

THE EXCAVATION OF A ROMAN CEMETERY AT 21–33 NEWARKE STREET, LEICESTER

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with contributions from:

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Archaeological excavation by University of Leicester Archaeological Services in advance of the redevelopment of 21–33 Newarke Street, Leicester, revealed significant extra-mural Roman deposits. Early activity comprised agricultural plot lay-outs, the alignment of which supports the proposal that Newarke Street follows the line of the Roman road from Leicester to Medbourne (Gartree Road). During the fourth century, the site was part of an extensive inhumation cemetery and 30 burials were excavated. Two contemporary structures are likely to represent mausolea. Two late seventeenth–early eighteenth-century brick-kilns were also located. The finds and archive are held by Leicester City Museums (Accession Nos. A5.2002 and A23.2002).

INTRODUCTION

The site at 21–33 Newarke Street, Leicester (SK 5857 3041; Figs 1–2) lies to the south of the Roman and medieval town defences, in an area known to have been part of an extensive extra-mural cemetery in the Roman period (Fig. 2; Dare 1927; *TLAHS* 1878, 246–9). More recently, it was occupied by nineteenth–twentieth century industrial buildings and ‘The Magazine’ public house. Proposals for redevelopment of the site, with the construction of new student accommodation, led to an initial desk-based assessment by University of Leicester Archaeological Services (ULAS; Derrick 2002a) which concluded that although extensive cellars were likely to be present, it was clear that some areas were probably undisturbed and therefore of high archaeological potential. The site is located north of Newarke Street, approximately 65m to the east of its junction with Southgates. The land was used for parking after the demolition of pre-existing buildings and comprised a roughly triangular plot of land some 0.2ha in area (Figs 1 and 3). The underlying geology consisted of Mercia Mudstone group and the site lies at a height of *c.* 63.69m OD to the west sloping up towards the east to a height of 64.55m OD.

In view of the potential for archaeological remains to be present a programme of trial trenching was undertaken by ULAS, targeting areas between basements, which confirmed the presence of Roman and medieval deposits (Derrick 2002b). As it proved impossible to preserve the archaeological deposits *in situ* an



Fig. 1. Site location.

excavation strategy was proposed in accordance with a ‘brief’ issued by the City Archaeologist on behalf of the planning authority. Only areas affected by ground-works which were within the zone of archaeological potential were excavated (Fig. 3). The excavation was undertaken in two stages in March–April 2002 and September–November 2002.

The aim of the excavation programme was to establish the nature, extent, character, date of any archaeological deposits within the area to be affected by the proposed development. The work was identified as having the potential to contribute to the study of Roman Leicester and extra-mural Roman activity including burial practices (Taylor 2006, 158).

A JCB 3CX fitted with a 1.6m wide ditching bucket was used to remove modern overburden and homogeneous garden soils in level spits until archaeological remains were reached. Of the 0.2ha area a substantial proportion had been destroyed by basements. Six areas were identified as containing archaeological deposits that faced imminent threat from piling activity. These

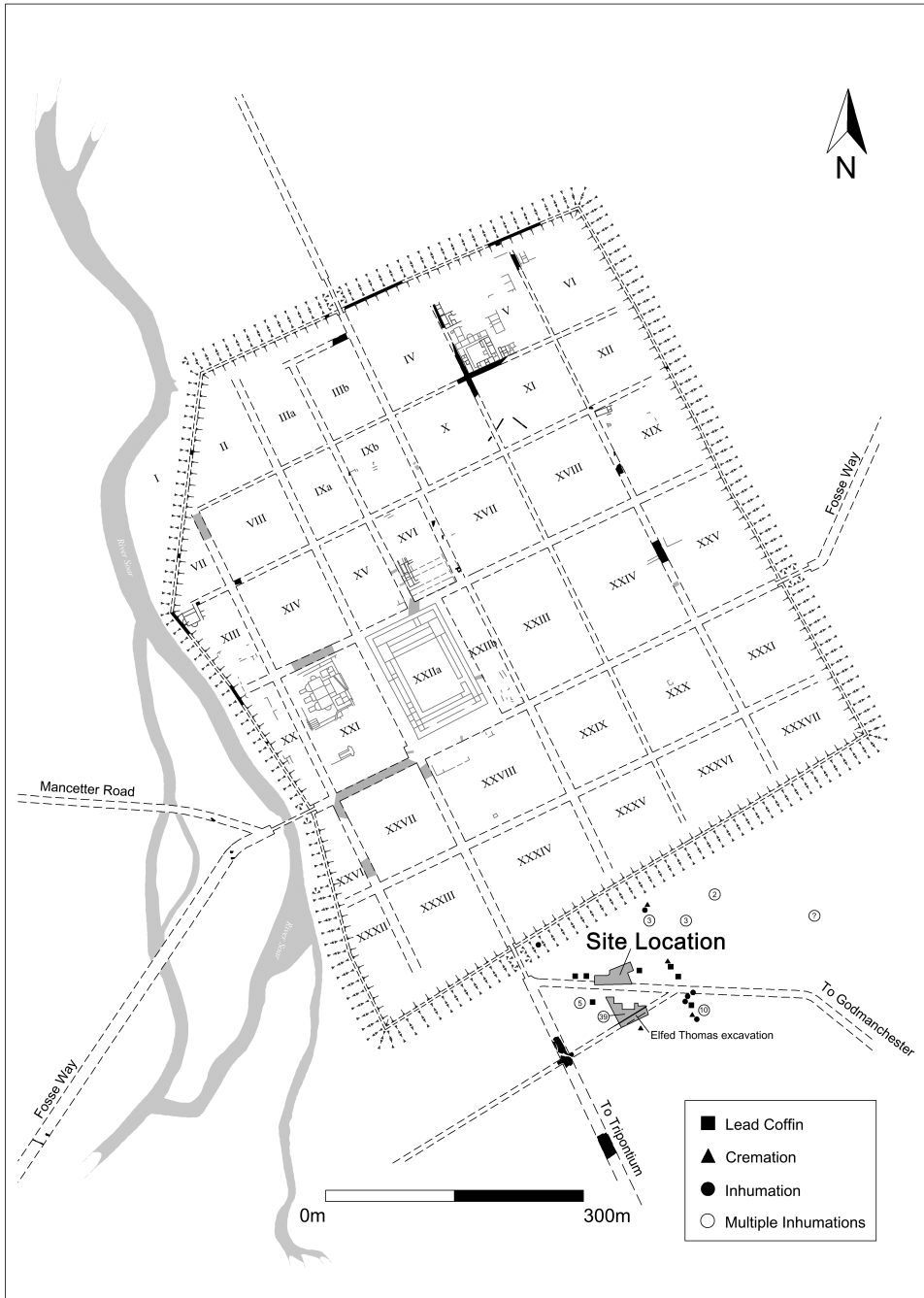


Fig. 2. Roman Leicester showing the location of the site.

were given numbers 1E, 3E, 4E, 5E, 6E and 7E (Fig. 3) and correspond with trench numbers allocated during the previous evaluation of the area (Derrick 2002b). The work followed the Institute of Field Archaeologists (IFA) *Standard and Guidance for Archaeological Excavation*.

RESULTS OF THE EXCAVATION

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Dating and phasing

The phasing of the site is based on stratigraphical information and, where possible, pottery dating. The dating of Roman contexts was problematic in that the pottery recovered was almost exclusively of late- first to second century date. Whilst a broad date for pre-cemetery activity could be obtained, in reality, the pottery evidence contributed little to the actual separation of phases during this period of site activity.

Phase 1 features contained pottery of late first century date while phase 2 deposits contain pottery dating to the middle decades of the second century. An apparent overlap occurs with phase 3 features where the pottery is dated to the middle to later second century. Phase 4 overlaps slightly with phase 3 and may

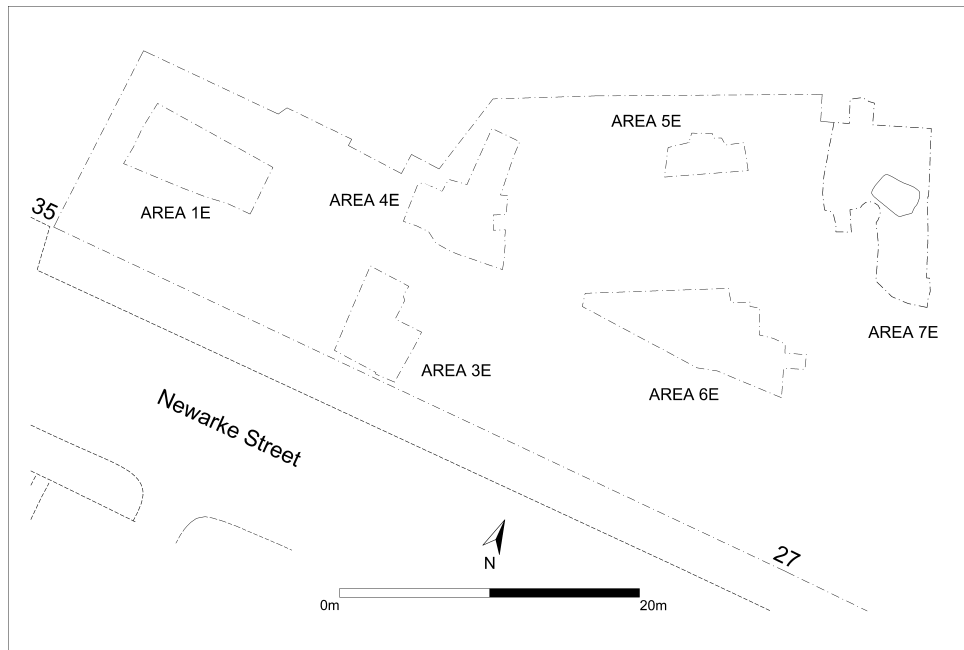


Fig. 3. Location of areas examined within the excavation (1E, 3E, 4E, 5E, 6E and 7E).

extend into a later phase as third- to fourth-century pottery was recovered from these contexts. Phase 5 represents the period of cemetery activity and is dated to the fourth century due to its association with the adjacent Elfed Thomas Building, Newarke Street cemetery (Cooper 1996), although the graves of phase 5 contained third-century pottery which was assumed to be residual. Phase 6 appeared to be post-Roman in date and contained a small assemblage of fourth-century pottery. Phase 7 contained pottery of a medieval date while phase 8 represents post-medieval activity.

Contexts in square brackets denote cut numbers, e.g. [232], while those in round brackets denote fills or spreads, e.g. (709).

Phase 1: Late first century AD

Phase 1 (Fig. 4) comprised two gullies which were on a north-east to south-west alignment, [73], [235], a pit, [225], pebble surfaces, (49), (200), make up deposits (82), (147), (148) and remnant soils (205), (233) in area 7E. These features may represent a phase of small-scale agricultural activity associated with the early foundation of Leicester. Phase 1 contained a few pottery sherds of late first century date.

The gully alignments differed from those of the known Roman street plan which together with the pottery recovered from the features may suggest a first century date for these deposits.

The upper layer of pit [73] (74) contained abundant charcoal and charred plant remains which included numerous seeds with cereal grains and a little chaff including spelt wheat. The sample was dominated by seeds and probably represented cereal cleaning waste from the preparation of cereals for consumption. The deposit also contained seeds of flax or linseed, which are edible and can be consumed by both people and animals, nutshell and a charred fragment of bean or pea. Together with the presence of a fishbone and domestic animal bone the pit appears to have been used for domestic waste, typical of the evidence from other extra-mural deposits found in Roman Leicester (e.g. Lucas 1977).

Phase 2: Early to mid-second century (alignment 1)

This phase of activity (see Fig. 5) comprised a series of ditches located in Areas 4E [746], 5E [635], 6E [732] and [734] and 7E [203], [207], [211] and [195]. Two pits in 7E [245] and [225] may also be associated with this activity. Although much truncated these ditches may be projected to form east-west and north-south alignments dividing the land into a series of rectangular plots. From the pottery recovered these contexts probably date to the middle decades of the second century. Examples of second-century jar and bowl/dish forms in Black Burnished ware (BB1) and two early types of mortaria from Mancetter-Hartshill, one of which bears an illegible stamp, are present and date to the period AD 100–150. An unusual occurrence is the Derbyshire ware campanulate jar rim, which might not be expected before about AD 150.

