skeletal element and more than one element (up to nine) was involved in most cases (33.3% of burials); in two cases elements derived from one skeletal area (lower limb), in one case from two areas (upper and lower limb), with three areas affected in two of cases (including upper and lower limb in both) and all four skeletal areas in one case. As is commonly observed (McKinley forthcoming a, table 2) elements of the lower limb (femur) were most frequently affected, but, contrary to the general observation, the skull was involved in only one case. No variations were observed in the remains of the young immature individuals.

Factors affecting the efficiency of oxidation have been discussed elsewhere by the writer (McKinley 1994a, 76-78; 2004d, 293-295; forthcoming a). In the cases discussed here all the variations are minor and suggestive of some general, overall shortfall, most probably in the quantity of wood used to construct the pyres – which influences both time for cremation and temperature sustained. There is a clear indication of temporal variation, though this could simply reflect slight differences in practice between the two populations following the rite.

Bone weight

A variety of intrinsic and extrinsic factors may influence the weight of bone recovered from a burial (McKinley 1993; 2000a) and deposits very rarely, if ever, contained all the bone which would have remained at the end of cremation, a wide ranges in bone weights being common (McKinley 1997b). It is not clear why such variations existed and no consistent pattern has yet been demonstrated for the Romano-British period.

The most reliable view of the quantity of bone originally included in the burial is provided by the least disturbed deposits and in both these assemblages most had survived relatively intact (Table HB1, ** intact, * slight damage but loss of bone unlikely). The burials from the earlier cemetery were all made unurned, some clearly enclosed within a wooden casket though possibly also held within a textile or similarly organic bag. The graves in the later cemetery all contained the remains of urned burials, most having employed amphora (Table HB1). Table HB7 presents the bone weight range and mean for the different burial types.

Table HB7: bone weights and means for different burial types

Burial type	*Coldswood Road: 1st century*	*Cottington Road: 2nd century*
all burials	113.9 - 638.5g: mean 353.5g	201.3 - 1371.0g: mean 653.3g (all*)
undisturbed burials**	259.5 - 638.5g: mean 429.9g	769.8g (one only)
casket burials	259.5 - 473.9g: mean 384.4g	
non-amphora urned burials		201.3 -769.8g: mean 485.5g
amphora burials		284.2 - 1371.0g : mean 720.4g
dual cremation/burial		284.2 - 821.5g

Although there is an overlap between the two groups, the unurned 1st century burials consistently have a shorter range and lower mean weight than those from the later urned burials, with a lower maximum weight. As is frequently observed, the number of individuals within the burial was of no significance to the weight of bone it contained. The maximum weight of bone recovered from the undisturbed 1st century burial represents *c.* 40% of the average expected from an adult cremation (McKinley 1993), and that from the later cemetery *c.* 85%. The variation in bone weights between unurned and urned burials is frequently observed and in many cases appears, at least in part, to reflect increased post-depositional bone loss from the former due to the lack of the protection from the burial microenvironment offered by a vessel; there is some evidenec to indicate that such has been the case in this instance (see *condition*). It is also possible, however, particularly in the light of very similar levels of fragmentation between the deposit types (see below), that slightly less bone was collected for inclusion in the unurned burials, a distinction potentially related to the size of the container in which the remains were placed on recovery from the pyre site.

The average weights from the undisturbed burials is within the median range of those recorded in contemporaneous cemeteries, falling closest to those from Baldock, Hertfordshire and Westhampnett, W. Sussex (McKinley 1997a; 2004d table 6.6), whilst also having some similarities with those from Pepper Hill, Kent (775.6g all burial types, 461.8g unurned burials; Boston and Witkin 2006). Higher maximum weights and means were recorded from Cranmer House, Canterbury (average 789g; Garrard 1987) and Each End, Ash (947g; Anderson 1998), and it has been suggested that variations in bone weights for the county may reflect a urban/rural divide (McKinley 2006a).

Fragmentation

The degree of fragmentation to cremated bone is influenced by a variety of intrinsic and extrinsic factors including cremation, burial type and microenvironment, and excavation and post-excavation processing (McKinley 1994b; 2004d). Table HB8 presents the maximum recorded fragment sizes together with the percentage of bone recovered from the 10mm sieve fraction. Most of the burials from both sites were undisturbed, consequently there is little difference between the figures for disturbed and undisturbed deposits. There is also, however, little of the commonly observed difference between the deposit types. This may partly reflect the effect of there being little disturbance to the deposits but may also illustrate the balancing-out between the deposit types resulting from the 'urns' employed in this instance mostly comprising amphora; the large, open 'necks' of which may have allowed more soil infiltration than is often experienced within more narrow-necked vessels. There is no evidence to suggest deliberate fragmentation of the bone occurred prior to burial.

Table HB8: Bone fragmentation within different deposit types and conditions

Burial condition/date	10mm fraction	Maximum fragment
all 1st C burials	range: 37.6-63.5% average: 49.9%	max. 36-65mm average max. 50mm
undisturbed 1st C burials	range: 37.6-63.5% average: 52%	max.: 36-65mm average max.: 51mm
all 2nd C burials	range: 37.2-61.2% average: 52.4%	max.: 49-76mm average max.: 53.2mm
undisturbed 2nd C burial	range: 53.8%	max. 50mm

Skeletal elements

Cremation burials generally comprise a range of bone fragments from all skeletal areas, but include a substantial proportion of undistinguished fragments of long bone shaft and trabecular bone. The proportion of identified skull elements is generally high due to the ease of identification of even very small fragments and, conversely, there is often an under-representation of axial skeletal elements resulting from the frequent preferential destruction of trabecular bone (see above; McKinley 2004d, 298-9).

