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Extreme Justice: Decapitations and Prone Burials in Three Late Roman Cemeteries at Knobb's Farm, Cambridgeshire

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ABSTRACT

Excavations at Knobb's Farm, Somersham, Cambridgeshire, uncovered three small late Roman cemeteries, positioned at the edge of a farming settlement. The 52 burials found included 17 decapitated bodies and 13 prone burials – far higher than the British average. In two cases, cut marks show decapitation to have been the mechanism of death, and cuts on two other bodies indicate they experienced extreme violence. We conclude that the decapitations were the result of judicial execution. The significance of the prone burials is less clear, but it is demonstrably related to decapitation. Supplementary material is available online (https://doi.org/10.1017/S0068113X21000064) and comprises a detailed osteological report and skeleton catalogue, specialist reports, DNA and isotopic analyses, and a complete description of the settlement's development.

Keywords: Roman settlement; judicial execution; Roman cemetery; decapitation; prone burial

Decapitation and prone burials are amongst the 'irregular' burial practices that have been a long-standing focus of Roman archaeology in Britain.[1] Hundreds have now been excavated in Britain. Most attention has gone to decapitation, with many explanations

[1] Harman *et al*. 1981; Philpott 1991; Cooke 1998; Taylor 2008; Crerar 2012; 2016; Tucker 2012; 2014; 2016; Milella *et al.* 2015; Smith *et al.* 2018, 226–31.

proposed: execution, trophy taking, desecration, human sacrifice, war, cult practice, releasing the soul, laying the unquiet dead and banishing witches. Prone burials, by contrast, have received much less attention in Britain and their significance remains unclear.

Part of the difficulty in studying both practices is that they are uncommon: across Britain, decapitations make up *c*. 2.3–3.7 per cent of Roman era inhumation burials, while prone burials are slightly less common at *c*. 2–3 per cent.[2] Few cemeteries produce more than one or two examples of either. This limits opportunities to see patterns at the cemetery level or their relationship to other burials and each other. For this reason, the excavation of 17 decapitated bodies and 13 prone burials at Knobb's Farm, Somersham, Cambridgeshire, provides a rare opportunity to examine patterns and practices in detail.

CONTEXT OF THE KNOBB'S FARM BURIALS

The burials at Knobb's Farm come from three small cemeteries positioned on the south-western edge of a Roman farm settlement. Regrettably, the core of the settlement was quarried away in the 1960s, and the areas excavated by the Cambridge Archaeological Unit (CAU) covered only some of its outer fields. The settlement lay at the centre of a small peninsula on the edge of the Cambridgeshire fens, with cropmarks showing rectilinear fields and droveways spread around it over some 300 ha (FIG. 1).[3] The farm had originated in an irregular Late Iron Age enclosure. Within the excavated area, this was replaced by a rectilinear field system in the first century A.D. In the second century, crop-processing facilities were established in one of the fields, with corn-drying flues, crop-processing debris, a potential granary and several other buildings. There was, however, no evidence for domestic activity in any of the fields excavated. The buildings were dismantled around the end of the second or early third century A.D. and all activity on the site ended in the third century. Even field manuring appears to have ceased, with trackside ditches and field boundaries producing very little ceramic material dating specifically to the third or fourth century A.D. The only Roman era activity of note at Knobb's Farm after the decline of crop-processing activity is the creation of the three burial plots around the edges of the defunct field system.

The Roman era settlement was one of several excavated within a few kilometres of each other along the Somersham fen edge. These provide the immediate social and economic contexts for the Knobb's Farm settlement and its burials. The focus of this activity lay about one kilometre to the south on the Camp Ground site, Colne, where there was a sizeable inland port and a village of 50–200 people.[4] Like Knobb's Farm, it grew out of Late Iron Age settlement. The village was occupied throughout the Roman period, with a peak of activity between A.D. 250 and 325, although it continued in use into the late fourth century.[5] Located by the Car Dyke, many of the identifiable buildings appear associated with the processing, storage and transport of grain, including a complex of granaries, along with a warehouse and mill, as well as loading points for barges. There is also evidence for meat rearing and butchery. Production and shipments of grain and meat appear to have been to fulfil army supply contracts.[6] Operations at the Camp Ground port were possibly organised by the Roman

[2] Philpott 1991, 80; Smith *et al.* 2018, 229, fig. 6.18.
[3] Cropmarks from Palmer and Cox 1996.
[4] Evans *et al.* 2013, 179–452.
[5] There were a considerable number of coins recovered from the period A.D. 330–438. The latest coins recovered date to A.D. 388–402 (Reece in Evans *et al.* 2013, 331–2).
[6] Evans *et al.* 2013, 432, 451.

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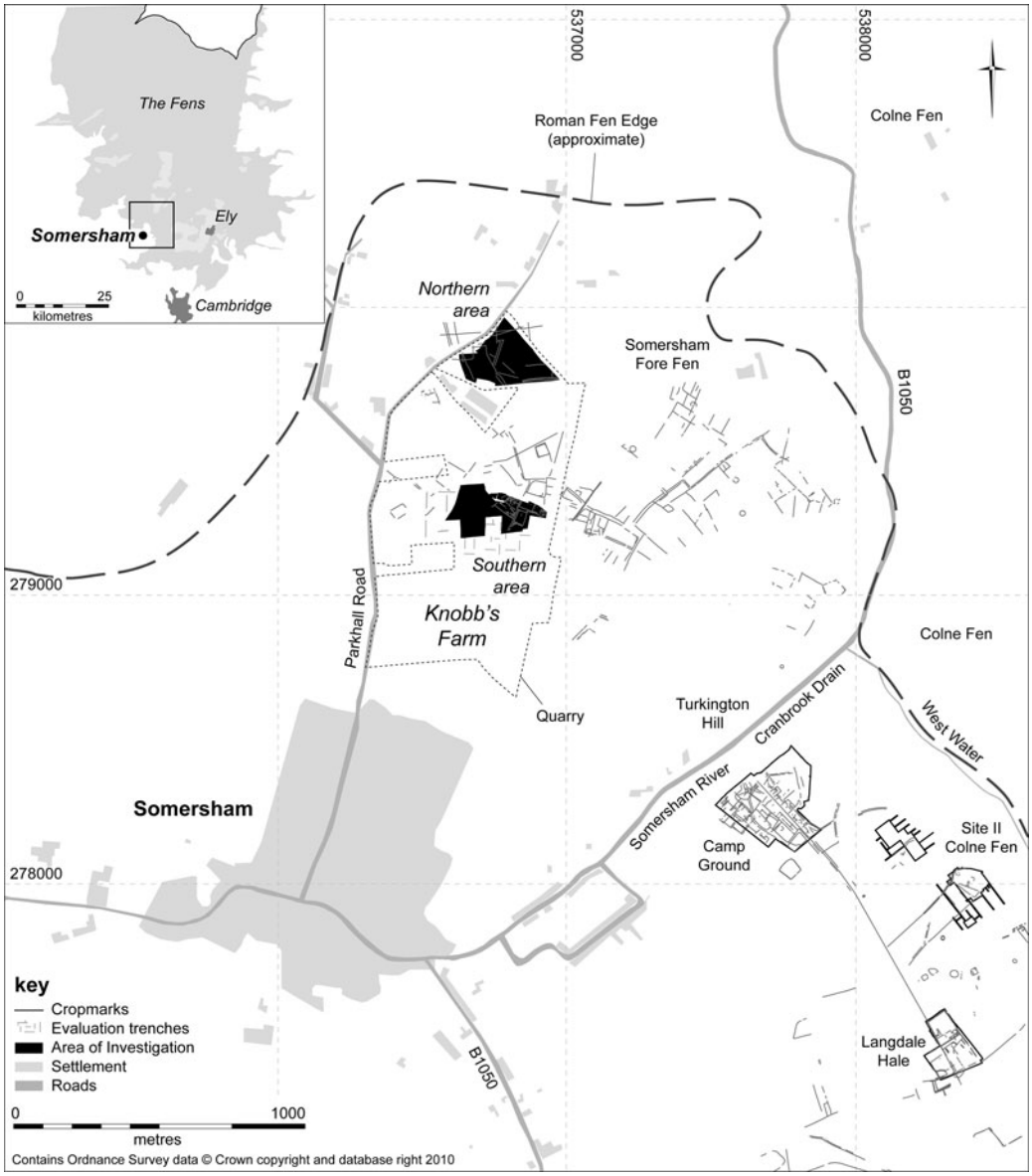

FIG. 1. Location map, showing the excavation areas and cropmarks.

state in the early second century A.D., although later production may have been delivered by private enterprise working under official regulation.[7]

[7] Evidence for the settlement's 'official' or state-sponsored status includes: its geometrically organised East Road compounds suggestive of official surveying (Evans 2013, 207, also 216: 'this appears to be the hallmark of other "official" Hadrianic-inspired initiatives within the region [around the first quarter of the second century]'); an array of 'state-related' facilities within the East Road compounds, including a warehouse, a mill and a granary complex (Evans *et al*. 2013, 216); a possible 'official' residence (Evans *et al*. 2013, 239); the presence of a steelyard; many

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A further kilometre to the south, and joined to the Camp Ground port by a well-made road, was a farming settlement at Langdale Hale.[8] Its layout was quite atypical of rural farmsteads in the region. It appears to have been another state-sponsored enterprise, established to supply the Camp Ground port with grain or flour.[9] There is substantial evidence for cereal production, including numerous corn-driers and two barns, along with stockyards. The site was established shortly after the conquest and continued in use until the start of the fourth century A.D., with a highpoint in activity between A.D. 120 and 250; although, like the Camp Ground settlement, the site saw diminished activity after A.D. 325, with coin deposition ceasing around A.D. 360.[10] Crop processing at Knobb's Farm is a good match for this date, and is one indication that the Knobb's Farm settlement might likewise have been engaged in crop production for 'official' supply via the Camp Ground port.

Three kilometres to the south of the Camp Ground was another substantial settlement at New Fen Drive, covering approximately 20 ha.[11] A rescue excavation in 1973–74, undertaken before the site was lost to gravel quarrying, recovered numerous buildings and considerable evidence for industrial activity: chiefly crop production and processing along with cattle raising. Evidence for metalworking and pottery kilns was also found. A third-century shrine was recovered, and its enclosure ditch was noted for the large number of female burials present (although unfortunately most were destroyed before they could be recorded). Like Knobb's Farm and the Camp Ground, the New Fen Drive site appears to have originated in the Late Iron Age, enjoying a high point in the second to fourth century A.D.

Finally, between Knobb's Farm and the Camp Ground site was what appears to have been a substantial Romano-British building at Turkington Hill. The site has not been excavated, but chance finds made in the early twentieth century include Barnack building stone, a hypocaust, roof tile and pottery.[12]

A full description of the development of the Knobb's Farm settlement and the excavation of the site is presented in the online supplementary material, along with all the specialist reports. This article focusses on the late Roman burials – their demographics, grave goods, burial practices and scientific analysis before turning to the significance of the irregular burials on the site.

CEMETERIES AND BURIALS

This section presents an overview of the characteristics of the cemeteries and burials. Irregular burials are discussed in more detail below. The online supplementary material contains a detailed catalogue of the burials, including osteological analysis and skeleton plans, as well as a discussion of methodology and scoring systems. The supplementary material also includes reports on the preservation of the assemblage, burial positions, demography, trauma and pathology.

BURIAL PATTERNS

A total of 52 individuals were recovered from the three late Roman cemeteries at Knobb's Farm (FIG. 2): 11 individuals from eight graves in Cemetery 1, including disarticulated remains in one grave (FIG. 3); 28 bodies from 30 graves in Cemetery 2 (FIG. 4); 13 skeletons from 12 graves in Cemetery 3 (FIG. 3). As these figures indicate, the bulk of the bodies were buried individually

lead weights and coins – notably, the inclusion of some rare coin types and a large number of coins dating to A.D. 294–330, possibly relating to official or military events (Evans *et al.* 2013, 332, 428).

8 Evans *et al.* 2013, 21–177.

9 Evans *et al.* 2013, 177.

10 Reece in Evans *et al.* 2013, 100.

11 Green and Henig in Evans *et al.* 2013, 459–64.

12 Tebbutt 1929, 307.

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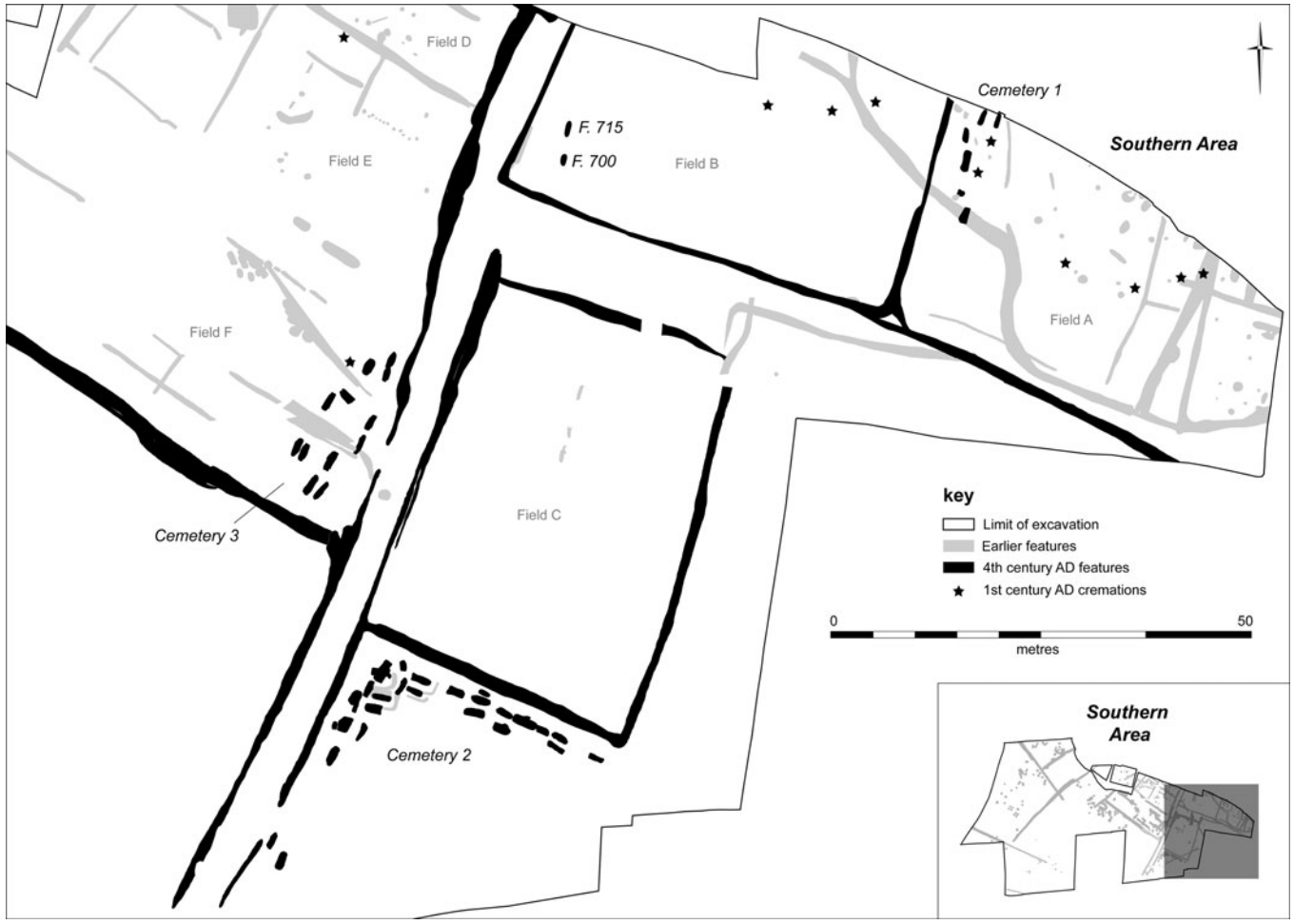

FIG. 2. Late Roman features and cemeteries at Knobb's Farm.

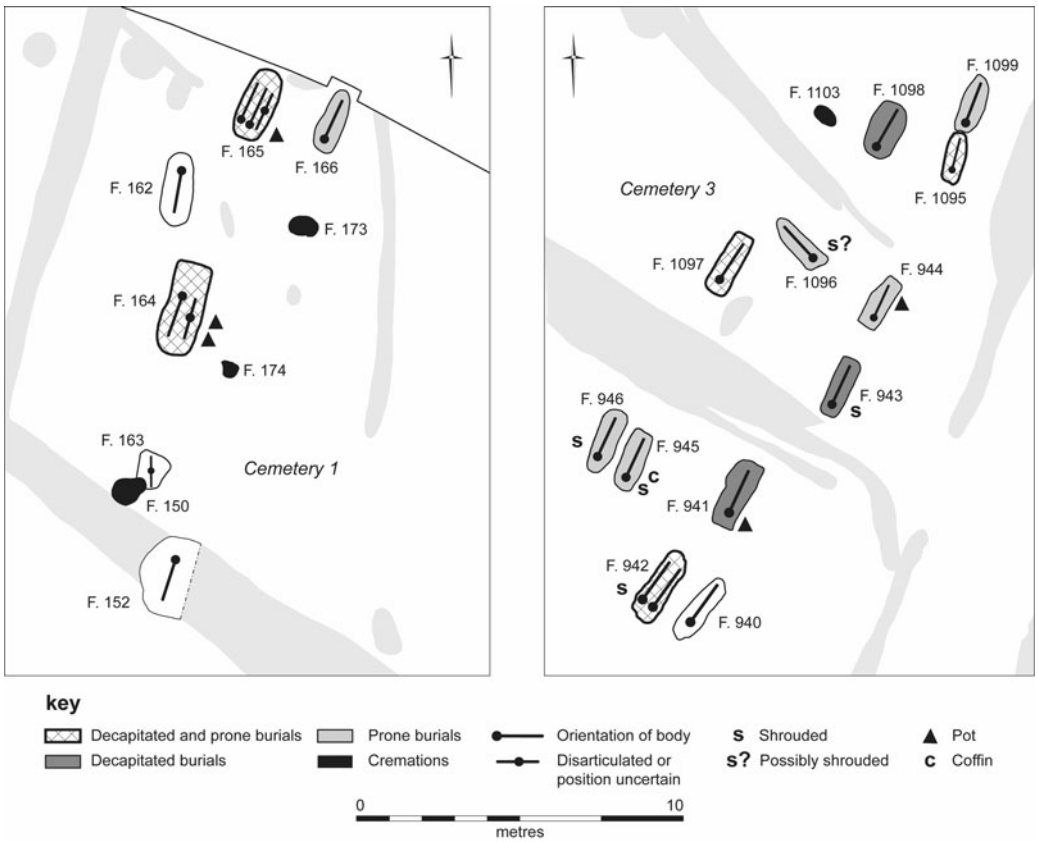

FIG. 3. Late Roman Cemeteries 1 and 3.

in separate graves, although there were two double burials (F.935 and F.942) and four cases where graves had been reopened and further bodies inserted (F.164, F.165, F.509/F.932, F.934). Four graves were found to be empty (F.934, F.936, F.952, F.962). APPENDICES 1–3 summarise key data for the individual burials.

Cemetery 1 was located on the site of several early Roman cremation burials (described in the online supplementary material). The reuse of the site probably reflects nothing more than the common Roman practice in rural settlements of placing burials at the edge of settlements.[13] There is no sign that this plot continued in use as a cemetery between the early and late Roman periods.[14]

All three cemeteries were positioned by boundary ditches in the former field system; Cemeteries 2 and 3 were in the corners of fields. With only a handful of exceptions, the burials were all parallel to the boundaries – another common practice in Roman Britain.[15] Cemeteries 1 and 3 show only one phase of activity, apart from the reopening of Graves F.164

[13] Pearce 2013, 102.

[14] It is possible that the infant and juvenile burials in Cemetery 1 date to the first century rather than the late Roman period. The infant inhumation in F.163 was immediately beside the first-century cremation F.150 and the juvenile in F.152 was buried in a shallow Late Iron Age/early Roman ditch. Neither burial produced any datable grave goods or other material. They have been grouped with the late Roman burials solely because they are inhumations rather than cremations.

[15] Esmonde Cleary 2000, 137; Pearce 2013, 102.