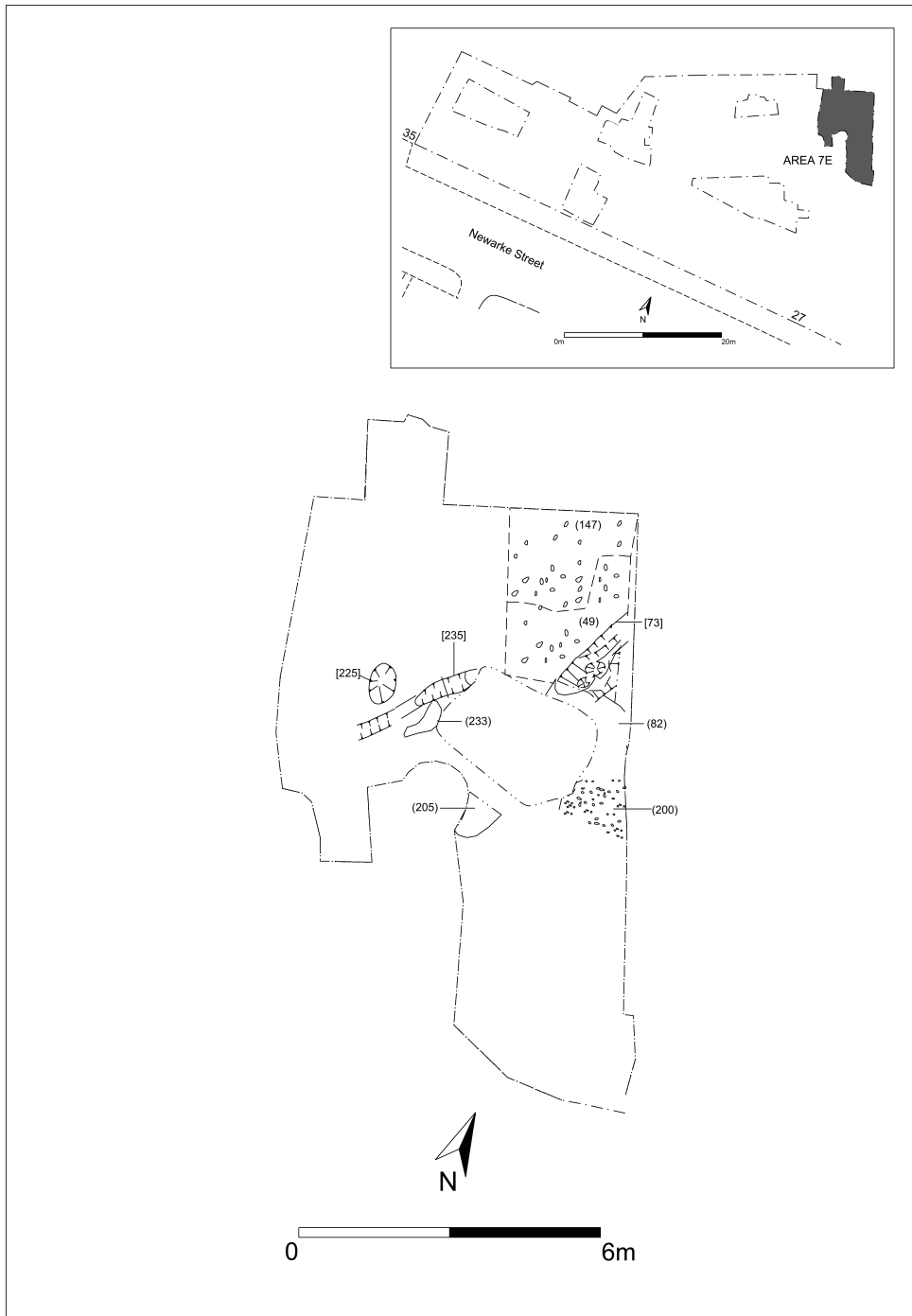


Fig. 4. Phase 1 area 7E.

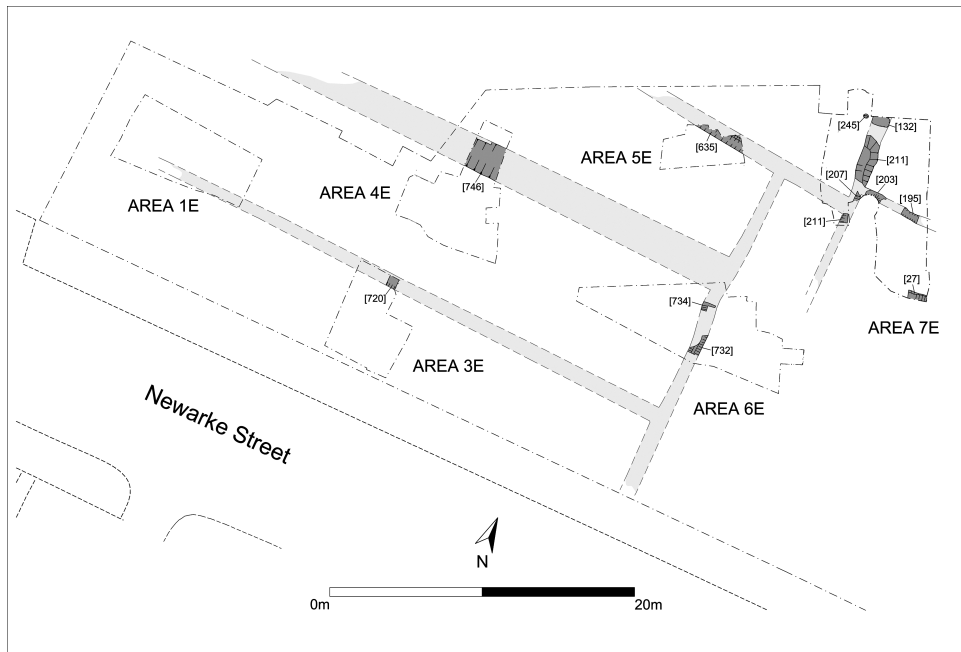


Fig. 5. Phase 2 features (cross hatching denotes projected alignments).

The alignment of the ditches is at variance with that of the Roman town street plan during this period. Furthermore, they appear to be aligned upon, or perpendicular to, Newarke Street, which it has been postulated was the final section of the Via Devana (Gartree Road) joining the Tripontium Road just to the south of the south gate (Cooper 1996; see Fig. 2). The ditches contained pottery dating to the late first and early second century and are likely to reflect an agricultural period of land management, drainage and boundary demarcation. Similar rectilinear roadside plots were laid out adjacent to the Fosse Way, on the west side of Leicester as inferred from the excavations at Great Holme Street in 1975 (Lucas 1977).

Phase 3: Early to mid-second century (alignment 2)

A slightly different alignment is evident from ditches located in areas 1E [687], [689], 5E [671], 6E [665] and 7E [79], [184], [259], and [261] which were located further south and east of those in phase 2 and were orientated west-south-west to east-north-east and north-north-west to south-south-west (Fig. 6). Again, they failed to respect the Roman town street grid and appeared to correspond with the alignment of Newarke Street. It is possible that these ditches, along with [665], could represent a major boundary in the agricultural landscape at this period.

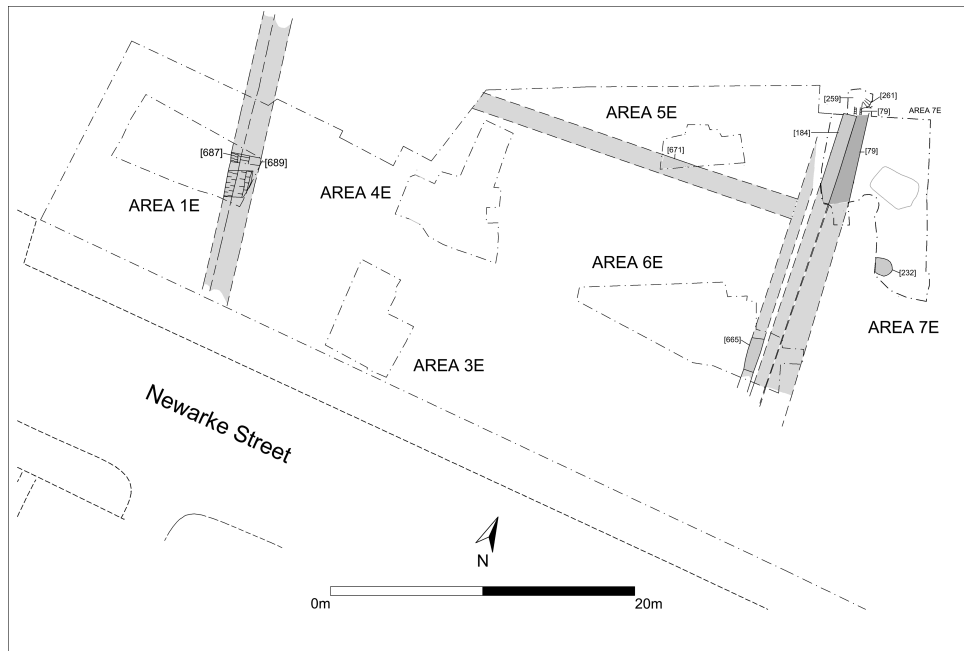


Fig. 6. Phase 3 features (cross hatching denotes projected alignments).

Pottery from this phase (203 sherds) dates to the middle or later decades of the second century and shows little difference in content to the phase 2 groups.

A cess pit was located in Area 7E. The pit was oval in plan, straight-sided and had a curved base [232]. A sample from the fill contained a few charred cereal grains and seeds but also contained mineralised seeds of opium poppy. Seeds become mineralised by impregnation with calcium phosphate minerals from sewage in cesspits. Opium poppy has been found in Roman contexts at Causeway Lane (Monckton 1999) and in a cesspit pre-dating the cemetery at the nearby Elfed Thomas site (Monckton 1996). It is recorded at other Roman sites in England (Greig 1991) and was used as a medicine and for food flavouring. Other remains in the pit included a few mineralised grass and organic fragments of similar appearance to remains from cesspits seen from other sites in Leicester. The upper fill (214) contained the remains of an articulated dog skeleton; a relatively small male animal represented by most anatomical parts except phalanges and caudal vertebrae (tail) (Fig. 7).

Phase 4: Mid to late-second century (alignment 3)

A re-alignment of boundaries took place during this phase indicated by ditches in areas 1E [686], [696], [698] and 7E [104], [117], [152], [207], [213], [241], [242], [247]. This phase contains second century pottery similar to that from phases 2 and 3 but also includes part of Samian Form 31, which should date from at least



Fig. 7. Dog skeleton in the top of phase 3 cesspit [232], context (214).

AD 160. Third and fourth-century pottery is likely to be intrusive material from the later use of these ditches.

In contrast to the phase 2–3 alignments the ditches in this phase (Fig. 8) appeared to reflect the Roman street plan and town boundary or *pomerium* that was laid down in the first quarter of the second century when Leicester became a *caput civitas* (Hebditch and Mellor 1973; Clay and Pollard 1994, 47). The nearby Elfed Thomas excavation (Cooper 1996) revealed ditches aligned on a similar axis, and these were dated to the late first to mid-second century (Elfed Thomas Phase 1) and late second to fourth century (Elfed Thomas Phase 2). The apparent conflicting dates obtained from both sites highlights the problems of dating such features using a relatively small sample of pottery. An absence of any pottery later than the second century and an apparent contemporaneity of the phase 4 ditches to the town alignment may suggest a mid- to late second century date. Three ditches observed in area 1E, [686], [689] and [698] may form a major western boundary in this area.