Most of the burials were deficient in elements from the axial skeleton, the undisturbed unurned burial in grave 8273 showing the closest to 'normal' distribution by weight of elements within the four skeletal areas (McKinley 1994a, 6) with 18.3% skull elements, 16.7% axial skeletal, 25.2% upper limb and 39.4% lower limb. There is, however, a very noticeable temporal variation in the proportion of identifiable skull elements. In the earlier assemblage, a range of 0.6-18.7% (mean 12%) of the identifiable skeletal elements comprise skull fragments compared with a substantially higher range of 23.7-41% (mean 31.3%) for the later assemblage. These figures, the latter of which are more akin to those generally seen in cremated bone assemblages, suggest deliberate non-selection of skull elements for inclusion in the 1st century burials; possibly because these elements were being selected for deposition other than within the burial rather than that they were being discarded (McKinley 2004d, 301; 2006a; forthcoming b).

Tooth roots and the small bones of the hands and feet are commonly recovered in cremation burials of all periods, and it is believed their frequency of occurrence may provide some indication of the mode of recovery of bone from the pyre site for burial (McKinley 2000a; 2004d, 299-301). There is a temporal variation in the frequency of occurrence of these small elements within burials; the 2nd century deposits each contain between one and 38 (average 18) such elements, whilst a maximum of eight (average four, two with none) were recovered from the 1st century burials. The frequency in the 2nd century deposits suggests collection of bone for burial via raking-off and winnowing of the cremated remains, thereby easing the recovery of the smaller skeletal elements as well as the larger ones, whilst in the 1st century rite the suggestion is there was individual hand-recovery of fragments.

Pyre goods

Small quantities (mostly <10g) of cremated animal bone were recovered from one, possibly two of the 1st century burials and all of the 2nd century burials. As with several other aspects of the cremation rite there appears to be some temporal variation. A much smaller proportion of the early graves contained pyre goods but fragments of unburnt animal bone were recovered from three (immature pig; Grimm, this volume) indicating the specific inclusion of grave goods as well as pyre goods. The cremated bone from both phases also includes pig, and elements of bird bone (including domestic fowl and other species) were also recovered from the 2nd century burials (Grimm, this volume). The popularity of pig is likely to reflect the ritual status of the animal, which included the legal requirement for their sacrifice at the graveside prior to burial (Toynbee 1971, 50; Witkin and Boston 2006).

The inclusion of cremated animal remains in Romano-British burials is relatively common, although there is wide variation in the number of burials with animal bone from different cemeteries ranging from *c.* 3.5% at Westhampnett, W. Sussex (McKinley and Smith 1997) to *c.* 80% of the urned burials from the Ryknield Street cemetery, Wall, Staffordshire (McKinley forthcoming b; 2004e). Its inclusion in burials of this date in Kent appears relatively frequent, the various burial groups within the recently excavated CTRL project ranging from 23.9% (Pepper Hill; Boston and Witkin 2006) to 40% (Saltwood Tunnel; McKinley 2006 a and b), and 25% of the burials from Each End, Ash contained the remains of animal pyre goods (Anderson 1998).

Evidence for artefactual pyre goods was recovered in osteological analysis from four 1st century graves and one 2nd century grave in the form of fragments of copper-alloy and, in one instance, fragments of worked animal bone (Table HB1). The fusion if an iron nail to a fragment of bone from one of the later burials probably occurred after cremation.

All the surviving evidence for pyre goods should be viewed as a minimum. Since it was a characteristic of the rite that not all the human remains were collected for burial, it is probable that the remains of pyre goods were also overlooked (accidentally or deliberately) in this secondary part of the mortuary rite.

Dual burials

Two of the urned (amphora) burials (28.6%) from the Cottington Road cemetery contained the remains of two individuals, both comprising the most frequently encountered combination of an adult and a young immature individual (McKinley 1994a, 100-102; 2000b, 272). None of the earlier graves contained the remains of more than one individual.

Numerous contemporaneous cemeteries have been found devoid of multiple burials, e.g. Derby Racecourse (Harman 1985, 279), Walls Field and Walls Common, Baldock (Stead and Rigby 1986), and none were recovered from the smaller burial groups within the Kentish CTRL project (McKinley 2006a). Elsewhere, between 2% and 8% of burials have been found to contain the remains of, generally, two individuals (Wells 1981; McKinley 2000b, 272), including 2.7% of graves at Pepper Hill (Witkin and Boston 2006). Although Philpott (1991, 25) states that amphora were 'frequently' used for the deposition of multiple cremation burials, his table of 'amphora burials' (which includes amphora used as graves goods as well as containers for the cremated bone; 254-258) shows that the remains from such burials have rarely been subject to analysis, and gives only one example, from Cranmer House, Canterbury, as containing the remains of more than one individual (two adults; Garrard 1987). It may lend some support to his contention, however, that two of the five burials made within amphora at Cottington Road included the remains of two individuals; though the age of those individuals and low bone weights recovered would not have necessitated a large vessel to hold them.

