A Roman Cemetery in Newarke Street, Leicester

by Lynden Cooper


The Elfed Thomas Law School site lies some 110m to the south of the Roman and medieval town defences in an area known to have been a Roman cemetery. Excavation during re-development revealed stratified archaeological deposits and features from the late first century AD to the post-medieval period. Early Roman features included an east-west boundary ditch with domestic activity to the north comprising cess and other pits, post holes and gulleys. In the latter half of the fourth century the northern area was part of an inhumation cemetery. The graves are notable for a consistent burial rite involving supine burial on a west-east axis in stone lined graves, often in nailed timber coffins, and lacking grave goods.

Introduction (illus. 1)  Lynden Cooper and Richard Buckley

Background

Proposed refurbishment of the Elfed Thomas Law School in Newarke Street, Leicester by De Montfort University included redevelopment to the rear of the building. An archaeological desk-top assessment was initially required by the planning authority in order to document the known archaeological potential of the area. With this information, preliminary assessment could be made of any possible threat from proposed ground-works. The study was undertaken by Leicestershire Archaeological Unit (LAU), and anticipated the survival of deposits relating to known Roman and medieval suburban topography (Courtney 1993). Consequently, an archaeological field evaluation was required to provide further information on the nature, extent, depth and date of any deposits which might be affected by the new building. Evaluation by LAU between 30 September and 1 October 1993 confirmed the presence of archaeological deposits including inhumations of suspected Roman date. In view of the tight development timetable and the clear indication from just two days of evaluation that archaeological levels would be affected, agreement was reached between the developer, LAU and the planning authority to proceed directly to a mitigation strategy. It was considered that the foundations of the new building would destroy a significant percentage of underlying archaeological deposits and full excavation of the footprint would therefore be required. This was undertaken by LAU between 4 October and 20 November 1993. A watching-brief on other minor works, with limited excavation and recording, was also undertaken between April and August 1994.

The project was managed by Richard Buckley and directed by Lynden Cooper, both of LAU. De Montfort University funded all phases of the project, including post-excavation analysis and the production of this report. The finds and archive have been donated to Leicestershire Museums, Arts and Records Service (Acc. No. A283.1993)

**Site Methodology** (illus. 2)

The site is divided into five distinct zones each of which demonstrated differential survival of deposits and had different development threats. Consequently, various strategies and methodologies were adopted across the site to meet these differing circumstances. Excavation and recording followed standard LAU guidelines.

*Area 1*, encompassing the evaluation area, was previously occupied by part of the Law School building (1930 or later). Mechanical stripping of the overburden was followed by trowel cleaning of the area. The survival of horizontal deposits was quite poor due to a previous reduction in ground levels, probably during the construction of the earlier Law School buildings. Major truncation was limited to a basement to the north, the brick wall foundations and associated service trenches. The development threat necessitated full excavation.
2. Detail of archaeological areas to the rear of the Elfed Thomas Law School.

*Area 2* also required full excavation, but only became available following the excavation of *Area 1*. There was a greater depth of archaeological survival as the area was not subject to the same degree of ground reduction as *Areas 1* and *3*.

*Area 3* was stripped at the same time as *Area 1*, but was not threatened by the new building foundations. Some ground reduction and the removal of previous brick foundations necessitated limited excavation. Archaeological survival was similar to *Area 1*.

*Area 4* was defined by the foundation trenches of the entrance porch to the new building and service trenches. Archaeological recording was of a salvage nature but cleaning of the trenches revealed at least four disturbed burials and a good depth of archaeological survival.

Work in *Area 5* comprised the monitoring of limited ground reduction and the excavation of new service trenches. Initial building plans suggested that archaeological damage from new services would be limited as much re-use of existing service trenches was anticipated. However, the re-routing of the service trenches and the unexpectedly shallow overburden meant that
considerable intrusion from the works occurred, with some 20 burials affected. Attempts were made to excavate the graves fully by enlarging the trenches by hand.

Surveying and finds location were undertaken with a Topcon Electronic Distance Measurer (EDM). Surveying of Areas 1 and 3, and overall trench location was based upon the Area 1 trench grid. Area 2 was recorded with an independent site grid. The human burials were not planned in situ due to time constraints; the cleaned skeletons were photographed from an overhead position with photogrammetric targets above the skull and below the feet. These were tied into the site grid.

Post-excavation methodology and report style

On-site recording of archaeological deposits was by context, whereby each stratigraphic unit was assigned a context number. During analysis the site data were placed into hierarchical, interpretative sets of related contexts known as groups and sub-groups. Sub-groups should represent self-contained archaeological episodes, for example a post hole and its construction backfill or a pit and its primary silting. The report convention for the sub-group is ‘Pit 20.2’, where the figures before the point refer to the overall group, the figures following the point refer to the sub-group.

Groups form the next level of interpretation, ideally representing a set of related sub-groups, such as post holes thought to represent a distinct structure. Initial grouping was provisional and used as a tool to test possible relationships. The groupings were amended in light of refined dating evidence and interpretation. The sub-group has also been used effectively to differentiate separate observations of a feature, for example where linear features such as ditches were excavated in distinct segments or recorded in different areas. Within the report such features are prefixed with a G, e.g. ‘Ditch G2’. Grouping has proved useful as a control for identifying residual and intrusive material in intercutting features. Attempts were made to relate groups morphologically and chronologically. Groups have been placed into higher interpretative sets, phases. The site phases attempt to provide a chronological development of the site, and to characterise the major land use changes.

The excavation report is weighted to reflect the relative importance of the stratigraphic and material evidence. Although the majority of excavated features were of post-Roman date, they were of insufficient quality to warrant full publication. Full details of the post-Roman deposits are retained in the computer and paper archive lodged with Leicestershire Museums (A283.1993). For reasons of economy textual description is only amplified where there are no accompanying illustrations.

When pottery is used to date a particular feature the number of sherds are given in parenthesis. For economy, site context numbers are generally not used in the following stratigraphic section unless to make distinctions within a subgroup. Where appropriate they are retained in other specialist reports denoted by parentheses, e.g. (210).

The Excavation

Lynden Cooper

Site Location

The site is situated some 125m to the south of the Roman and medieval town wall in an area where little archaeological fieldwork has been undertaken. It has a west facing aspect and is situated on a gentle escarpment falling to the river Soar on a decline of 1 in 33. The natural Mercia mudstone subsoil was a reddish brown clay with shallow patches of overlying yellowish brown silty sand and rounded pebbles. This contrasts with sites in the historic urban core to the north where there is a considerable depth of sand and gravel over the Mercia mudstone, but compares with the Bonners Lane site some 125m to the south (Finn, forthcoming) and sites in the area of Leicester Castle (Buckley, pers. comm.). The lack of such sand and gravel deposits is thought to be a natural feature, and not due to quarrying. The area is known to have been within a
Romano-British cemetery, evident from the many burials that have been observed during past building works, particularly in the late Victorian period and 1920s.

Pre-Roman features were absent, although some prehistoric activity may be inferred from a number of flint tools and waste, and a single Iron Age coin, all residual in later deposits.

**Phase 1: Late first to mid second century** (illus. 3 and 4)

Group 1: Buried Soil Remnants (1.1-1.10)
Group 2: E-W Ditch (2.1)
Group 3: Ditch 2.1 recut (3.1-3.2)
Group 6: Gullies (6.1-6.4, 6.6, 6.7) and post holes? (6.5, 6.8)
Group 7: Post-pit? (7.1) and associated post holes (7.2-7.4)
Group 8: Pits (8.1-8.7) and post holes (8.8-8.11)
Group 9: Four Post Structure (9.1-9.4)

Overlying the natural subsoil was a brown loamy soil, Group 1, up to 0.25m thick, thought to represent the original topsoil with some re-working. The layer was cut by several Phase 1 features, though the similarity of some fills with the layer meant that this was not always apparent. The layer was directly overlain by a darker loam layer Group 18, phase 4 probably

3. Phase 1 features, with conjectured walls of building as dashed line.
4. Sections of phase 1 features.

representing post-Roman cultivation, which is likely to have truncated the depth of the G1 layer. More severe truncation occurred from the medieval 'quarry' cut G19, phase 4 and ground preparation for the recent buildings, almost completely removing the layer from Areas 1 and 3. The layer contained a broad date range of pottery, from the late first to fourth century, and also some intrusive later pottery. The ceramic date extended beyond the stratigraphic date of the layer, probably due to the inclusion of finds from unrecognised later features and bioturbation. It would seem likely that the topsoil developed during the Roman period, particularly during the cemetery phase as a build up of grave earth, but this was not recognised.