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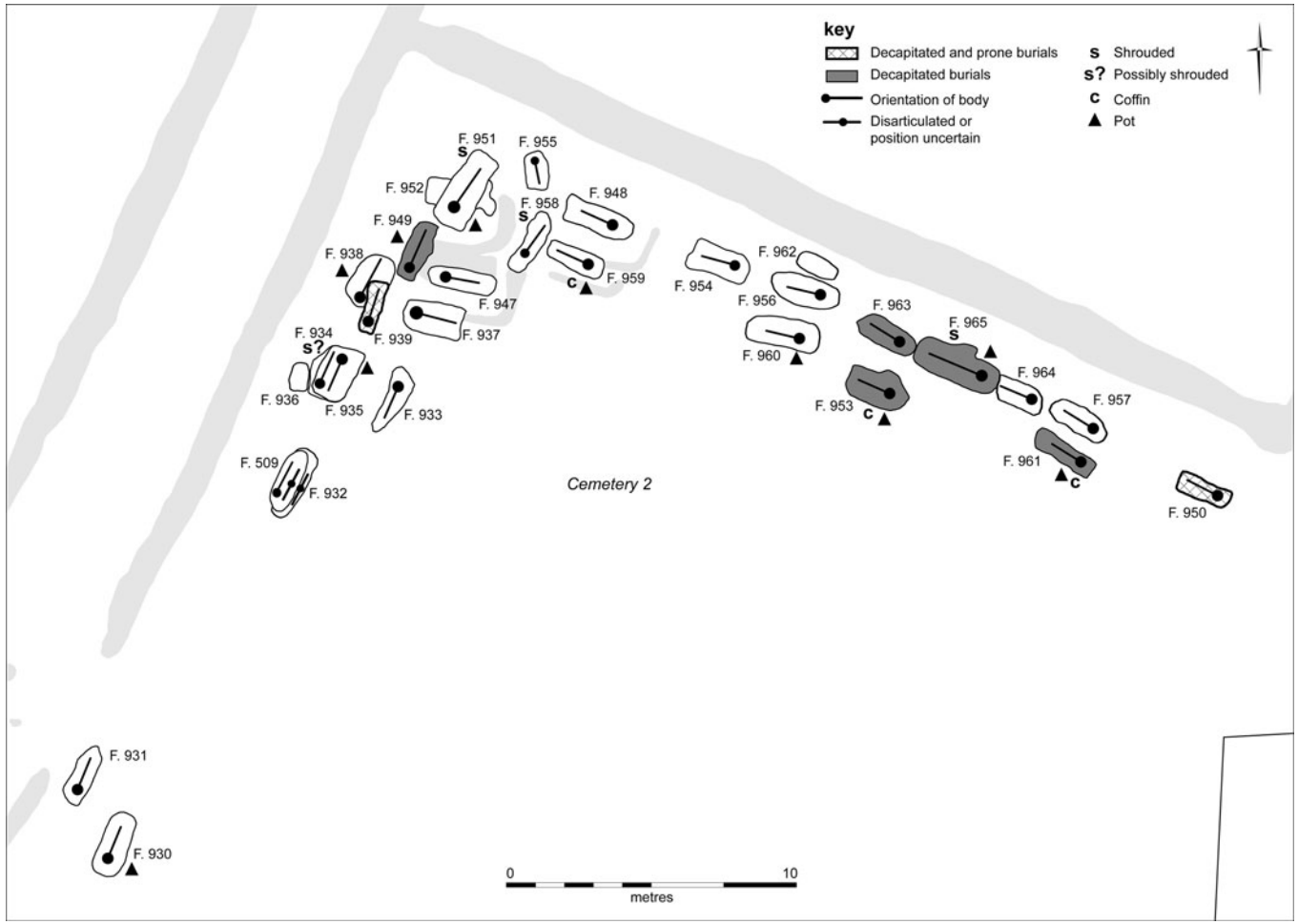

FIG. 4. Late Roman Cemetery 2.

and F.165. Cemetery 2, by contrast, shows at least two and possibly three phases. The first five burials (one empty) were positioned in the corner of the field and demarcated with small L-shaped gullies. These were succeeded by a further ten inhumations and one empty grave to the east, all on the same orientation, parallel to the field's northern margin. Finally, another 12 inhumations and one empty grave were inserted along the western edge of the field, over the first burials and at 90 degrees to the earlier two phases. In this phase, graves F.932 and F.934 were reopened to insert more bodies. This final phase saw bodies buried on the same orientation as Cemeteries 1 and 3, although this simply may reflect orientation to the rectilinear field boundaries rather than necessarily implying the cemeteries were contemporary.

Most of the skeletons were in poor condition and several had been reduced to little more than sand shadows. Of the 41 bodies that were still articulated, almost all had been laid out in an extended position: 26 were buried supine; 13 prone; and two were on their side. Seventeen of the bodies had been decapitated and 13 buried prone, including six involving both practices. The irregular burials are discussed in detail below.

DEMOGRAPHY

Of the 52 bodies recovered, 15 are female and 21 male. The remainder could not be sexed, chiefly because of poor bone preservation. Two are infants; one is juvenile and one subadult; the remainder are adults. The largest age cohort amongst the adults is middle adults aged 25–45 years (21 skeletons), followed by mature adults aged 45+ (11 skeletons) with a small number of young adults aged 18–25 (six skeletons). FIG. 5 shows the probable number of deaths per year, assuming they were distributed equally within each age cohort. It shows that the peak death rate amongst middle adults was driven by decapitations.

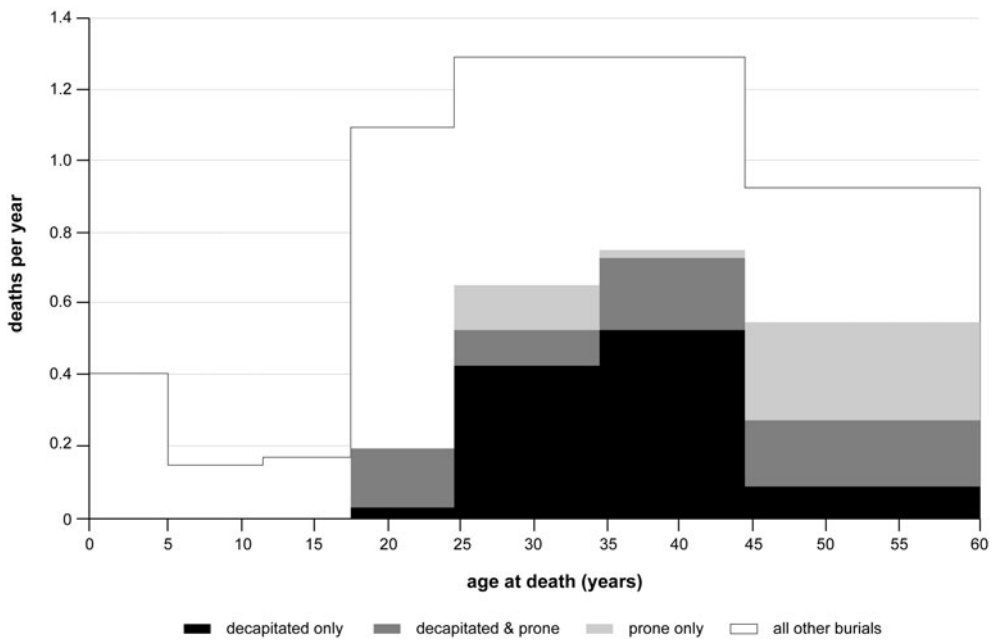

FIG. 5. Probable number of deaths per year, based on the age categories, showing frequency of decapitation and prone burial.

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Fourteen of the bodies had evidence for skeletal trauma. Apart from decapitation, which is discussed below, the skeletal trauma identified on the skeletons consists of healed fractures: a broken finger (F.1099), a torn ligament in a right leg (F.946), trauma to a right femur (F.951), a fracture to an elbow (F.942), a 'clay-digger's' fracture on one vertebra (F.152), a possible long-standing dislocated hip (F.949), hip trauma (relating to the ossification centres of the acetabulum) (F.1097) and a healed cranial fracture (F.941). While the last of these may indicate interpersonal violence, most of this trauma was likely the product of overuse or injury through activities such as heavy physical labour.

The skeletons show a variety of pathologies. Twelve show hypoplasia on the teeth, suggesting systemic stress in childhood such as dietary disorders or infection. Nine have evidence of possible anaemic disorders, indicated by thickened or porous bones in the cranium. This may have resulted from a vitamin deficiency or been the product of a dietary disorder or an inherited condition such as thalassemia. Eighteen burials have signs of age-related skeletal degeneration, mostly amongst older individuals. Fifteen of these have osteoarthritic changes in the spine, hips and other joints. Dental caries were found on 17 skeletons; five have abscesses and two have periodontal disease. Fifteen of these individuals had lost teeth during their lives. These figures underestimate dental disease as poor preservation meant that no teeth remained in 18 of the bodies. Finally, two skeletons from Cemetery 1 have an extra sixth lumbar vertebra (F.166 and F.164). Both were buried prone.

COFFINS, A GRAVE BOX, SHROUDS AND GULLIES

Judging by the number of nails found in the graves, at least three bodies were buried in coffins: F953, F.959 and F.961. All were in Cemetery 2. The bodies in two of them, F.959 and F.961, had been decapitated. Fifteen other graves contained one to six nail fragments, almost all of them in Cemetery 2. Preservation in this part of the site was very poor, and most of the nails were little more than fragmentary corrosion tubes. Combined with the high level of truncation, it is possible more coffins might have been used, but this is impossible to demonstrate.[16]

F.945 in Cemetery 3 appears to have been a box burial or a crude coffin. During excavation, a layer of paler soil was found over the body and in vertical bands alongside the body, interpreted by the excavator as the decayed remains of a timber lining. Three nails were also recovered from this grave. This is not enough for a coffin but, if they were not simply unintentional inclusions from some previous use of the timber, these few nails might have been sufficient to hold planks in place within the grave.

The burials in Cemetery 3 were surprisingly uniform in their burial posture: eight of the 11 largely complete skeletons had their arms wrapped tightly around the abdomen or chest; only two other whole skeletons had one or both arms extended. A number also had their knees and ankles drawn together, some with their lower legs stacked or crossed. This occurred in both supine and prone burials, and includes decapitated individuals (F.942, F.1095, F.1097). Since it would be very difficult to place a body in a grave face down in this position, these individuals were probably buried in a winding sheet. At least six individuals were likely to have been shrouded (F.942 Sk.1352, F.943, F.945, F.946, F.958 and F.965), with a further three possibly buried this way (F.939, F.951 and F.1096). Three of the clearest cases are illustrated in FIG. 6.

[16] For further details of the nails, see Justin Wiles' analysis in the online supplementary material.

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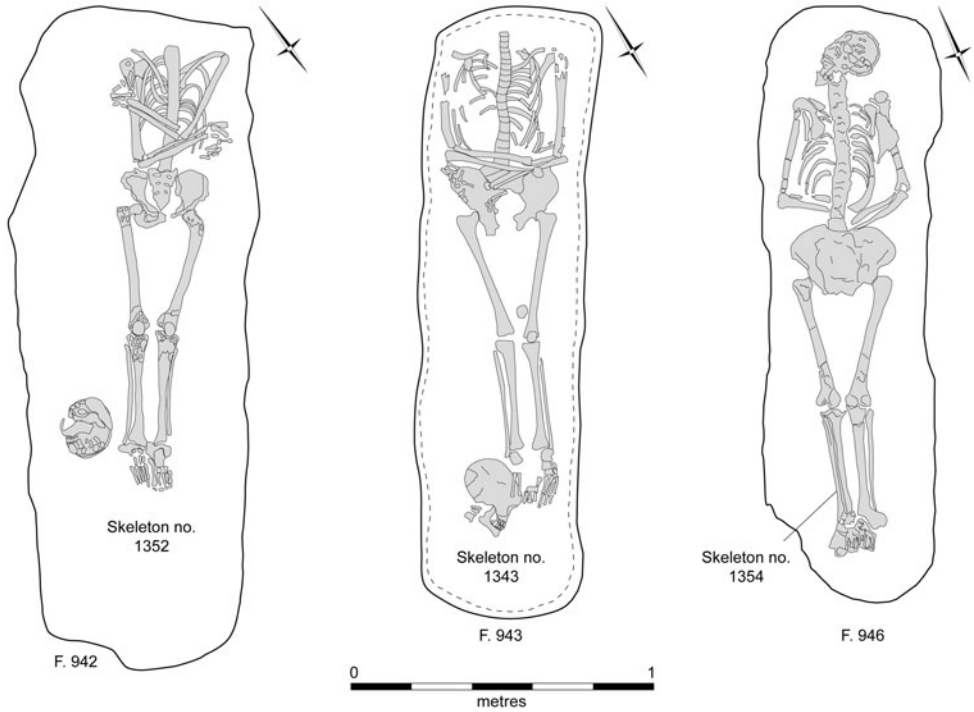

FIG. 6. Three likely shrouded burials: F.942 (Sk.1352), F.943 and F.946 (the latter was also buried prone).

Finally, four of the earliest graves in Cemetery 2 were demarcated by small L-shaped gullies. One of the graves was empty (F.951). The skeletons in two more were in very poor condition, buried supine with no grave goods (F.947 and F.948). The last (F.959) had been placed supine in a coffin with a miniature beaker. None of these bodies had been decapitated or buried prone. These burials lay in the corner of a ditched field, and the gullies lay on the 'outward' sides of each grave. Owing to the level of truncation, it is not possible to estimate the original dimensions of the gullies, but they cannot have been much more than 0.6 m deep. There is no parallel for them in the region.[17] Their purpose is unclear; they might have been intended to 'contain' symbolically the graves in the corner of the field or dug simply to provide extra soil to make the burial mounds look larger.

GRAVE GOODS

Pottery

The main grave goods are pottery vessels (FIG. 7, FIG. 8, APPENDIX 4). Fifteen burials produced a total of 14 whole vessels and one fragmented, including two pots in one double grave (presumably

[17] The closest parallels to the L-shaped gullies in the east of England are the square and circular enclosures with around ten inhumations of the mid- to late fourth century A.D. at Kempston, Bedfordshire (Dawson 2004, 226–7, fig. 5.116).

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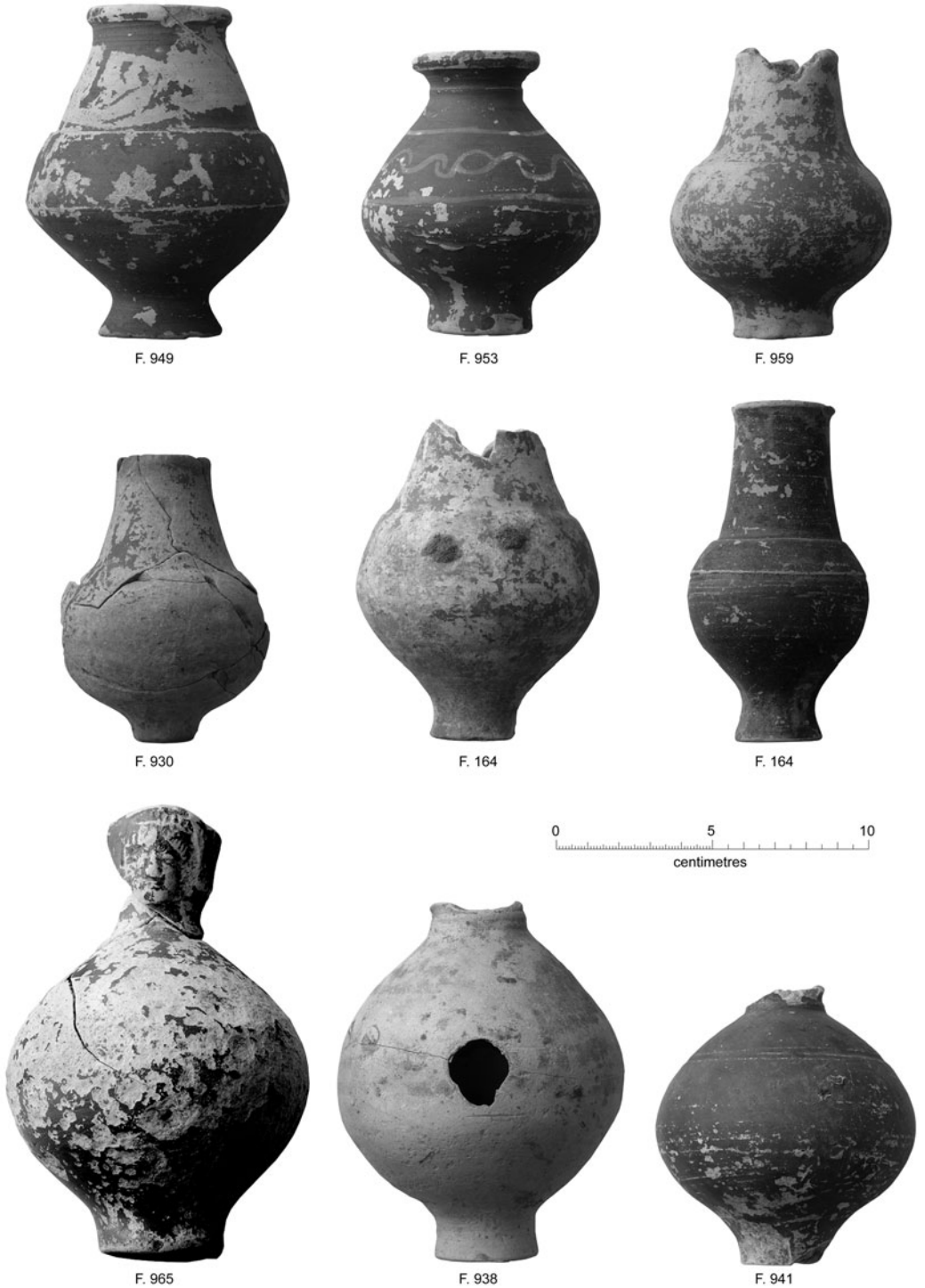

FIG. 7. Small and miniature vessels recovered from graves at Knobb's Farm.

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FIG. 8. Small and miniature vessels recovered from graves at Knobb's Farm.

one apiece).[18] The pots had been placed either by the head or by the shoulder, apart from the prone decapitated burial in F.164, where the pot had been placed on the middle of the back.

Most of the vessels from Knobb's Farm are beakers (nine) – the most common vessel in Britain during the third and fourth centuries A.D.[19] – followed by flagons (three) and small jars (three). This is typical of the pottery vessels used as grave goods both locally and in Roman Britain generally.[20] It reflects a preference for drinking vessels in late Roman burials and may be the last vestige of the more elaborate 'dining sets' placed in early Roman graves.[21] Ten of the 15 vessels were colour coated, which was also common amongst grave goods across the province.[22] The main source of pots at Knobb's Farm was the Nene Valley industry.[23] Other sources were Colchester (one), possibly Horningsea (one) and local shell-tempered ware (three). The Nene Valley industry also supplied several other cemeteries in Cambridgeshire (see FIG. 19).

[18] Across Roman Britain by the fourth century A.D., almost invariably just one pottery vessel was deposited per burial (Philpott 1991, 110).
[19] Philpott 1991, 108.
[20] Philpott 1991, 30–6, 108; Biddulph 2005.
[21] Philpott 1991, 36; Willis 2005, section 9.3; Pearce 2013, 130.
[22] Philpott 1991, 109.
[23] Perrin in Mackreth 1996, 177 (Orton Hall Farm); Jones 1975 (Lynch Farm).

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The majority of the pottery grave goods are late Roman in date. Eight of the 15 vessels are dated specifically to the fourth century A.D.; 13 are dated more broadly to the late third or fourth century A.D.

A particularly significant find is the face-necked flagon from F.965 in Cemetery 2. It accompanied a decapitated mature adult male. Regrettably, the surface of this vessel has been badly eroded and the face's features are unclear (FIG. 9). Like many British examples,[24] the face appears to be surmounted with a diadem, suggesting it may represent a goddess. This type of flagon dates to the late Roman period, with most in Britain produced in the mid-fourth century.[25] This type of vessel, however, developed on the Rhine, where it was popular with the military. In Britain, these flagons were produced in a number of centres, including the Nene Valley – the source of the Knobb's Farm example. At 14.6 cm tall, the vessel from F.965 is at the bottom end of the reported size range of the Nene Valley flagons (13.5–29 cm)[26] and is also small compared with other examples found in British graves.

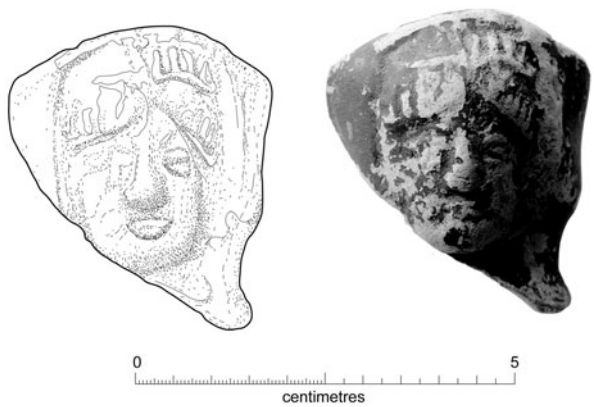

FIG. 9. Detail of the face-necked flagon from grave F.965.

Two other miniature flagons of note were found in F.938 (Cemetery 2) and F.941 (Cemetery 3); both have lost their necks. Although the three flagons are not identical, there is a possibility that the missing necks might also have carried faces. Both are also notable for a second reason. The flagon in grave F.938 has a circular hole bored in the middle of the globular body, while the flagon from grave F.941 shows the beginnings of a similar perforation. Boring holes or inflicting other minor 'injuries' to ceramics was common practice in Roman Britain,[27] and such pots accompany both cremation and inhumation burials in all phases of the Roman period.

Beyond the whole and near-whole pots deposited in the graves, 89 sherds (469 g) were recovered from 12 graves. Edward Biddulph has suggested that apparently residual pottery might sometimes reflect remains of graveside rituals.[28] Most of the sherds recovered from the Knobb's Farm graves are small and worn, which suggests that they were not deliberately

[24] Dövener 2000, 163.
[25] Dövener 2000, 159–61.
[26] Dövener 2000, 127.
[27] Philpott 1991, 112; Willis 2005, section 9.6 (samian vessels). Fulford 2001 notes several examples in non-funerary contexts.
[28] Biddulph 2015.