Redeposited pyre debris

The backfills of four of the 2nd century graves (*c*. 57.1%) were described as 'charcoal rich' and fuel ash was recovered throughout the fill of one 1st century grave (*c*. 14.3%). In each case the pyre debris incorporated some cremated bone, the quantities varying between *c*. 2.7-4.5% of the total weight of bone from the grave in the later deposits (the proportion is difficult to deduce for the unurned burial due to the inevitable slight mixing of the bone within the two deposit types in excavation). There is no evidence in any of these cases to suggest the pyre debris derived from other than the same cremation as that within the associated burial. In most instances the debris appears to have been added to the grave subsequent to the burial having been made, but in one case – grave 6015 – debris was also recovered from below the urned burial.

The recovery of redeposited pyre debris from Romano-British grave fills is relatively common and its presence indicates the relatively close proximity of the pyre sites to the place of burial (McKinley 2000c; 2004d, 304-6). Its inclusion generally appears to be more common within graves containing the remains of unurned burials, further highlighting its paucity within the 1st century graves from this project. This trait appears to represent yet a further temporal variation in the rite.

Burial formation processes

Detailed analysis of the bone distribution by spit and quadrant in most of the urned burials and two of the unurned burials showed no ordered deposition of the remains by skeletal element, the remains showing an apparently random distribution throughout each deposit. Where parts of two individuals were recovered within the burial, the elements of both were also distributed homogenously.

The unurned burials within the 1st-century graves 8195 (Fig. 2. 33) and 8198 (not illustrated), despite being undistinguished from the rest of the grave fill in excavation, could be seen to have been made within the NE and SW quadrants of the graves respectively, where the bone was concentrated (*c*. 74% and *c*. 52% respectively). The burials may originally have been made within some form of bag.

The distribution of the bone within the remaining 1st century graves also suggests the bone was bagged, even where the bag was subsequently placed in a wooden casket for burial (Figs 34–38).

The concentration of *c*. 50% of the bone from two of the burials made in amphora within one quadrant of the lowest 50mm depth of the fills also suggests the bone, at least in those two cases, may originally have been placed in a bag before being deposited in the vessel. Alternatively, the vessels may have been angled at the time the bone was incorporated and not levelled before burial.

Cenotaphs

The possible nature of the two potential 'token' deposits from the 2nd century cemetery at Cottington Road have been discussed above (*demography*). They represent quite distinct forms of deposition from one other feature/deposit type which has often in the past been referred to a 'token burial' (due to the extreme paucity or absence of cremated bone) but which the writer believes should more correctly be interpreted as a 'cenotaph' (McKinley 2000c; 2004d; 2006a). Such features have many of the characteristic of cremation graves within a burial group – size, shape and fill often inclusive of pyre and/or grave goods – but containing either no bone or very small quantities. One such possible feature was recorded at Cottington Road (6027), though the interpretation is inconclusive and the fill may represent redeposited pyre debris.

Bibliography

Adams, J.C. 1986 *Outline of Orthopaedics* (Churchill Livingstone) London.

Anderson, T. 1995 The human skeletons, in K. Parfitt *Iron Age Burials from Mill Hill, Deal* British Museum Press 114-145

Anderson, T. 1998 The Human remains, 119-130, in A. J. Hicks, Excavations at Each End, Ash, 1992 *Archaeologia Cantiana* 158, 91-172

Anderson, T. 1999 The cremated bone, 386-9 in K. Parfitt A 'Belgic' cremation: Deal *Archaeologia Cantiana* CXIX, 381-389

Aufderheide, A.C. and Rodríguez-Martín, C. 1998 *The Cambridge Encyclopaedia of Human Palaeopathology* Cambridge University Press

Bass, W.M. l987 *Human osteology* Missouri Arch Soc.

Beek, G.C. van 1983 *Dental Morphology: an illustrated guide,* Bristol: Wright PSG

Berry, A.C. and Berry, R.J. 1967 Epigenetic variation in the human cranium *Journal of Anatomy* 101(2), 261-379.

Boston, C. and Witkin, A.S. 2006 'Iron Age and Roman human remains from Pepper Hill, Southfleet, Kent' *CTRL specialist report series*, in ADS 2006

Bowden, L., Anderson, T. and Andrews, J. 1998 Cremated bone, 349-50 in K. Parfitt Late Iron Age burials, Chilham Castle, Kent *Proceedings Prehistoric Society* 64, 343-352

Brothwell, D. and Zakrzewski, S. 2004 Metric and non-metric studies of archaeological human remains, in M. Brickley and J.I. McKinley (eds.) *Guidelines to the Standards for Recording Human Remains* British Association for Biological Anthropology and Osteoarchaeology and Institute for Field Archaeology, 24-30

Buikstra, J.E. and Ubelaker, D.H. 1994 *Standards for data collection from human skeletal remains* Arkansas Archaeological Survey Research Series 44

Cameron, A. 1985 Human Bone from Clubb's Pit, Isle of Grain (Unpublished AML report)

Cruse, R.J. 1985 Excavation at Pring's Quarry, Upper Halling *Archaeologia Cantiana* CII, 129-134