Group 2 comprised an east-west ditch, up to 0.37m deep, cutting into the natural subsoil. The feature was mostly removed by subsequent ditches of phases 1 and 2 and feature G19, phase 4. Excavation was limited to subgroup 2.1, so finds recovery was very limited. The primary ditch
fill was a clean sandy silt, presumably derived from erosion of the natural subsoil. This was overlain by a sandy silt with pockets of re-deposited clay. The surviving portion of the ditch profile demonstrated a steep, concave southern side gently breaking to a flat base. The pottery (5) from the ditch and its relationship with ditch G3, suggests a possible late first century date for the feature.

Group 3 was a recut of the G2 ditch, but with a slight shift to the north. It was U-shaped in profile, up to 0.50m deep, and extended some 25m across the site. It contained pottery of late first and early second century date, possibly including some residual material from G2. The ditch was cut by the phase 2 ditch G5, suggesting an early second century *terminus post quem (TPQ)* for the filling of the feature.

Group 6 comprised six gullies and associated features with similarities in terms of alignment, dating and stratigraphic sequence. ‘Gully’ is used as a descriptive term to avoid functional interpretation where there is uncertainty; it is possible that some of these features may represent beamslots, drains or culverts. The three gullies 6.2, 6.3 and 6.6 have evidence for post settings and may be seen as the surviving elements of a timber building.

Gully 6.1 comprised a 1.5m straight length with a 45° turn. It was up to 0.14m deep and had a silty fill. Gully 6.2 had a U-shaped profile, up to 0.24m deep, and contained a brown sandy silt with Roman pottery. It was the only feature from this group which demonstrably cut layer G1, hence its relative depth. Gully 6.3 was 0.08m deep and had a silty sand fill containing a single sherd of late first-mid second century date. It had a possible post hole 7.4 along its length and a probable butt-end to the north (recorded as post holes 7.2 and 7.3), probably respecting feature 7.1. Post hole 7.2 had vertical sides and was 0.23m deep. It had a compacted lower fill of small pebbles, up to 0.23m deep, which also extended into gully 6.3. The upper fill of silty sand was up to 0.10m deep and indistinguishable from the gully fill. Pottery (3) from the feature is dated to c. AD 120-150. A small depression beneath the pebbles of 7.2 was recorded as post hole 7.3. It was 0.21 by 0.15m across and 0.08m deep and filled with silty sand with one sherd of Roman pot. Gully 6.4 was poorly defined, but there were some indications that the feature extended further to the south towards pit 8.4, and also to the north. A short length was excavated demonstrating a silt fill some 0.19m deep, containing pottery (22) of late first-early second century date. The feature could be a continuation of gully 6.1. Possible post holes 6.5 and 6.8 are assigned to the group due to their apparent association with gully 6.6. Pottery (5) from 6.5 and 6.6 was of a probable second century date. Feature 6.7 was heavily truncated with only a small portion of the northern edge surviving up to 0.21m deep. The pottery (34) provided a date of late first-early second century, mainly from a single greyware vessel represented by 29 sherds.

Feature 7.1 was a small, rectangular pit some 0.24m deep. It had a tile set into the base which was overlain by a series of shallow deposits mostly comprising charcoal fragments or ash. Towards the top of the feature was a concentration of burnt clay flecks and fragments. The feature was considered as a possible hearth, with the remaining Group 7 features possibly associated. However, the tile showed no sign of burning and there was no scorching of the sides of the pit. The feature could be a post hole with the tile functioning as a post pad. The Group 7 features are interpreted here as part of the possible building represented by the gullies 6.2, 6.3 and 6.6.

Group 8 is based principally on two pits 8.1 and 8.3 with a further nine possibly related features. The pits were targeted for specialist analyses as there was a relative abundance of material and environmental evidence with a low risk of residuality. Pit 8.1 was identified on-site as a possible cesspit on the basis of its homogeneous greenish silt fill and therefore well sampled for possible environmental evidence. The sub-square pit had a slot, some 0.10m wide by 0.05-0.10m deep, cut into the base along the northern and western sides, possibly serving as a foundation for
timber shuttering. A curious feature 8.2, some 0.30m wide at the top tapering to c. 0.10m at the base and 0.50m deep, was revealed in the north-east corner following the excavation of 8.1. Its relationship with 8.1 was uncertain; though it was also cut by ditch G12 of Phase 2. If associated with the pit 8.1 the feature could represent a downpipe serving the pit with water or sewage, or perhaps represent a stake securing the putative shuttering. Alternatively it may be associated with the suggested shuttering building, indicating a continuation of gully 6.6.

Pit 8.1 contained considerable amounts of pottery, including complete vessels, animal bone, vessel glass, small finds and plant remains. It is possible that the pit functioned entirely as a rubbish pit with some of the finds representing primary deposits. However, the preferred interpretation is that the pit served as a cesspit or soakaway with the majority of the finds resulting from secondary use as a convenient rubbish pit when it became redundant. There was green staining throughout the feature; its identification as cess is confirmed by the recovered plant remains, coprolites and the presence of parasite eggs. Baxter (below, p.83-4) has suggested that the small, light animal bones may have arrived into the pit via a drainage channel. The pottery is dated to the first quarter of the second century, suggesting a disuse of the feature by the middle of the century. A coin of Trajan provides a TPQ of AD 103-111, falling within the date range suggested by the ceramic evidence. The vessel glass is also of a similar date range.

Pit 8.3 contained abundant animal bone, fragmentary oyster shell and pottery (264) dated from c. AD 100-120, suggesting that it was broadly contemporary with 8.1. The remaining Group 8 features have a less certain association. Pit 8.4 had a silt fill and was 0.18m deep. Pit 8.5 contained a sandy loam fill with frequent charcoal flecks. It was truncated by ditch G3. Pit 8.6 contained a primary fill of silty sand 0.05m deep, overlain by a sandy silt with frequent small pebbles, some 0.12m deep. Most of the feature had been removed by ditch G12, only surviving to a depth of 0.25m. It contained pottery (6) of a late first-early second century date. Pit 8.7 was 0.15m deep and filled with a sterile clay silt. Post hole 8.8 was 0.20m deep and contained a silty sandy clay fill. Pit 8.8 was a large post hole, some 0.80m in diameter and 0.32m deep, with a post pipe of 0.51m diameter. It was cut by grave 15.6. Post hole 8.10 was 0.32m deep and contained a clayey silt sand.

Group 9 comprised four possible post pits grouped mainly by their spatial arrangement. Only 9.1 can be positively identified as a post hole, with evidence of a post pipe of 0.14m diameter. All four features were only observed cutting the subsoil, varying in depth from 0.05m (9.4) to 0.27m (9.1). Dating evidence is very sparse with no stratigraphic relationships and only five small sherds from the group as a whole, with a single sherd dated as Trajanic.

Discussion of Phase 1

This is a broad phase based on the collective evidence for plot layout and land use from around the late first to mid second century AD. Although further chronological resolution is possible, with some demonstrable sequences of features in the phase, the generally weak stratigraphic links and limited dating evidence favours broad phasing of features. A suggested chronology, though partly speculative, suggests initial plot establishment with ditch G2 in the late first to early second century, and subsequent maintenance, evident from its re-cut G3, with activity to the north of this line.