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deposited. There are, however, three exceptions: ten large, unworn, coarse sandy greyware sherds (109 g) dating to between the mid-second and the fourth century A.D. from F.165 (Cemetery 1); 25 small sherds (62 g) of a shell-tempered jar dating to the second century A.D. in F.958 (Cemetery 2); 27 sherds (439 g) from a semi-complete burnt, coarse sandy oxidised jar dating to the second to the early third century A.D. from F.940 (Cemetery 3).[29]

Other grave contents: a comb, beads and a box

In addition to the pots, several other objects were found in graves.

A double-sided composite comb made of antler (FIG. 10) was found in grave F.1097: the burial of a decapitated older woman whose body had been mutilated and then buried face down. The comb was found in three pieces: one under the abdomen; a second in the grave fill by the lower spine; and the third behind the decapitated head between the lower legs. None of the iron rivets, which would have held the antler pieces together, had survived. The breaking was presumably deliberate: most combs found in Roman graves are whole. This burial does preserve the usual custom of placing the comb near the head[30] and, like most other examples, it accompanied the burial of an adult woman.[31] As the comb may have been in the woman's hair when she was beheaded, it is possible that this may not have been a deliberate grave offering. The earliest double-sided composite combs were deposited *c.* A.D. 350, or possibly a little later, and they continued in use into the early part of the fifth century.[32]

By the right shoulder of the decapitated skeleton in F.164 were 30 beads; one more was found around the mouth of the skull which had been placed between the knees. This bead around the skeleton's mouth, separate from the others, suggests the woman may have been wearing a necklace when she was decapitated, and that the remaining beads were subsequently gathered up and placed with her in the grave. All the beads are made from a material identified as cannel coal (FIG. 10). They are long, segmented beads with a circular section and vary in length from 6 to 18 mm; the shortest is a single segment of a longer broken bead. The average diameter is 6 mm, with many tapering slightly to one end. With the exception of the single broken bead, all had two to four segments. Each had been lathe turned, with incised lines scored round the circumference. Each bead had been polished leaving a matt-black surface. When all the beads are laid out end to end they form a necklace with a diameter of *c.* 10.5 cm.

Finally, an incomplete double-spiked loop was recovered from the south-eastern corner of grave F.949. This object suggests the presence of an object such as a box or drawer.[33] This would fit with the unusual layout of this grave: it is especially wide and the body is laid off-centre – possibly to make space for a box at the head of the grave where the spiked loop was found.

SCIENTIFIC ANALYSIS OF THE HUMAN BONE

Isotopes *By* Emma Lightfoot

Enamel samples were analysed from 32 inhumation burials.[34] Sampling focused on adult individuals and included males and females, individuals from all three cemeteries and examples of both decapitated and prone burials.

[29] For further details, see Francesca Mazzilli's analysis in the online supplementary material.
[30] Jones 2013, 68.
[31] Cool 2010, 273; Jones 2013, 62.
[32] Crummy 2004, 175. For further details of the Knobb's Farm comb, see Ian Riddler's analysis in the online supplementary material.
[33] Crummy 1983, 119.
[34] One Iron Age burial was also sampled (Wiseman 2020). Results are presented in the online supplementary material.

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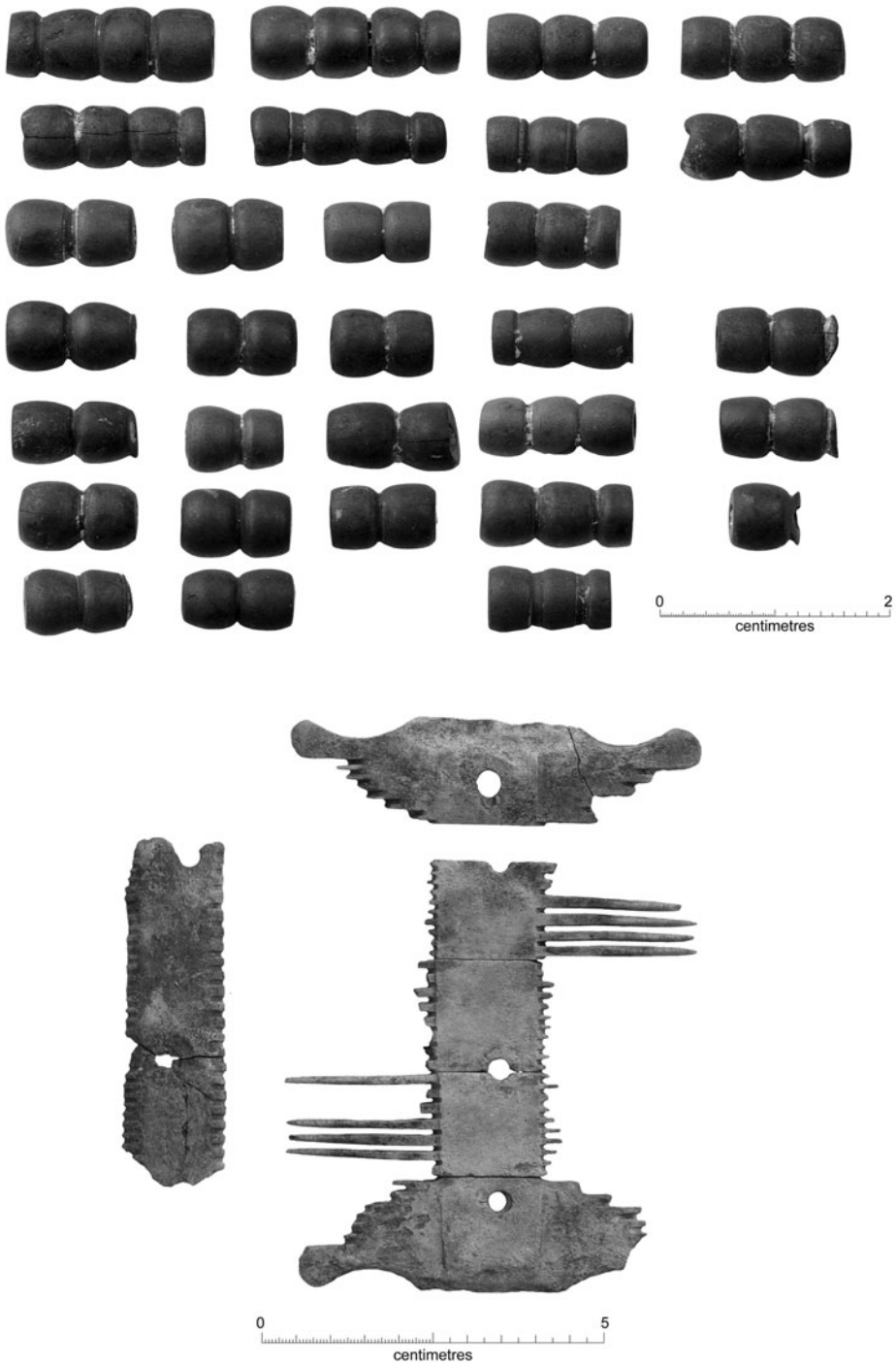

FIG. 10. Camel coal beads from grave F.164 and late fourth-century bone comb from grave F.1097.

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The $\delta^{18}O_{CO3}$ values ranged from -7.0‰ to -3.0‰ (mean -4.7 ± 1.0‰), equivalent to a $\delta^{18}O_{PO4}$ values of 14.8‰ to 19.1‰ (mean 17.2 ± 1.1‰). One clear outlier was identified in the skeleton from F.165, with a low oxygen isotope value of 14.8‰. A second individual with an unusual value was F.959; this had the highest $\delta^{18}O_{PO4}$ value (19.1‰).

British oxygen isotope data can be divided into two groups, representing two bioclimatic zones: (a) a largely eastern, low-rainfall zone and (b) a largely western and southern, high-rainfall zone.[35] The mean $\delta^{18}O_{PO4}$ for the low-rainfall zone is 17.2‰ ± 1.3‰ (2SD). The $\delta^{18}O_{PO4}$ values indicate that all the skeletons apart from the two outliers are likely to be from the eastern 'low-rainfall' zone of Britain. The individual buried in F.165 is likely to have spent their childhood somewhere colder than Cambridgeshire (such as the Alps), while the individual in F.959 could have spent their childhood in the 'high-rainfall' area of Britain or somewhere warmer than Cambridgeshire (such as the Mediterranean, although the low carbon isotope values suggest this individual did not grow up in a subtropical environment).

There was no statistical differences in isotope values between the sexes, between the three cemeteries or between regular burials and those that had been buried prone or decapitated.[36]

Ancient DNA *By* Christiana Lyn Scheib

Teeth and petrous bones from 33 individuals were processed using standard protocols for ancient DNA extraction and sequencing.[37] It was possible to sequence material from 21 individuals. Unfortunately, only 11 samples had high enough quantities of host DNA for analysis.

The genetic sex could be positively established in the case of 11 samples and possibly established for a further three. The genetic sex of the remainder could not be established due to a lack of data. Of the 13 bodies where genetic and morphological estimations of sex were possible, eight were in agreement and five were not.[38]

In the 11 samples with more than 1 per cent human DNA, mitochondrial lineages could be identified for ten. There are at least nine independent maternal lineages from mitochondrial DNA located at this site, and none of these lineages match each other (except for disarticulated Sk.318 and Sk.319, which share a matching haplotype and genetic sex, indicating that they are possibly from the same individual). All the lineages belong to mitochondrial haplogroups H and J. Both are common groups in Britain today: H is found in 44.7 per cent of the modern British population and J in 11.5 per cent (Eupedia website). Both haplogroups are also widespread across modern Europe.

A similarly wide range of mitochondrial lineages was identified in the Roman cemetery at Vicar's Farm, north-west Cambridge[39] – the only other Roman cemetery in the area that has been subjected to full genetic analysis. In total, there are 12 distinct maternal lineages belonging to mitochondrial haplogroups H and U. Of the 14 samples that could be assigned to

[35] Evans *et al.* 2012.

[36] For further details, see Emma Lightfoot's analysis in the online supplementary material.

[37] Scheib *et al.* 2019.

[38] See ONLINE TABLE T14.1 in the supplementary material for details. Discrepancies between morphological and aDNA sex are due chiefly to the high-level fragmentation and poor preservation of the skeletons; most of the affected morphological assessments were rated as only 'probable' or 'possible' identifications of sex. Four of the discrepant skeletons are from Cemetery 3: F.943 with only 37 per cent of the skeleton present, identified as male but DNA returned XX; F.944 with 67 per cent of the skeleton present, identified as probably male, but DNA producing XX; F.945 with 79 per cent present, identified as a probable female with DNA consistent with XY but not XX; and F.1099 with just 28 per cent of the skeleton present, identified as possibly male, but DNA consistent with XX but not XY. The fifth discrepancy was in Cemetery 1: F.165 Sk.324 with 45 per cent of the skeleton present, probably female on morphological grounds, but DNA determined the sex as XY. For consistency, in the remainder of this article, sex given will be based on skeletal morphology, as that could be determined for 36 burials, compared with only 11 certain aDNA determinations. Any relevant differences are noted in the footnotes.

[39] Scheib in Evans and Lucas 2020, 326–7.

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a mitochondrial haplogroup, two pairs belong to the same groups (two brothers and either two sisters or a mother/daughter pair). There is also one second-degree relationship (half siblings, first cousins or a nephew/uncle pair). These results indicate that the cemeteries at Knobb's Farm and Vicar's Farm both contain mixed populations with few people related by family.

Unfortunately, due to the state of preservation, none of the samples from Knobb's Farm has a high enough coverage at this stage to explore phylogeography (the extent to which individuals came from indigenous or migrant populations). Two results are notable, however. Sample KNF006 (F.166 Sk.327) belongs to haplogroup H1i1, which is today found predominantly in Scotland and Ireland, while KNF014 (F.943 Sk.1343) belongs to H17, which is found primarily across northern Europe and Scandinavia (Eupedia website). All the other individual haplogroups are widely distributed across modern Europe.

Due to poor preservation, no Y chromosomes (patrilineal DNA) could be determined.[40]

A CHRONOLOGY FOR THE CEMETERIES

Radiocarbon dating

Samples from 16 skeletons were submitted to SUERC (University of Glasgow) for radiocarbon dating. The initial test runs of four ribs all failed to produce sufficient collagen for processing, and so a second group of 12 large bones (femorae and ulnae) was submitted. Only two returned a result: F.1095 and F.1098 from Cemetery 3 (TABLE 1).

TABLE 1. RADIOCARBON DATES FOR SKELETONS FROM KNOBB'S FARM

Feature	Sample	C14 reference	$\delta^{13}C$ $\delta^{15}N$	Uncalibrated date (68.2%)	Calibrated date (IntCal 13) (95.4%)
F.1095	Human femur	SUERC-86551 (GU51687)	-21.0‰ 11.9‰	1648 ± 29 BP	332–433 cal. A.D. (85.8%) 461 cal. A.D. (0.5%) 489–533 cal. A.D. (9.1%)
F.1098	Human femur	SUERC-86550 (GU51685)	-21.0‰ 11.9‰	1747 ± 29 BP	231–384 cal. A.D. (95.4%)

These two skeletons were adjacent to one another at the northern end of Cemetery 3. It seems plausible, therefore, that they might have been buried at or around the same time. Based on this assumption, the combined probability distributions for each produce dates of A.D. 260–75 cal. (9.2 per cent) or A.D. 325–95 cal. (86.2 per cent), peaking at A.D. 340–80.

Artefact dating

With only two radiocarbon dates, the weight of chronological evidence falls on the grave goods. All the artefactual evidence (summarised in TABLE 2) points to the burials dating to the fourth century A.D. It is possible to refine this somewhat with two sets of observations. The first is the

[40] For further details, see Christiana Lyn Scheib's analysis in the online supplementary material.

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unusually consistent use of miniature vessels as grave goods, the unvarying placement of decapitated heads at the foot of each grave (described below) and the high possible incidence of shrouding in Cemetery 3 (with potential parallels in Cemetery 2). Together, this suggests that most burials were conducted over a fairly short period, before external influences and changes in fashion led to variations to burial practices. The second set of observations concerns the development of Cemetery 2. The second phase plainly respects the orientation and burials of phase 1. All the pottery in this second phase belongs to the fourth century A.D. By contrast, phase 3 of the cemetery truncates several of the phase 1 burials, suggesting a hiatus of use between phases 2 and 3. This suggests that Cemetery 2 received its first burials in the late third to early fourth century, the second phase in the early to mid-fourth century, followed by a break of maybe one or more decades, with the final phase 3 burials occurring in the mid- to late fourth century. This would make the last phase of Cemetery 2 more or less contemporary with Cemetery 3, which produced artefactual and C14 evidence of between *c.* A.D. 350 and 385–95. This suggests Cemetery 2 might have received its first burials around the early to mid-fourth century AD, with Cemeteries 1, 3 and the final phase of Cemetery 2 dating to the second half of the fourth century.

This chronology implies that the irregular burials are not the product of a single event. In particular, the cluster of five from the middle phase of Cemetery 2 (F.950, F.953, F.961, F.963, F.965) appear to predate the two from the cemetery's final phase (FG.939 and F.949). It is also worth reiterating that several graves were reopened to accommodate later burials (Cemetery 1: F.164 and F.165; Cemetery 2 phase 3: F.509/F.932 and F.934).

TABLE 2. DATES FOR ARTEFACTS FROM THE LATE ROMAN INHUMATION BURIALS

	Pottery (century)	**Other artefacts**
Cemetery 1	4th: F.165 Later 3rd–4th: F.164 (Sk.320) Mid-2nd–3rd: F.164 (Sk.319)	–
Cemetery 2: first phase	Later 3rd–4th: F.959	–
Cemetery 2: middle phase	4th: F.953, F.960, F.961, F.965	–
Cemetery 2: final phase	4th: F.938, F.951 Later 3rd–4th: F.930, F.949 ?3rd–4th: F.935	–
Cemetery 3	4th: F.941 2nd–4th: F.944	Comb in F.1097: post-A.D. 350

DECAPITATED BODIES AND PRONE BURIALS

THE GENERAL BURIAL PATTERN AT KNOBB'S FARM

Before considering the irregular burials at Knobb's Farm, it is worth summarising the general form of the late Roman burials described above, so divergences can be appreciated. The bodies were buried in an extended position, usually individually but occasionally with more than one body in the grave. Several of the bodies had been placed in coffins (at least three) or possibly shrouds (at least six and potentially up to nine). Four of the graves in Cemetery 2 had L-shaped gullies by them. Around a third of the bodies were accompanied by a pottery drinking vessel, almost invariably placed by the head or shoulders.

Table 3 summarises the characteristics of the regular, prone and decapitated burials excavated at Knobb's Farm.

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TABLE 3. ASPECTS OF DECAPITATED AND PRONE BURIALS, ALONGSIDE ALL OTHER LATE ROMAN BURIALS AT KNOBB'S FARM

	Decapitated (n = 17)	Non-decapitated and articulated (n = 24)	Prone (n = 13)	Supine (n = 26)	Other positions & indet. (n = 12)
Burial position					
Prone	6	7	13	n.a.	n.a.
Supine	11	15	n.a.	26	n.a
Other positions	0	2	n.a.	n.a.	2
Indeterminate	0	0	n.a.	n.a.	10
Sex					
Female	8	4	8	4	3
Male	9	10	4	14	3
Indeterminate	0	10	1	8	6
Age categories					
Infant (0–4 years)	0	1	0	1	1
Juvenile	0	1	0	1	0
Subadult (11–17 years)	0	1	0	1	0
Adult (18+ years)	1	7	1	7	2
Young adult (18–25 years)	0	3	1	2	3
Mid-adult (25–45 years)	4	1	2	3	2
Young mid-adult (25–45 years)	3	3	1	4	1
Old mid-adult (35–45 years)	5	2	1	6	0
Mature adult (45+ years)	4	5	7	1	3
Grave furniture					
Coffin and grave box	1	2	0	3	0
L-shaped gully around grave	0	3	0	3	0
Shroud	3	14	3	4	0
Grave goods					
Pottery	7	8	3	8	4
Other grave goods*	1	0	0	1	0

*The bone comb in grave F.1097 and the beads in F.164 are interpreted as having been on the bodies when they were decapitated and, therefore, not specifically selected as grave goods.

PRONE BURIALS

Thirteen of the burials at Knobb's Farm were buried in an extended prone position.[41] Six of these had also been beheaded. As noted above, there was a clear bias toward older individuals, with seven of the prone burials classified as 'mature adults', with another four 'middle adults'. Establishing any relationship between sex and prone burial is complicated by poor preservation. Assessments of sex based on skeletal morphology conclude that females are overrepresented amongst the prone burials: eight females, four males and one undetermined.[42] Women are correspondingly underrepresented amongst the supine burials: four females, 14 males and eight unsexed. However, once the numbers of bodies with undetermined morphological sex or burial position are accounted for, the difference between the two is not statistically significant.

Three of the 13 prone burials were potentially shrouded, all from Cemetery 3. None of the three bodies in coffins was buried prone.

Three of the 13 prone burials were accompanied by a pottery vessel; this is about the expected number, given that 15 of the total 51 burials (30 per cent) had pots in the graves. In short, apart

[41] Prone burials: F.162, F.1964 Sk.320, F.165 Sk.324, F.166, F.939, F.944, F.945, F.946, F.950, F.1095, F.1096, F.1097 and F.1099.

[42] Sex identifications from the ancient DNA suggest an equal split of sexes: four females, four males, three undetermined and two with insufficient material to sequence ancient DNA.

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from the age of the individuals, the form of these burials is indistinguishable from the others at Knobb's Farm.

DECAPITATION BURIALS

Seventeen of the bodies at Knobb's Farm had been decapitated.[43] Like most decapitation burials in Britain, the heads were placed at the lower body; notably, the examples at Knobb's Farm were surprisingly consistent, with ten of the 17 (*c*. 60 per cent) placed on or beside the feet (FIG. 11; also TABLE 6).

Of note are the three double burials that also involved decapitations. Both bodies in F.942 had been decapitated: Sk.1338 had been placed over the top of Sk.1352 without disturbing it. In F.164, decapitated Sk.320 disturbed the bones of Sk.319 (three-quarters of which were missing). And in F.165, Sk.323 was buried in a flexed position over decapitated and prone Sk.324, leaving it in a partially articulated state. The same grave also contained a small amount of disarticulated bone of a third adult.

As highlighted in FIG. 5, middle adults were most likely to be decapitated. The skeletons of eight decapitated individuals were identified as female and nine as male.[44] Seven of the decapitated burials (40 per cent) were accompanied by a pottery vessel; this is two more than expected (30 per cent), but not a significant difference. Two of the three bodies in coffins had been beheaded and three had been shrouded. As with prone burials, the burial practices for decapitated individuals appear to have been the same as regular burials at Knobb's Farm.

Regrettably, the poor state of preservation meant that much of the fine-detail skeletal evidence for how the decapitations had been carried out was absent. Seven of the 17 decapitated bodies had no surviving cervical vertebrae at all. Only four of the remaining ten had good preservation (F.165, F.941, F.943, 1097; although most comprised non-refitting fragments). Just one skeleton (F.164) had all seven cervical vertebrae present, although preservation was variable; two had six cervical vertebrae (F.1097, F.1098). Unsurprisingly therefore, cut marks associated with beheading survived on the vertebrae of just one individual (F.164), although a second had a cut mark on the right clavicle (collarbone), which would have been produced during decapitation (F.165), and two others had serious trauma on other bones (F.943 and F.1097). The following section describes all four in detail. The skeletal characterisation is limited to trauma (or lack thereof) relating to their decapitations. The skeletons are illustrated in FIG. 12.