Phase 5: Fourth-century cemetery

The cemetery phase comprised 30 inhumation burials, seven possible (empty) grave pits and two beam-slot and post-hole rectangular structures (Fig. 9). The

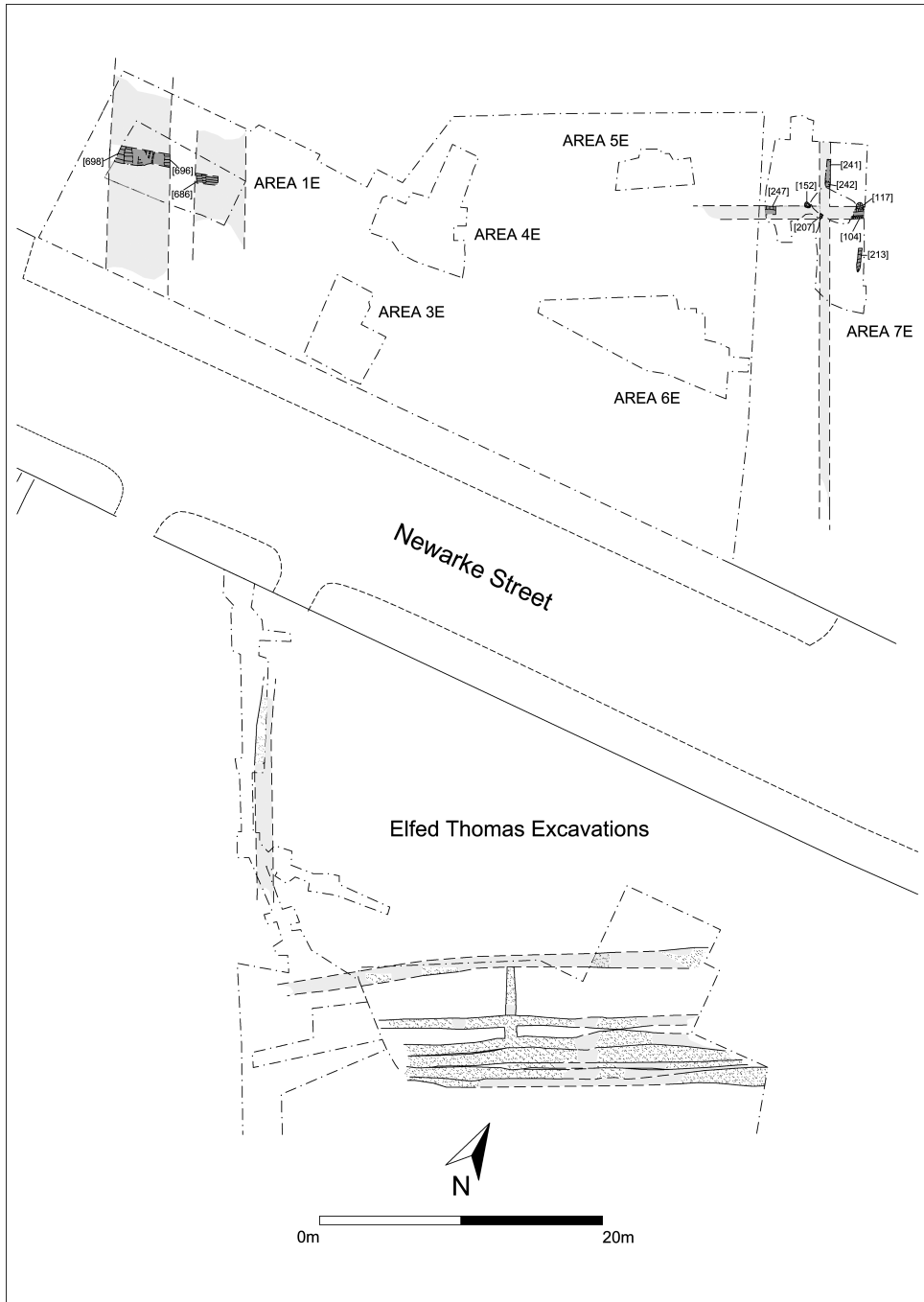


Fig. 8. Phase 4 features in relation to the ditches of the Elfed Thomas excavations.

pottery assemblage is very similar to that from phases 2–4 both in terms of vessel forms and the proportions of fabrics in the assemblage. The only exception is the presence of 14 sherds of Lower Nene Valley colour-coated ware beaker sherds dating from the mid-second to the mid-third century. It might be assumed that the grave fills contain residual material from the previous phases and on the basis of

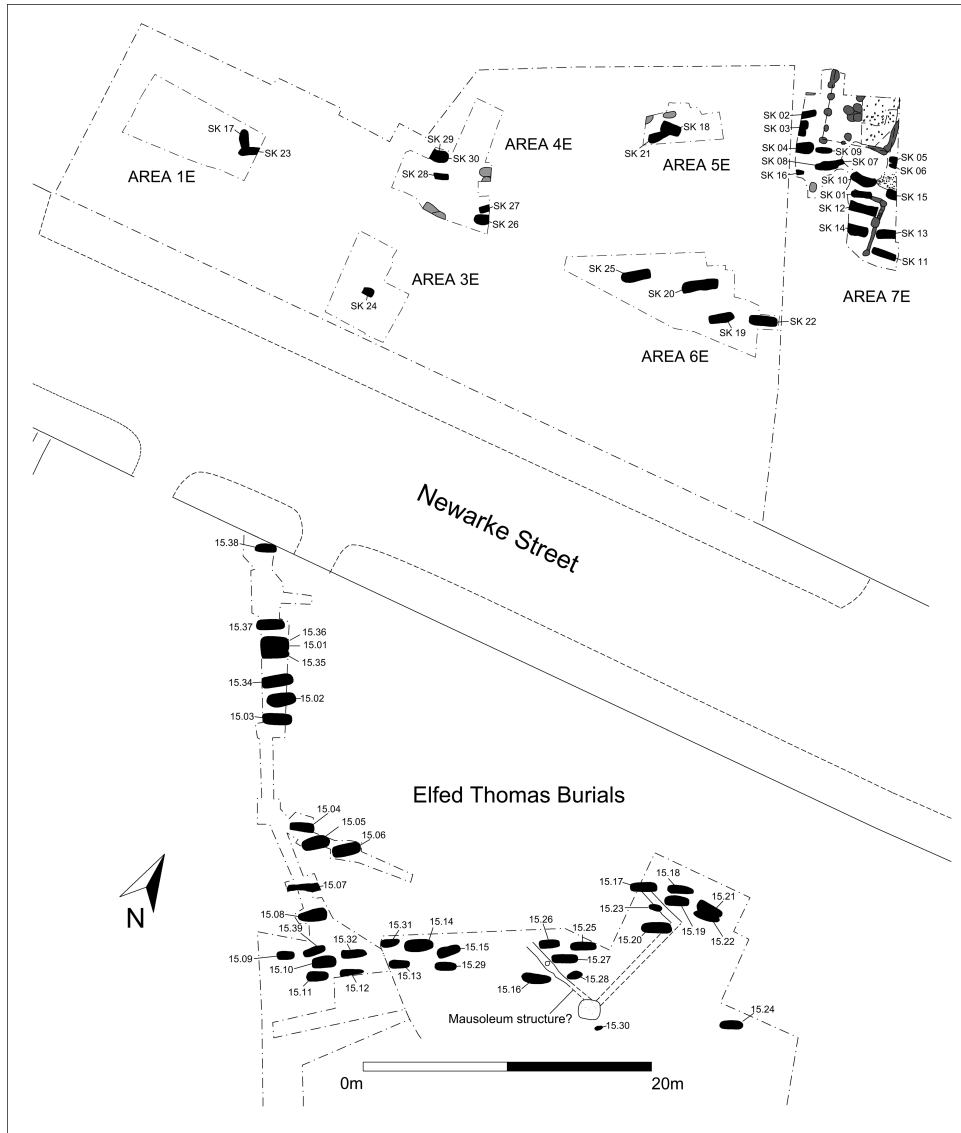


Fig. 9. Phase 5 features showing cemetery and associated structures in relation to the burials in the Elfed Thomas excavations.

the evidence from the Elfed Thomas site a fourth century date for the cemetery and associated features is suggested.

Cemetery layout

The burials were orientated approximately west-east with the head at the west end and the body laid out in a supine position. The characteristics of the graves were very similar to those observed at the nearby Elfed Thomas site where a Christian tradition was suggested, based upon date, orientation, presence of stone lining, absence of grave goods and lack of grave intersection (Cooper 1996). Previous finds of lead coffins with plaster or lime packing in Newarke Street lends further support for a possible Christian cemetery. However, the late Roman west-east burials reported from Clarence Street, Leicester have been interpreted as representing a wider trend in burial treatment unrelated to religion (Gardner 2005, 76).

Unlike the Elfed Thomas excavations there seems to be very little in the way of corresponding boundary ditches demarcating space within the cemetery. The inhumations cut earlier ditches in areas 1E, 5E, 6E and 7E. However, the graves were equally spaced and there appeared to be discernible rows similar to those observed at the Elfed Thomas excavation. There are four instances of intersection within this part of the cemetery (SK7 cutting SK8, SK18 cutting SK 21, SK23 cutting SK 17 and SK29 cutting SK30) and almost all burials with the exception of SK17 conformed to a west-east alignment. Although the site was greatly truncated by Victorian cellaring it would appear that the burials were more densely concentrated towards the eastern corner of the site, in area 7E.

Grave pits

All grave pits were straight sided and had relatively flat bases. The overlying plough soil, which survived to depths of 1.5m, appears to have preserved the original ground level and very little truncation seems to have occurred across the site.

Stone linings

Six graves were stone-lined (SK10, SK12, SK14, SK18, SK19, SK22), and one, SK 6, was buried within a Swithland slate cist (see Figs 10 and 12). The stone linings were mainly discontinuous although SK18 and SK22 exhibited full lining. The linings comprised granite, Dane Hills sandstone and occasionally Swithland slate and fragments of tile. In addition to the stone lining present in SK19, there appears to have been an attempt to partially cover or pack the body using re-used Swithland slate; this slate was laid flat across the body and was also evident underneath the burial (Fig. 11). Some of the Dane Hills sandstone present in this burial also showed signs of re-use evident from mortar adhering to the stone. Twenty-two of the burials excavated at Elfed Thomas, Newarke Street provided evidence for stone lining (Cooper 1996), while the excavations at Great Holme Street produced two burials with evidence for partial stone lining (J. Lucas pers. comm.). Evidence for stone-lined graves or packing has been reported at several