The zone to the north of this boundary appears to be the focus for subsequent activity, the exact nature of which is uncertain but includes features associated with domestic activity, such as human cess and domestic rubbish disposal as well as structural features. Datable finds suggest that this activity was short-lived with a disuse TPQ in the 120s or soon after for pits 8.1 and 8.3. The spatial organisation of the Phase 1 ‘domestic’ features, given the lack of activity to the south, suggests that they are ‘backyard’ features from an adjacent building to the north of the site. It is uncertain if any of the structural features are part of a building, although the truncated
gullies 6.2, 6.3 and 6.6 may be interpreted as beamslots or foundation trenches and as such are good contenders for such a structure. The putative building comprises two parallel walls (6.2 and 6.6) with the line of a possible cross wall perhaps indicated by feature 7.1. From this, gully 6.3 may form a wall at right angles extending to the east. The gullies show some evidence for discontinuous post settings. A possible construction could have involved loadbearing earthfast posts with slots in between to take either beams or serve as foundation trenches for wattled panels. The waterlogged site of Castle Street, Carlisle illustrates such building methods (McCarthy 1991). The incongruous bearing of the gullies in relation to the ditch line may suggest that the building was aligned on another topographic feature, possibly the Gartree Road.

The land use of the southern area of the site during this period is uncertain, but was probably subject to less activity than that to the north. The first edition OS map (25", 1887) records a Roman cinerary urn found some 25 metres to the south of the site, but this is in isolation. To the south of the ditch complex was a large cut feature G19 of medieval date (phase 4), essentially a trench which terraced into the natural subsoil to a depth of 0.30m (63.05m OD). The northern limit of the trench follows the line of the ditch almost exactly. Although the trench would have obliterated evidence such as post holes and beam slots, features such as the deeper graves and pits should have survived if present. A previous interpretation of this area was that it may have been a thoroughfare in the Roman period, with the ditches G2+ representing a northern flanking drainage ditch and the trench seen as a quarry exploiting the gravel surfaces of the supposed road (Cooper 1994), the metalling having been laid into a prepared shallow trench cut into the natural subsoil. Though the interpretation is attractive, it should be stressed that it is based upon negative evidence. Therefore this part of the site is more cautiously interpreted as an open area, possibly a field on the margin of the town.

The urban topography for this area of the town’s suburbs is not well known, mostly due to a paucity of fieldwork in the area. Recent work at Bonners Lane (illus.1), some 125 metres to the south, has confirmed the line of the Tripontium Road (Margary No.572) as it enters the south gate of the Roman town (Finn 1994, p.167). The ditch line of G2 is at right angles to the road and may have been laid out from it. The dating of the road is problematic, based only upon a few pottery sherds in the fills of the flanking ditches, but does appear to be slightly later than ditch G2 (Marsden, pers. comm.). The ditch is also on a similar axis to the urban street grid, at least to that observed in the western part of the town, but also slightly earlier in date given the recent re-interpretation of dating evidence for grid layout to the first half of the second century (Clay and Pollard 1994, p.47).

**Phase 2: Late second to fourth century** (illus. 5 and 6)

Group 4: N-S Ditch (4.1-4.2)
Group 5: Ditch 3 recut (5.1-5.3)
Group 10: E-W Ditch (10.1-10.5)
Group 11: E-W Ditch (11.1-11.4)
Group 12: E-W Ditch (12.1-12.4)
Group 13: E-W Ditch (13.1-13.6)
Group 14: N-S Ditch (14.1-14.2)

Group 4 was a shallow ditch, some 0.24m deep, at right angles to the east-west line of G2/G3. It had a rounded profile and contained a fill with undiagnostic second-fourth century pottery (23).
5. Phase 2 features.

It was cut by grave 15.16 and ditch G11. Group 5 is a recut of the phase 1 ditch G3, but only to the east of the intersection with G4. It was mostly removed by the later ditch G10, but compared with the other ditches produced a relative abundance of finds, including 14 horn cores, roofing slate and ceramic building material. The fill of the ditch had a distinct greenish hue, particularly to the east, which may indicate the presence of cess. It contained pottery (41) of a wide date range, but as it is stratigraphically between the earlier ditch G3 and the later ditch G10 a likely date of the mid second to early third century is suggested. A similar date range for G4 is suggested given the apparent association of the two ditches.
Ditch G10 cut ditch G5 and was itself cut by grave 15.24, phase 3. Secure dating is not possible due to a general problem of finds residuality and unrecognised intrusion from slumpage into the upper part of the fill. A general third-fourth century date is suggested, though it should be noted that the ditch segment 10.4, identified as not having intrusion problems, produced pottery of fourth century date.

Ditch G11 cut a number of Phase 1 features, and ditch G4. It also contained pottery (79) with a wide date range, much of which was residual. The latest pottery was third-fourth century in date. It contained two fragments of human bone which may indicate a post-cemetery date, but is more likely to be intrusive. An adult tibia fragment may derive from grave 15.16 which had machine damage to its legs whilst a radius from a child under one year old may represent an unobserved burial.

Ditch G12 was immediately to the north of G10 but no relationship could be established. It contained pottery (76) with a wide date range, much of which was residual from pits 8.3 and 8.1, but included material of late third-early fourth century date.

Ditch G13 was cut by several Phase 3 graves and contained pottery (117) which is dated to the third century, or possibly later.

Ditch G14 was also cut by several graves. It cut the natural subsoil to a depth of 0.28m, and had a rounded profile. The primary fill of sandy silt was 0.16m deep. This was overlain by a
similar soil, but of a more loamy texture. Pottery (18) from its fills was of a mid third-fourth century date.

**Discussion of Phase 2**

Phase 2 covers a broad period, possibly up to 200 years, following the apparent end of ‘occupation’ in the mid second century and preceding the late fourth century cemetery. The only demonstrable activity during this period is repeated cutting of ditches. The ditches G10 to G14 have no direct stratigraphic links between them so any chronological development of this phase is based upon dating of finds. Ditch G10, a re-cut of G2 and its successors, indicates that the boundary continued to be maintained, but the evidence for the continuation of domestic activity to the north is sparse. The later ditches G11-13, though not actual re-cuts of the east-west ditch line, may be taken to represent the same boundary. Plot division is evident from the two north-south ditches G4 and G14, and the partial recut G5, but the reason for this is uncertain. The recovered plant remains show a consistent presence of cereals and other foodstuffs. The pottery and animal bone also indicate the dumping of domestic waste but its source is unknown, and by itself cannot be used to argue for settlement continuity in this area. The presence of horn cores in ditch G5 may indicate hornr’s waste but the location of the activity is also unknown.

The dating of this phase is broadly contemporary with the establishment of the town defences. It is tempting to speculate that the demise of activity at this site might indicate a depopulation of the newly created suburban area with contraction of settlement into the town. A similar hypothesis has been suggested for extra-mural sites to the north and east of the defences (Buckley and Lucas 1987, p.50; Finn 1993, p.93).

**Phase 3: Late fourth century** (illus. 7, 8 and 9)

Group 15: Inhumation Graves (15.1-15.39)

The inhumation burials are perhaps the most important features on the site in terms of national research priorities and depth of possible interpretation/deduction and are therefore accorded a greater degree of description and discussion. Much of the descriptive detail can be gained from the individual grave inventory and the illustrations (for graves which are not illustrated there is a greater degree of text description below). The graves are listed in sub-group order with the site skeleton number in parentheses (to allow comparison with the published and archive skeletal report). Sex and age estimates are included to allow comparison of burial treatment and is based on the archive catalogue of skeletons produced by Dr. J. Wakely. The results of skeletal analysis as regards population structure, height and physical characteristics and evidence for health and disease are presented separately below. The orientation of grave pit and corpse was concordant, and is not considered separately. Orientation of individual graves (from corpse midline) is based on the OS grid; graves in the inventory are described as west-east, implying that the head is placed to the west (after Viner and Leach 1982, p.76) within 45° of the cardinal point. The surviving depth of grave is given with an indication of depth cut into the natural subsoil to allow broad comparison of original depth.