Cemetery 1: grave F.164, skeleton 320

F.164 originally held Sk.319, an adult female; this was almost entirely displaced by the subsequent burial of Sk.320. All that remained of Sk.319 were fragments of cranium, mandible, ribs, pelvis, legs and feet; none was in its original position. Sk.320 is also of an adult female, *c*. 40 years old. The skeleton is approximately 90 per cent complete, although bone condition is variable.

Sk.320 had been laid out in an extended, prone position. It had been decapitated and the skull placed face down between the knees. The right arm was flexed at the elbow to bring the hand underneath the left pelvis. The left arm was extended beside the body.

A cluster of 30 beads was located around 5 cm to the right of the severed neck, with a single bead of the same type located around the mouth of the skull. There were two pots in the grave. A miniature Nene Valley beaker was placed on the back of Sk.320. There was also a miniature

[43] Decapitations: F.164 Sk.320, F.165 Sk.324, F.700, F.939, F.941, F.942 Sk.1332 and Sk.1352, F.943, F.949, F.950, F.953, F.961, F.963, F.965, F.1095, F.1097 and F.1098.

[44] One male (F.942) and one female (F.165 Sk.324) returned a genetic sex that did not match the sex based on skeletal classification, but this does not change the ratio of male to female decapitations.

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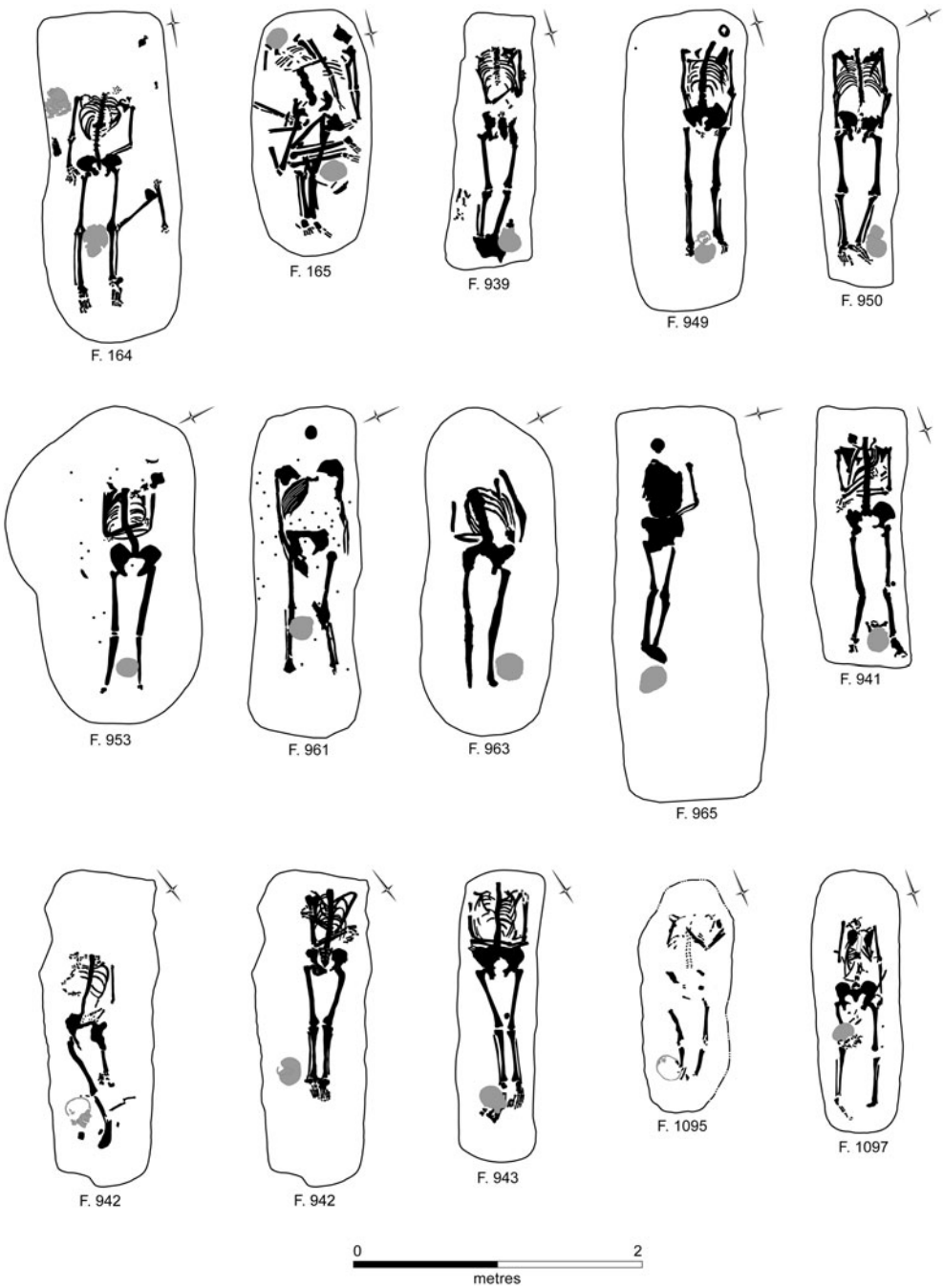

FIG. 11. Location of the decapitated skulls in graves.

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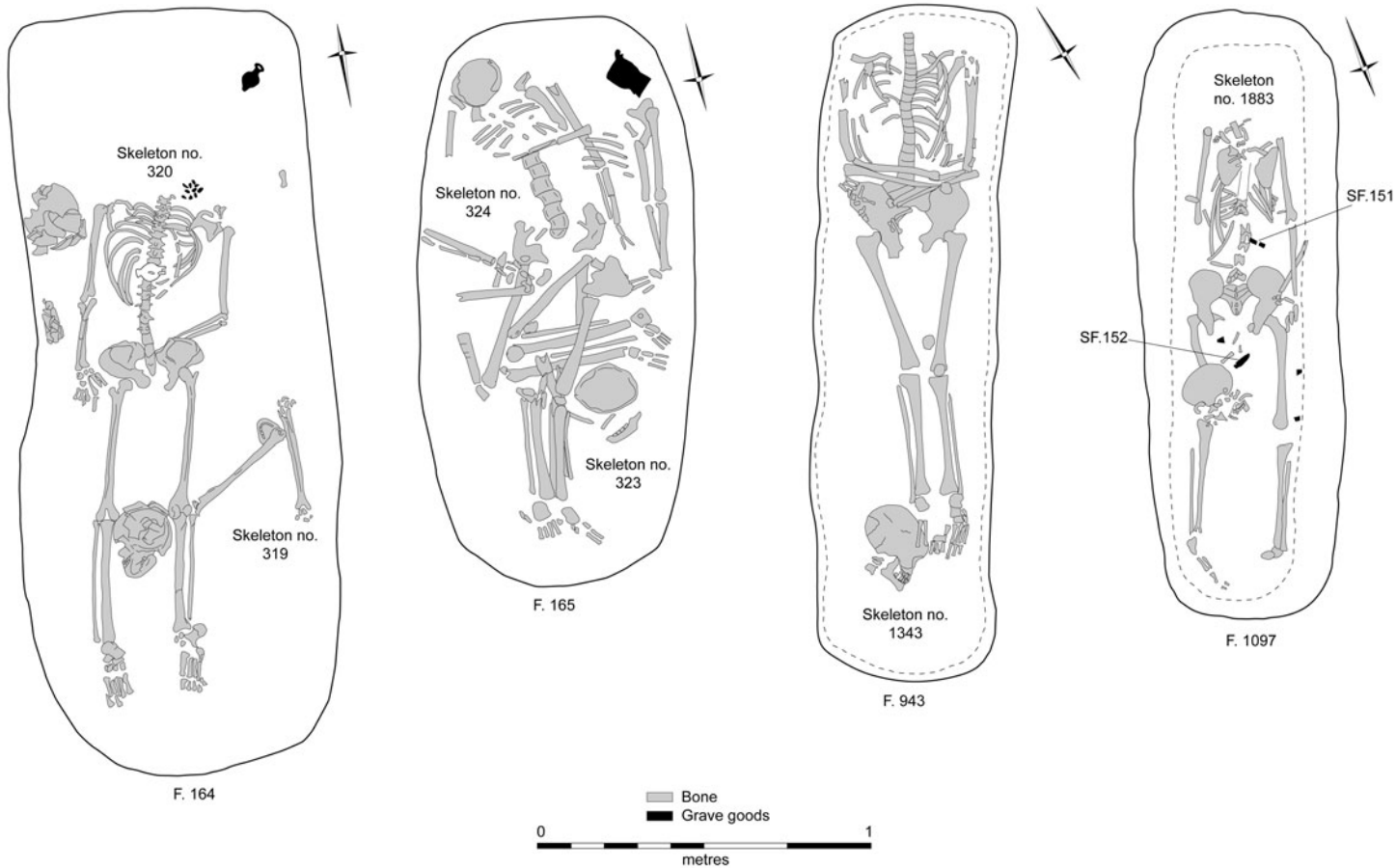

FIG. 12. The four skeletons from Knobb's Farm bearing cut marks: F.164, F.165, F.943 and F.1097.

Colchester beaker in the northern end of the grave. This second pot might have been placed with either burial, but the interpretation here is that it is more likely that each individual was provided with one vessel.

Sk.320 had been decapitated by a single blow from the rear. The blow was made at an oblique angle to the body across the neck and delivered with enough force to cut through three bones: the underside of the left jaw (specifically, inferior border of the left mandibular body); the inferior portion of the fourth cervical vertebra; and the body of the fifth cervical vertebra. The blow appears to have been directed left to right from behind, narrowly missing the right clavicle (FIG. 13). The cut to the mandible clearly shows areas of sharp striations and ridges across the cut profile, suggesting the action of a heavy blade.[45]

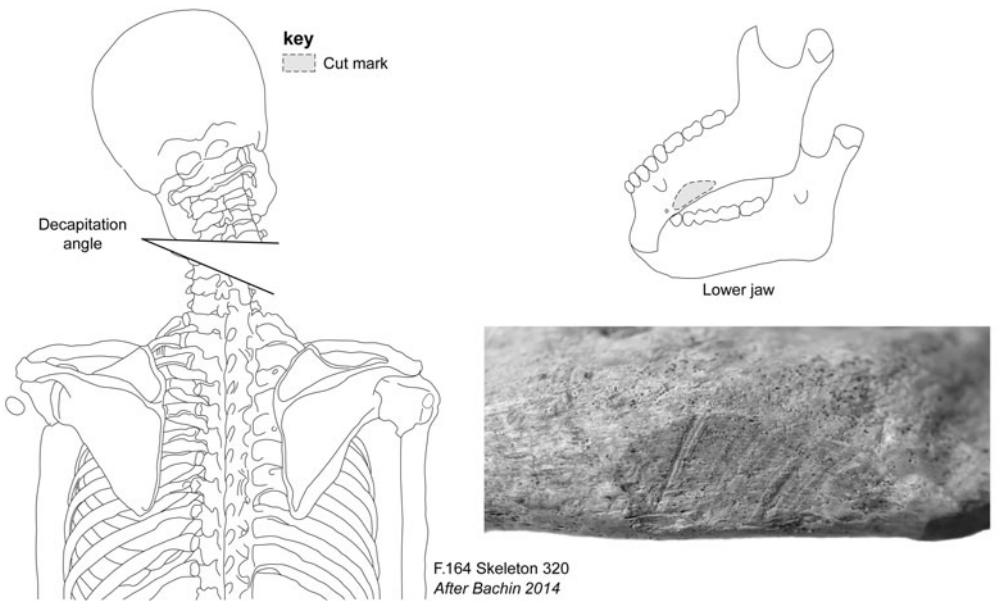

FIG. 13. Detail of the cuts to the vertebrae and mandible of Sk.320 in F.164.

Cemetery 1: grave F.165, skeleton 324

Grave F.165 contained the burial of a decapitated adult, probably a female based on skeletal morphology,[46] and was aligned south–north. The skeleton was 45 per cent complete.

The body was laid out in an extended prone position. The skull was placed vertically, facing west, on the outside of the right femur. The left arm was extended beside the body. Both legs were extended, although the right femur was out of anatomical position.

Interestingly, the low oxygen isotope values for this individual indicate they grew up in a place colder than Cambridgeshire, which in the Roman world was most likely the Alps.[47] However, despite this individual's distant origins, they were interred with grave goods typical of local burial practice: a miniature jar, dating to the fourth century A.D., was placed by the right

[45] See Greenfield 2011; Tennick 2012.

[46] Ancient DNA analysis identified XY chromosomes, indicating a male. The discrepancy is down to skeletal fragmentation: only 45 per cent of this skeleton was recovered.

[47] Garbaras *et al.* 2019, fig. 5.

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shoulder. The grave fill also contained a small amount of disarticulated human bone, possibly of a middle-adult female, along with ten large, unworn, coarse sandy greyware sherds of a type in use between the mid-second and the fourth centuries.

Due to the absence of the cervical vertebrae, it was not possible to identify evidence of decapitation at the neck. However, the right clavicle has a chop mark approximately 7 mm long on its anterior side. This mark indicates use of a heavy blade. The orientation of the cut suggests that the blow was directed obliquely downwards from behind and to the left (FIG. 14). This in turn implies that the individual was probably kneeling when beheaded.

In addition to evidence of decapitation, the remains of this individual also display a healed fracture in the right hand and a button lesion on the inner surface of the cranium. They also had osteoarthritis in the right elbow and a bony expression (enthesophyte) over the right patella, suggesting overuse relating to activities such as jumping or kneeling.

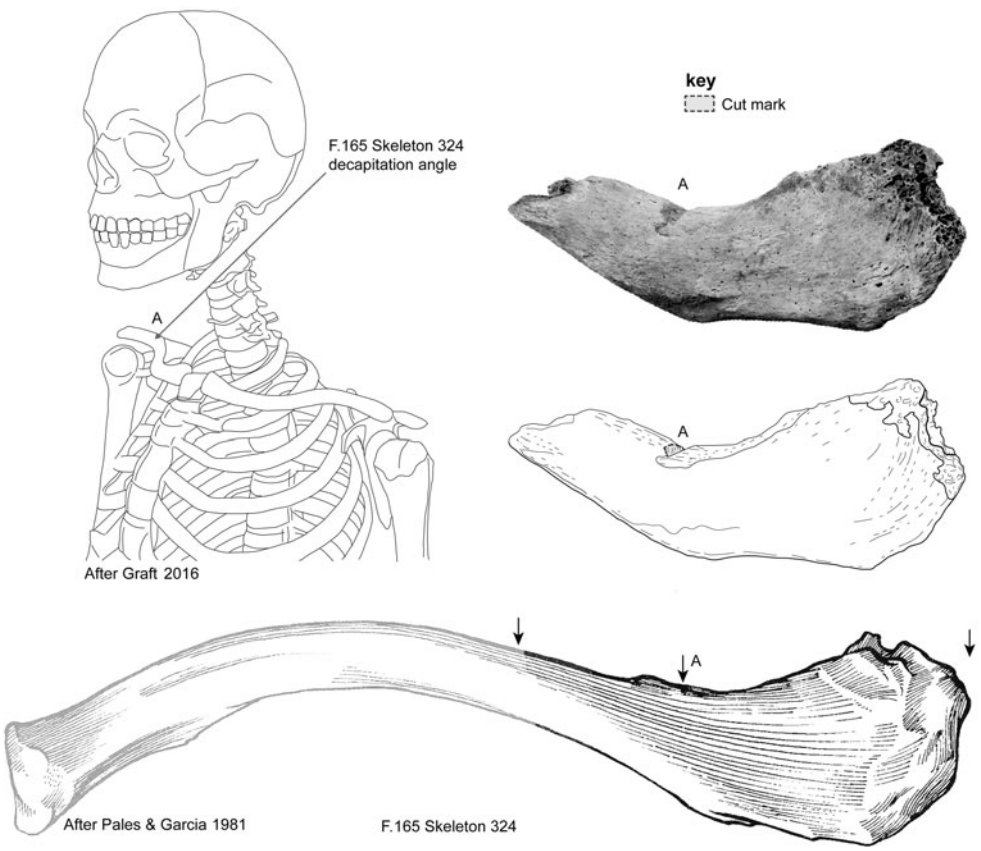

FIG. 14. Decapitation and cut marks on Sk.324 in F.165.

Cemetery 3: grave F.943, skeleton 1343

F.943 contained the decapitated body of an adult male. The grave was orientated SSW–NNE. It was slightly too long for the decapitated body, which was placed up against the southern cut.

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This position indicates that the individual was beheaded before being buried. The skeleton is approximately 75 per cent complete.

The body had been laid out in an extended, supine position. The skull was placed under the right foot, laid to rest on its right side, facing north. There were no grave goods found, although there were three pot sherds in the grave fill.

Due to the condition of the bone, it was not possible to identify evidence of cut marks or trauma relating specifically to the decapitation of this individual. There are, however, four wounds to the back of the skull (FIG. 15): (A) a cut, 11.4 mm long, made across the back of the cranium; (B) a second similar sized cut, parallel to A, 3 cm above and to the right; (C) a third cut, forward of B, which removed a roundel of bone deep enough to have exposed the outer membrane of the brain; (D) a final cut mark, *c*. 44 mm long, made perpendicular to the third; it too was deep and may have damaged a branch of the superficial temporal artery – one of the main blood vessels of the head. The lack of healing or inflammation indicates that all occurred around the time of death, and all

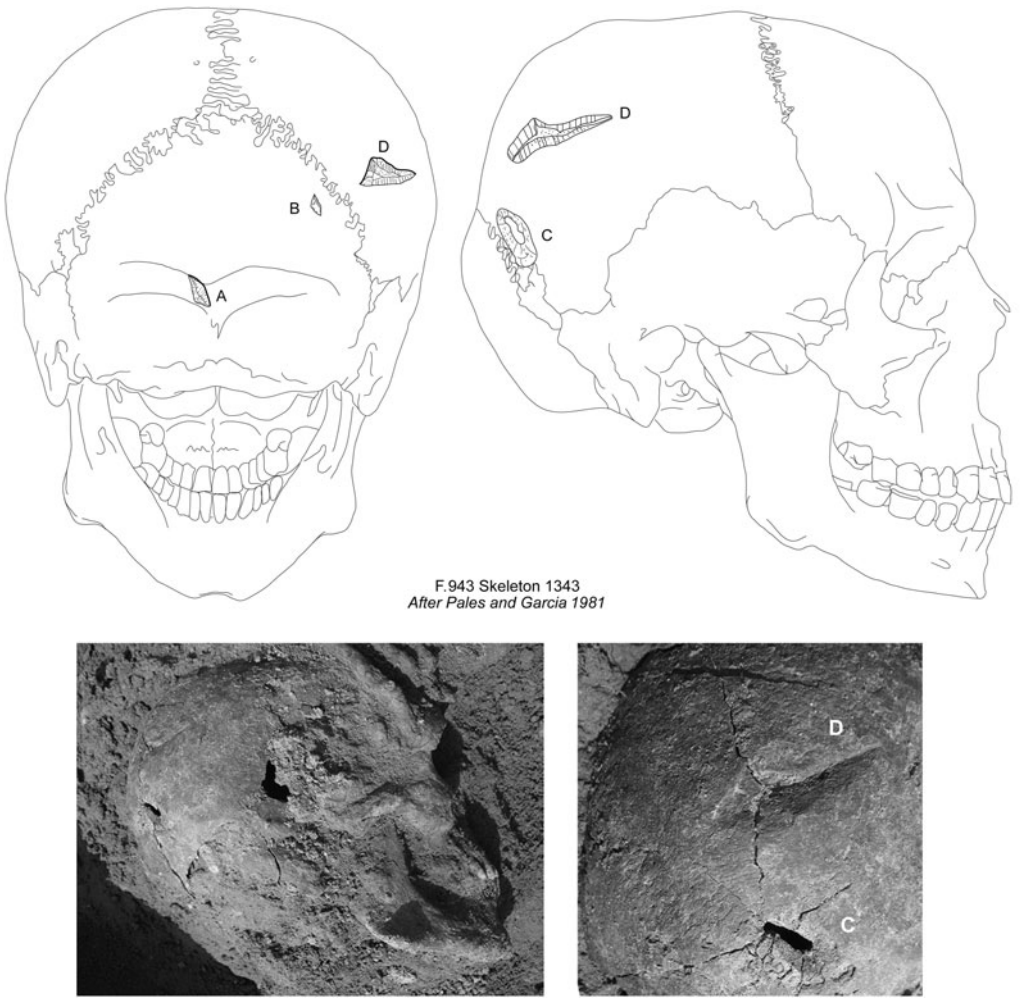

FIG. 15. Details of cut marks to the posterior and right side of the cranium of Sk.1343 in F.943.

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four marks are consistent with the action of a sword.[48] These injuries would have been traumatic but not necessarily fatal. There are no obvious signs of defensive wounds to the arms or hands, suggesting that the head was deliberately targeted to disorientate and incapacitate the individual quickly and prevent retaliation.[49]

Cemetery 3: grave F.1097, skeleton 1883

Feature F.1097 contained the burial of a decapitated adult female who had been buried face down and was orientated south-west–north-east. The skeleton is approximately 40 per cent complete.

The body was laid out in an extended, prone position. The cranium, part of the mandible and several cervical vertebrae had been placed right-side up on the back of the left knee. The remaining fragment of the mandible was found by the neck, roughly parallel with the shoulders. The right arm was extended beside the body; the left arm was flexed at the elbow, so the hand lay underneath the right chest. A bone comb was found in several pieces: one behind the cranium; one under the abdomen; and the last in the grave fill by the lower spine.