Cunliffe, B. 1992 Pits, Preconceptions and Propitiation in the British Iron Age *Oxford Journal of Archaeology* 11 (1), 69-87

Finnegan, M. 1978 Non-metric variations of the infracranial skeleton *Journal Anatomy* 125(1); 23-37

Frere, S., Bennett, P., Rady, J. and Stow, S. 1987 *The Archaeology and Canterbury Volume VIII: Canterbury excavations intra- and extra-mural sites 1949-55 and 1980-84*

Garrard, P. H. 1987 The human bones in S. Frere, S., P. Bennett, J. Rady, and S. Stow *The Archaeology and Canterbury Volume VIII: Canterbury excavations intra- and extra-mural sites 1949-55 and 1980-84* 263-271

Hammond, S, Preston, S and Taylor, A. 2003 A first century field system and cremation cemetery at Wises Lane, Borden, Sittingbourne, Kent, in S Coles, S Hammond, J Pine, S Preston and A Taylor *Bronze Age, Roman and Saxon sites on Shrubsoles Hill, Sheppey and at Wises Lane, Borden, Kent*, Thames Valley Archaeological Services Monograph 4 (Reading) 56–86

Harman, M. 1985 'The Mammalian Bones', 274-280 in Wheeler, H. 'The Racecourse cemetery' in Dool, J., Wheeler, H. *et al* 'Roman Derby: Excavations 1968-1983' *Derbyshire Archaeological J*. 105, 222-80

Holden, J.L., Phakley, P.P. and Clement, J.G. 1995a Scanning electron microscope observations of incinerated human femoral bone: a case study. *Forensic Science International* 74, 17-28

Holden, J.L., Phakley, P.P. and Clement, J.G. 1995b Scanning electron microscope observations of heat-treated human bone. *Forensic Science International* 74, 29-45

Knüsel, C. 2000 'Activity related changes', V. Fiorato, A. Boylston and C. Knüsel (eds.) *Blood Red Roses: The archaeology of the mass grave from the battle of Towton AD 1461* Oxbow Books (Oxford) 103- 118

Mays, S.A. and Anderson, T. 1995 Archaeological Research Priorities for Human Remains from South-West England (Kent, East and West Sussex and Surrey) *Archaeologia Cantiana* CXV, 355-388

McKinley, J.I. 1993 Bone fragment size and weights of bone from modern British cremations and its implications for the interpretation of archaeological cremations. *International J. Osteoarchaeology* 3: 283-287

McKinley, J.I. 1994a *The Anglo-Saxon cemetery at Spong Hill, North Elmham Part VIII: The Cremations*. East Anglian Archaeology No. 69.

McKinley, J.I. 1994b Bone fragment size in British cremation burials and its implications for pyre technology and ritual. *J. Arch. Sci.* 21: 339-342.
McKinley, J.I. 1997a 'The cremated human bone from burial and cremation-related contexts', p. 55-72 in Fitzpatrick, A. P. 1997 *Archaeological Excavations on the Route of the A27 Westhampnett Bypass, West Sussex, 1992 Volume 2*. Wessex Archaeology Report No. 12
McKinley, J.I. 1997b 'Bronze Age 'Barrows' and the Funerary Rites and Rituals of Cremation' *PPS* 63; 129-145
McKinley, J.I. 2000a 'The Analysis of Cremated Bone', in Cox, M. and Mays, S. (eds.) *Human Osteology* Greenwich Medical Media (London), 403-421
McKinley, J.I. 2000b 'Cremated human remains', 'Cremation burials' and 'Cremated Remains' in Barber, B. and Bowsher, D. *The Eastern Cemetery of Roman London* MoLAS monograph 5, 61-67, 264-277, 360-265
McKinley, J.I. 2000c 'Phoenix rising; aspects of cremation in Roman Britain' in Millett, M., Pearce, J. and Struck (eds.) *Burial, Society and Context in the Roman World* Oxbow Books (Oxford), 38-44
McKinley, J.I 2004a Compiling a skeletal inventory: cremated human bone, in M. Brickley and J.I. McKinley (eds.) *Guidelines to the Standards for Recording Human Remains* British Association for Biological Anthropology and Osteoarchaeology and Institute for Field Archaeology, 9-12
McKinley, J.I 2004b 'Compiling a skeletal inventory: disarticulated and co-mingled remains' in M. Brickley and J.I. McKinley (eds.) *Guidelines to the Standards for Recording Human Remains* British Association for Biological Anthropology and Osteoarchaeology and Institute for Field Archaeology, 13-16
McKinley, J.I. 2004c 'The cremated bone' 97-103 in V. Birbeck and C. Moore, 'Preservation and investigation of Roman and medieval Remains at Hyde Street, Winchester' *Proc. Hampshire Field Club and Arch. Soc.* 59, 77-110
McKinley, J.I. 2004d 'The human remains and aspects of pyre technology and cremation rituals', H.E.M. Cool, *The Roman Cemetery at Brougham Cumbria: Excavations 1966-67*. Britannia Monograph 21. 283-309
McKinley, J.I. 2004e 'Aspects of cremation ritual as evidenced by the animal bone', H.E.M. Cool, *The Roman Cemetery at Brougham Cumbria: Excavations 1966-67*. Britannia Monograph 21. 331-332
McKinley, J.I. 2006a Human Bone Scheme-wide Overview *CTRL specialist report series*, in ADS 2006
McKinley, J.I. 2006b Prehistoric, Roman and Anglo-Saxon human remains from Saltwood Tunnel, Kent *CTRL specialist report series*, in ADS 2006
McKinley, J.I. forthcoming a 'In the heat of the pyre: efficiency of oxidation in Romano-British cremations – did it really matter?' In C.W. Schmidt and S. Symes (eds.) *Beyond recognition: the analysis of burned human remains*
McKinley, J.I., forthcoming b Ryknield Street, Wall (Site 12), in P. Booth, A.D. Crockett, A.P. Fitzpatrick and A.B. Powell, *The Archaeology of the M6 Toll 2000-2002*, Oxford Wessex Archaeology, 87-190
McKinley, J.I. in prep. The cremated remains from the Romano-British cemetery of St. Dunstan's, Canterbury. Report for Canterbury Archaeological Trust
McKinley, J. I. and Smith, P. 1997 'Cremated animal bone from burials and other cremation-related contexts' in Fitzpatrick, A. P. 1997 *Archaeological Excavations on the Route of the A27 Westhampnett Bypass, West Sussex, 1992 Volume 2*. Wessex Archaeology Report No. 12, 253
Molleson, T.I. 1993 The Human Remains, in Farwell, D.E. and Molleson, T.I. *Poundbury Volume 2: The Cemeteries*. Dorset Nat. Hist. & Arch. Soc. Monograph No. 11, 142-214
Nielsen-Marsh, C., Gernaey, A., Turner-Walker, G., Hedges, R., Pike, A. and Collins, M. 2000 'The chemical degradation of bone' in Cox, M. and Mays. S. (eds.) *Human Osteology in Archaeology and Forensic Science* GMM (London) 439-454
O'Connor, T. 1975 Bridge By-Pass, Canterbury; Cremation report (AML Report 1921)
Ogden, A.R. 2005 'Identifying and scoring periodontal disease in skeletal material' Biological Anthropology Research Centre, University of Bradford
Parfitt, K. 1995 *Iron Age Burials from Mill Hill, Deal* British Museum Press
Parfitt, K. 2004 A round barrow near Heynes farm, Eythorne *Archaeologia Cantiana* CXXIV, 397-415
Philpott, R. 1991 *Burial Practices in Roman Britain* BAR British Series 219