Grave 15.1 (574): Male, 30-35 years. Orientated W-E, 252°

The grave was one of the few to yield definite evidence of fill differentiation for a coffin and grave backfill. However, the three nails found towards the base of the grave could have derived from the coffins of two earlier graves. The grave was partially lined with stone along the northern and southern sides. The northern side was unusual for the site in having two courses of lining, an upper course of mixed stone (sandstone, limestone, millstone grit and ironstone), and
7. Phase 3 features, with areas of the site unaffected by post-Roman truncation stippled
(i.e. intrusions are not deeper than the level of the natural subsoil).

a lower course of large granite slabs, all set on edge. The lower course had either slumped into,
or was compressed into the fill of grave 15.36 below (as a result of coffin collapse of the earlier
gavel?). The southern side comprised two limestone fragments. The pit was 0.28m deep,
cutting into the fills of two earlier graves 15.35 and 15.36. Neither of the two earlier corpses
were disturbed, so this may represent a deliberate attempt to place the grave between the two
earlier burials.

Grave 15.2 (567): Male, 45+. W-E, 248°
Truncated from the thigh downwards, with some damage to the skull. Two nails were
recovered, one from above the skull and one from the chest area; possibly derived from a coffin.
8. Selection of individual grave plans.
A stone lining comprised eight stones (limestone and granite), four along each side. The stone to the right of the head was a fragment of a quern (see below p.65). The stones were mostly lying flat on the surface of the subsoil, possibly the result of later damage. The grave was quite shallow, with the base of the pit barely cut into the natural. The upright stones were 0.19-0.26m high, and conceivably could have been visible at the surface if the original topsoil was shallow. A bone hairpin fragment was located between the legs.

Grave 15.3 (585): Female, 35-45. W-E, 252°
Truncated from just below the knees. The grave pit was 0.39m deep and lined with granite and tile set on edge onto the grave base. Behind the head was an upright tegula. A coffin was evident from two nails half way down each femur, with two more nails behind the skull possibly associated (the latter were recorded as belonging to grave 15.33 below). The apparent lateral constriction of the torso might indicate an under-sized coffin. A coin dated to AD 364-78 was found in the grave fill some 0.10m above the left knee. A copper alloy object was found some 0.22m above the skull. The grave directly overlaid grave 15.33, cutting into its grave fill. The co-incidental location can be seen as deliberate.

Grave 15.4 (542): Child, 3-4. W-E, 258°
This had been disturbed by a recent machine cut which effectively removed the northern side of the grave, and displaced the skull (J. Wakely confirmed the likely association of skull and body). The surviving southern side had a near continuous lining of granite set on edge on the grave base. At the feet end was an upright slate, and a roofing slate overlying the tibiae. One of the tibiae was broken at the point of contact with the slate, probably from its recent collapse. The grave pit was cut some 0.33m into the natural.

Grave 15.5 (526): Male, 45+. W-E, 237°
Severely truncated but retaining evidence of stone lining (granite and sandstone) and a possible coffin from a single nail found at the foot end. The grave was cut into the natural to a depth of 0.32m, with stones at the foot end protruding slightly above the level of natural. The stone at the head end was inclined at c. 30°, probably a result of coffin collapse.

Grave 15.6 (530): Male, 45+. W-E, 235°
A discontinuous lining (granite and one boulder) defined the grave along both sides. It cut the natural to a depth of 0.27m, with some of the stones protruding above this level by up to 0.09m.

Grave 15.7 (538): Female, 17-25. W-E, 245°
The grave cut into layer G1 to a depth of 0.22m, barely cutting into the natural. The grave cut at the foot end was packed with fragments of tile, slate, mortar, granite and sandstone, forming a tight internal corner, probably from packing against a coffin. Two iron nails were recovered one adjacent to the right foot, the other unspecified. A coin dated to AD 347-8 was located to the inside of the right knee.

Grave 15.8 (534): Female, 25-35. W-E, 242°
Stone lining, mostly of granite but with some sandstone and slate, along both sides. The grave pit was cut into the layer G1 to a depth of 0.17m, with the grave base on the surface of the natural. The upright stones were up to 0.27m high, and conceivably could have been visible at the surface if the original topsoil was shallow. An iron stud and five nails were recovered, with one located to near the feet and two in the region of the right arm. A coin dated to AD 268-70 was recovered adjacent to the right knee.

Grave 15.9 (505): Child, 5-6. W-E, c. 240°
The grave was severely truncated with only the skull surviving, but yielded evidence for stone lining and two coffin nails, either side of the head. The grave pit cut into layer G1 to a depth of 0.20m with the grave base on the natural surface.
9. Selection of individual grave plans.
Grave 15.10 (484): Male, adult. W-E, 242°
The skull and right tibia had been truncated. The grave was lined with granite along its northern side; the southern side was lost to machining. Five coffin nails were recovered, two adjacent to the left tibia and two from the foot end. The grave pit was of uncertain depth, but its base was approximately 0.10m below the level of natural. The top of the stone lining was up to 0.33m above the base of the grave. The grave cut into the fill of ditch G13.

Grave 15.11 (488): Female, 17-25. W-E
Severely truncated by recent groundworks from the upper torso downwards, the grave had evidence for granite lining along both sides (seen in section). The grave cut was indistinct as it cut into ditch G13. The surviving grave cut was extremely shallow with the skeleton lying some 0.20m above the approximate level of natural. The remaining skeleton was salvaged by tunnelling into the section edge, so further details are unavailable.

Grave 15.12 (496): Adult. W-E
The grave was recorded after almost complete truncation by machining, so observations were limited. The grave was noted as being at a similar level to 15.10. Only the lower right leg was undisturbed. A single upright slate was noted towards the feet.

Grave 15.13 (311): Adult. W-E, 246°
Truncated from the pelvis downwards by pit 17.11. Human bone recovered from the pit was from 2 adults, a possible male of 25-35 in fill (270) and an elderly adult in fill (272). The grave was cut some 0.08m into the natural. A single large flat stone of Charnwood ash lay behind the head. This may have collapsed from an upright position.

The grave was cut into the fill of ditch G13 to a depth of 0.42m below the level of natural. It had elements of stone lining, mostly of granite, but with some slate and sandstone. Some of the stones were set quite high against the side of the grave pit, with the tops just protruding above the level of natural. Two unlocated nails may indicate a coffin.

Cut into the natural to a depth of 0.27m. There was a stone lining around the lower half of the grave mostly of granite, but with some sandstone and slate, set on edge on the grave base. A single sandstone fragment was located against the grave cut behind the head. Some of the stone lining protruded above the level of natural to a height of 0.10m. A fragment of millstone grit quern was found on the base of the grave between the femurs.

Grave 15.16 (176): Adult, 25-35. W-E, 245°
Slightly disturbed by the machining of overburden during the evaluation. The burial cut into the layer G1 to a depth of c. 0.15m, just into the natural subsoil. Stone lining of sandstone was observed on both sides.

Grave 15.17 (426): Child, aged less than 12. W-E, 243°
Only lower legs observed, most of the grave lying beneath the present foundations of the Law School. The grave was cut into the natural to a depth of 0.41m. It had a stone lining of two granite slabs at the feet and a sandstone slab against the northern edge at the mid point of the tibia. A single nail was found between the sandstone lining and left tibia.

Grave 15.18 (425): Male, 45+. W-E, 252°
The lower portions of the grave and its neighbour 15.19 were truncated by a medieval ditch, though the corpses were not disturbed. A lining of sandstone slates and ceramic tile was observed either side of the upper body, with a single cobble at the feet end, all set onto the base of the grave.
The lining on the south was inclined at c. 30° possibly the result of coffin collapse. An iron nail and a second possible nail were recovered from the grave fill. A copper alloy brooch dated to c. AD 125-225 was found in the grave fill some 0.07m above the skull. The grave was 0.46m deep cutting the natural to a depth of c. 0.30m.

Grave 15.19 (424): Male, 45+. W-E, 247°
The grave was 0.48m deep cutting the natural to a depth of c. 0.30m. There was a single small cobble at the feet end. The left leg was crossed over the right.

Grave 15.20 (427): Female, 17-25. W-E, 245°
The grave was 0.37m deep. Four nails were found towards the base of the grave and a single piece of granite was found against the northern side.