There are no cut marks or associated trauma directly relating to decapitation and no evidence to explain the fragmentation of the jaw. There are, however, numerous other cuts marks on the skeleton (FIG. 16). Two cut marks on the right side of the mandible appear to have targeted the temporomandibular ligament which attaches the mandible to the cranium. Additionally, the right ear appears to have been partially chopped off with a glancing blow, likely retained by a flap of soft tissue; this is evidenced by two loose, sharp-bordered bone fragments from immediately behind and in front of the ear, as well as a chop mark into the top of the mandible. The profile of the cut marks suggests a sharp, heavy blade directed from above and behind. There is a third, fine vertical cut mark, 4.5 mm long, on the lower lingual inside of the mandible, aligned approximately with the left canine. Elsewhere on the body, there are: two fine cut marks (*c*. 1.2 mm long) to the left clavicle, specifically across the long axis of the superior and posterior borders; multiple fine cut marks, 5–40 mm long, angled across the posterior of the left and right humeri, which would have severed the triceps muscle; a total of six cut marks 1–2 mm long to the posterior side of the radii (four to the right, two to the left), which would have cut through the superior part of the extensor muscle group; multiple fine cut marks across the back of the left femur, presumably severing the tendons of the adductor muscle group, although these cuts would probably have missed the major arteries and veins of the leg. That these fine marks were mostly parallel and orientated in the same direction suggests a human cause rather than a natural one. Together with the cut marks on the mandible, they might indicate butchery or de-fleshing. A lack of healing suggests this occurred around the time of death, but it is not possible to distinguish whether they were made immediately before death (resulting from, for example, torture or flaying) or after death (for example, from corpse mutilation, post-mortem 'punishment' or ritual de-fleshing of the body).

KNOBB'S FARM COMPARED: NATIONAL, LOCAL AND INTRA-SITE

DECAPITATION AND PRONE BURIAL PATTERNS

Knobb's Farm has an exceptionally high proportion of decapitated bodies and prone burials (33 per cent and 25 per cent) when compared with burial grounds locally and across

[48] Lewis 2008.
[49] Powers 2005.

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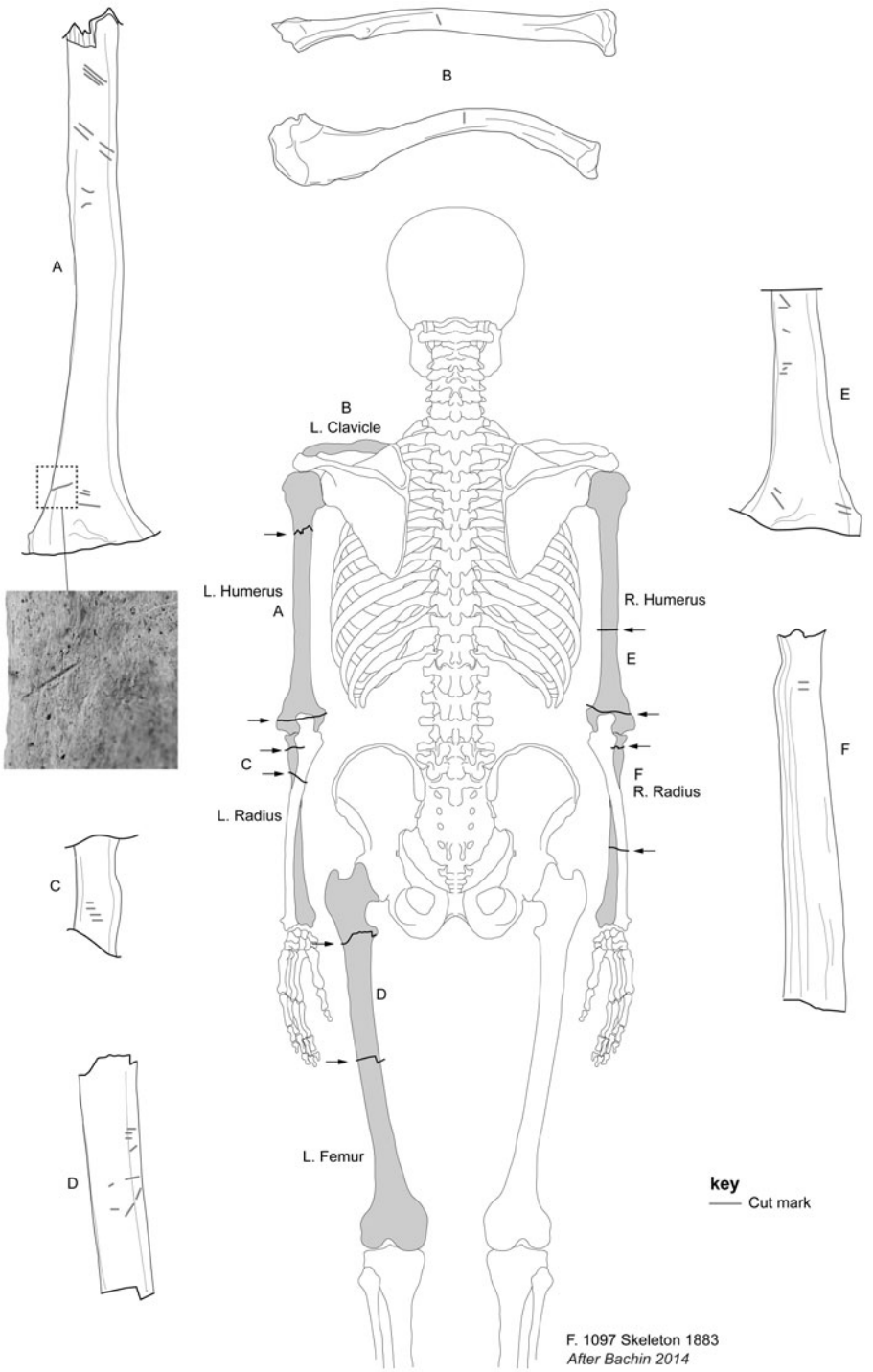

FIG. 16. Cut marks to Sk.1883 in F.1097.

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Roman Britain. By contrast, Robert Philpott notes that, amongst examples reported to 1991, 2.5–6.1 per cent of skeletons had been decapitated,[50] while the 'Roman Rural Settlement Project' reports 2.3–3.7 per cent decapitated and 2–3 per cent buried prone.[51] To flesh out these national figures, we compiled a database of excavated Roman era burials in Cambridgeshire and Peterborough, identifying 891 burials from 49 Roman era cemeteries (FIG. 17).[52] This identifies both decapitations and prone burials in 21 of the burial grounds,

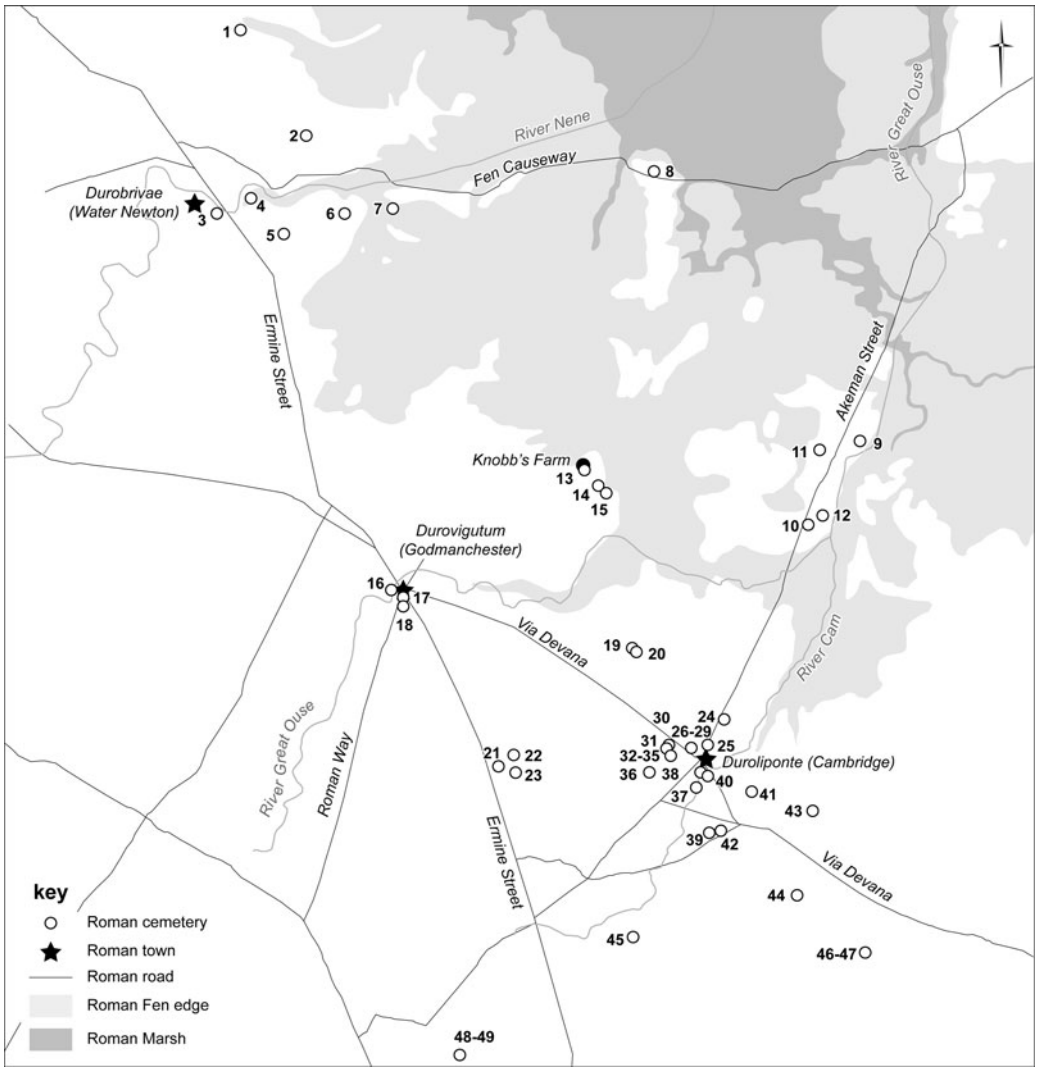

FIG. 17. Local burials: 49 excavated Roman cemeteries around Knobb's Farm in Cambridgeshire and Peterborough.

[50] Philpott 1991, 80.
[51] Smith *et al.* 2018, 228, 229; Allen *et al.* 2018.
[52] Further details can be found in the online supplementary material.

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although most contained only one to three examples (FIG. 18). Approximately 5 per cent of local burials (five of 105 assessable skeletons) dating to the first and second centuries A.D. had been decapitated. This rose to nearly 10 per cent (27 of 288) in cemeteries dating between the third and fifth centuries.

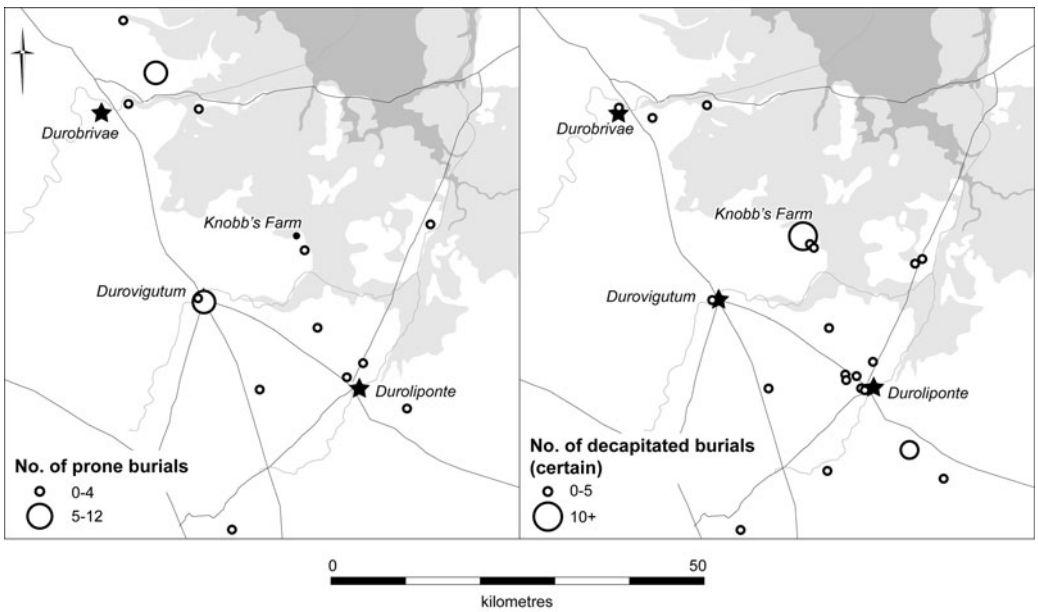

FIG. 18. Numbers of individuals (1) buried prone and (2) decapitated in local Roman era cemeteries around Knobb's Farm in Cambridgeshire and Peterborough.

Demographics

As TABLE 4 indicates, the bulk of the decapitated bodies and prone burials at Knobb's Farm involved people over *c*. 25 years of age. There are no obvious differences between the health of individuals in regular and irregular burials, other than age-related conditions. This is typical of decapitated bodies in Roman rural settlements across Britain.[53] Although morphologically more females than males were buried prone at Knobb's Farm, the difference is not significant once the number of bodies of indeterminate sex and burial position are taken into account.

Trauma

As discussed above, although 17 bodies at Knobb's Farm had been decapitated, only one had direct evidence of cut marks to any of the vertebrae (F.164). This was due, in part, to the poor state of preservation on the site, but the lack of trauma-related evidence for decapitation is not unusual. In the 49 Cambridgeshire and Peterborough cemeteries reviewed, 57 decapitation

[53] Tucker 2012, 91.

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TABLE 4. NUMBER OF DECAPITATIONS AND PRONE BURIALS BY AGE CATEGORY AND SEX ('indeterminate' includes cases where morphological sex could not be determined and morphological sex did not coincide with sex determined from aDNA)

Age category	**Decapitated**	**Prone**	**Both**	**Recorded**
Infant, juvenile, subadult	0	0	0	4
Adult (18+ years)	1	1	0	12
Young adult (18–25 years)	0	1	0	5
Middle adult (25–45 years)	12	4	3	19
Mature adult (45+ years)	4	7	3	12
Total	17	13	6	52
Sex				
Female	7	6	4	13
Male	8	3	1	19
Indeterminate	2	4	1	20

burials were identified, but osteological assessment of some kind had only been carried out at 12 of the sites with decapitations. This identified just ten bodies with marks directly associated with beheading (17 per cent). Nationally, the 1981 survey by Mary Harman and colleagues identified just 30 individuals amongst 203 decapitated bodies with evidence of cut marks (15 per cent). It is entirely possible to put a sword through a human neck without leaving any archaeologically identifiable mark. Indeed, there are other decapitation sites with excellent bone preservation where, nonetheless, the majority of bodies lack evidence for chop marks to the neck.[54] The consequence for interpreting the practice of decapitation at Knobb's Farm is that the lack of marks on most of the skeletons cannot be taken to indicate that heads were removed with tools that would have left only fine marks, such as a knife or scalpel.

The two skeletons at Knobb's Farm with cut marks associated with decapitation are broadly consistent with the pattern across Roman Britain, as is the likely use of swords on the skeletons in F.943 and F.1097. Katie Tucker's osteological analysis of 120 Roman era bodies[55] found that the bulk (73 per cent) carried chop marks consistent with a sharp heavy blade wielded from behind, like the decapitated bodies in F.164 and F165. A further 23 per cent in her study had been chopped, stabbed or cut from the front. In 26 per cent of the cases Tucker examined, decapitation had been the mechanism of death. In addition to decapitation, some bodies in her analysis also carried incapacitating wounds or defence injuries to hands and arms. The sword blows to the cranium of F.943 are consistent with this pattern. Just 4 per cent of the decapitated individuals that Tucker examined carried only fine cut marks from the front of the neck, consistent with removal of the head with a knife. All appeared to have been carried out on an already-dead body. Knobb's Farm would be highly atypical if all 16 bodies without evidence of cut marks to the vertebra had been decapitated in this way.

[54] Perhaps the best example in Britain of archaeologically invisible decapitation comes from the mass execution of 48–52 Vikings at Ridgeway Hill, Weymouth, Dorset (Loe *et al.* 2014). All the victims were men beheaded in a single event, all in much the same way using a sword. Bone preservation on the site was good to excellent. Nonetheless, only 32 per cent of the bodies had vertebrae bearing evidence for trauma (Loe *et al.* 2014, 106), while only 44 per cent of all vertebrae associated with the skulls bore chop marks (Loe *et al.* 2014, 78).

[55] Tucker 2012; 2014; 2016.

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It is also important to highlight the general lack of trauma, apart from decapitation. In our survey of 891 burials from Cambridgeshire and Peterborough, while we identified 57 decapitated bodies, only 25 of the burials showed fractures or trauma anywhere else on the skeleton. The bulk of these breaks had healed before death. There were no cases of defensive injuries, such as cut marks or fractures to the forearms, although a few showed potentially peri-mortem injuries.[56] An immediate implication of the frequency of decapitation over other injuries is that beheadings were not part of a culture of widespread violence – warfare, banditry or murder. Such a culture would have left much wider evidence for other injuries, beyond the one very specific, difficult act of decapitation. This suggests a highly controlled use of the practice.

Grave goods and grave furniture

As noted above, at least three of the individuals in Cemetery 2 were buried in coffins. In the late third and fourth centuries, around 20–25 per cent of burials in the region were placed in coffins. Of the three confirmed coffin burials, two of the bodies had been decapitated (F.958 and F.961) and the other had not (F.953). None had been buried prone. Given the poor level of preservation of nails, it is not clear whether the association of two decapitations with coffins is particularly significant.[57]

In Cambridgeshire and Peterborough, the use of coffins is strongly associated with Roman towns: Cambridge (Durolipons), Godmanchester (Durovigutum) and Water Newton (Durobrivae) (FIG. 19). The presence of three confirmed coffin burials at Knobb's Farm may indicate that the settlement enjoyed a higher status than most rural sites. This may be related to an association with the settlements at the Camp Ground and Langdale Hale, where coffin burials were also found.

The use of shrouds is not routinely reported in local or British datasets, so comparisons cannot be made with Knobb's Farm. However, by comparing burials within Knobb's Farm, it appears that the use of shrouds here was unrelated to irregular burials: three prone burials (23 per cent) seem to have been shrouded and ten were not; five of the decapitated burials (29 per cent) were potentially shrouded and 12 were not – these proportions are consistent for both practices across the three cemeteries.

The number of inhumation burials with grave goods at Knobb's Farm is somewhat higher than at other cemeteries locally: in the third century, 15–20 per cent of local inhumations had some form of grave goods, falling to around 10 per cent in the early fourth century; at Knobb's Farm, 15 of the 51 graves (29 per cent) included grave goods – mostly pottery (the bone comb and beads were probably not specially selected grave goods, as the evidence indicates that both were worn by the individuals when they were beheaded).

What is most striking about the pottery vessels at Knobb's Farm is that almost all are miniatures, less than 13 cm high. Looking at other cemeteries in Cambridgeshire and Peterborough, just 14 pots are described by the excavators as 'miniature' (nine beakers, three flagons, one jar and one pot) and nine of these came from just three graves at Hatherdene

[56] One mature adult male at Babraham Institute site (Sk.288) appears to have a depressed fracture in the parietal bone and to have been buried with his hands bound (Timberlake *et al.* 2007). At Vicar's Farm, Cambridge, a young adult male (F.2058) had fractures to the shafts of the left second metacarpal and middle phalanx, interpreted as the result of a heavy stamp on the hand prior to burial (Dodwell in Evans and Lucas 2020, 317–26).

[57] If the 17 decapitations and three confirmed coffins had been distributed at random across the three cemeteries, then there would have been a *c*. 20 per cent chance that one decapitated body would have been buried in a coffin and a *c*. 2 per cent chance of two. This calculation is complicated by the fact that F.961 and F.953 were both buried in Cemetery 2, where preservation was poor. Of the 30 graves in this burial plot, 12 contained at least one nail, suggesting that there could have been rather more coffins. If so, then the association of decapitations with coffins ceases to be significant.

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Close, Cambridge.[58] Rather more pots are termed 'small' (25 in total: seven pots, six jars, four flagons, three beakers, two bowls, two flasks and one cup). Together, 'miniature' and 'small' vessels account for just under a third of all pottery vessels found in local graves (FIG. 19).[59] This suggests that, while the number of miniature vessels at Knobb's Farm is unusually high, the use of small or miniature vessels is far from an unusual practice locally.

A surprisingly high proportion of the pottery grave goods also came from the Nene Valley industries, compared with other local cemeteries (FIG. 19). Curiously, Nene Valley vessels are more common around Cambridge, with an apparent lack of this pottery type in cemeteries immediately around the Nene Valley production centres.[60] Also noteworthy is the inclusion of the face-necked flagon in F.965 in Cemetery 2, accompanying a decapitated mature adult male, as described above.

The regular and irregular burials at Knobb's Farm received broadly similar grave goods. Once juveniles, subadults[61] and those bodies whose position could not identified are excluded, regular and irregular burials were equally likely to be buried with a pot (TABLE 5). There is no statistically significant association between decapitation or prone burial, on the one hand, and the use or type of pottery, on the other.