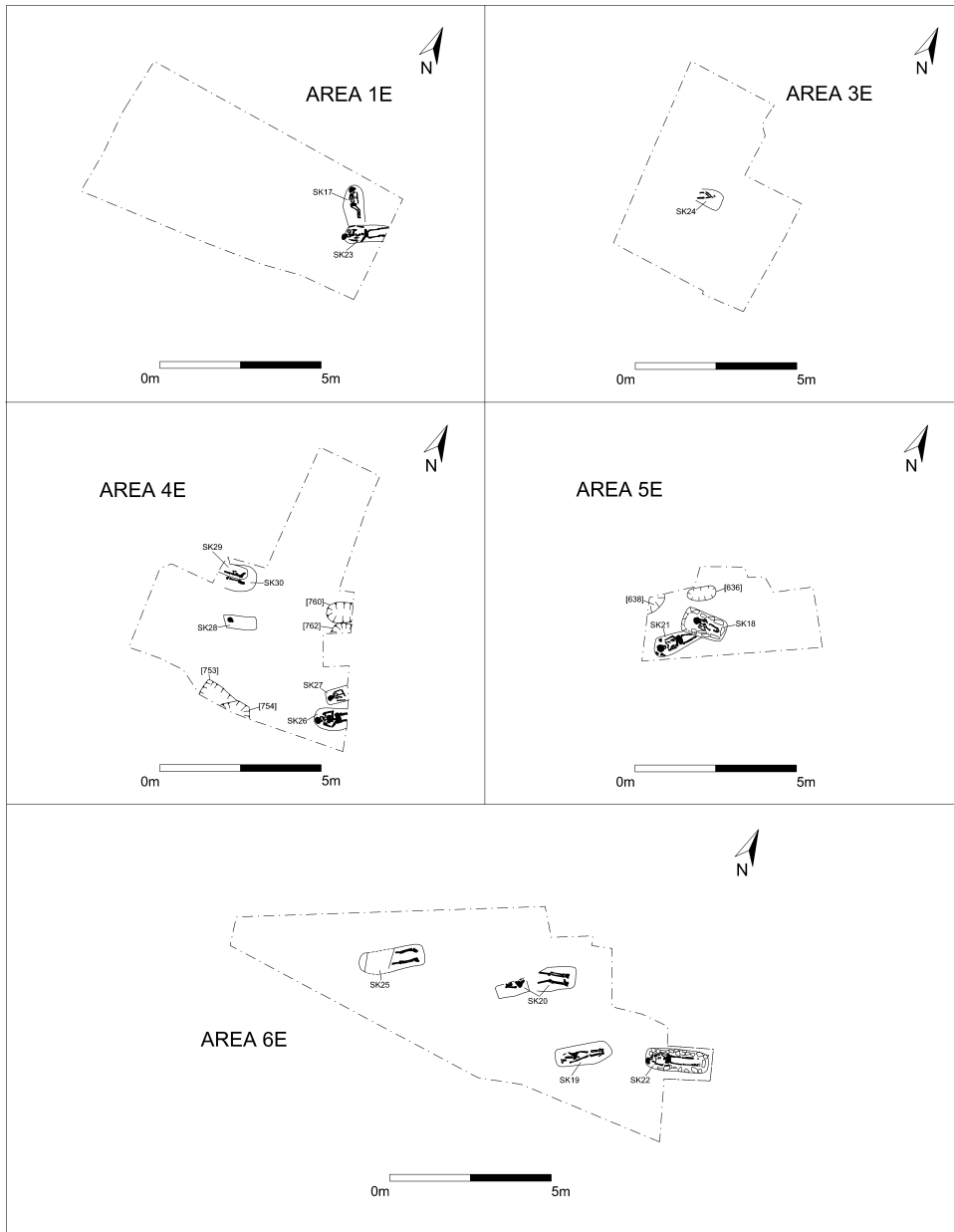


Fig. 10. The phase 5 burials in areas 1E, 2E, 3E, 5E and 6E.

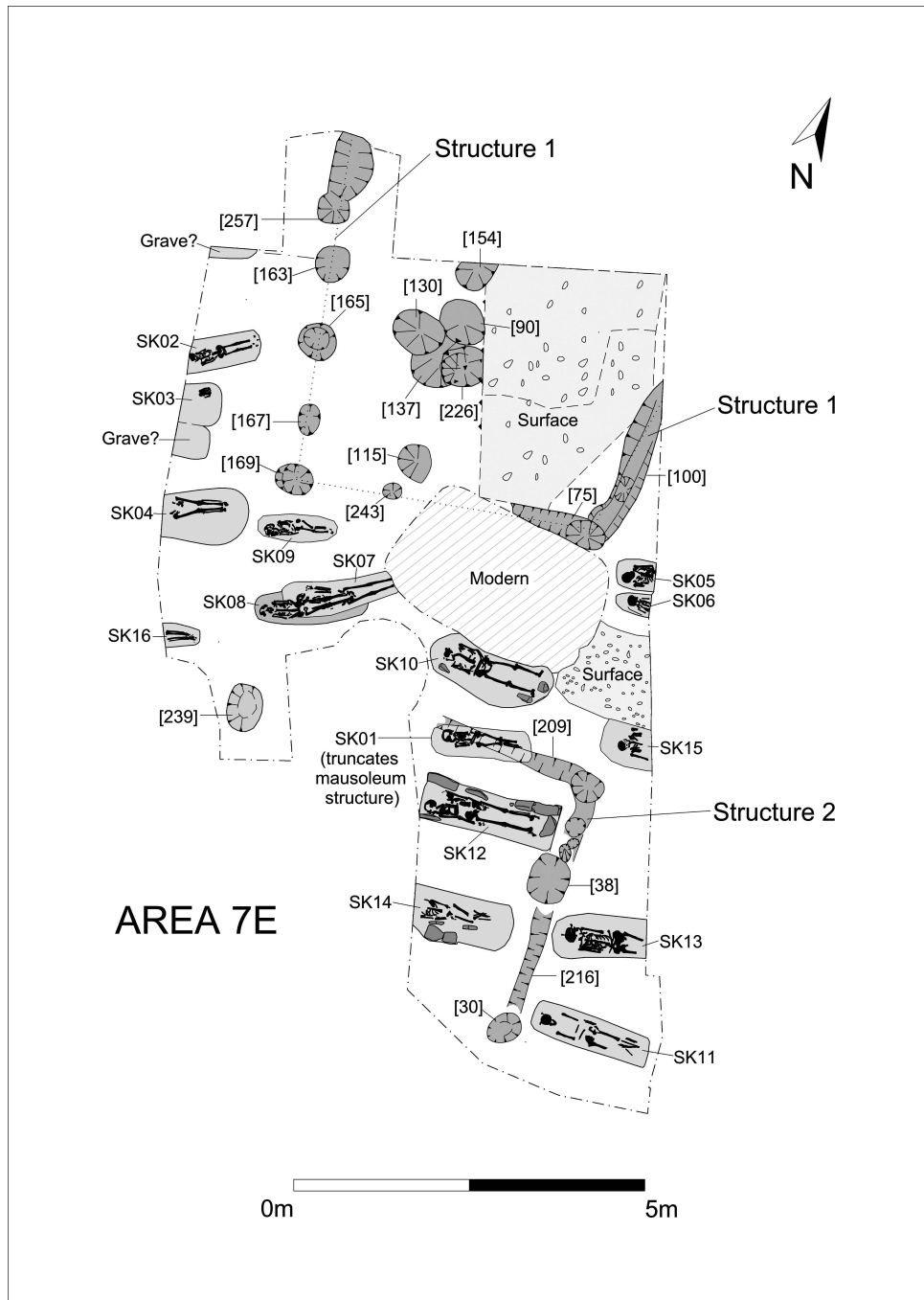


Fig. 11. The phase 5 burials and structures 1 and 2 in area 7E.



Fig. 12. Burial SK12, located within structure 1, showing stone packing.

Roman cemeteries in England such as Lankhills, Winchester where linings of flint and tile were observed (Clarke 1979, 355–6) and at Bath Gate, Cirencester where 27 of the 453 graves contained evidence for stone packing, while most had continuous linings (Viner and Leach 1982, 95). The late Roman burials at Clarence Street, Leicester (Gardner 2005) did not have any with stone lining.

Crummy and Crossan (1993, 101–2) have suggested that stone linings may have been used as markers to ‘prevent future disturbance of the coffin/corpses, or to facilitate its location for the insertion nearby of a related burial’. Although this may be the case for SK10 and SK19 the remaining lined burials would not have been visible from the surface and may have served as a crude form of cist. The slate cist in SK19 contained an infant burial and was formed using three slates, two of which were laid on edge and the third covering the burial. A parallel may be seen at Great Casterton, Rutland where ‘rough cists of local limestone’ (Grainger and Mahany n.d.) were observed.

The pottery retrieved from the grave fills provided a third-century *terminus post quem* for the burials. It is likely that the burials date broadly to the latter half of the fourth century, which was the case with those found at the nearby Elfed Thomas site (Cooper 1996). Further evidence for a fourth century date may be evident from the use of stone and tile packing which Clarke (1979, 335) has postulated may be a fourth-century burial rite.

Coffins

The presence of nails recovered from around the edge of burials SK2, 4, 11, 13, 15, 18, 19, 20, 22, 23, 24, 26, 29 and 30 may suggest the presence of wooden coffins. The fact that nails were not recovered from all the graves may reflect differing excavation methods or, as at Great Holme Street, the use of wooden pegs in the construction of the coffin (Lucas 1977).

Corpse orientation and position

All heads with the exception of SK17 were placed to the west of the grave. MacDonald has suggested that west-east orientated burial was adopted in the fourth century in response to the popular sun cult *Sol Invictus* (1979, 425–6). Other sites such as Butt Road, Colchester display a rapid adoption of west-east burials at this period where it has been suggested to represent the widespread adoption of Christianity (Crummy and Crossan 1993). The bodies were laid in a supine and extended position and the arms were either extended or flexed across the pelvis.

Burial chronology and dating

Dating the burials is problematic in that there were no deliberately-placed finds that are datable. As mentioned earlier, the graves contained sherds of pottery dating to the third century, therefore providing a *terminus post quem* date for the burial phase. The graves themselves were stratigraphically later than the ditch phases and therefore provide a post second century date. A large quarry pit truncates the graves in area 4E and contains pottery dating to the fourth century suggesting that the area had gone out of use as a cemetery shortly after this period. By using the dating evidence suggested for the adjacent Elfed Thomas excavations and taking into account the dating of similar burial layout and practice at sites such as Colchester and Lankhills, Winchester it seems probable that the graves date to the fourth century.

Grave offerings

Only two burials exhibited traits that could be classed as ‘grave offerings’. Grave SK21 contained a supine burial, with head to the west and arms flexed across the pelvis. The grave was similar to many of the other burials, although an animal tooth had been placed in both hands and two horn cores had been laid close to the head. Offerings of this kind may indicate a pagan origin and could be viewed as an attempt to ‘hedge ones bets’ in the afterlife in respect of pagan and Christian beliefs. An indication that this sort of practice was tolerated can be found in canon 41 of the Council of Elvira, held in Spain in AD 305 which permitted pagan shrines to remain in Christian households, in order to avoid confrontation (Watts 1993, 194). The horn cores and teeth could also represent the remains of a ritual meal or feasting, associated with Roman funerary practices.

Skeleton 6 was buried within a slate cist comprising re-used building material. Underneath the capping slate was a folded strip of lead that appeared to have been placed prior to the closing of the cist. While it is possible that this lead could have been residual and associated with the slate used in the cist’s construction, it remains possible that it was deliberately deposited as a charm of some kind.

A bone hair pin (Crummy 1983, type 2) was recovered from the fill of burial SK9 and may have been associated with the corpse prior to burial. The skeleton was of indeterminate sex, although it may be possible to infer female gender from the presence of the hairpin.

The pottery recovered from the graves was second to third century in date and there was no evidence that it represented ritual deposition and it would appear to

be residual. The ferrous finds within the graves can be interpreted as nails associated with coffin construction.

Funerary structures

Two structures, which were probably contemporary with the cemetery phase, were located in area 7E (Fig. 9). The structure to the north (structure 1) comprised a post-hole and beam slot construction. A line of post-holes, [257], [163], [165], [167] and [169], aligned approximately north-south cuts through phase 3 ditch deposits, with [169] perhaps forming a south-west corner post. The south-east corner however comprised two beam slots, [75] and [100]. The area enclosed contained a series of post-holes, [90], [130], [137] and [226], that may indicate internal features or another phase of construction. Within the structure was a gravel area that contained pottery of a late first to early second century date although its association with the structure is equivocal. The area enclosed was free of burial activity and the post-holes and beam slots were similarly free of truncation which would suggest an earlier foundation or contemporaneity with the burials which seem to have respected the structure.

Structure 2 was revealed to the south and consisted of two shallow, almost flat-bottomed slots, running at right angles to each other, [209] and [216]. A post-hole, [30], may form a continuation of the line of [216]. These enclosed two burials (SK12 and SK14), and respected a row of burials comprising SK11, 10, 13 and 15. Burial SK1 truncated slot [209] and may represent a later phase of internment after the structure fell into disuse.

A possible hearth may have been associated with structure 2 [38]. It was bowl-shaped with a rounded base and sides of 45 degrees with an upper fill formed from a concentrated layer of scorched small and medium rounded pebbles below a fragment of redeposited burnt clay which had been burnt *in situ*. A deposit of highly fired vitrified stone fragments overlay the top of the feature (33). A sample from the upper deposit (11) contained charcoal, a few wheat grains and several weed seeds. Bean or pea and hazel nutshell were also present. These remains compare with the scatter of domestic waste found in many features in the town and are insufficient to suggest cereal related activity here.