Roberts, C. and Manchester, K. 1997 *The Archaeology of Disease* Sutton

Roberts, C. and Cox, M. 2003 *Health and disease in Britain from prehistory to the present day* Sutton (Stroud)

Rogers, J. and Waldron, T. 1995 *A field guide to Joint Disease in Archaeology* Wiley (Chichester)

Scheuer, L. and Black, S. 2000 *Developmental Juvenile Osteology* Academic Press: London

Stead, I.M. and Rigby, V. 1986 *Baldock: The excavation of a Roman and Pre-Roman settlement, 1968-72* Britannia Monograph Series 7, London: Society for the promotion of Roman Studies

Stirland, A. 1984 'A possible correlation between *Os acromialie* and occupation in the burials from the Mary Rose. Proceedings of the fifth European meeting of the Palaeopathology Association Siena. 327 – 334.

Toynbee, J.M.C. 1971 *Death and Burial in the Roman World* Johns Hopkins University Press (Paperback edition; London)

Trotter, M. and Gleser, G.C. 1952 'Estimation of stature from long bones of American whites and Negroes' *American Journal of Physical Anthropology* 10(4): 463-514.

Trotter, M. and Gleser, G.C. 1958 'A re-evaluation of estimation of stature bases on measurements of stature taken during life and of long bones after death'*American J. Physical Anthropology* 16(1): 79-123.

Tyrrell, A. 2000 Skeletal non-metric traits and the assessment of inter- and intra-population diversity: past problems and future potential, in M. Cox and S. Mays (eds.) *Human osteology in archaeology and forensic science* GMM (London)

Wells, C. 1981 Human Remains, 277-303 in Partridge, C. *Skeleton Green; a Late Iron Age and Romano-British Site* Britannia Monograph Series No. 2.

Wheeler, H. 1985 'The Racecourse cemetery' in Dool, J., Wheeler, H. *et al* 'Roman Derby: Excavations 1968-1983' *Derbyshire Archaeological J.* 105, 222-80

Table HB1: Summary of results from analysis of cremated bone

KEY: * burial remains largely undisturbed; ** burial remains undisturbed; mv - morphological variation; T – thoracic; L – lumbar; u/b - unburnt