Grave 15.21 (423): Child, 10-12. W-E, 261°
The grave was cut into the natural to a depth of 0.14m, with the stone lining protruding some 0.06m above this level. The stone lining only occurred on the southern side of the grave cut. It was built of granite slabs set on edge at the base of the grave cut. Five nails were recovered from around the lower legs, probably from a coffin.

Grave 15.22 (447): Child, 9-10. W-E, 255°
The grave was discovered during the removal of a drain. Its upper body was removed by machine but salvaged. The legs were recorded in situ, confirming its west-east orientation. Six (unlocated) nails were recovered from the remaining grave fill, and suggest the presence of a coffin. The corpse seemed to have lain immediately to the south of grave 15.21, possibly with some grave intersection.

Grave 15.23 (448): Child, 5-6. W-E, 258°
The grave was discovered in similar circumstances to 15.22, but recorded in situ.

The grave was cut into the fill of ditch G10 to a depth of 0.21m. A incomplete copper alloy nail cleaner was found some 0.02m above the skull.

Grave 15.25 (449): Female, 25-35. W-E
The evidence for this grave comprised an intact skull with mandible found during the ground reduction of Area 1 following the excavation. It was probably associated to a small island of stratigraphy which was not available for excavation. The presence of undisturbed natural immediately to the west of this location suggests that it probably had its head to the west.

Grave 15.26 (346): Adult. W-E, c. 245°
Machine truncation left only the right leg and left lower leg. It cut into the natural to a depth of 0.26m.

Grave 15.27 (341): Female, 25-35. W-E, c. 240°
It was machine truncated from the neck down. It cut into the natural to a depth of 0.20m.

Grave 15.28 (169): Infant.
Relatively deep and large grave, cut into the natural to a depth of 0.33m. The bone survival was very poor, so that the corpse position could not be deduced. Four nails were located. Two were in the corners at the west end, one 0.24m and the other 0.09m above the base, with two more on the base of the grave some 0.80m to the east.

Grave 15.29 (308): Female, 17-25. W-E, 246°
Cut into the natural to a depth of c. 0.14m. The skull was mostly removed by later activity.
Grave 15.30 (322): Infant. W-E, c. 235°
It was discovered at the base of ditch G10, cutting into its primary fill. Its association with Phase 3 remains uncertain.

Grave 15.31 (309): Child, 10-12. W-E, 244°
It was machine truncated from the thighs upwards. The skull and arm fragments were recovered from an intrusive pit (316) derived from 15.31. It cut into the natural to a depth of 0.05m. An iron object was located near to the right foot, and may represent a coffin remnant.

Grave 15.32 (498): Female, adult. W-E
Found after disturbance by the builders. The tibiae were observed in situ, and were crossed, left over right.

Found immediately beneath 15.3. It was cut into the natural to a depth of c. 0.48m. There were distinct cuts for each grave. Two nails were recorded near to the head, but these may belong to the later grave 15.3.

Grave 15.34 (602): Female, 45+. W-E, 246°
Cut into the natural to a depth of 0.58m. Three nails at the head end suggest the presence of a coffin.

Grave 15.35 (593): Adult, 60+. W-E, 253°
Cut into the natural to a depth of 0.29m. Much of the upper skeleton had poor survival, apparently due to chemical weathering where the body overlay the natural subsoil. Survival was better where the skeleton overlay ditch G14. A single nail above the left shoulder may belong to the overlying burial 15.1. A Roman copper alloy nail/stud was found above the right arm.

Grave 15.36 (590): Adult. W-E, 252°
Also overlain by 15.1 and exhibited similar skeletal survival. The grave cut into the natural to c. 0.37m depth. Six nails were found in the grave. Three of these were very large and from their recorded positions demonstrated that the coffin sides had been nailed to the base board. Two nails located behind the head, some 0.28-0.30m above the base of the coffin, may relate to construction of the upper part of the coffin. The remaining nail was located adjacent to the right elbow, some 0.17m above the grave base. From its position it may belong to either 15.1 or 15.36.

Grave 15.37 (581): Adult. W-E, c. 250°
Mostly removed by ditch 16.5, with only the right arm and some ribs remaining. A single nail adjacent to the right shoulder on the base of the grave probably indicates a coffin. The grave cut into the natural to a depth of 0.22m.

Grave 15.38 (562): Adult. W-E
Observed in the sections of the machine trench. Tibia and pelvic fragments recovered from sections. It was 0.25m deep apparently just cutting the natural.

Grave 15.39:
Assigned to a line of three granite slabs within layer G1. The stones would seem to be from one side, probably the southern, of an east-west grave.
Discussion of Phase 3

Cemetery layout

The alignment and position of the Phase 1 and 2 boundary, formed by ditch G2 and subsequent ditches, seems to exert a definite influence upon the layout of the cemetery in this area. The evidence for boundary maintenance into the fourth century is discussed under Phase 2. It is uncertain which of the Phase 2 ditches, if any, provides a contemporary boundary for the cemetery though G11 and G12 are both candidates. None of the graves cut these features, and only two graves occur to the south of them. A number of the Phase 2 ditches are cut by graves indicating that they had become redundant by this time. It is possible that some were still open features and were deliberately backfilled, perhaps to allow a southern expansion of the cemetery. The most southerly graves, 15.24 and 15.30, have uncertain affiliation with the graves to the north of this line. Grave 15.30 (an infant) was found during excavation of the base of the Phase 2 ditch G10, the relationship remaining uncertain. The corpse may have been deposited during an earlier period, prior to the filling of the ditch. Grave 15.24 is a conspicuous outlier, located some distance from the other graves and the only example of burial with the head to the east. The grave cuts into ditch G10, which is broadly dated to the third-fourth century.

The limited area of the cemetery investigated, together with the effects of considerable truncation, precludes any conclusive statement as regards patterning. However, there are possible indications of grave rows particularly towards the west of the site. The majority of graves were discrete and apparently evenly spaced, but with some notable gaps. These could indicate vacant plots, cemetery features such as paths or structures or the positions of shallow graves truncated by later activity. The unused space around the Group 9 structure may suggest that it was a contemporary feature (and therefore wrongly assigned to Phase 1). Similar structures have been seen in other cemeteries as possible shrines or memorial structures (Barber et al. 1990, p.9).

There are two clear cases of superimposed graves, in each case only the later graves had stone lining. Grave 15.1 was inserted between 15.35 and 15.36, cutting the two earlier grave pits, but without disturbing the corpses. Grave 15.3 directly overlies 15.33, though there is evidence for two distinct burial episodes. A third possible example of grave intersection occurred with 15.21 and 15.22. They appeared to have separate cuts with slight intersection where there was stone lining of 15.21. All of the above examples might be seen as deliberate positionings perhaps comparable to the shared family plots seen in modern burial grounds.

Grave pits

The grave pits were rectangular with vertical sides and flat bases with plan dimensions appropriate for each corpse. Two examples of over-sized grave cuts relative to the corpse were recorded, 15.4 which contained an infant, and 15.28 which contained a 3-4 year old child. Grave depth was more variable ranging from 0.20m above the level of natural subsoil to 0.58m below. The original ground level was truncated by later activity, and cannot be ascertained. However, the survival of the Roman topsoil (layer G1) to a depth of 0.25m does provide a minimum level for the contemporary land surface. Furthermore, as the area is beyond the urban core, where an accretion of occupation and deliberate make up deposits might be expected, it might be assumed that there was a relatively shallow depth of deposit overlying the subsoil. The presence
of charnel material residual in later features and deposits, together with the evident ground reduction in some areas of the site, would suggest that there were once other shallow graves.