TABLE 5. NUMBER OF INDIVIDUALS WITH AND WITHOUT POTTERY GRAVE GOODS: REGULAR AND IRREGULAR BURIALS

	Regular adult burials (n = 14)	**Prone and decapitated adult burials (n = 24)**
No pottery	10 (72%)	16 (67%)
Pottery present	4 (28%)	8 (33%)

Also striking is what was *not* found at Knobb's Farm. Both hobnail boots and dress ornaments (rings, bracelets, brooches) have been found in around 5 per cent of local burials. Hobnailed boots were commonly placed in burials in the north-western Cambridge sites, but beyond this there are only a handful of other examples, mostly on sites along the main Roman roads (for example at Cambourne, Babraham Institute and on the Isle of Ely). Hobnails are completely absent from anywhere north-west of Cambridge, including Knobb's Farm (FIG. 19).

Placement of skulls and grave goods

Both decapitated skulls and grave goods were deliberately placed in the graves at Knobb's Farm, and so their positions will be considered together. Locally, the preferred position for the decapitated skull was at the feet (TABLE 6) with declining numbers in positions further up the body. A few decapitated heads were also found in the anatomically correct location. This mirrors the pattern across Roman Britain.[62] In this respect, the preferred placement of decapitated heads between the feet or lower legs at Knobb's Farm is entirely normal, although the positioning is rather more rigid than seen elsewhere.

[58] Ladd and Mortimer 2017, 130.
[59] Biddulph 2005 notes the occasional use of miniature vessels and other objects in Essex.
[60] The six miniature beakers excavated from two graves at Hatherdene Close also came from the Nene Valley potteries (Ladd and Mortimer 2017).
[61] Subadults, juveniles and infants have been excluded as, in Roman Britain, decapitation and prone burial almost invariably involved adults.
[62] Philpott 1991, 78.

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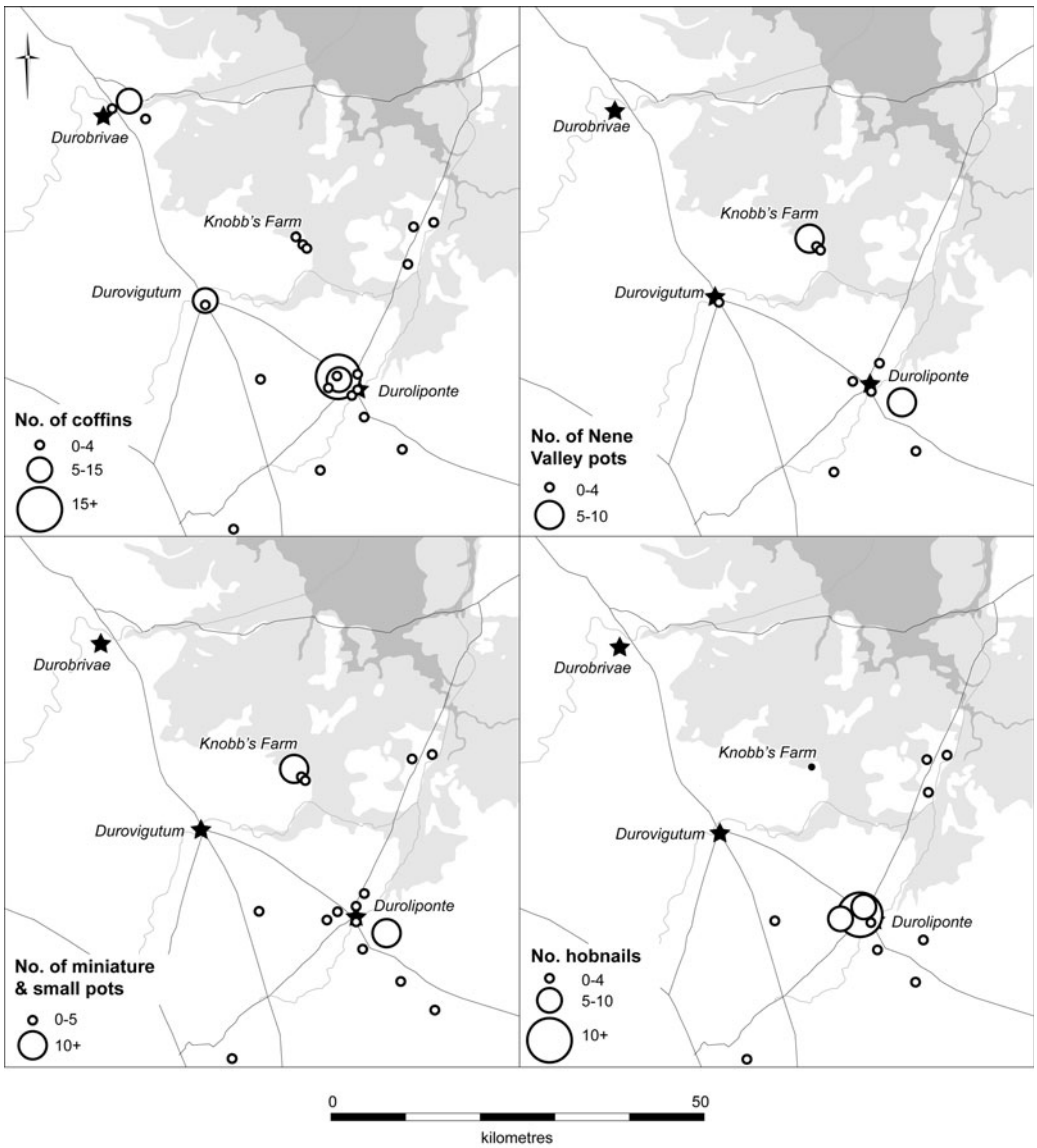

FIG. 19. Numbers of individuals in local cemeteries (1) buried in a coffin, (2) buried with pottery vessels from the Nene Valley industries, (3) buried with small or miniature pottery vessels and (4) found with hobnails in the grave.

The location of pottery vessels in graves is reported for 28 of the local cemeteries; the figures are summarised in TABLE 6 along with the corresponding numbers for Knobb's Farm. Locally, about half of the pots were placed at the head or shoulder and half at the feet or lower legs; graves with multiple vessels might have had vessels placed at either or both positions, and there appears to have been no strong preference for either locally. In contrast, all but two of the pots from the Knobb's Farm excavation were placed around the head. However, despite this

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TABLE 6. LOCATIONS OF DECAPITATED SKULLS AND POTS IN GRAVES AT KNOBB'S FARM AND 28 ROMAN ERA CEMETERIES IN CAMBRIDGESHIRE AND PETERBOROUGH

	Local burials		Knobb's Farm	
Location	**Pots**	**Skulls**	**Pots**	**Skulls**
Head	21	4	9	–
Shoulder	2	–	4	–
Chest/ribs	–	1	1	–
Pelvis	5	2	–	–
Thighs	–	4	–	–
Knees	1	4	–	4
Shins	2	7	–	2
Feet/ankles	15	9	–	10
Other locations	1	1	–	–
Location not recorded	21	5	1	–
Skull missing	n.a.	6	n.a.	–
Total	68	43	15	16

strong preference, like the other burials in the wider region, the pots were not positioned around the head in any fixed location: seven lay to the right, four to the left; four were by the shoulder, six by the head and one was above the head.

In two notable examples, the pots accompanying the decapitated skeletons F.949 and F.961 were placed where the head would normally have been (a position reported in a handful of other cemeteries[63]). In another burial (un-decapitated), F.951, a miniature beaker was placed in direct contact with the skull, as was one at the Camp Ground site.[64] This may suggest some connection was being made between the head and the pot. However, a comparison of the figures in TABLE 6 shows that, for both the Knobb's Farm burials and those of the local cemeteries, the placement of pots did not correspond with where decapitated skulls were deposited in the graves. If some reference was being made by the mourners, then there is insufficient patterning to interpret it: it could have held deep religious significance or, like the rat stuffed into the mouth of skeleton 18 at Lynch Farm, Orton Longueville,[65] been an insult or a joke.

THE SIGNIFICANCE OF DECAPITATION

As noted at the start of this article, many explanations have been offered for the removal of heads in Roman burials. Interpretations include war, military trophy taking, the execution of slaves or criminals, post-mortem punishment (*poena post mortem*), human sacrifice, fertility rituals, religious persecution, a continuing Iron Age head cult, a cult imported from the Continent, desecration of an unpopular individual's remains (*damnatio memoriae*), a treatment for witches, a way of helping the soul into the afterlife, a way of preventing the soul reaching the afterlife, a means of depriving the dead of their soul and a method for laying the unquiet dead to rest.[66] Plainly, there are conflicting interpretations within this list, and there is nothing approaching a consensus regarding the significance of irregular burial.

[63] For example, one burial at Navenby, Lincolnshire (Allen and Palmer-Brown 2001).

[64] Burial F.618 (Evans *et al.* 2013, 233–4, fig. F.3.35). At both Knobb's Farm and the Camp Ground sites, the proximity of pot to skull may be down to the proximity of the body to the edge of the grave.

[65] Upex 2018.

[66] See, for example, Philpott 1991; Taylor 2008; Crerar 2012; 2016; Tucker 2012, 16, 21, 157–8; 2014; 2016, 19, 157–8.

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A detailed critique of all these various interpretations would make this article inordinately long and take it far beyond its scope; however, the main objections to a number of these interpretations as an explanation for hundreds of decapitated burials across late Roman Britain are outlined briefly.

Human sacrifice: illegal throughout the Roman Empire from at least the first century B.C.[67] It is most unlikely that dozens of victims would have been buried openly in public cemeteries in Roman administrative centres like York, Winchester and Dorchester.[68]

Punishment of slaves: under Roman law, slaves and criminals could be executed using far more painful and humiliating methods, such as crucifixion or being burnt alive.

Persecution of Christians, Manichees and other religious minorities: decapitation in Britain began before these eastern cults could have impacted the province to any great degree. There is no evidence for mass persecution of Christians in the western empire in any period.[69] The bulk of decapitations in Britain date from after the Edict of Milan, which proclaimed official tolerance for Christianity (A.D. 311).

Trophy-taking or continuation of an Iron Age head cult: Iron Age practices involved *taking* the head, rather than depositing the severed head in the grave. Iron Age victims were almost invariably young men, unlike Roman cases.[70] There is a gap of around 200 years between the ending of the Iron Age practice and the increase of decapitations in Roman Britain in the third century A.D.

Warfare, banditry or murder: as noted earlier, in our review of burials from Cambridgeshire and Peterborough, twice as many bodies were decapitated (51) as those with fractures or skeletal traumas elsewhere (25). Almost all these other injuries had healed before death, which implies that most of these individuals' deaths did not involve violence.

Defence against witchcraft: certainly plausible in some cases, and there is literary evidence of a widespread fear of witches. However, most decapitated burials in Britain show no evidence of social marginalisation or fear. Indeed, like the decapitated skeletons at Knobb's Farm, the bulk are otherwise entirely normal burials in communal burial plots.[71]

Preventing corpses from reanimating: fear of revenants is reported in Roman literature, and one way thought to prevent resurrection, attested elsewhere in the Empire, was dismemberment of the body.[72] This might explain the small percentage of cases where the head was removed after death, but does not explain the much larger proportion of cases where decapitation was the mechanism of death.

Only two interpretations might explain the hundreds of decapitated bodies that have now been excavated in Britain: decapitation as some form of ritual or cult activity; and decapitation as legal execution for capital crimes.

The case for ritual decapitation at Knobb's Farm

The burial of a person can potentially involve a number of rituals, including: those conducted at the moment of death; those involved in preparation of the body; those carried out at the time the body is buried; and post-burial activities at the grave site.

[67] Most notably under the *Lex Cornelia* of 81 B.C.; Pliny refers to a slightly earlier law of 97 B.C. (*HN* 30.3).
[68] Hunter-Mann 2015 (York); Booth *et al.* 2010, 480–1 (Winchester); Philpott 1991, 85 (Dorchester).
[69] Southern 2001, 168.
[70] Tucker 2014, 228–9; 2016, 30–42.
[71] Crerar 2012.
[72] The Greeks, for example, refer to the practice of 'arm-pitting' (μασχαλισμός), which involved cutting various extremities from the corpse, stringing them together and hanging them in the victim's armpits. 'The thinking behind it was evidently that a ghost and its powers were drawn directly from the corpse in its current state. Accordingly, if one hobbled the corpse, one hobbled the ghost' (Ogden 2002, 162, no. 122). Beyond the Roman period, during the Middle Ages, decapitating the body and placing the head between the feet or legs was also an approach used to quieten the undead, along with dismembering or destroying the body (see Gordon 2017 for examples).

If the decapitations of the individuals buried in F.164, F.165 and F.943 (the man with sword blows to the skull) were ritual beheadings, it should be noted that the osteological evidence implies all three were alive when decapitated. The orientation of the blow that decapitated the woman in F.165 implies she would have been kneeling when beheaded. This single oblique blow which killed the woman in F.164 would have been very difficult to deliver on a dead body lying flat or on the ground, and again suggests she was kneeling when beheaded. And the man buried in F.943 took four savage sword blows to the back of the head, presumably intended to immobilise him, which again implies he was alive when beheaded. In these cases, if removal of the head from a living person was part of a ritual, then what we see here is human sacrifice.

Leaving aside the problem noted above that human sacrifice was always illegal under Roman law, if the decapitated individuals at Knobb's Farm were human sacrifices, then the osteological evidence from F.164, F.165, F.943 and F.1097 is entirely inconsistent with what we know of Roman sacrificial practice. Animal victims – which would presumably have provided the primary model for any human sacrifice – had to be consecrated, willing and calm, and then killed quickly and cleanly by having their throats cut.[73] However, the incapacitating blows inflicted on F.943 are not at all in keeping with a calm and willing victim. (This man's treatment is not unique: other decapitated individuals have been found with incapacitating wounds or else their hands bound, such as the male at Langdale Hale,[74] which also suggests unwilling victims.[75]) Furthermore, all illustrations of Roman animal sacrifices depict the throat being cut from the front with a knife, not a beheading from behind using a sword, as happened to the women in F.164 and F.165.

Archaeological interpretations that favour a ritual interpretation point to a 'signature' for the practice: careful and skilful post-mortem removal of the head using a knife[76] (although, as noted earlier, Tucker's review found only 4 per cent of Roman era beheadings were conducted this way[77]). This model is not what was found on the skeletons in F.164 and F.165: both were decapitated with a single oblique blow from behind delivered by a heavy blade, which also severed the mandible (F.164) and clavicle (F.165). Careful, precise removal of the head is inconsistent with the evidence of the treatment of the woman in F.1097. Her mandible was severed in two and there were numerous cut marks to her humeri, clavicles and femora; although, as noted earlier, the osteological evidence does not allow us to establish whether these were inflicted before or after death, or their purpose (torture, flaying, de-fleshing, mutilation and post-mortem punishment are all possible).

Another problem with a ritual interpretation of the evidence from Knobb's Farm is one that has also been identified at the national level: by local standards, the decapitated bodies were interred in the same manner as the 'regular' burials and mingled in with them. If people were being ritually decapitated while alive, then the ritual involved must have been highly significant, but there is no corroborating evidence from Knobb's Farm to indicate this occurred. In fact, no distinct group was

[73] Scheid 2007, 263–71.

[74] Dodwell in Evans *et al.* 2013, 79 (Burial 2).

[75] Locally, two decapitated skeletons (052 and 091) at Jesus Lane, Cambridge, were each found with a cut mark to the parietal bone in the skull, interpreted as being made by a 'sharp edged weapon' from the front and intended to stun the victims before decapitation (Alexander *et al.* 2004). Tucker (2014, 227) details a number of incapacitating wounds on the skull of skeleton SK16 from Driffield Terrace, York, blunt force trauma to the head (fracture in the left parietal) and a stab mark to the sacrum, which must have occurred through the bowels. Another example is skeleton SK18/19a from St Martin's Close, Winchester, Hampshire, which suffered three chopping blows to the frontal bone and stab wounds to two lumbar vertebrae in the lower back, the anterior aspect of the ilium and one of the lower ribs. Examples of defensive wounds on decapitated individuals are those on skeleton SK3 from Driffield Terrace: three chop marks and a butterfly fracture of the right ulna.

[76] Clark 1979, 193, 374, 415; cf. Philpott 1991, 80.

[77] Tucker 2012; 2014; 2016.

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singled out for special treatment: decapitated individuals received no distinctive grave goods; they were no more or less likely to be placed in a coffin or a shroud; and they were not obviously marginalised within any of the three cemeteries at Knobb's Farm.

In short, there is no evidence from Knobb's Farm to indicate ritual post-mortem removal of the skull, and so, if decapitation was in fact a ritual, then the available evidence points to illegal human sacrifice; but the form of this at Knobb's Farm would have been markedly different from what is known of Roman sacrificial practices.

The case for judicial decapitation at Knobb's Farm

Execution by decapitation is well attested in both historical and legal documents. However, the difficulty in interpreting archaeological cases of decapitation as being the result of legal processes is that it is unclear to what extent Roman law operated in Roman Britain, particularly in rural areas away from administrative centres. Some historians argue that Roman law did apply in Britain,[78] and Britain is certainly mentioned occasionally in Roman legal texts. There have also been finds of legal documents in Britain,[79] including those from Vindolanda and the Bloomberg excavations, London, along with quasi-legal phrasing in other media, such as curse tablets.[80] However, it is not possible to demonstrate directly that Roman capital punishments operated in Britain or that executions were carried out as described in Roman written sources. Here, our working assumption is that Roman law did operate in Roman Britain, at least in broad terms, if not in every specific detail.

There are several potential lines of evidence for a judicial interpretation of the evidence from Knobb's Farm.

Osteological evidence suggests a sword was used to kill those buried in F.164, F.165 and F.943: decapitation by sword (*decollatio*) was a standard method of execution referred to frequently in surviving Roman legal texts.[81]

Treatment of the female in F.1097, particularly the chop marks to her jaw and the removal of her ear: mutilation following execution is referred to occasionally in Roman historical sources and is paralleled by the destruction of the head or face of images of executed criminals. Severing of the jaw was also inflicted on a few other British decapitated bodies, mostly in cases interpreted as executions rather than ritual decapitations.[82]

[78] Thomas 1984, 585–8; Korporowicz 2012.

[79] For example, contracts (Turner 1956; Tomlin 1988; 1996; 2003; 2016).

[80] For example, Uley 43 in Adams 1992.

[81] From the third century, provincial governors were given the *jus gladii* or *potestas gladii*, 'power of the sword', which, according to Ulpianus, signified the power 'to punish criminal persons' (*ad animadevetendum facinorosos homines*: *Digest* 2.1.3), and he specifically refers to individuals being condemned to death with the sword (*Digest* 48.19.8; cf. *Theodosian Codex* 2.1.1). Edicts issued by Constantine and Theodosius also refer to the use of the sword for carrying out capital punishment (e.g. *Theodosian Codex* 9.6.3, 9.16.4, 9.41.1, 10.10.3).

[82] Tucker reports that skeleton SK33 from 1–3 Driffield Terrace, York, had been decapitated while the neck was flexed, and hence the individual was probably alive in a kneeling position when beheaded (2012, 145–6). In addition, there were 'nine chops to the left and right body of the mandible, made from a variety of directions. The anterior portion of the mandible was not recovered from the grave, suggesting that part of his face had been entirely separated from the rest of the remains prior to interment.' Tucker also notes the presence of a second decapitated individual in the same cemetery with multiple chopping blows to the mandible, but does not specify which skeleton. In the case of skeleton AX from Dunstable the 'right mastoid [had been] chopped through cleanly at 45 degrees to the horizontal. The slash carried on to severe the right dorsal arch and lateral mass of C2. The preserved fragment of mandible showed a slash through the lingual surface of the left mandible. The whole sequence is most consistent with a beheading in the kneeling position by a right handed person from the rear' (Matthews 1981, 38). Tucker reports skeleton SK1118 from Little Keep, Dorchester, Dorset, with chop marks to the left mandible, along with chop marks to the right clavicle and two fingers (2014, 227). The last probably represent defensive wounds and suggest an unwilling victim. J. Bernard Calkin reports that the jaws of the two females at Kimmeridge and one decapitated female at Studland had been intentionally severed, although he provides no detailed osteological evidence (1947, 36–7).

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The late date of the executions: the rise in decapitations in Britain coincided with increasing severity in Roman law. The number of crimes that carried the death penalty more than doubled in the third century and quadrupled in the fourth.[83]

A legal reason for the decapitations could potentially explain why the burials at Knobb's Farm and across Roman Britain are otherwise apparently normal in terms of their contents and their location within cemeteries.[84] Under Roman law, family and friends could request the return of the body of an executed criminal for burial[85] (although the extent to which this actually applied in Britain is unknown). It would have been the family and friends of the deceased, not the state, who would make decisions about how the body was interred. And the excavated evidence suggests that their decisions about how to bury these executed individuals were shaped by local conventions, not the fact of execution.

In short, where the manner of decapitation can be determined, it is consistent with the judicial executions described in Roman legal texts, as are the date, the use of mutilation and burial accompanied by otherwise-normal grave goods.

Ritual practices in burial

If decapitation was the result of execution, and the authorities subsequently handed over the body to friends and family for burial, then the act of decapitating the victim and the act of burying their body were entirely separate activities, carried out by different groups of people. This would explain why there appear to be several ritual aspects to the burials at Knobb's Farm, but which are unrelated to decapitation.