Grave	context	deposit type	bone weight	age/sex	pathology	pyre/grave goods
Coldswood Road						
8195	8196	unurned burial	211.3g	adult c. 40-60 yr. ??female	osteoarthritis – T/L	u/b pig teeth
8198	8197	unurned burial	113.9g	subadult/adult >13 yr.		
8199	8200	grave fill	2.8g	= 8211		
8199	8204 (inc. 8211)	casket burial**	471.1g	adult >30 yr.	mv – wormian bones	0.6g Cu-alloy
8202	8203	grave fill + part of burial **	88.6g	= 8205	mv – mandibular tori	u/b animal (immature) & Cu-alloy ring
8202	8205	unurned burial**	549.9g	adult c. 21-45 yr. ??male		worked animal bone. 0.1g ?animal bone
8206	8207	grave fill + part of burial *	32.0g	= 8223		
8206	8223	unurned burial** (?casket)	227.5g	adult >25 yr. ??female		
8208	8212	casket burial**	276.7g	adult c. 35-60 yr.	enthesophytes – femur	
8208	8201	rpd grave fill (+ part of burial)	143.1g	= 8212		
8273	8209	grave fill, most from burial**	28.0g	= 8272		0.1g ?u/b fish bone
8273	8272	unurned burial**	329.7g	adult c. 20-28 yr. female	osteophytes - atlas	0.7g animal bone; 3 Cu-alloy brooches; FAS
Cottington Road						
6003	6004	rpd grave fill	27.2g	= 6005		0.2g animal bone
6003	6005	urned burial **	769.8g	adult >45 yr. female	osteoarthritis – left patella; osteophytes – distal ulna, metatarsal	66.7g animal bone
6006	6008	urned burial*	201.3g	subadult/adult >13 yr. ??female		0.1g animal bone
6009	6010	?rpd grave fill	13.4g	= 6011		<0.1g animal bone
6009	6011	urned burial* (amphora)	284.2g	1) infant *c.* 3-5 yr. 2) adult *c.* 20-40 yr. ??female		1.5g animal bone
6012	6013	rpd grave fill	17.6g	= 6018		
6012	6018 (inc. 1614)	urned burial (amphora)	623.6g	1) adult *c.* 20-25 yr. female 2) ?juvenile *c.* 7 yr.		5.2g animal bone
6015	6016	rpd grave fill	27.2g	= 6017		

Grave	context	deposit type	bone weight	age/sex	pathology	pyre/grave goods
6015	6017	urned burial * (amphora)	821.5g	1) adult c. 40-60 yr. female 2) infant c. 0.5 – 3 yr.	?amtl; osteophytes - atlas	1.5g animal bone; fused Fe nail
6019	6021 (inc. 6020)	urned burial* (amphora)	501.7g	adult >30 yr.		0.6g ?animal bone. Cu-alloy frags.
6022	6023	grave fill	19.3g	= 6024		
6022	6024	urned burial* (amphora)	1371.0g	adult c. 30-50 yr. female	caries; hypervascularity – skull vault	8.4g animal bone
6025	6026	redep.?urned ?burial	199.4g	subadult/adult >13 yr.		Fe nail
6027	6028	?cenotaph	0.1g			
6033	6034	?redep.	3.2g	subadult/adult >10 yr.		
6035	6036	?redep.	19.6g	subadult/adult >13 yr.		
6049	6048	?token within inh. grave	21.7g	subadult/adult >13 yr.		0.1g animal bone
6060	6063	redep. ?=6036	1g	subadult/adult >13 yr.		
6060	6072	redep. ?=6036	3.8g	subadult/adult >13 yr.		

Table HB2: Summary of results from analysis of unburnt human bone

KEY: amtl - *ante mortem* tooth loss; oa – osteoarthritis ; op – osteophytes; mv - morphological variation; C – cervical; T – thoracic; L – lumbar; bsm - body surface margins; dl - destructive lesion; Mt-T – metatarsal; Mt-C - metacarpal

Context	cut	deposit type	phase	quantification	age/sex	pathology summary
Ebbsfleet Lane						
1029	1028	redep.	LIA/ERB	*c*. 5% a.u. (=1033)	subadult *c*. 14-17 yr.	
1032	1028	redep.	LIA/ERB	3 frags. u.l. (=1033)	subadult *c*. 15-17 yr.	
1033	1931	*in situ* burial	LIA/ERB	*c*. 25% a.u.l.	subadult *c*. 15-17 yr.	enthesophytes – fibula
1088	1208	redep.	M/LIA	*c*. 3% s.	adult *c*. 20-45 yr. ?female	
1111	1110	*in situ* burial	LIA/ERB	*c*. 98%	adult *c*. 45-55 yr. male	amtl; caries; calculus; abscess; periodontal disease; hypoplasia; fracture – rib, L5 (spondylolysis); infection – sinusitis, L5 & S1; degenerative disc disease – L4-5; Schmorl's node – 4T, 3L; oa – costo-vertebral, C6, 4T, r. acetabulum; op – C3 & 7, 11T, 4L, carpals, r.1st & 2nd Mt-Cs, knees, tarsals; mv – wormian bones
1127	1195	redep.	M/LIA	1 frag. l.	adult >18yr.	
1148	1195	redep.	M/LIA	1 frag. l.	adult >18 yr.	
1184	1195	redep.	M/LIA	*c*. 25% s.l.	adult *c*. 18-30 yr. male	calculus; hypoplasia; mv – wormian bones
Weatherlees WTW						
3122	3121	?coffined burial	LIA/ERB	*c*. 99%	adult >50 yr. male	amtl; abscess; calculus; caries; fracture – l.nasal; ankylosis – C6-7; degenerative disc disease – C3-6, L1-3; Schmorl's node – L2-3; oa – C2-3, T2-12, L2-3, costo-vertebral; op – shoulders, elbows, carpals, MtC & IP joints, hips, knees, tarsals, MtT & IP joints; enthesophytes – iliac crests, femora, calcanea; exostoses – l. humerus; calcified cartilage – rib, thyroid; mv – wormian bones, palatine torus, *os acromialie* (bilateral)
3137	3131	redep.	LIA/ERB	1 frag. a. (= 3138)	adult >45 yr. ?male	
3138	3131	redep.; ditch fill	LIA/ERB	6 frags. a.	adult >25 yr.	op – L5, S1; degenerative disc disease – S1; mv - sacralised L5/lumbarised S1