Stone linings

Twenty-two of the identified graves had some element of stone lining, though this figure could be an under-representation due to the limited survival of some graves. The linings were apparently all discontinuous and lacked a roof and for this reason are not described as ‘cists’ (following the distinction made by Clarke 1979, p.355). The discontinuous lining was not due to differential survival as some of the graves were of sufficient depth to indicate that this was a real observation (e.g. 15.18). Lining material was generally of stone slabs, predominantly granite but with some Dane Hills sandstone, Swithland slate and, occasionally ceramic building material such as brick and tile. Much of the material was re-used building material, evident from mortar adhering to the fragments. The linings were quite variable ranging from single stones (e.g. 15.19, 15.13) to the complete lining of the lower half of the grave (e.g. 15.15). Sometimes the lining was along one side only (e.g. 15.4, 15.21) or one end only (e.g. 15.7). The stone slabs were predominantly set on edge and rested on the base between the sides of the grave pit and the coffin/corpse. There were insufficient undisturbed graves to demonstrate any conclusive overall patterning, though it may be significant that where a grave sequence was demonstrable, the earlier graves (15.33, 15.35, 15.36) did not have stone lining. In a few examples the slabs are slightly offset from the grave sides with a linearity on the internal face. This has been interpreted as evidence of a timber coffin or grave structure (see below, p.23) with the stones added within the space between the coffin and the edge of the grave.

Graves with stone lining or packing, as distinct from true cist graves, have been reported from several Roman cemeteries in England (see references below). However, there may be an under-representation of the former with many being interpreted as the remains of disturbed or rough cists (e.g. Jones 1975, Fig 11, p.107 and Plate 5; Grainger and Mahaney). Various interpretations have been suggested for the practical and symbolic function of stone linings. At Lankhills, Winchester, linings of flint and tile were recorded in 38 graves, some with evidence for coffins, dating from c. AD 370 onwards (Clarke 1979, p.355-6). MacDonald (1979, p.428) suggests that the linings had a symbolic rather than practical function (as with the Newark Street examples there were often only one or two stones), and that they may be an aspect of Christian burial, possibly a symbolic imitation of the stone tomb of Christ. At the Bath Gate cemetery, Cirencester, there were 27 graves (from a total of 453) with evidence of some form of ‘stone packing’ but most of these had continuous linings: ‘the grave cuts were packed with stones on all sides of the wooden coffins and a pile of stone heaped on top’ (Viner and Leach 1982, p.95). The significance of this burial rite was regarded as problematic by Viner and Leach; they remarked upon the functional aspect of packing or wedging (an inadequately constructed?) coffin, and noted that the depth of burial precluded a tombstone or surface marker function (1982, p.95). Coffin packing would seem to imply that the stones were an integral part of coffin construction, possibly in the grave itself. A single example from Newark Street (15.7) may be interpreted as packing, though if coffin packing was a structural necessity it could be achieved by merely using earth. The coin evidence from Bath Gate shows that at least some of the graves can be dated to the fourth century, possibly to the latter half.
A marker function has been suggested at Butt Road, Colchester where a number of burials were found associated with stone and tile fragments along the sides or overlying corpses (Crummy and Crossan 1993, pp.93-104). A distinction is made between 'grave surface markers' and 'coffin/corpse markers'. The former group comprised 12 graves (from a total of 669 Period 2 burials) with evidence for either timber posts or stone and tile fragments acting as surface markers. Although several of the Newark Street graves were very shallow none could be demonstrated to have stones visible at the surface. Coffin/corpse markers of stone and tile were observed in some 22 of the Butt Road Period 2 inhumations, 19 of which had coffins. Period 2 burials were orientated west/east, lacked grave goods and date from 320/340 continuing into the late fourth century, if not into the early fifth (Crummy and Crossan 1993, pp.159-162). Stone linings were predominantly from final graves in a sequence. The markers were usually set on edge and placed between the side of the coffin or corpse and the grave pit. Often there were only a few stones, sometimes placed in a row along a particular side or with single stones set into the corners of the pit or centred along the sides. It is suggested that many such markers were set at coffin lid height. Grave and coffin/corpse markers were seen as attempts to 'prevent future disturbance of the coffin/corpse, or to facilitate its location for the insertion nearby of a related burial' (Crummy and Crossan 1993, pp.101-2). It might be added that the positioning of partial stone lining, such as along one side only, could therefore indicate the anticipated location of later burials. The Newark Street burials are remarkably comparable and a similar functional interpretation is favoured.

Close parallels for the use of stone linings in the region can be found at Great Casterton, Rutland, Ancaster, Lincs., Stathern/Eaton, Leics. and Ashton, Northants. At Great Casterton, partial stone linings of limestone slabs were observed in 10 of the 29 late Roman inhumations observed in 1966; some of these were placed around coffins (Grainger and Mahany undated). All bar one of the group lacked grave goods. The burial orientation of the group was quite diverse. An earlier group of burials recorded in 1959 some 50m from the latter group included numerous burials, orientated with head to west, some in 'rough cists of local limestone' (Grainger and Mahany undated). There was a lack of grave goods, though residual pot sherds suggested a TPQ date from the late third to second half of the fourth century. Such grave furnishing are seen as 'very simple token structures' used as a means of 'enhancing' the burials. At Stathern, Leics., three or four burials observed during limestone quarrying in 1941 and reported by F. Cottrill had small stones set on edge along the grave, with larger stones at head and feet. Two associated colour coat vessels provide a TPQ of third century and later (Leics. Museums SMR, 73 SE L). At Ashton, Northants. two contemporary areas of burials were recorded both having graves with 'stones placed at various points along the body'. The 'backyard burials' had grave furniture including pots and hobnail boots and the 'formal cemetery' had rows of west-east burials lacking grave goods (Watts 1991, p.73 and Fig.6). Watts has suggested that the stone lining at the Ashton cemeteries (and also Ancaster and Cannington) represent contemporary pagan and Christian beliefs, with the lining seen as an earlier pagan trait acceptable to the early church. It is not viewed as a criterion for the identification of Christian cemeteries by Watts. However, a cursory examination of ten of the thirteen sites proposed by Watts as probable Christian reveals that eight of these have some stone-lined graves (Poundbury Camp 3; Green 1971, p.154: Butt Road II, Colchester; Crummy and Crossan 1993, pp.93-104:
Ashton, formal cemetery; B. Dix pers. comm. in Watts 1991, p.73 and Fig.6, p.92: Lankhills Feature 6; Clarke 1979, pp.97-8; Cannington; Rahtz, 1977, p.58: Bradley Hill Group III; Britannia 1 (1970), p.267 and Britannia 4 (1973), pp.310-311: Ancaster; Wilson 1968, pp.197-9 ref. in Watts, 1991: Brean Down; ref. in Rahtz, 1977, p.60

The possibility that 'stone and tile packing' may be a later fourth century burial rite was mentioned by Clarke (1979, p.355). The Newarke Street evidence, together with that from the aforementioned late Roman cemeteries, supports this view and suggests that discontinuous stone lining was a deliberate burial tradition during this period, with the stones serving as coffin markers. This is supported by the occurrence of stone lining in cemeteries, or phases thereof, where there is a distinct lack of grave intersection. Many of these cemeteries are thought to have a Christian identity. Early Christian burials can be seen to be carefully laid out to avoid grave intersection and disturbance of previous burials, probably reflecting a belief in physical resurrection (Watts 1991, pp.55-7). Stone linings, coffins and plaster packing can all be viewed as different practical measures to prevent subsequent disturbance of the graves and to preserve the physical integrity of the body while it awaited resurrection at the time of the Second Coming (Merrifield 1980, p.78). In a Christian context it is possible that stone lining also had a symbolic aspect, representing the rock cut tomb of Christ, as suggested by MacDonald (1979, p.428).

There is no evidence for above ground markers in the form of tombstones or wooden posts, suggesting that the graves were probably visible as small mounds. This seems to be the case in other late Roman inhumation cemeteries such as Bath Gate, Cirencester where none of the 453 burials were marked (Viner and Leach 1982, p.97) and Butt Road, Colchester where only 12 of 669 Period 2 burials showed evidence of marking (Crummy and Crossan 1993, p.93).

Coffins

Soil conditions were such that timber coffins did not survive physically, nor as a stain, and therefore burials in coffins could only be deduced from the presence of nails. Differences in the grave fills also provided supporting evidence for coffins (e.g. 15.1) as did stone linings which had been packed between the sides of the grave pit and coffin edge, producing an internal linearity to the lining (e.g. 15.7, 15.15). Analysis of nail positions suggests that 21 graves contained coffins, though limitations imposed by excavation conditions and the effects of considerable truncation means that little can be said about construction techniques. Well recorded, deeper graves with good survival demonstrated that the coffins were not necessarily secured with nails symmetrically. Nails may even indicate the strengthening of weak joints in an otherwise joined timber construction. A preserved timber coffin excavated at Great Holme Street in 1976 (J. Lucas, pers comm) was jointed with treenails (wooden pegs) and demonstrates that burials in coffins may not always be evident. Given such difficulties in identification it may be better to state that no graves produced positive evidence for the lack of coffins.