Use of miniature vessels, mainly colour-coated and from the Nene Valley: the provision of single pottery drinking vessels was a normal burial ritual locally in the fourth century A.D. Use of miniature vessels and colour-coated vessels is by no means unknown locally; indeed it is common in the burials at the Camp Ground and Landgale Hale. However, as noted earlier, the sheer number of miniature vessels at Knobb's Farm is certainly exceptional by local standards, where a quarter of graves received a small or miniature vessel.[86] However, as regular and irregular burials at Knobb's Farm were equally likely to be provided with a pot, there is no evidence that their use is specially connected with a ritual for decapitated or prone burials.

Holes bored in flagons found with the disturbed burial in F.938 and with the decapitated body in F.941: as noted earlier, the practices of creating small holes in vessels used a grave goods and breaking off small sherds were commonplace throughout the Roman period and have been noted for both cremations and inhumations. These are certainly funeral rituals of some kind, but not routinely associated with either decapitation or prone burials.

The presence of the face-necked flagon in F.945: while the context of most examples of face-necked vessels found in Britain and the near Continent is unrecorded, provenanced flagons are most commonly found in graves.[87] There is a notable concentration around Worms on the Rhine and also Trier on the Moselle, with 20 cases recorded in Britain.[88] Several interpretations of

[83] MacMullen 1986.

[84] Crerar 2012; 2016.

[85] The fifth-century *Digest* preserves opinions by two third-century jurists, Paulus (48.24.3) and Ulpianus (48.24.1), directing magistrates to return the bodies of executed criminals to their relatives if they request it. Both jurists are known to have been in Britain with Septimus Severus (Korporowicz 2012, 144).

[86] Only the burials at Hatherdene Close, Cambridge, come close (Ladd and Mortimer 2017).

[87] Dövenor 2000, 161.

[88] Dövenor 2000, 99–146 catalogues known examples in Britain. She lists 12 face-necked flagons from burials in Colchester, three from London and one each from Welney (Cambridgeshire Fens), Burgh Castle (Norfolk), Irchester (Northamptonshire), Cirencester (Gloucestershire) and Burgh-by-Sands (Cumbria). To this list should be added one recently excavated example from Northstowe, Cambridgeshire, 13 km to the south of Knobb's Farm (Aldred 2020; Mazzilli in Collins 2020).

this type of pottery have been offered: divine protection from the goddess depicted; participation in a Dionysian cult with the hope of resurrection; and provision of the 'sap of life' in the form of wine.[89] All imply some form of aid to the dead in the afterlife. The example in F.945 appears to be the only one from Britain or the Continent to have been buried with a decapitated body, however.

None of these practices is demonstrably linked to either decapitation or prone burials, and they seem to be unrelated burial rites. Moreover, the provision of drinking vessels, use of miniature grave goods and boring holes are all practices that preceded the rise of irregular burials in the third century; this suggests they were unrelated to either decapitation or prone burial.

As noted above, there may have been a symbolic connection being drawn between pots and heads in F.949 and F.961, where pots accompanying decapitated skeletons were placed where the head would normally have been; and this may have been the case in F.951, too, where a beaker was placed in direct contact with the cranium.[90] While replacing the head with a pot is not entirely unknown elsewhere,[91] generally, the placement of a pot in a grave did not correspond to the position of the head, whether decapitated or intact. The placements noted at Knobb's Farm may represent one-off symbol gestures[92] specific to the individuals in F.949 and F.961 (the symbolic equivalent of an 'in joke'), but, as noted earlier, they may also have been intended as insults or jokes. The rarity of this practice implies that it was not a ritual as normally understood.[93]

One practice that is certainly associated with decapitation is the placement of the severed head near the feet. The treatment of the head at Knobb's Farm is consistent with most decapitation burials in Britain, along with the few examples found in continental Europe. No mention of the practice is made in Latin literature, but folklore and mythology from other times and places across Europe consistently suggest that heads were cut off and placed by the feet post-mortem to silence unquiet spirits or to prevent dead bodies from rising from the grave.[94] As noted above (n. 72), there appears to have been a widespread belief that a ghost's power derived from the corpse, so decapitating or dismembering the body either destroyed or banished the ghost.[95] Such a line of thought would readily explain why the heads of decapitated individuals in Roman Britain were routinely placed at the lower end of the grave: to prevent the corpse from reassembling itself. While there is literary evidence that some people in Rome believed in ghosts and revenants, it is not at all certain if this explanation can be applied to Britain. Against such an interpretation should be set the sequence of burials in F.165, where the grave of decapitated and prone Sk.323 was reopened to bury a second body, Sk.324. A similar pattern was found at the Camp Ground site, 1 km to the south, where a decapitated female was buried in a coffin with a second burial overlaying her.[96] Presumably, those who re-dug these

[89] Onians 1951, 216–17, 223–8; Dövener 2000, 163; Braithwaite 2008, 384–5.

[90] The proximity of the pot in F.951 to the skull may simply be due to the body being placed close to the grave cut, meaning the pot had to be wedged in beside the head.

[91] For example, Navenby, Lincolnshire (Allen and Palmer-Brown 2001).

[92] There is linguistic evidence for a systematic connection between pots and heads elsewhere in the north-western Roman provinces, but not in Britain. The French *tête*, 'head', derives from Latin *testa*, 'pot, jug', while the German *Kopf*, 'head', Dutch *kopje*, 'head, cup', and Old Frisian *kopp*, 'head, cup', all derive from Latin *cuppa*, 'cup'. While the Latin word *cuppa* was also adopted by the British – surviving in Welsh *cwpa* and Irish *cuipe* – there is no linguistic evidence that this term displaced the Celtic term for head, *penn*.

[93] For example, Bell 2009, 150: 'One of the most common characteristics of ritual-like behavior is the quality of *invariance*, usually seen in a disciplined set of actions marked by precise *repetition* and physical control. For some theorists, this feature is the prime characteristic of ritual behavior' (our italics).

[94] Caciola 2016, particularly 109–253. Specific examples of decapitation being used to quiet a revenant include the Icelandic *Grettir's Saga* 18 and the medieval German *Malleus Maleficarum* 1.15 (MacKay 2009, 237).

[95] Ogden 2002, 162, no. 122.

[96] Dodwell in Evans *et al.* 2013, 234.

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graves were not concerned about the presence of a possible revenant or any risk associated with interring a second cadaver in the same grave as one.

Weighing up the ritual and judicial explanations for decapitation

On balance, judicial execution is a better explanation for the decapitation burials at Knobb's Farm than a ritual interpretation. It is also a better fit with the pattern across Roman Britain, particularly the osteological evidence.[97] The skeletons at Knobb's Farm shown no evidence consistent with post-mortem removal of skulls and human sacrifice appears implausible given the lack of distinctive burial treatment (leaving aside its likely illegality). While only three bodies bear direct evidence for decapitation as the manner of death, none of the other decapitated bodies shows any evidence of special treatment. They were mixed in with other burials and provided with the same types of grave goods and furniture. While there do appear to be ritual elements in the decapitation burials, these seem unrelated to the fact of decapitation. Rather, they parallel rites used in regular burials at Knobb's Farm and most are variants of long-standing local traditions, such as the use of pottery grave goods and boring holes in pots. The placing of pots where the heads would have been if left intact in F.949 and F.961 has so few parallels that it is impossible to know the significance of their inclusion or placement.

PRONE BURIAL

Prone burials have received very much less attention than decapitations. Unhelpfully, although prone burials have been excavated across the western Roman Empire,[98] prone burial is not mentioned in Roman literary sources. The few cross-cultural syntheses of the practice suggest that it had no single meaning and may have had many different purposes, including the burial of suicides, criminals, injured individuals, low-status individuals and people buried alive, the prevention of revenants rising and atonement for the immorality of parents.[99] No society, however, appears to regard the practice as positive for either the deceased or their family.[100]

Given that 13 people were buried prone at Knobb's Farm, the practice cannot have been a mistake. At least three of the bodies at Knobb's Farm were buried in shrouds, and this would have made the orientation of the body instantly apparent. Prone burial was certainly a deliberate decision on the part of those conducting the funeral. However, by itself, the practice of burying a body face down provides little information regarding its significance or motivations. Like decapitation burials, the prone burials at Knobb's Farm show no clear associations with other burial characteristics at the site such as age, sex, grave goods or grave furniture. In the absence of any contemporary written testimony, interpretations of the practice depend entirely on establishing associations with other burial patterns. Elsewhere, the low prevalence of both practices in most Roman era cemeteries has made detection of any correlation difficult, and previous surveys in Britain have only been able to suggest a possible relationship between the two.[101] The unusually high number of both decapitations and prone burials at Knobb's Farm does, however, suggest some kind of association (TABLE 7).

[97] Crerar 2012; 2016; Tucker 2012; 2014; 2016.
[98] Milella *et al.* 2015.
[99] Arcini 2009; Reynolds 2009, 68–76, 89–91, 160–1; Gardeła 2015.
[100] Arcini 2009, 196.
[101] Harman *et al.* 1981, 166; Philpott 1991, 74, 76; Tucker 2016, 52.

TABLE 7. NUMBER OF REGULAR, DECAPITATED AND PRONE BURIALS AT KNOBB'S FARM

	Decapitated only	Decapitated and prone	Prone only	Remainder
Cemetery 1	1	2	0	8
Cemetery 2: first phase	0	0	0	5
Cemetery 2: middle phase	4	1	0	5
Cemetery 2: final phase	1	1	0	10
Cemetery 3	5	2	5	1

The relationship between the two practices can be appreciated by considering what the pattern of burials would have been if the 17 decapitation and 13 prone burials had been distributed randomly across the 52 burials found at Knobb's Farm. In that case, there would be around a 20 per cent chance that six or more of the bodies would have been *both* prone and decapitated. At face value, this suggests only a weak correlation. However, decapitation and prone burial were not evenly spread across the three cemeteries. For example, there was a particularly dense cluster of irregular burials in Cemetery 3, where there were seven decapitations and seven prone burials. If the 17 decapitations identified at Knobb's Farm had been distributed across all three cemeteries at random, then there would have been a *c*. 6.5 per cent chance that at least seven of them would have been buried in Cemetery 3. Similarly, if the 13 prone burials had been distributed randomly, there would have been a *c*. 1.2 per cent chance that seven would be in Cemetery 3. But the chance of this number of *both* practices occurring at random in this cemetery is only about one in 1,300. The figures for Cemetery 2 are not as striking, but the odds of both prone burials also being decapitated is about one in 18. These low probabilities show that the two practices were in fact related.

Another curious feature about Cemetery 3 is the limited overlap between the two practices: just two bodies were both decapitated and buried prone, despite the frequency of both types in this burial plot. The chances of this happening at random are about one in 13. The general lack of overlap between the two practices is also apparent, although not as pronounced, at other sites in the region where large numbers of both have been found, such as Kempston, Bedfordshire,[102] and Great Welnetham, Suffolk.[103] These figures suggest that, although decapitation and prone burials were related, they might also have been contrasting ways of treating the body.

Assuming decapitation reflects execution at Knobb's Farm, then an association between beheading and prone burial helps narrow the range of potential interpretations. It might indicate the family's response to the individual or the manner of the death, possibly expressing shame or fear. This might explain why the mutilated female in F.1097 was buried face down. Prone burial may also indicate that the people involved were criminals. On the contrary, it might have had nothing to do with the specific individual and, like the practice of placing the head at the foot of the grave, may have been intended to prevent revenants rising from the grave.

WHY KNOBB'S FARM?

A final question to be addressed is why so many people were decapitated and/or buried prone at Knobb's Farm. As their presence does not appear to have been the result of a single event, the practice implies a social environment in which people were unusually prone to execution for at least several generations.

[102] Boylston and Roberts 2004, 87 inhumations, 12 decapitations, 12 prone burials, one involving both; *c*. 50 per cent chance of two or more bodies with both practices.

[103] Newton and Bull 2020: 56 inhumations, 17 decapitations, five prone burials, no burials with both; *c*. 85 per cent chance of one or more bodies with both practices.

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Before venturing into the social and economic factors, it is worth reiterating that, although a third of the bodies excavated at Knobb's Farm appear to have been executed, this does not imply that a third of the settlement's population suffered the same fate. Only one outer part of the farming settlement has been excavated, and none of its core. Consequently, there are potentially more burials unaccounted for. A farm covering around 300 ha producing grain and meat would have required 30–50 labourers, along with domestic support,[104] so the cemetery at Knobb's Farm represents the population of around one generation. But, as the farm operated from at least the first to the mid-third century (i.e. for eight to ten generations), there are many burials not accounted for. Even so, taking into consideration this missing population, the number of decapitated bodies excavated implies the execution of *minimally* 3–6 per cent of the settlement's total population.

Most of the social and economic data that might have provided information about the 'execution environment' at Knobb's Farm was lost when the core of the settlement was quarried away in the 1960s. In the parts excavated by the CAU, there was no evidence for *in situ* domestic activity, almost no evidence for consumption, no indication of social status and no numismatic evidence. This reduces the evidence available with which to assess socio-economic influences to just two sources: the burials themselves and comparison with nearby settlements.

As noted in the introduction, the settlements immediately to the south at the Camp Ground site and Langdale Hale were both unusual, as they appear to have been the sites of either state-sponsored enterprises producing and shipping grain or private undertakings supplying the army, possibly under official regulation. Simple proximity suggests that the large Camp Ground site would have influenced the settlement at Knobb's Farm. However, despite the loss of the Knobb's Farm settlement core to quarrying, there are several indications of a close economic association with the 'state-associated' settlements. For example, there are similarities in the crop-processing methods used at Knobb's Farm and Langdale Hale. Furthermore, cereal production at both appears to have peaked around the same time: A.D. 120–250 at Langdale Hale and the mid-second to mid-third century A.D. at Knobb's Farm. Knobb's Farm also has a building – possibly a granary – built on beam-slots. This is an unusual construction method, requiring the use of scarce long tree trunks, but one that was shared by many of the buildings at the Camp Ground, where they are associated with official grain supplies. The only other local building with this construction method was a large warehouse, measuring *c*. 20 by 20 m, excavated at Waterbeach;[105] this was slightly bigger than the large granary complex at the Camp Gound site.[106] Like Knobb's Farm and Camp Ground, the Waterbeach warehouse was located immediately beside the Car dyke. Such large wooden granaries in Britain have been associated with the Roman military,[107] and their presence here suggests that the Knobb's Farm settlement was part of a much larger enterprise to supply the Roman army.

[104] Figures reported by the first-century writer Columella imply that Roman cereal production required 10.5 labour days per *iugerum* spread over an agricultural year of 250 days (White 1965, 102–3). For 300 ha, this equates to 12,500 labour days or the work of *c*. 50 labourers. The presence of droveways and some animal bones indicates that the farm was not devoted solely to cropping. The labour involved in stock rearing would have been less than for agriculture. So, the population of Knobb's Farm might have included 30–50 labourers plus domestic support along with non-productive individuals like young children.

[105] Evans *et al.* 2017.

[106] Buildings 24 and 26; 360 m^2 (Evans *et al.* 2013, 267). By way of comparison, the internal areas of *horrea* on northern military sites were generally much smaller, with just two of comparable size: South Shields 102 m^2; Newcastle (east) 90 m^2; Newcastle (west) 90 m^2; Houseteads (Hadrianic) 309 m^2; Houseteads (Building XV) 425 m^2; Vindolanda (east) 160 m^2; Vindolanda (west) 161 m^2; Birdoswald (north) 156 m^2; and Birdoswald (south) 156 m^2 (Collins 2015, table 3.1).

[107] Manning 1975.

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Possibly the biggest indication that the Knobb's Farm settlement was not a regular farm, however, is the size of the burial population: it is over three times larger than the average size of cemeteries associated with rural settlements in the local area. Indeed, it is amongst the largest burial populations of Cambridgeshire and Peterborough, with most of the larger sites found around the towns of Durobrivae (Water Newton/Peterborough), Durovigutum (Godmanchester) and Duroliponte (Cambridge).[108] A property worked by 30–50 people is plainly something more than a regular family-based farmstead and suggests that it was an 'estate farm' of some form.

Just as the settlements to the south of Knobb's Farm were atypical for the region, the population at Knobb's Farm is also unusual. In particular, the finding that nine people here belonged to nine separate haplogroups is highly unlikely in a rural population.[109] While isotopic studies of Roman towns in Britain have shown that roughly half their populations came from other parts of Britain or further afield[110] and that Roman towns had pronounced immigrant populations,[111] in rural areas a much more settled population with numerous familial connections would seem more likely. So, a lack of genetic relationships at Knobb's Farm suggests a population that had moved, either deliberately or involuntarily, or was unusual in some other way. In the case of the settlements at Somersham, which were not major administrative centres, the main factors that might explain the lack of familial connections in the Roman period would appear to be state or army service, trade or some form of slavery or indentured service. At Knobb's Farm, isotopic analysis has identified two 'non-local' signatures – the decapitated individual in F.165 and the male in F.959 – which might be consistent with movement prompted by trade or an official posting. Another potential indicator of movement is the presence of two haplogroups that are now uncommon locally: one in F.166 (Sk.327), which is today found most commonly in Scotland and Ireland (H1i1), and another in F.943 (Sk.1343), which is nowadays found mostly across northern Europe and Scandinavia (H17).[112] The presence of these haplogroups does not necessarily imply first-generation movement, although the lack of other individuals bearing these markers in the nine samples obtained does suggest this is more likely than second- or third-generation migrants. A final potential indicator of non-local origins is the face-necked flagon found in F.965. These are unusual pots – Franziska Dövener's catalogue lists just 270 in Britain[113] – but there is a

[108] For the size of local cemeteries, see section 16 of the online supplementary material.

[109] An example of a more typical pattern of relations is provided by the recently published genetic make-up of the nineteenth-century poor working-class burial plot at Darwen, Lancashire (Drousou *et al.* 2019). Of the 25 individuals successful sampled for aDNA, 19 belonged to clusters of shared mtDNA – eight separate clusters containing 2–4 people. Only six people in the Darwen plot belonged to unique haplogroups. The late Roman site at Vicar's Farm, Cambridge, 20 km to the south, provides a loosely similar pattern (Scheib in Evans and Lucas 2020: 326–7). There, matrilineal lines from 14 samples were sequenced. Two pairs share the same haplogroup, along with a second-degree relationship – that is, six people out of the 14 had some kind of genetic connection. The absence of genetic relations among the nine individuals from Knobb's Farm from which mtDNA could be extracted is noteworthy. It is not, however, unique; the mtDNA haplogroups deduced for 12 neonates excavated at Yewden Roman villa belonged to 12 separate maternal lineages (Abu-Mandil Hassan *et al.* 2014). One explanation offered for the number of infant burials present is that the villa had been the site of a brothel, and the infants were the unwanted babies of the workers (Eyers 2011, 278).

[110] Eckardt *et al.* 2010, 122. Sites samples were York, Catterick, Gloucester and Lankhills (Winchester).

[111] Martiniano *et al.* 2016 identifies an individual in York who was probably from Arabia.

[112] The oxygen isotopic value for the individual in F.166 ($\delta^{18}O_{PO4}$ 15.89) is consistent with the low-rainfall zone of Britain, which includes much of central and eastern Scotland and northern Ireland, although not the wetter western coasts of either (Lightfoot and O'Connell 2016, fig 6; Pellegrini *et al.* 2016, fig. 2). The individual in F.943, which belonged to haplogroup H17, produced a $\delta^{18}O_{PO4}$ value of 15.56. As noted by Lightfoot and O'Connell 2016, 23, 'Phosphate oxygen isotope values between 16 and 17‰ (or even 14 to 18‰) are very common across Europe'; and so, in principle, this individual could have come from a wide swathe of northern Europe, although, as lower values are less common at higher latitudes in Europe, a Scandinavian origin is less likely.

[113] Dövenor 2000, 99–146.

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concentration around Somersham.[114] This type of pot originated amongst the Rhineland garrisons. Although face-necked flagons were manufactured in Britain, their distribution within the province suggests some Rhineland influence.[115]

Three of these five potentially 'non-local' individuals were decapitated (F.165 Sk.324, F.943 and F.965); it is, though, not possible to determine from the available evidence whether their origins had any direct influence on their fate. Nonetheless, an association between the Knobb's Farm settlement site and the late phases of activity at Camp Ground and Langdale Hale provides some rationale for the high level of decapitation. If the settlements to the south were involved in official supply and trade, they would presumably have been under stricter official scrutiny than regular rural settlements, even if they were not under direct state control.

During the third and fourth centuries, the penalties available under Roman law grew steadily harsher. The number of crimes that carried the death penalty grew from 14 at the start of the third century to around 60 by the death of Constantine in A.D. 337.[116] The main drivers of these new penalties were state security and the need to ensure state finances – large portions of which went to the military and state bureaucracy. Sites that supplied the army, either contractually or under direct state control, would presumably have been under particular scrutiny, and malfeasance would have been treated harshly. Even if Roman law was only applied broadly in most of rural Britannia, it seems plausible that the law and its penalties might have been applied more stringently in the case of the Somersham settlements. Even if the Knobb's Farm settlement was not under the direct control of the Camp Ground, the jurisdiction of the magistrate who ordered the execution of people at Knobb's Farm presumably also covered the Camp Ground port and Langdale Hale farm.