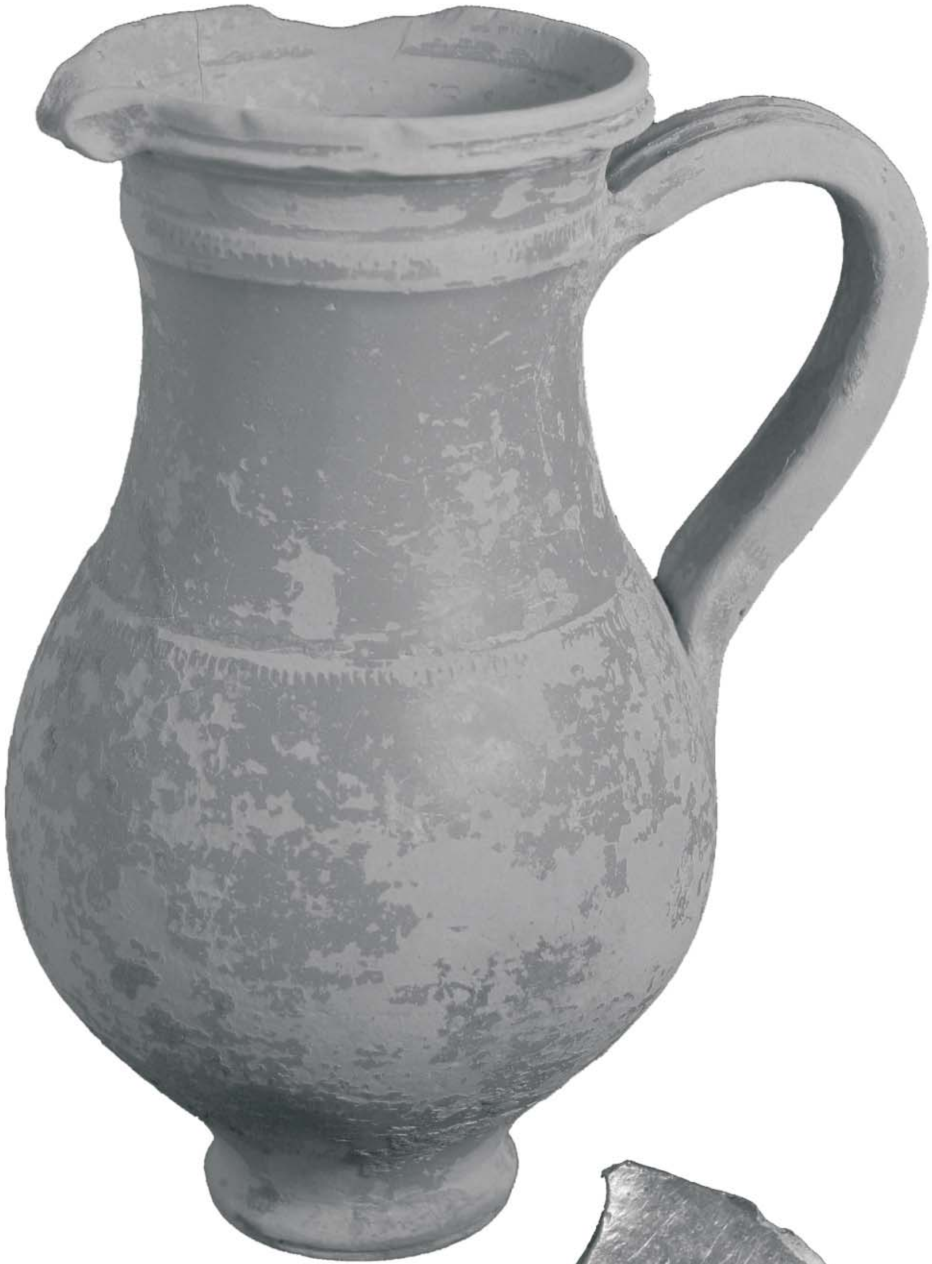
Context	cut	deposit type	phase	quantification	age/sex	pathology summary
3139	3131	redep.	LIA/ERB	1 frag. l. (= 3138)	adult >18 yr.	
3309	3308	*in situ* burial	LIA/ERB	*c*. 97%	adult >50 yr. male	amtl; calculus; hypoplasia; periodontal disease; vertebral body collapse – T11 (osteoporosis); periosteal new bone – l. maxilla, tibiae, fibula; DISH - L3-5 & S1; degenerative disc disease – C4-6, T1-4, 7-9, L2; Schmorl's nodes – T8, 11-12; oa - 5T, L3-4, right shoulder; l.wrist, r. knee; op –5C, 12T, ribs, shoulders, elbows, carpals, Mt-C & IP joints, hips, knees, tarsals, Mt-T & IP joints; ankylosis – C2-3; enthesophytes – femora, calcanei, tibiae, fibula; mv – metopic suture, *os acromialie*
Cottington Hill						
5123	5122	redep.	MSaxon	*c*. 1% s. (= 5135)	subadult/adult >15 yr.	
5134	layer	redep.	LIA/ERB	1 bone l.	adult >18 yr.	
5135	5350	*in situ* burial	MSaxon	*c*. 80%	adult 45-60 yr. male	calculus; periodontal disease; hypoplasia; hyperostosis; ?trauma – humerus; op – 6T, carpals, 1st Mt-C & IP joints, tarsals, elbows, knees; enthesophytes – patellae, femur, calcaneum
5164	5163	*in situ* burial	LIA/ERB	*c*. 80%	adult >50 yr. male	amtl; caries; abscess; hypercementosis; hypoplasia; degenerative disc disease – 2T; oa – 4C, r. hip; Schmorl’s node – 1T; op – 6C, 10T, shoulders, wrists, carpals, Mt-C & IP joints (hands), knees, tarsals; enthesophytes – calcanea
5208	5166	redep.	LIA/ERB	*c*. 10% s.a.u. (= 5209)	infant *c*.3-5 yr.	
5209	5166	*in situ* burial	LIA/ERB	*c*. 10% l.	infant *c*.4-5 yr.	
Cottington Road						
6048	6049	coffined burial	RB	*c*. 6% s.u.l.	adult 25-35 yr. ??male	calculus
6063	6060	coffined burial	RB	*c*. 15% s.u.l.	infant *c*. 2-3 yr.	hypoplasia
6158	6156	coffined burial	RB	*c*. 25%	adult >50 yr. ?male	amtl; abscess; hypoplasia; calculus; oa – r. femur head; mv – extra cusp – 2nd max incisors
6161	6214	*in situ* burial	RB	*c*. 20% s.a.	infant *c*. 3 yr.	hypoplasia/enamel malformation