Corpse orientation and position

Individual corpses were aligned within an arc of 26°, broadly reflective of the line of the ditches G11 and G12. The range of variation is not unexpected nor viewed as particularly significant. The position of the head, however, is of significance, with all
placed to the west of the grave, with one exception. There is a good body of evidence to show the increased frequency of orientated burials with heads to west in fourth century Romano-British cemeteries. MacDonald (1979, pp.425-6) has suggested that orientated burial was a pagan adoption in the fourth century, as a response to a popular sun cult (Sol Invictus). The association of Christianity and orientated burials is long established in archaeological accounts despite the many provisos (e.g. Rahtz 1977, p.54; Green 1977, p.47; Watts 1991, pp.53-5). Butt Road, Colchester is a good example where it can be shown that there was a rapid and complete adoption of West-East burials c. 320-40, with an associated improvement of cemetery organisation (Crummy and Crossan 1991, pp.159-60; Crummy 1991, p.266). It has been convincingly argued that this change of burial ritual is associated with the adoption of Christianity (Watts 1991, pp.192-201). The evidence for religious beliefs at the Newark Street cemetery is presented below.

The attitude of the corpse was consistently of a supine and extended body. There is some variation in the position that the head faces, though this may have resulted from post-depositional processes. Arm placement is structured but varied, with arms placed along the side of the body or flexed across the upper leg, pelvis, waist and chest.

Burial chronology and dating

The lack of deliberately deposited finds that may be interpreted as grave goods does cause some problems with the dating of the cemetery. A possible start date may be obtained by considering the stratigraphic links with dated pre-cemetery features and residual finds within the fills of the grave pits. It is assumed that the cemetery activity was short-lived. The lack of disturbance to the graves, given the fairly close spacing, would seem to suggest that the area was not used for interment for a long period, with any earlier graves still being visible or known about from a cemetery plan. The only examples of sequential burial (see above p.20) have been argued as deliberate, their careful positioning suggests that the earlier burials were still visible or known about.

Some seven burials (15.1, 15.2, 15.3, 15.7, 15.34, 15.35, 15.36) cut the north-south ditch G14, which has been dated to the third century or later. Six burials (15.10, 15.14, 15.31, 15.20, 15.21, 15.22) cut the ditch G13 which is also dated to the third century or later. Grave 15.16 cuts into Ditch G4, dated to the mid-second-early third century. Pottery sherds were found in several graves, with a date range throughout the Roman period. There was no evidence to suggest that the broken pottery was part of the burial ritual. Of particular note are graves producing identifiable fourth century pottery (15.3, 15.11, 15.19). Coins were recovered from three graves (15.3, 15.7, 15.8) with respective issue dates of AD 364-378, 347-8 and 268-70. The coincidental positions of the coins within the graves, close to knees, may suggest deliberate deposition (see below p.25). Although the dating evidence is somewhat limited it does suggest that the burials were interred during the second half of the fourth century, at least one of which was not earlier than AD 364. If the coin found in 15.8 was a deliberate offering its earlier date is problematic, and counters the argument for the cemetery activity as short-lived and occurring in the later fourth century. The coin was taken out of circulation in the later third century and would have had no monetary value by the fourth century (R. Buckley and R.A. Rutland, pers. comm.). It is possible that the coin was curated for a non-monetary function. A terminal date for the cemetery activity is also problematic partly due to the difficulty in dating the ceramic evidence in the latter decades of the Roman period. The possibility that stone lining of
graves is a late fourth century burial fashion has been discussed above; the dating is consistent with other sites.

Grave offerings

Preliminary assessment of the site led to the conclusion that there was no evidence for deliberate deposition of finds within the graves, and any such finds were probably residual from earlier features (Cooper 1994, p.171). However, it has been suggested that this hypothesis can be questioned, particularly for the coinage (D. Mattingly, pers. comm.), and should therefore be qualified. Details of finds associated with graves are given by Harvey (p.65), and their provenance presented above (pp.12-19).

There was no evidence that the pottery recovered from the graves indicated grave offerings. It has been shown that the cemetery activity was probably short-lived, and restricted to the late fourth century. A measure of residuality is indicated by the date range of pottery recovered from the graves. Of the 328 sherds recovered from grave fills only 16 pieces (4.9%) can be dated to the fourth century, the remainder being early Roman or not closely datable. Conjoining sherds, as might be expected if pottery vessels had suffered post-depositional damage or if the deliberate breakage of pottery was a part of the burial ritual, were not found. It would seem that pottery was incidentally introduced into the graves with the back-fill. The ferrous finds can all be interpreted as coffin fittings. Excluding the coins, there were seven non-ferrous finds from the graves (see grave descriptions above and Harvey, below p.65). Quern fragments were located in two graves. The fragment from 15.2 was incorporated into the stone lining, and may well represent the ad hoc re-use of available material such as the building stone. The other fragment was located on the base of grave 15.15, between the legs of the corpse. It is uncertain whether this represents deliberate deposition. The brooch from 15.18 had a floruit of c. AD 125-225 (Mackreth below p.66) and has to be considered residual. The bone needle fragment from 15.36 is probably of a first or second century date (Harvey below p.68), and may also be considered residual. The damaged nail cleaners from 15.24 have a possible mid to late third century date and so cannot be dismissed as residual. It remains uncertain whether this, the furniture nail/stud from 15.35 or the hair pin fragment from 15.2 could represent deliberate offerings. There was no evidence that the plant and animal remains recovered from graves represented deliberate offerings (see Monckton, p.75 and Baxter, p.84).

Of the four Roman coins found stratified in Roman deposits, three were recovered from the lower fills of graves, all located by the knees. This pattern suggests that the location of the coins is not random and would seem to represent structured deposition. Deliberate grave offerings of coins are known in Roman Britain, but are generally located in the mouth (Philpott 1991, pp.364-371) and interpreted as representing Charon's fee (Watts 1991, p.71). Phillpot has recorded eleven other examples of coins located from between the legs or close to the knees, from some 223 listed burials with associated coinage, though there is no obvious patterning with regards to similar dates or other aspects of burial practice.

Religious beliefs

The difficulty of inferring belief systems and social stratification from funerary remains can be considerable as Ucko has warned (1969, pp.262-80). In Romano-British archaeology there has been an oversimplification with religion often viewed simply as a
Pagan/Christian dichotomy (e.g. Merrifield 1980) or, otherwise, the reporters of
cemetery sites have been overcautious preferring to avoid the minefield and leave all
options open. However, many of the attributes of the burials from the Newark Street
evacuation have been described in cemeteries elsewhere as indicative of Christian
communities. The Christian burial of popular conception is seen as an extended
inhumation with the head to the west of the grave, possibly in a shroud, and coffin,
and devoid of the pagan trappings of food, drink and grave goods (Thomas 1981,
p.231). There are many cautionary tales demonstrating the oversimplification of this
view as such attributes can also be found in pagan contexts. The problems of
identifying religion in the Romano-British archaeological record have recently been
considered by Watts (1991) who analysed twenty-nine cemeteries for internal and
external evidence of Christianity. For each cemetery (internal evidence) she proposes
sixteen criteria of burial ritual and accords these relative weightings (Watts 1991,
pp.38-98). The criteria are presented below (in italics, with Watts’ weighted scores in
parentheses), followed by a brief discussion of the evidence from the Newark Street
site.