This would explain the similarities in the irregular burials across all three sites. Although large formal burial grounds have not been found at either the Camp Ground or Langdale Hale, small numbers of cremations and inhumations have been located at each settlement: 14 adult inhumations at the Camp Ground and seven at Langdale Hale,[117] of which four were irregular burials (20 per cent). At Langdale Hale, all seven inhumations were male; the absence of females or subadults from a rural settlement is unusual. Three of the bodies had been buried prone and one had also been decapitated. Like Knobb's Farm, these figures present a very high ratio of irregular burials. The decapitated individual was a mature male (F.853) who had been buried prone with his hands bound behind his back and his head between his lower legs. He had also been buried in a coffin and was accompanied by a small jar. His burial is dated to A.D. 180–250. The prone burial in F.937 was broadly contemporary. This was of a mature adult male, buried in a pit. The position of the body suggests he might have been flung in the pit rather than buried formally. The last prone burial, a mature adult male in F.1101, belonged to a later phase of activity (A.D. 250–325). This burial post-dates the main phase of activity at

[114] In addition to the example from F.965, two were found during the Camp Ground excavations (Evans *et al.* 2013, 317, fig. 4.8 no. 57, 321, fig. 4.12 no. 147) and a further one was found at 'Somersham' in 1918 (Dövenor 2000, no. 217). No less than 12 face-necked flagons and other ceramic vessels with faces have been excavated within 20 km of Knobb's Farm. In addition to those listed above, one was found at Cambourne (Wright *et al.* 2009), two at Vicar's Farm, west Cambridge (Evans and Lucas 2020, 400) and five at Northstowe, including one with an inhumation burial (Aldred 2020; Mazzilli in Collins 2020). On the Rhine, these pots are associated with the military (Dövenor 2000, 157); Braithwaite 2008 argues for a connection between the military and face pots. It would, however, be overstretching the evidence to claim an official or military presence at Knobb's Farm on the basis of a single pot in a single grave.

[115] Unfortunately, it is not possible to use isotopes to identify potential immigrants from the Rhine. The $\delta^{18}O_{PO4}$ groundwater values for this part of Germany are very similar to those of Cambridgeshire (Lightfoot and O'Connell 2016, 16, fig. 6). Also, the values for strontium isotopes around Worms ($^{87}Sr/^{86}Sr \approx 0.708–0.7095$) overlap those around Somersham (0.709–0.710) (Bentley *et al.* 2002; British Geological Survey, Biosphere Isotope Domains).

[116] MacMullen 1986; also Garnsey 1968.

[117] Dodwell in Evans 2013, 79–85, 230–6.

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Langdale Hale, although it probably pre-dates the burials at Knobb's Farm. At the Camp Ground, one middle-adult female (F.1363) had been decapitated and subsequently buried in a coffin with her head placed over her left foot. She was accompanied by a miniature Nene Valley pot placed at the head end of the grave. Over her had been buried a mature male (F.1361), possibly in a shroud. Their interment belongs to the final phase of activity on the site, post-dating A.D. 325, and is nearly identical to the burial practices seen at Knobb's Farm.[118]

Taken together, the proximity of Knobb's Farm to the other Somersham sites, their collective scale and unusual form, suggesting involvement in supplying the army, and parallels in irregular burials across all three sites (some pre-dating the cemeteries at Knobb's Farm) suggest that the high levels of decapitation relate to oversight of official state supplies and the consequent strict application of capital punishment. Naturally, we cannot know whether these individuals were killed legally or not: the judicial system might have been used to dispose of individuals on trumped-up charges and it is not impossible that draconian punishments were inflicted on a few individuals to keep the remainder of the population obedient. Nonetheless, whatever their motivation, the form of the decapitations at Knobb's Farm does suggest official involvement.

CONCLUSION

Despite the poor bone preservation at Knobb's Farm, which limited analysis of the skeletal remains, the large burial assemblage nonetheless permits an assessment of current interpretations of irregular burials, which is not feasible for most Roman era cemeteries. In contrast to most interpretations over the last 40 years, the decapitations at Knobb's Farm are considered the result of judicial execution. After execution, the bodies were probably interred by friends or family, and their burials included variations of several funeral rites used locally. These rituals do not seem to reference specifically either decapitation or prone burial. Like the bulk of other British cemeteries containing irregular burials, the individuals at Knobb's Farm were chiefly mature adults, but, otherwise, they do not appear to have been selected for any particular characteristic and were buried in generally the same manner as others in the same cemetery. Prone burial was related to decapitation: it appears to have been used in contrast to it, although its precise significance remains unclear. The association with decapitation does, however, narrow the range of possible meanings: prone burial might have been related to the family's response to execution or an expression of criminality or else a means to prevent revenants from rising from the grave.

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[118] Another parallel in burial practices is the inclusion of two miniature greyware vessels in the grave of a middle-adult male (F.618; A.D. 250–325); these were placed directly beside the head.

from their excavations at Hatherdene Close, Cambridge. We also appreciate discussions with Andy Peachey about Archaeological Solutions' recent excavation of a decapitation cemetery at Great Welnetham, Suffolk.

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SUPPLEMENTARY MATERIAL

For supplementary material for this article, please visit https://doi.org/10.1017/S0068113X21000064.
The supplementary material comprises the following additional material.
Section 1: Project background *By* Rob Wiseman
Section 2: Excavations in the Northern Area *By* Rob Wiseman
Section 3: Excavations in the Southern Area *By* Rob Wiseman
Section 4: Cremated human bone *By* Natasha Dodwell
Section 5: Inhumation burials: general discussion *By* Benjamin Neil
Section 6: Inhumation burials: catalogue *By* Benjamin Neil
Section 7: Late Iron Age and Roman pottery *By* Katie Anderson and Francesca Mazzilli
Section 8: Faunal Remains *By* Vida Rajkovača
Section 9: Environmental Remains *By* Rachel Ballantyne and Anne de Vareilles
Section 10: Worked stone *By* Simon Timberlake
Section 11: Metalwork *By* Justin Wiles
Section 12: Bone comb *By* Ian Riddler
Section 13: Scientific dating *By* Rob Wiseman
Section 14: Ancient DNA *By* Christina Lyn Scheib
Section 15: Isotopes *By* Emma Lightfoot
Section 16: Local Roman era burials *By* Rob Wiseman

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APPENDIX 1: INHUMATIONS IN CEMETERY 1

Orientation: the position of the head is shown first (i.e. N–S indicates head at the northern end). *Fragmentation*: 1 = low; 2 = medium; 3 = high; 4 = very high. *Preservation*: 0 = fresh bone to 5 = heavy erosion. *Sex*: determined from morphological characteristics of the skeleton and the assessment of ancient DNA (XX = female; XY = male; XX* = consistent with XX but not XY; XY* = consistent with XY but not XX).

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Feature	Skeleton	Grave dimensions and orientation	Skeleton present	Preservation	Fragmentation	Age	Skeletal and genetic sex	Decapitated	Burial position	Notes
F.152	259	*c*. 1.75 × *c*. 07 × 0.31 m N–S	48%	3–4	3	Juvenile	(M) [n.a.]	N	Supine	–
F.162	313	1.77 × 0.8 × 0.08 m N–S	7%	1	3	Adult	Indet.	N	Prone	–
F.163	316	1.05 × 0.75 × ? m indet.	20%	2–3	4	Infant	(F)	–	n.a.	–
F.164	319	2.3 × 0.85 × 0.15 m N–S?	28%	2	3	Mature	F [XX]	–	Disartic.	Disarticulated bone in grave fill. Disturbed by burial of Sk.320. Miniature beaker placed above presumed location of right shoulder/head (though may belong to Sk.320)
F.164	320	2.3 × 0.85 × 0.15 m N–S	90%	1–4	1	Mature	F [n.a.]	Y	Prone	Reused grave of Sk.319. Decapitated head placed between knees. 30 beads of a necklace placed by right shoulder, one around mouth. Miniature beaker placed on centre of back. The pot attributed to Sk.319 may belong to this individual. 2 nail fragments (minimum 1 nail)
F.165	323	1.8 × 0.85 × 0.33 m S–N	60%	1–2	2	Mature adult	M	N	Flexed on right side	Reused grave of Sk.324
F.165	324	1.8 × 0.85 × 0.33 m S–N	45%	1–2	2	Middle adult	(F) [XY]	Y	Prone	Double burial with Sk.323. Decapitated head placed by right knee. Miniature jar placed by right shoulder. Sherds of a coarse sandy greyware vessel in the grave fill
F.165	n.a.	1.8 × 0.85 × 0.33 m indet.	8%	2–3	3	Middle adult	F?	–	Disartic.	Disarticulated bone in the grave fill
F.166	327	1.86 × 0.69 × 0.31 m S–N	85%	1–2	2	Mature adult	M [XY]	N	Prone	—
F.700	701	Truncated S–N	15%	3–4	4	Middle adult	(F) [XX*]	Y	Supine	Top half of body truncated. Head between knees
F.715	751	1.53+ × 0.6 × 0.12 m truncated N–S	17%	1–3	3	Adult	Indet.	–	Supine	Top half of body truncated

APPENDIX 2: INHUMATIONS IN CEMETERY 2

Feature	Skeleton	Grave dimensions and orientation	Skeleton present	Preservation	Fragmentation	Age	Skeletal and genetic sex	Decapitated	Burial position	Notes
F.509	521	*c.* 2.0 × *c.* 1.0 × 0.4 m SSW–NNE	60%	3–4	3	Mature	M	N	Supine	Interred over grave F.932
F.930	1300	2.06 × 0.91 × 0.22 m SSW–NNE	3%	4–5	5	Young middle adult	Indet.	–	Extended left side	Body lies along eastern edge of grave on its left side. Miniature beaker placed by head
F.931	1303	*c.* 1.9 × *c.* 0.7 × 0.06 m SSW–NNE	10%	4	3	Young middle adult	(M)	N	Supine	4 nail fragments (minimum 1 nail)
F.932	1306	2.58 × 0.94 × 0.34 m SSW–NNE	12%	3–4	3	Young adult	Indet.	–	Redeposited disartic.	Group of disarticulated bones in same grave as Sk.1307
F.932	1307	2.58 × 0.94 × 0.34 m SSW–NNE	8%	3–4	4	Adult	(M) [n.a.]	–	Redeposited disartic.	Group of disarticulated bones in same grave as Sk.1306
F.933	1312	1.7 × 0.7 × 0.02–0.09 m NNE–SSW	2%	2	4	Subadult	Indet.	N	Supine?	–
F.934	n.a.	1.8 × 0.5 × 0.05 m truncated S–N	0%	n.a.	n.a.	n.a.	n.a.	–	n.a.	Truncated by grave F.935. No bone found
F.935	1314	2.0 × 1.4 × 0.05 m SSW–NNE	5%	4–5	4	Middle adult	Indet.	–	Disartic.	Miniature beaker placed above head. Double burial with Sk.1317
F.935	1317	2.0 × 1.4 × 0.05 m N–S?	2%	2	4	Young adult	Indet.	–	n.a.	Double burial with Sk.1314. 1 nail fragment
F.936	n.a.	1.05 × 0.7 × 0.05 m N–S	0%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	No bone found
F.937	1322	2.05 × 1.2 × 0.17 m WNW–ESE	2%	4–5	4	Adult	Indet.	–	Disartic.	Skull only
F.938	1327	1.7 × 1.30 × 0.04–0.10 m SSW–NNE	3%	3–4	4	Adult	Indet.	–	Disturbed	Grave truncated by F.939. Only lower legs remain *in situ*. Miniature flagon (probably not *in situ*)
F.939	1330	1.77 × 0.60 × 0.12–0.18 m SSW–NNE	32%	2–3	3	Middle adult	F	Y	Prone	Decapitated head beside left foot. 3 nail fragments (minimum 2 nails)
F.947	1357	2.08 × 0.76 × 0.32 m W–E	4%	4–5	4	Adult	Indet.	–	Supine	L-shaped gully around grave. 6 nail fragments (minimum 3 nails)
F.948	1360	2.40 × 0.80 × 0.05–0.07 m ESE–WNW	16%	3–5+	4	Young adult	M	N	Supine	L-shaped gully around grave. 1 nail fragment.
F.949	1363	2.15 × 0.87 × 0.23 m SSW–NNE	58%	4–5	4	Old middle adult	M [n.a.]	Y	Supine	Decapitated head placed between feet. Miniature beaker placed immediately to left of where head should be located. Double-spiked loop, possibly remains of a wooden box or drawer, in NW corner of grave

Continued

F.950	1366	1.90 × 0.06 × 0.20 m ESE–WNW	76%	3–5	2–3	Mature adult	M [XY]	Y	Prone	Decapitated head placed by right foot
F.951	1369	2.65 × 1.26 × 0.13–0.25 m NNE–SSW	43%	3–5+	3	Middle adult	M [n.a.]	N	Supine	Miniature beaker placed on right side of head. 2 nail fragments (minimum 2 nails)
F.952	n.a.	2.20 × 0.75 × 0.10–0.23 m ESE–WNW	0%	n.a.	n.a.	n.a.	n.a.		n.a.	L-shaped gully around grave. Grave truncated by F.951. No bone found
F.953	1374	2.25 × 1.10 × 0.37 m ESE–WNW	58%	3–5	3	Young middle adult	M	Y	Supine, coffin	Decapitated head placed between ankles. Miniature beaker placed by left shoulder. 26 nail fragments (minimum 11 nails)
F.954	1377	2.00 × 1.00 × 0.03–0.08 m ESE–WNW	30%	4–5	4	Young adult	Indet.	N	Supine	Body placed in a curious 'banana' position. 2 nail fragments (minimum 2 nails)
F.955	1380	1.37 × 0.62 × 0.15 m NNW–SSE	36%	3–4	4	Infant	M?	N	Supine disturbed	2 nail fragments (minimum 1 nail)
F.956	1383	1.92 × 0.75 × 0.16 m ESE–WNW	3%	4–5+	4	Adult	Indet.	–	Supine?	–
F.957	1386	1.85 × 0.55 × 0.12 m ESE–WNW	5%	4–5+	4	Adult	Indet.	N	Supine?	–
F.958	1389	*c.* 1.80 × 0.75 × 0.40 m SSW–NNE	68%	2	3	Old middle adult	(F)	N	Supine, shroud	1 nail fragment
F.959	1392	1.90 × 0.65 × 0.20 m ESE–WNW	33%	4–5+	3–4	Old middle adult	M	N	Supine, coffin	L-shaped gully around grave. Miniature beaker placed above and to right of head. 129 nail fragments (minimum 22 nails)
F.960	1395	2.32 × 0.74 × 0.18 m ESE–WNW	3%	4–5	4	Adult	Indet.	N	Supine	Miniature jar placed by right side of head
F.961	1647	2.27 × 0.77 × 0.22 m ESE–WNW	25%	3	4	Young middle adult	M	Y	Supine, coffin, gully?	Decapitated head placed between upper shins. Miniature jar placed where decapitated head should be. 80 nail fragments (minimum 18 nails)
F.962	n.a.	1.40 × 0.60 × 0.10 m truncated ESE–WNW	0%	n.a.	n.a.	n.a.	n.a.	–	n.a.	No bone found. 3 nail fragments (minimum 2 nails)
F.963	1398	2.10 × 0.90 × 0.40 m ESE–WNW	34%	4–5	3	Adult	M	Y	Supine	Decapitated head placed by left foot. 2 nail fragments (minimum 1 nail)
F.964	1641	1.80 × 0.82 × 0.12 m ESE–WNW	5%	4	4	Young adult	Indet.	–	Indet.	Grave truncated
F.965	1644	1.85 × 0.55 × 0.12 m ESE–WNW	29%	5	3–4	Old middle adult	M	Y	Supine	Grave too large for body. Decapitated head placed beyond feet in grave. Miniature face-necked flagon placed above right shoulder

APPENDIX 3: INHUMATIONS IN CEMETERY 3

Feature	Skeleton	Grave dimensions and orientation	Skeleton present	Preservation	Fragmentation	Age	Skeletal and genetic sex	Decapitated	Burial position	Notes
F.940	1333	*c.* 2.2 × *c.* 0.6 × ? m SSW–NNE	13%	3–4	4	Adult	Indet.	–	Supine	–
F.941	1337	1.80 × 0.65 × 0.18 m SSW–NNE	57%	2	3	Mature	F [XX]	Y	Supine	Decapitated head placed between ankles. Miniature flagon placed at right shoulder
F.942	1338	2.17 × 0.75 × 0.24 m SSW–NNE	37%	2–3	3–4	Old middle adult	M [XX]	Y	Supine, shroud	Double burial overlying Sk.1352. Decapitated skull placed by left shin
F.942	1352	2.17 × 0.75 × 0.24 m SSW–NNE	78%	3	3–4	Young middle adult	F	Y	Supine, shroud	Double burial underneath Sk.1338. Decapitated skull by right ankle
F.943	1343	2.00 × 0.60 × 0.10–0.20 m SSW–NNE	65%	1	2	Old middle adult	M [XY]	Y	Supine, shroud	Decapitated head placed under right foot. 4 cut marks to back and right of skull. 5 nail fragments (minimum 1 nail)
F.944	1346	1.70 × 0.73 × 0.16 m SSW–NNE	67%	2	3	Mature adult	(M) [XX]	N	Prone	Miniature jar placed against left side of head
F.945	1350	1.80 × 0.75 × 0.20 m SSW–NNE	79%	1–2	3	Young middle adult	(F) [XY*]	N	Prone, shroud, box burial	3 nail fragments (minimum 1 nail)
F.946	1354	2.04 × 0.59 × 0.25 m SSW–NNE	60%	1–3	4	Mature adult	F [XX]	N	Prone, shroud	–
F.1095	1910	1.80 × 0.65 × 0.10 m SSW–NNE	30%	3–4	4	Old middle adult	F? [n.a.]	Y	Prone	Bone very degraded. Skull placed beside left foot
F.1096	1880	1.70 × 0.70 × 0.10 m SE–NW	47%	3–4	4	Young adult	F? [n.a.]	N	Prone, shroud	Lower part of grave truncated
F.1097	1883	1.95 × 0.55–0.65 × 0.4 m SSW–NNE	45%	2	3	Mature adult	(F) [XX]	Y	Prone	Decapitated head placed on back of left knee. Cut marks to skull, jaw, clavicle, both arms and left thigh. Bone comb dating to A. D. 350–410 found in 3 pieces (behind head, in abdomen and under spine)
F.1098	1886	*c.* 1.80 × 0.9 × 0.13 m SSW–NNE	23%	2–3	4	Old middle adult	M?	Y?	Supine	Head missing
F.1099	1889	1.68 × 0.58 × 0.11 m SSW–NNE	28%	3	4	Mature adult	M? [XX*]	N	Prone	–

APPENDIX 4: POTTERY GRAVE GOODS

Cem.	Feature	Fabric	Form	No.	Wt (g)	Date	Location of grave goods	Posture	Age and sex
1	F.164, Sk.319	Colchester colour-coated ware	Miniature globular funnel-necked beaker	2	97	Mid-2nd–3rd century A.D.	Above right shoulder/ head	Indet.	Mature female
1	F.164, Sk.320	Nene Valley colour-coated ware	Truncated miniature globular beaker	9	161	Later 3rd–4th century A.D.	Centre of back	Decap. prone	Mature female
1	F.165, Sk.324	Shell-tempered ware	Miniature everted-rim jar	1	302	4th century A.D.	Right shoulder	Decap. prone	Middle-adult female
2	F.930, Sk.1300	Nene Valley colour-coated ware	Miniature globular beaker	16	112	Later 3rd–4th century A.D.	By head	Ext. on left side	Young middle adult, sex indet.
2	F.935 Sk.1314	Nene Valley? colour-coated ware	Fragmented miniature truncated beaker	10	30	3rd–4th century A.D.?	Above head	Indet.	Middle adult, sex indet.
2	F.938 Sk.1327	Nene Valley parchment ware	Truncated miniature flagon	1	200	4th century A.D.	Probably not *in situ*	Indet.	Adult, sex indet.
2	F.949 Sk.1363	Nene Valley colour-coated ware	Miniature waisted beaker	1	162	Later 3rd–4th century A.D.	Left of where head should be	Decap. supine	Old middle-adult male
2	F.951 Sk.1369	Nene Valley colour-coated ware	Waisted beaker	9	172	4th century A.D.	Right side of head	Supine	Middle adult, probably male
2	F.953 Sk.1374	Nene Valley colour-coated ware	Miniature waisted beaker	1	107	4th century A.D.	Left shoulder	Decap. supine, coffin	Young middle-adult male
2	F.959 Sk.1392	Nene Valley colour-coated ware	Miniature waisted beaker	1	107	Later 3rd–4th century A.D.	Right side of head	Supine, coffin	Old middle-adult male
2	F.960 Sk.1395	Shell-tempered ware	Miniature everted-rim jar	8	135	4th century A.D.	Right side of head	Supine	Adult, sex indet.
2	F.961 Sk.1647	Shell-tempered ware	Miniature everted-rim jar	1	149	4th century A.D.	Where head should be	Decap. supine, coffin	Young middle-adult male
2	F.965 Sk. 1644	Nene Valley colour-coated ware	Miniature face-necked flagon	6	223	4th century A.D.	Right shoulder	Decap. supine	Old middle-adult male
3	F.941 Sk.1337	Nene Valley colour-coated ware	Truncated miniature flagon	1	121	4th century A.D.	Right shoulder	Decap. supine	Mature-adult female
3	F.944 Sk.1346	Horningsea greyware	Miniature everted-rim jar	3	217	2nd–4th century A.D.	Left side of head	Prone	Mature adult, probably female

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