Both structures could be interpreted as mausolea. Structure 1 is similar to the temple-mausoleum found during excavation at 165 Great Dover Street, Southwark, London which was similar in plan to many Romano-Celtic temples from north-western Europe (Mackinder 2001, 9–10). The structure at Dover Street had associated masonry walls whereas structure 1 did not. The external and internal post-holes evident in structure 1, however, may indicate a post-built structure with an inner and outer wall similar to the Dover Street mausoleum. No associated features were found within the area enclosed by the foundations, as was the case at Dover Street (*ibid*).

A possible mausoleum structure was located at Butt Road, Colchester although the evidence was not conclusive and the interpretation of the structure remains tentative (Crummy *et al.* 1993). A possible comparable feature to structure 2 was also located on the Elfed Thomas site. This comprised

fragmented sections of gullies which appeared to enclose a series of five burials and could be re-interpreted as a mausoleum structure although the original phasing did suggest that this was a pre-cemetery feature (Cooper 1996, 5, fig. 3 and 13, fig. 7).

As there are no burials within structure 1, however, it is possible, if the cemetery included Christian burials, that it was an early church. Possible churches have been interpreted for structures at Silchester, Richborough and Icklingham (Morris 1983, 12–14).

Inferred earlier burials

The evidence for pre-Christian burial practice on site was scant. There is a possibility that burial SK21 may reflect earlier pagan practice while the north-south alignment of SK17 may also suggest an earlier practice. Evidence for pagan burial practice was found on the nearby site of York Road (Gossip 1998) where burials aligned north-south and wearing hobnailed shoes were revealed. One burial appeared to have been included in the backfill of a ditch, which can be compared with the partially articulated bones found in ditch [696]. Human bone was also found within ditches at Bonners Lane, Mill Lane and Causeway Lane, perhaps suggesting early Roman funerary activity (Wakely 1999; Finn 2002, 94; Baxter 2004).

Fragments of unidentified burnt bone may be evidence for disturbed cremation burials. Cremations are known in the Newarke Street area (Dare 1927; Cooper 1996, fig. 10), while elsewhere four urned cremations were located at Grange Lane, Leicester (Thomas 2006) and cremated bone was recovered from the excavations at Mill Lane, Leicester (Finn 2002, 94). Fragments of glass were recovered from Roman contexts in area 7E. These fragments appear to be part of thick flat-bottomed vessels and are often associated with cremation burial.

THE HUMAN REMAINS: HARRIET JACKLIN AND SIMON CHAPMAN

Age

The results show that the demography of the cemetery is mainly made up of adults aged over 17 years (66%), followed by children aged less than 12 years (27%). The remaining 7% of the cemetery population is made up of adolescents aged between 12 and 17 years. Analysis has also found that five out of the eight children (62%) died before reaching their ninth birthday.

Due to the nature of skeletal analysis, no aging method is totally reliable and even the most reliable methods should only be seen as a rough guide to age. Taking this, together with the fragmentary nature and poor state of preservation of the skeletons, into account, they can be placed into three broad age categories: young (18 to 35 years), middle aged (36 to 55 years) and old aged (56+ years). Individuals whose age breached one or more of these categories have been excluded in order to increase the reliability of the data.

The following data is based on nine adult skeletons: SK 4, 5, 7, 12, 13, 15, 22, 23 and 27. The evidence shows that the majority of the population died between

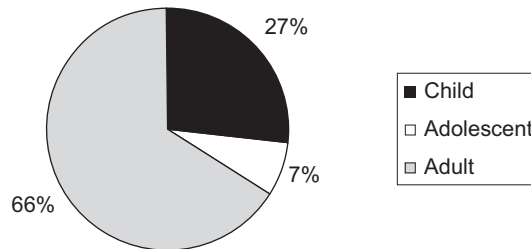


Fig. 13. Percentage of adults, adolescents and children.

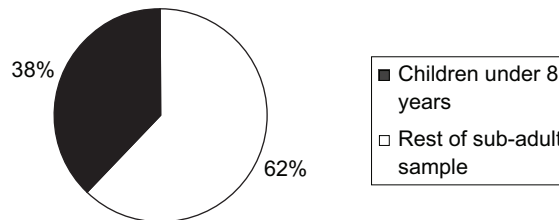


Fig. 14. Percentage of children who died before their ninth birthday.

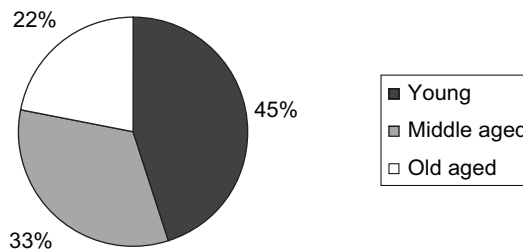


Fig. 15. Age distribution: young, middle aged and old.

18 and 35 years of age (45%), with 33% surviving until middle age (26 to 55 years) and only 22% of the population living beyond the age of 56.

Sex

Only 12 of the 20 adults present (60%) could be sexed due to the incompleteness of the skeletons represented. Sub-adults have not been sexed due to a lack of sexual dimorphism. The results appear to show that the male population of the cemetery (40%) far outnumbers that of the females (20%), although this figure should be regarded with some caution considering the number of individuals for which sex could not be determined (40%). The Elfed Thomas site to the south had a relatively even division of adult males (11), adult females (12) and children (11; Wakely 1996, 33).

A study of age and sex distribution has revealed that the males lived longer than the females, some surviving into old age (56+ years), whilst the majority of

females died between the ages of 17 and 35. Similar results were found by Wakely (1996, 33) at the Elfed Thomas, Newarke Street site.

The predominance of females dying in the younger age group suggests a high mortality, which may be associated with pregnancy and childbirth, leaving more of the male population to survive into old age.

Stature

A calculation of living stature, using the formulae described by Trotter and Gleser (1952; 1958) for adults and Maresh (1955) for juveniles, was attempted for each individual with at least one well-preserved long bone. Due to pronounced sexual dimorphism in adults (especially in terms of stature) estimated stature was only calculated for individuals of known sex. Calculations were based upon the length of the left femur wherever possible, but when this was not present (or was broken) other long-bones were used (right femur, tibia, humerus, fibular, radius, ulna in that order).

Calculated from seven of the 20 adult skeletons (35%), the stature of the five males of the sample varies from 1.60 to 1.76m, with a mean height of 1.67m. The height of the two females varies from 1.61 to 1.69m, with a mean height of 1.65m.

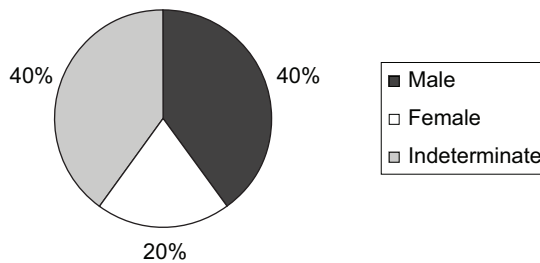


Fig. 16. Sex distribution.

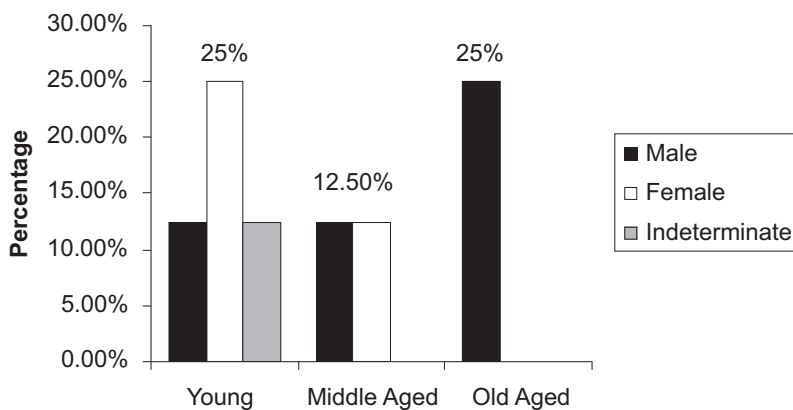


Fig. 17. Age and sex distribution.

Site	Mean male stature	Mean female stature
Newarke Street	1.67m	1.65m*
Oxford St, Leicester (Chapman 1999)	1.72m	1.61m
Haymarket, Leicester (Chapman 1997)	1.69m	–
Elfed Thomas, Leicester (Wakely 1996)	1.71m	1.59m
Cirencester (Wells 1982)	1.69m	1.58m
Poundbury (Farwell and Molleson 1993)	1.66m	1.61m
Modern (from 1981 Population Census)	1.73m	1.61m

* Based on only two female statures.

Table 1. Mean adult statures observed at other Roman sites.

The mean male adult statures observed in the Newarke Street population are broadly comparable to other Roman groups. The stature for the females is slightly higher, although this figure should be regarded with some caution due to it being based on only two skeletons. This reflects ‘normal’ developmental growth patterns associated with adequate nutritional conditions for the period.

In the juveniles, however, it was apparent that linear growth (which dictates stature) often lagged behind biological age. In other words, several of the juveniles (SKs 1, 2 & 9) were slightly under-sized for their age. This may have been due to inadequate childhood nutrition or even disease.

Robusticity index

Unfortunately, due to the fragmentary nature of the long bones, no analysis of the robusticity of the individuals was possible. SK 7’s left femur has been found to be 8mm smaller than the right, which may indicate some kind of trauma or injury, although no evidence of this is present on the long bones.

Platymeria and Platycnemias index

Platymeria indices below 85 (Brothwell 1981) are regarded as platymeric (flattening of the thigh bone). Only seven skeletons provided both left and right measurements, four of which showed platymeric anteposterior flattening of the upper femoral shaft (13.3%).

SK 4 shows platymeric flattening of the right femur, SK 13 shows platymeric flattening of both shafts, SK 17 exhibits platymeric flattening of the left shaft of the femur and SK 19 shows platymeric flattening of the right shaft.

Platycnemias indices below 62 (Brothwell 1981) are regarded as platycnemic (ante posterior flattening of the tibia). SK 4 shows abnormal flattening of both left and right tibia.

The reasons for this flattening are poorly understood but may be related to the effect of the muscles on the bone during movements, i.e. the abnormal flattening of SK 4 could be due to occupation or nutritional factors.

Post-cranial non-metric traits

Non-metric traits are minor anatomical variations in the bone, which vary between individuals, representing genetic variability and can indicate genetic

relationships. Mostly occurring after adolescence, non-metric traits are recorded as either present or absent. Very few traits were witnessed on the material and therefore no further conclusions were drawn.

Trait	Affected skeleton
Atlas posterior bridge	15, 21
Atlas lateral bridge	5, 15, 21
Septal aperture (humerus)	10
Os trigonum (talus)	7
Anterior calcaneal facet	
absent	12, 16
double	3, 4, 7, 8, 17

Table 2. Post-cranial non-metric traits.

Pathology

Most human disease and trauma only affects the soft tissues of the victim, rarely causing death, and consequently is very rarely preserved in archaeological specimens, there are certain conditions that leave an indelible mark on the human skeleton. Diseases infecting the skeleton will usually initiate an osteoblastic (bone growth) or an osteoclastic (bone resorption) reaction within living bone cells; similar reactions are commonly observed also as a result of mechanical stress and trauma.

The following pathological conditions were observed:

Degenerative disease/arthropathies

Degenerative joint disease (arthropathy) is the most commonly observed skeletal disease in both modern and archaeological material. Most such conditions arise as a result of normal prolonged use of the joints over a long lifespan. However, repetitive occupational use of a particular joint may lead to early onset. Traumatic damage to a joint may also lead to early onset arthropathies. Unsurprisingly, degenerative arthropathy was mostly present in the older members of the Newarke Street population. Only SK 13, a female aged between 20–30 years, was the exception to this rule with arthritic lesions on her rib ends.