Context	cut	deposit type	phase	quantification	age/sex	pathology summary
6164	6093	coffined burial	LRB	*c*. 85%	adult *c*. 30-40 yr. male	amtl; abscess; calculus; caries, hypoplasia; periodontal disease; op –1st Mt-T & IP joints; cortical defects – 1st Mt-T; mv – man. M3 5 cusps
6168	6166	coffined burial + redep.	RB	*c*. 35% <1% s.	infant *c*. 4-5 yr. adult >45 yr.	hypoplasia caries
6171	6169	coffined burial	RB	*c*. 90%	adult *c*. 30-40 yr. female	amtl; abscess; calculus; caries; hypoplasia; periodontal disease; periosteal new bone – l. ribs; oa – femur heads; op – 4L, S1, r.elbow; enthesophytes – tibiae, fibula
6172	6154	coffined burial	RB	*c*. 8%	subadult/adult *c*. 15-25 yr.	caries, calculus, hypoplasia; mv- max. r.M3 5 cusps, man. M3s 5 cusps, max. l.I1 shovelled, max. l.I2 accessory tubercle
6174	6176	coffined burial	RB	*c*. 1% s.	infant *c*. 4-5 yr.	
6177	6165	coffined burial	RB	*c*. 3% s.u.l.	adult >40 yr.	calculus
6185	6214	redep.	RB	1) *c*. 10% s. 2) *c*. 36% u.l.	subadult/adult *c*. 15-20 yr. juvenile *c*. 6-8 yr.	calculus; caries
6186	6214	coffined burial	RB	*c*. 85%	adult *c*. 35-45 yr. male	amtl; abscess; calculus; caries; hypoplasia; *cribra orbitalia*; oa – l. hip, 1 r. & 1 l. Mt-T
Broadley Road						
7023	7021	redep.	LBA	frags. l. ? = 7175	subadult/adult >15yr	
7024	7021	redep.	LBA	80.7g	adult >18 yr.	
7175	7173	redep.	LBA	7 frags. s.u.l.	subadult/adult >16 yr.	

This volume presents the results of archaeological investigations undertaken at four sites in Kent. The two 'linear' schemes: the West Malling and Leybourne Bypass and Weatherlees–Margate–Broadstairs Wastewater Pipeline, provided transects across the landscape revealing settlement and cemetery evidence of Neolithic, Bronze Age, Iron Age, Romano-British and Anglo-Saxon date. Two Bronze Age metalwork hoards were also recovered and a variety of World War II features.

Medieval settlement remains included sunken-featured buildings at West Malling, Fulston Manor, and Star Lane, Manston, that appear to belong to a type of building specific to Kent that had combined uses as bakeries, brewhouses, and/or kitchens. A short study of these, their distribution, form and possible functions, is included.

In addition to evidence for Bronze Age occupation, Manston Road, Ramsgate produced Anglo-Saxon settlement evidence with six sunken-featured buildings and a sizeable assemblage of domestic items.



Southern Water

Kent County Council

WARD HOMES

TESCO

Online specialist report to accompany Wessex Archaeology Report 24:

ISBN 978-1-874350-50-7

http://www.wessexarch.co.uk/projects/kent/margate

Wessex Archaeology