The joint disease observed can be classified according to several types:

OSTEOPHYTOSIS: SKs 7, 12, 13, 21, 22, 26 & 27

Osteophytosis is a condition where growths of new bone (Osteophytes) arise around the margins of joints and may vary in size according to severity. This condition is extremely common in all skeletal populations, becoming more common with the advancement of age. Most individuals over the age of 50 years will show some sign of osteophytosis.

Based on nine adult skeletons with sufficient bones present for osteophytosis to be diagnosed, 78% were affected.

OSTEOARTHRITIS: SKs 15, 21 & 22

Osteoarthritis is primarily caused by the wear and tear of joints through continuous use due to occupation or advanced age and arises as a result of the loss of joint cartilage, eventually leading to friction between the articulating bones. Unlike in osteophytosis, the condition is erosive (rather than proliferative) and affects the joint's articular surface rather than its margins and may be seen as surface pitting of the joint surface in its early stages. SK 21; a male aged over 45 years is severely affected by osteoarthritis.

Based on nine adult skeletons with sufficient bones present for osteoarthritis to be diagnosed, 33% were affected.

SCHMORL'S NODES: SKs 12, 22, 23, 26 & 27

A Schmorl's node is a crater like depression occurring either on the anterior or posterior surface, mostly toward the dorsal side, of vertebral bodies. These are caused by herniation or prolapse of inter-vertebral disk tissue, forming ectopic deposits of nucleus pulpous material in the neighbouring vertebral bodies. These are most common in the lumbar and lower thoracic regions of the human spine (Resnick and Niwayama 1978). It has been suggested (Schmorl and Junghanns 1971) that trauma and or strenuous activity, especially in adolescence, and metabolic and degenerative disorders may contribute to the formation of these lesions. SK 26, a male aged between 30 and 40 years, is severely affected by Schmorl's nodes.

Based on 12 adult vertebrae complete enough to show any signs of the disorder, 45% were affected by Schmorl's nodes.

ENTHESOPHYTES AND EXOSTOSES: SKs 4, 12 & 21

Enthesophytes and exostoses are similar to osteophytes in appearance and arise at the site of a tendon insertion or entheses. They arise from repeated trauma to



Fig. 18. Vertebra of SK 21 exhibiting osteoarthritic lipping and a Schmorl's node.

tendons through repeated muscular exertion. Other osteophytes like growths may be simply ossified haematomas (bleeds) more correctly known as exostoses, arising from damage to muscle through strain or injury. Both of these bony growths are frequently used in the identification and interpretation of occupational stress and injury (Dutour 1986).

Based on nine adult skeletons with sufficient bones present for the condition to be diagnosed, 33% were affected by Enthesophytes and Exostoses. Enthesophytes were identified on the left femur and tibia of SK 4 and on both patellae of SK 12. Both of these cases were probably merely a result of continuous and strenuous use of the legs. Enthesophytes also affected both clavicles of SK 21, a male over 45 years.

METABOLIC DISEASE

Metabolic diseases are often used as indicators of 'stress' during the life of the individual, since they represent an individual's adaptive response to stresses inflicted upon the body during its developmental years. Stresses may take the form of vitamin or mineral deficiencies such as iron (causing anemia), calcium (may cause osteoporosis), vitamin C (causing scurvy), vitamin D (causing rickets) etc. However, skeletons displaying such conditions should not be regarded as 'victims' of these conditions, since the bone response to the deficiency is a survival mechanism, not a failure. The true 'victims' of metabolic disorders are those that became so physiologically stressed that they died before the bone changes could be implemented.

CRIBRA ORBITALIA: SKs 1, 6, 17, 18 & 28

Cribra orbitalia is a common condition in many ancient populations, manifesting itself as a pitting on the bone within the orbits (eye sockets). The condition is often associated with a similar pitting of the parietal bones of the skull known as porotic hyperostosis.

Based on 18 craniums complete enough to observe the condition, 28% were affected by cribra orbitalia.

POROTIC HYPERTOSIS: SK 18

It is believed that the main cause of cribra orbitalia and porotic hypertosis is a nutritional deficiency, in particular of chronic iron-deficiency anaemia. Anaemia itself is caused by a reduction (in number and/or quality) of blood haemoglobin, which in turn leads to hypoplasia (increase) of bone marrow in an attempt to produce more red blood cells. That the condition is caused by iron deficiency is clear, but it is often difficult to determine the cause of the iron deficiency itself since this may arise as a result of a large blood-loss, parasitic infection, nutritional deficiency, disease etc. Hypoplasia of bone marrow has a two-fold affect on bone; firstly it causes a destruction of the outer table of compact bone through the development of porotic lesions (in the orbits and on the cranial vault), and secondly an expansion of the middle layer of bone or diploe (Stuart-Macadam 1991, 101). The osteological manifestation of this condition is predominant in

juveniles, probably due to the increased nutritional demands associated with childhood growth and development. When observed in older adults it is more than likely that the lesions reflect a period of childhood anaemia. Indeed the severity of the porotic lesions can be seen to lessen with the advancing age of the person, i.e. gradually healing over time (Nathan and Haas 1966).

Based on 18 crania complete enough to observe the condition, 6% were affected by porotic hypertosis.

RICKETS: SK 23

Rickets is partially caused by a lack of vitamin D, which leads to softening of the bones. This causes a bowed appearance in the legs and in some cases the arms due to the pressure exerted on them by standing up and crawling as an infant. Aufderheide and Rodriguez-Martin (1998) explain that the exact cause of this condition is still unknown, but it is generally believed that it is a reaction to stress caused by disease or a deficiency of vitamin D in the diet.

Based on 15 femurs complete enough to observe the condition, 7% were affected by rickets.

Infectious disease

MENINGITIS: SK 28

Signs of meningitis are visible in the cranial vault of SK 28, an infant aged between five and seven years. Diagnosis is based on recent research by Cox and Mays (2000, 149), who suggest that there are consistent changes on the endocranial surface of the skull, which may be consistent with meningitis or inflammation of the meninges.

Based on 18 skeletal remains, which have sufficient bones present to conclude the presence or absence of the disease, 6% were affected by possible meningitis.

FRACTURE/TRAUMA

Fractures in human bone material can be of two varieties; either healed, the result of minor accidental injury, or unhealed, as a result of far more serious and fatal injuries. Once a fracture has been sustained, if the individual survives the trauma, the cells of the bones endosteum and periosteum react in such a way as to repair the break. They do this through the secretion of new bone tissue and enzymes which promote the deposition of salts and combine with coagulated tissue fluids, creating a fibrous wrapping around the break. Collagen fibres then fortify the fibrous wrapping and the broken bones begin to reunite. This so called 'periosteal reaction' or 'callus' is easily recognised in pathological samples by its coarse granular appearance.

FRACTURE: SK 14

Only one fracture was identified in the human remains from Newarke Street, affecting the left femur of SK 14. The femur was badly affected by the break

resulting in a complete lateral fracture, which had displaced and shifted out of position prior to reuniting with a foreshortening of 6cm.

Based on 30 individuals, one (3%) was affected by a fracture.

PERIOSTITIS: SKs 19 & 23

Periostitis is a non-specific surface inflammation of bone and is most commonly witnessed on the tibia, although it can occur elsewhere, the location of which can provide evidence of a specific infection. Periostitis is manifested as fine pitting, longitudinal striation and plaque like new bone formation on the original cortical surface. Huss-Ashmore *et al.* (1982) suggest that tibia periostitis may be an indicator of stress.

Based on 30 skeletons, 7% were affected by periostitis.

DENTAL PATHOLOGY

Human teeth, by virtue of their almost indestructible enamel shell, are usually very



Fig. 19. Dislocated fracture of the left femur (mid-shaft) of SK 14.

Pathological condition	Number of individuals affected	Prevalence rate
Osteophytosis	9	78%
Osteoarthritis	3	33%
Schmorl's Nodes	5	45%
Enthesophytes & Exostoses	3	33%
Cribræ Orbitalia	5	28%
Porotic Hypertosis	1	6%
Rickets	1	7%
Meningitis	1	6%
Fracture	1	3%
Periostitis	2	7%

Table 3. Conditions affecting individuals.

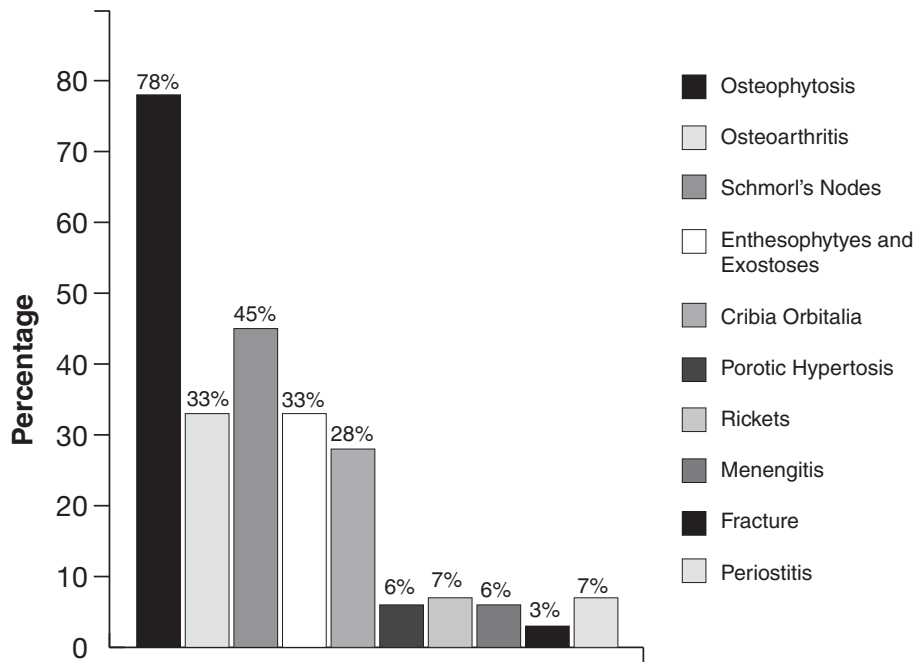


Fig. 20. Pathological prevalence rates.

well preserved in grave deposits. Frequently, as Zivanovic (1982, 205) states, teeth are the only surviving trace of the skeleton and as such have become the subject of considerable pathological consideration.

Dental attrition was noticed on every individual examined, with the severity increasing with the advancement of age and as such this has been utilised in the determination of age. Subsequently the most severe cases of dental attrition were seen in the over 40s age group.

Twenty sets of teeth were available for analysis, nine of which showed evidence of dental disease (45%).

Twenty per cent of the individuals studied suffered from two or more caries while abscesses occurred in 20% of the jaws examined (4; see Table 4). Twenty per cent of the jaws examined (4) also showed evidence of periodontal disease. Periodontitis is an infection of the alveolar bone and the soft tissues of the mouth. The condition is recognised by the recession of the alveolar bone from around the base of the teeth, which, in the most extreme cases, can lead to the loosening and eventual loss of teeth.

One individual (SK 1) showed clear signs of arrested growth, in the form of enamel hypoplasia, on the front teeth. Hypoplasia is manifest as horizontal grooves of thinned enamel around the circumference of a tooth. These grooves, developed during the period of enamel formation (from birth to 13 years), represent periods of childhood stresses, such as nutritional deficiencies (Huss-Ashmore *et al.* 1982),

Skeleton	No. of caries	Prevalence rate of no. of teeth affected	No. of abscesses	Prevalence rate of no. of teeth affected	Enamel hypoplasia	Periodontal disease
1	3	9%	1	3%	Yes	No
2	0	0	0	0	No	No
5	0	0	1	3%	No	No
6	0	0	0	0	No	No
7	2	6%	0	0	No	Yes
8	0	0	0	0	No	No
9	0	0	0	0	No	No
10	0	0	1	3%	No	No
11	0	0	0	0	No	No
12	0	0	0	0	No	Yes
13	0	0	0	0	No	Yes
15	0	0	0	0	No	No
17	0	0	0	0	No	No
18	0	0	0	0	No	No
21	4	12.5%	4	12.5%	No	No
22	0	0	0	0	No	No
23	2	6%	0	0	No	No
26	0	0	0	0	No	Yes
27	0	0	0	0	No	No
28	0	0	0	0	No	No

Table 4. Results of dental analysis.

vitamin D deficiency, hyperparathyroidism and exantematous fevers (Lukacs 1989, 267), during which times tooth enamel cannot develop fully. In this case the presence of hypoplasia supports the findings of under developed bone lengths and cribra orbitalia, indicating that the individual was nutritionally stressed during childhood, perhaps eventually resulting in its death at the age of 10 to 11 years.

SK 21 (a male over 45 years of age) is of particular interest, when considering dental health, as he suffered from severe dental disease; four carious lesions and four abscesses. The high number of affected teeth may be due to poor dental hygiene, diet and the individual's age; dental pathology had more time to develop than in other younger individuals.

Summary of skeletal and dental analysis

Although the fragmentary survival and the poor condition of the skeletons buried at Newarke Street has meant that the detailed analysis of demography and pathological conditions is somewhat limited, subsequent analysis has revealed that the individuals buried here belonged to a community who experienced times of nutritional stress and led physically demanding lives. These individuals were of average height and build for the period and the males often showed a high level of muscular development indicating that they engaged in physical activity and were strong.

Analysis shows that the majority of the males lived longer than the females, whose mortality was greatest between 18 to 35 years, which is commonly referred

to as the childbearing years. Whilst reproduction is an important consideration regarding female mortality, Wakely (1996, 49) suggests that women may also have been deprived of certain resources such as the best food, which may have undermined their health and made them more susceptible to disease and early mortality.

Diet has been recognised as an important factor regarding the health of the individuals, evident by the variety of metabolic diseases caused by vitamin deficiencies: Cribra orbitalia, porotic hypertosis and rickets. It is therefore clear that those buried here may have lacked nutrients essential for growth and health. These findings are further supported by evidence of enamel hypoplasia and arrested development amongst the adolescents in the sample.

The results show that the Newarke Street individuals must also have eaten a relatively hard and coarse diet, which caused substantial wear to their teeth. Their dental health was also below modern standards with a number of individuals suffering from severe tooth decay and dental abscesses.

Proportionally, more of the males in the community lived into and beyond middle age, and as expected suffered from more of the conditions associated with getting older. The older males in the sample showed signs of osteoarthritis, related to age and a high level of wear and tear on one or more joints and spine. The spine was also often subject to the pathological condition known as Schmorl's nodes, which is indicative of strenuous activity and trauma.

Phase 6: Fourth-century post-cemetery activity

This phase consists of a series of layers and pits which overlay the phase 5 graves in area 7E (Fig. 21). The layers (47), (50), (65) and (70) consisted of dumps of household rubbish which contained pottery dating to the late first to early second century. The absence of later pottery may reflect the relatively low sherd numbers recovered from the site. Two pits [102], [104] overlay graves SK5 and 6 and contained late first to early second century and third- to fourth-century pottery sherds respectively and probably indicate small scale habitation of the surrounding area. Pit [741] may have been a quarry and had truncated two graves; third- and fourth-century pottery was present in its lower fills suggesting a fourth century date for this encroachment into the cemetery.

Phase 7: Medieval period (Fig. 22)

Archaeological deposits from the medieval period were few in all areas. Two ditches, [24] and [54], containing medieval pottery in area 7E were aligned north-south. The ditches enclosed a strip of land perpendicular to Newarke Street and were probably utilised for boundary and drainage purposes. A flat-bottomed ditch [739] in area 4E contained pottery dating to the late medieval period and was aligned on a similar north-south axis. The alignments of these medieval features reflect the medieval line of Newarke Street, or Hangman's Lane as it was known during this period.

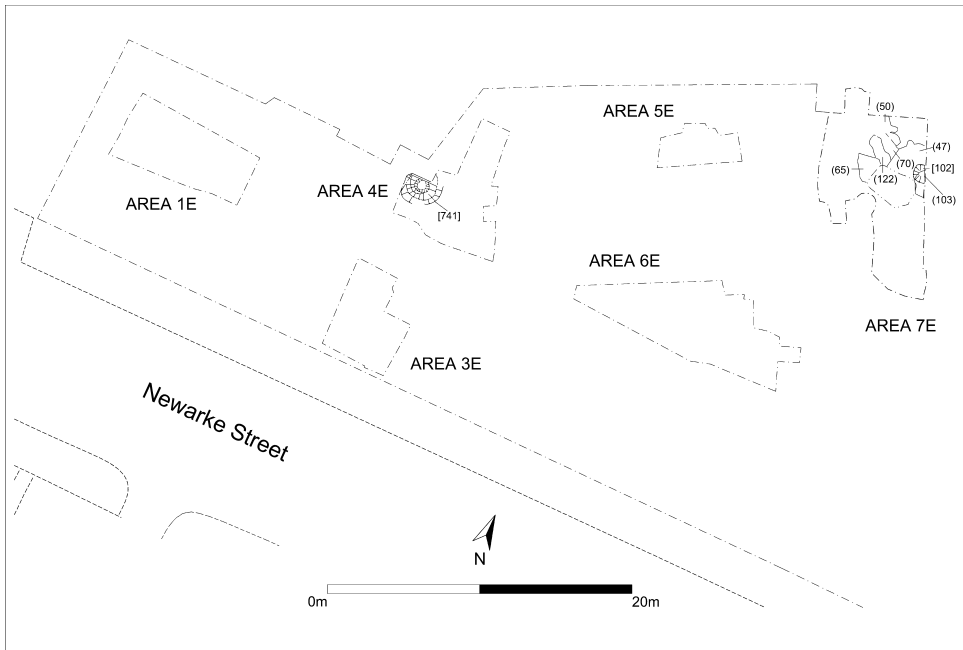


Fig. 21. Phase 6 features.

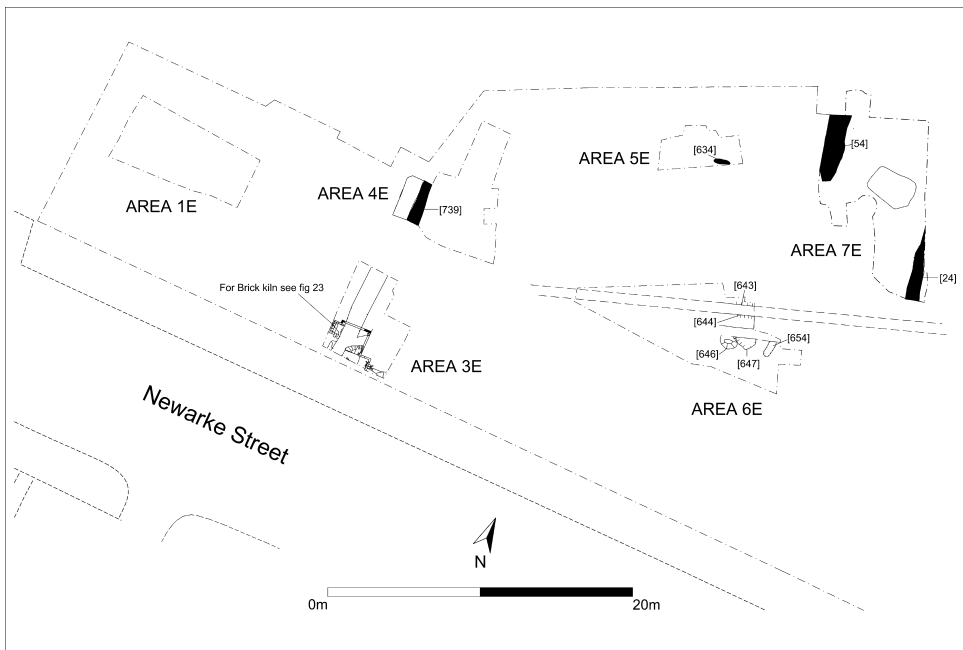


Fig. 22. The medieval and post-medieval phases 7 and 8.

A pit dated by a single sherd of thirteenth-century pottery was excavated in area 5E and was probably for refuse. In area 6E, pit [647] contained a sherd of pottery dating to the twelfth–thirteenth century and was cut by another pit [646]. Two ditches, [643] and [644], which contained no dating evidence, and overlay the cemetery phase (5), may be medieval in date as they were filled with similar dark sediments to the other medieval features.

These contexts produced a range of medieval pottery, and ridge tile fabrics dating from the eleventh or twelfth to the fifteenth or sixteenth centuries, typical of that found in Leicester and its immediate environs (Davies and Sawday 1999; Sawday and Davies 1996).

The paucity of medieval deposits on site may indicate an absence of habitation and an emphasis on agricultural activity during this period. Similar ditches, albeit on a slightly different alignment, were found at the Elfed Thomas site and were also interpreted as for drainage or boundaries (Cooper 1996).

Phase 8: Post-medieval period (Fig. 22)

The post-medieval period was represented by an early post-medieval bedding trench and two brick kilns. As with the bedding trenches found on the Elfed Thomas site (Cooper 1996, 30), [654] was rectangular in plan and had straight sides. It contained a similar dark charcoal-stained loamy deposit and contained seven sherds of twelfth- to thirteenth-century pottery in addition to some residual Roman sherds. These trenches were cut to receive manure or compost and similarly-dated features, noted at Usk, were thought to represent small-scale production of garden produce (Courtney 1994, 14–16).

The remains of post-medieval brick and/or tile kilns were discovered in area 3E, Kiln 1 (704), (706), (709), (710) and (716) to the south-east and Kiln 2 (700–3) to the north-west (Fig. 23). The kilns were constructed using unfired (green) brick, as well as fired brick and tile, and were similar in plan to a larger structure excavated at Runsell Green, Danbury, Essex (Drury 1975). They lay directly on the natural substratum that had consequently become highly fired. They appeared to be of an updraught type with firing tunnels to the south and west of the main area, similar to the kilns at Runsell Green (*ibid*, 210). A charcoal and ash layer lay across the main area of firing and probably related to the fuel used during the firing process. On top of this layer were tile and brick fragments relating to the last firing which had survived *in situ*.

Forty fragments, representing a minimum of 31 individual bricks, were recovered from the kiln structures. All had been made in sanded moulds and the upper surfaces had been fettled off in a manner similar to that involved in the manufacture of the nib tiles. Fragments of three unfired bricks were recovered which varied in thickness between 2½ and 3 inches – the measurements being taken after the bricks had dried out. Another three bricks, one of which was 4½ inches wide, and which varied between 1⁵/₈ and 1⁷/₈ inches in thickness, were found associated with the construction of the kiln.

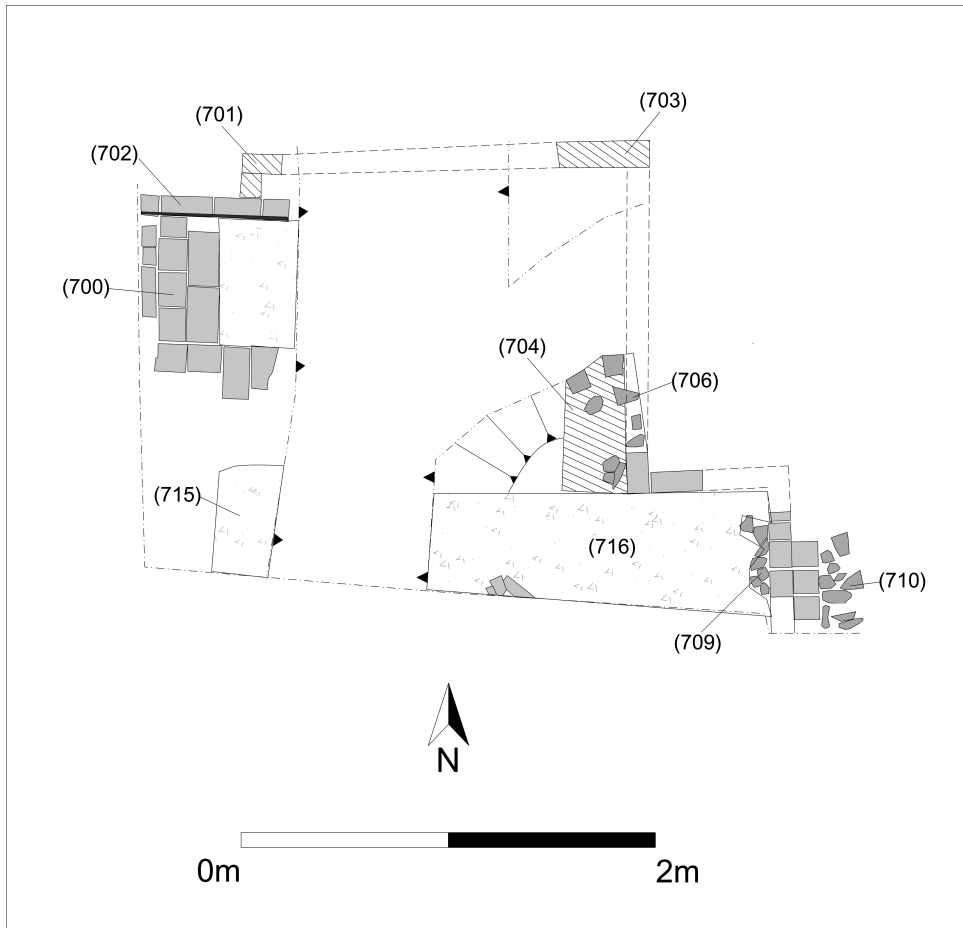


Fig. 23. Phase 8 brick kilns.

The fired bricks were similar in thickness and width to those recovered from the kiln structure itself, contexts associated with the last firing, and in the layers representing the collapse of the kiln after it had been abandoned. Complete and slightly thicker bricks, measuring up to 2 inches, and 4½ inches wide and 9½ to 10 inches in length, were found in the firing chamber of the kiln structures and the collapsed kiln material. This latter group were of note as, on many of the bricks, the impressions of the fingertips of an extended right hand were visible on the sanded lower surface. Evidently the bricks had been removed from the mould whilst still green – before they had dried out – the similarity of the finger signatures suggesting that this was a batch of bricks that had been handled by one individual only. Three brick fragments from the last firing were notably narrower and thicker than the others, varying between 1⅞ to 2⅛ inches thick and 3⅞ to 4⅛ inches wide, and are possibly slightly later in date.

Many of the fragments were overfired, fragmented and some were completely vitrified. Bands of reduction may have been the result of stacking in the kiln, or secondary use in the kiln structure. Some of the bricks had the remains of others adhering to them while two from the firing chamber and kiln structure had clay adhering to their undersides, possibly used in place of mortar. Only the square flue tile showed evidence of mortar.

Forty-four fragments of moulded nib tile were recovered, mostly from contexts associated with the kiln structure, the last firing of the kilns, and their abandonment. All the tiles had been made in sanded moulds and consequently had five sanded surfaces, whilst the remaining upper surface had been fettled off. Unfortunately, no complete examples were found, and the length of the tiles is not known. The thickness varied between 10 and 20mm, the majority measuring between 14 and 18mm, whilst two tiles were between 165 and 166mm wide. A third tile had an estimated width of 170mm. A few nibs survived, and the tiles evidently lacked peg holes. The nib is on the smooth side, and the sanded side would have appeared uppermost on the roof, a characteristic shared with most nib tiles in the region (Allin 1981) and elsewhere (Moorhouse 1988, 36). A sample of 29 fragments of tile was recovered from the base of the firing chamber in kiln 2. Measuring approximately 7 inches square by 1 inch thick, the tile had evidently been rolled out on a sanded surface and then cut into shape, unlike the moulded nib tile.

A thin deposit of lime lay across the floor of the kilns and within the firing tunnel and may indicate that lime burning had taken place as well as brick production. Evidence for brick firing and lime burning was encountered at Runsell Green where large quantities of chalk and lime were encountered (Drury 1975, 211). The kilns at Runsell Green may have had walls above ground to a height of 2m but it is not possible to say if there was a permanent roof or whether a temporary cover of wasters or turf was used (*op. cit.*).

Evidence for the production of bricks within the immediate area comes in the form of cartographic and standing building evidence. Stukeley's map of 1722 mentions 'brick kilns where antiently was a Roman pottery' in the area, while Roberts' map of 1741 shows brick kilns and possibly a hovel (drying shed) at the north-eastern end of Hangman's Lane (Newarke Street).

The earliest brick-built standing buildings in Leicestershire appeared in the late fifteenth–early sixteenth century and were high-status constructions such as Kirby Muxloe castle, Bradgate House, Groby Manor and Abbot Penny's wall, Leicester Abbey (McWhirr 1997). In the sixteenth century, brick became a popular building material among the gentry and continued well into the early seventeenth century as seen at Quenby Hall. The earliest small-scale building using brick started in the late seventeenth century when timber-framed buildings in the south of the county were part brick. The earliest brick building in the city is the east front of the Great Hall of Leicester Castle of *c.* 1695 whilst the earliest securely dated brick buildings are the Great Meeting House (1708) and a building in Highcross Street (1712). A refurbished building in Churchgate revealed a date of 1717 (McWhirr 1997, 53; N. Finn pers. comm.)

A probable date for the brick/tile kilns would seem to range from between the late seventeenth century and 1722 (Stukeley's map). The dimensions of the brick are similar to those in use at this period and the earliest brick buildings seem to be appearing in the city at this time.

DISCUSSION

Despite considerable disturbance from cellarage the excavation at Newarke Street has contributed to the increased understanding of the extra-mural activities associated with the Roman, medieval and post-medieval town (e.g. Cooper 1996; Finn 2004; Gardner 2005). Although there is some evidence for prehistoric activity in the area from flint material (including a rolled flint flake of Palaeolithic date) the main evidence is for Roman and post-medieval occupation.

The earliest phase (1) comprises a series of gullies, a pit, pebble surface and remnant soils which appear to represent first century agricultural activity. Phases 2 and 3 indicate early second century land management and boundary division occurring outside the Roman town. Although only located in limited areas due to cellar disturbance a series of ditches containing late first to early second-century pottery do appear to run parallel and perpendicular to Newarke Street (Figs 5 and 6). The fact that the orientation of the ditches appears to be reflected in the alignment of Newarke Street may support the suggestion that it had a Roman origin (Cooper 1996) representing the final stretch of the *Via Devana* before joining the road to the southern gate. The final phase of agricultural management prior to the cemetery (Fig. 8, phase 4) comprises a series of ditches which have a corresponding alignment to those observed at the Elfed Thomas site. Pottery recovered from these ditches dates them to the middle to late second century which would place them together with the phase 2 ditches from the Elfed Thomas site (Cooper 1996, 9–12). The date-range is broadly contemporary with the establishment of the town defences and, as suggested by Cooper, it may have been the case that abandonment of the agricultural activity and the silting/deliberate backfilling of the ditches indicates a depopulation of the newly created suburban areas with contraction of settlement into the town. This hypothesis has also been suggested for other extra mural sites to the north and east of the defences (Buckley and Lucas 1987, 50; Finn 1993, 93). The ceramic evidence may also point to a shift in land use, as there is a distinct lack of third-century material arising in the assemblages. This absence of material, which was also encountered within phases 1 to 3 at Causeway Lane (Clark 1999) and the early groups from the Elfed Thomas cemetery (Marsden 1996), could be attributed to the construction of earthen defences at the end of the second century. This construction may have altered the function and status of the extra-mural area rendering it unoccupied and no longer used for rubbish disposal.

The cemetery phase (Fig. 9, phase 5) contained 30 burials, which almost exclusively exhibit an east/west burial orientation, the exception being burial SK17 which was aligned north/south and SK21 which contained possible ritually-placed burial goods. A proportion of the graves were stone-lined while some

appear to have been buried in coffins, as attested by the presence of nails within the burial fill, and one was interred within a slate cist. Seven other possible grave pits were observed which contained no trace of a body. The pottery assemblage recovered from the grave fills is similar in date and character to that from phases 1–3. As it was not possible to date the burials from the finds a combination of stratigraphic position, burial rites and an association with the Elfed Thomas site, where some of the burials were associated with coins, has been attempted which suggests a fourth century date. Despite modern disturbance, taken together with the Elfed Thomas excavations, 68 late Roman burials have been examined enabling comparisons to be made with other cemeteries around Leicester including the 91 burials located during the Clarence Street excavations (Gardner 2005). Newarke Street and Clarence Street both show a predominance of east-west orientated burials although Clarence Street does not include any stone-lined graves. Following the criteria used by Watts (1991) there is some evidence that the Newarke Street burials follow a Christian tradition (Cooper 1996, 27; Mattingly 2006, 343). However some of the criteria put forward by Watts are open to challenge and it is possible that a prevailing fashion of burial rite was being adopted which had evolved through the fourth century which need not conclusively denote Christian burial (Gardner 2005, 76).

Two possible *mausolea* structures were present, one of which (structure 1) resembles a temple-mausoleum uncovered at 165 Great Dover Street, Southwark, London (Mackinder 2001) while the other (Structure 2) is similar to a structure excavated at the Elfed Thomas site (Cooper 1996, 7, fig. 3, features 6.2, 7.1 and 6.6). Structures 1 and 2 provided little in the way of clear ceramic dating evidence. Structure 1 comprised a post-hole and beam slot arrangement which respected graves to the east and south but which was devoid of any burials. The absence of burials within the structure perhaps suggests that the mausoleum interpretation is open to question and if the burials are Christian it is possible that this may represent a church (Morris 1983, 12). In contrast, structure 2 contained burials SK12 and 14 within its bounds and respected several burials to its north-west and north-east suggesting a contemporaneous date with these graves. Structure 2 also cut through grave SK1 suggesting an earlier burial phase within the cemetery. It would appear that these structures were from the latest phase of burial within the cemetery possibly during the later fourth century.

The cemetery appears to have fallen into disuse some time in the fourth century whereupon limited pitting activity appears to have taken place. The pottery recovered from this activity (phase 6) contains residual earlier material and some stratified fourth-century sherds. Little of the material dates to after *c.* AD 200 and appears to represent the redeposition of earlier deposits.

Medieval activity (phase 7) is extremely sparse and comprises ditches which run perpendicular to Newarke Street forming strips of land running north/south which contain pottery of a twelfth to thirteenth century date. Pits containing pottery of a similar date and a flat-based ditch containing late medieval pottery suggest that this extra-mural area was used for agriculture and was very sparsely settled during this period.

A bedding trench of a type previously recorded at the Elfed Thomas Law School site was excavated and was found to contain early post-medieval pottery thus suggesting horticultural activity at this time. Two post-medieval brick kilns possibly dating to the late seventeenth or early eighteenth century were discovered along the Newarke Street frontage. Such brick kilns are shown on Stukeley's map of 1722 and Roberts' map of 1741 and provide more evidence for the development of the city of Leicester.

In conclusion, this work has increased our knowledge of extra-mural agricultural and cemetery activity in the Newarke Street area where similar trends in burial rite such as position of body, alignment and stone-lined graves were observed on the Elfed Thomas site. These burials were comparable in date with others from Leicester at Clarence Street, Great Holme Street and Haymarket Towers and suggest a broad contemporaneity of burial rite, perhaps consistent with Roman Christian practice at this time, although as Gardener has pointed out we can see as many significant differences in the burial practices as there are similarities (Gardner 2005, 76). While the Newarke Street and Great Holme Street cemeteries contained stone-lined graves these were absent at Clarence Street. In contrast the burials at Haymarket Towers contained more grave goods and displayed a range of orientations. These differences may reflect factors other than religious belief and provide tantalising glimpses of variation within the *civitas* capital of *Ratae Corieltavorum*.

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