- **Christian evidence in situ** (10), in common with the majority of Watts’ sites, was
  absent.
- **West-east orientation** (10) was seen in all discernible graves within the cemetery zone
defined by the east-west ditch line.
- **Undisturbed burials** (10) were also the norm; where intersection occurred (two,
  possibly three, examples) there was no corpse disturbance, and it is suggested that
they could all be deliberate, careful positionings.
- **Supine extended position** (10) was consistent.
- There was an **absence of decapitated burials** (9).
- **‘Plaster’ burials** (2), that is burials with coffins packed with lime or gypsum plaster
  (after Green 1977, p52), were not found in the recent excavation. However, and
perhaps significantly, such burials have been located in Newark Street. In 1873
two ‘leaden coffins…partly filled with lime’ were found some 35 metres to the
north-west (TLAS IV, p.246).
- **Neonatal/very young infants given equal respect** (9): as seen in grave 15.28 where an
  infant aged to 3-6 months is provided with a coffin and a relatively deep, over-
proportioned grave cut. Another infant burial, 15.30 was located but its date and
affiliation with the defined cemetery is uncertain.
- **Contemporaneous pagan burials** (10) have been located in Leicester cemeteries. At
  least five burials with fourth century vessels have been listed by Maull. Re-
examination by R.J. Pollard (pers. comm.) of the pottery reported in Dare (1927,
pp.33-57) has also identified additional burials with fourth century vessels,
previously not assigned a date or, worryingly, assigned an earlier date. Two of the
burials located on the corner of Newark Street and Oxford Street were associated
with ceramic vessels (Dare 1927, p.53) one of which has been re-assigned a mid to
late fourth century date by Pollard.
- The presence of a **mausoleum or enclosure** (7) at Newark Street is unconfirmed. The
cemetery is certainly bounded to the south but due to the limited area available the
cemetery cannot be described as enclosed. Indirect evidence that the graves could
represent a distinct social group is perhaps seen in the cohesive burial rite, particularity the incidence of stone lining.
- There were no **focal graves** (7).
The following criteria refer to absence of grave goods, seen as evidence of pagan customs, with additional weighting given if the burial rite can be shown to be absent but present in contemporaneous pagan cemetery.

- There was an absence of vessels (5).
- No remains of animals or birds (7) were found to be deliberately deposited. Fragments of animal bone were found in several grave fills, but evidence of any deliberate deposition was absent.
- There was an absence of hobnails, the remains of obvious deposition of footwear (3 if only absent). However, hobnails in a contemporaneous pagan cemetery (alternative score of 6) is possibly seen at Free Lane (Lucas 1992, p.186) where residual pottery in the grave fill is dated to the third century.
- Absence of coins in mouth (3) was seen at Newark Street, but there is no record of a coin in mouth in a contemporaneous pagan cemetery (alternative score of 6).

External evidence, that is contextual evidence for a Christian community in the area, is not considered here: Leicester and its hinterland has very little evidence for Christianity in the Roman period comprising only a single tile with a chi-rho monogram found close to the south of the Forum (Britannia 7, p.387). Suffice to say Leicester only scores 5 from a possible maximum score of 41 for external evidence of Christianity.

Watts applied the criteria to twenty-nine cemetery sites which produced a range of scores from 2 to 95 (from a possible maximum of 108) for internal evidence and from 7 to 102 if the external evidence is incorporated (from a maximum total of 149). A possible Christian identity is suggested for the thirteen highest ranking sites with a score range of 57 to 102 (Watts 1991, p.89). Application of the criteria to the Newark Street site produces an overall score of 86. According to Watts’ criteria, this places the site as a good contender for a Christian identity despite the discounting due to a lack of external evidence. Admittedly, the adoption of such a ‘shopping list’ of attributes is not ideal, but it does provide a relative measure of many accepted attributes. Additional support for such an identity for the Newark Street site is the common and consistent burial rite, in particular the incidence of stone lining (see above p.23). Stone lining is not identified by Watts as a criterion, though it is an attribute observed in at least eight of the thirteen sites that she proposed as Christian.

Other burials in the Newark Street area (illus. 10)

By 1874 sufficient numbers of burials had been found in the Newark Street area for it to be recognised as the ‘cemetery of Roman Leicester’ (TLAAS 4, p.248). The burials recently recorded at Newark Street undoubtedly form just a part of a larger cemetery area, possibly a ‘southern extra-mural cemetery’ as defined by Dare (1927, pp.33-57). He inferred that Leicester had ‘at least one burial ground of considerable size, situated outside the southern wall of the town...an area bounded today by the lines approximately of Millstone Lane, Newark Street, Pocklington’s Walk, and the line of Oxford Street and Southgate Street (Dare 1927, p.34).’ The definition of separate extra-mural cemeteries for Roman Leicester (Haverfield 1918; Dare 1927; Esmonde-Cleary 1987, p.104) should perhaps be treated with some caution: The burial record for Roman Leicester is limited to c. 200 inhumations and 60 cremations, and primarily based upon chance observations during construction work. It is therefore biased to areas of such work, and possibly to the more conspicuous burials furnished with lead
10. Location of Roman burials in the Newarke Street area.

coffins and grave goods. This is demonstrated by a relative lack of references to discoveries in the area prior to 1873, despite the cemetery area being recognised by that date (TLAAS 4, p.248). However, a synthesis of recorded burials beyond the southern wall (based upon the work of Maull and the Leics. SMR) does highlight a concentration of burials in the Newarke Street area with a fall off close to the boundaries suggested by Dare. The ditch complex G2+ is seen to act as a boundary to the inhumations at the Newarke Street site, and may have been more extensive, perhaps serving as a southern boundary to the larger cemetery. However, a projection of this ditch line demonstrates that the conjectured boundary is not respected by a group of burials c. 40m to the east of the site.

The cemeteries of Roman Leicester would have had some spatial differences which reflect changing burial traditions through time, the areas in use at any given time and possibly zoning of different social groups. The burials recorded in the Newarke Street area are predominantly inhumations, but it is uncertain whether this is due to an observational bias. It may indicate that the cemetery in this area dates from late in the Roman period (at which time inhumation became the dominant rite in the Roman world). A greater concentration of cremation burials is seen to the east of the Roman town (Churchgate, Gallowtree Gate and Humberstone Gate) which might suggest a different focus for these earlier burials. The dating of burials from observations in the 19th and early 20th century around Newarke Street is problematic as it is not always certain whether the finds were truly associated, especially when burials were reported
by workmen. Indeed, of the burials reported by Dare none was recorded as having grave cuts, and finds association appears to be inferred from general proximity. The problem of dating is also compounded by the possibility of erroneous pottery identification (as exemplified by several re-interpretations by Dr. R. Pollard of ceramic dates from sites reported by Dare). For these reasons it is impossible to detect any definite chronological development of the cemetery in this area. However, it has been demonstrated above that the recently excavated burials are likely to date from the latter half of the fourth century, and that the area shows no evidence for earlier burials. It would seem that the excavated cemetery area had only come into use quite late in the Roman period, and may represent a southern expansion of the cemetery.

Stone lined graves extended beyond the limits of excavation to the north, west and east of the site but none is reported from previous observations in the area, nor from any other site in Leicester. The adjacent building plot to the west was monitored by Dare during ground preparation for the present building in 1926, but with ‘rather disappointing’ results. Three in situ inhumations and two further disturbed burials were observed at all of the level of the clay natural subsoil (Dare 1927, pp.53-54). Two of the burials were associated with ceramic vessels, one of a late second-fourth century date and the other dated to mid-late fourth century (Pollard pers. comm.), indicating contemporary cemetery activity with the Law School burials but with a different burial treatment. Dare also noted the previous discovery of a lead coffin on the site in 1911 (1927, Plate 2). The contrast of burial frequency with that found on this excavation could indicate a fall off in the cemetery zone immediately adjacent to the Tripontium Road, but could easily result from other factors. The lack of recognition of grave cuts by the observer might cause any graves not at the level of natural to escape detection. This certainly occurred during the recent excavation when initial machining of Areas 1 and 3 led to the discovery of only two of the twelve burials now known to exist. The lack of stone-lined graves in this area could result from such graves, especially those with few stones, escaping detection. There are no records of burials from the construction of the Elfed Thomas building in 1930. Many burials could be preserved beneath the building, as evident from Areas 1 and 2, though a good proportion must have been disturbed by cellaring. While it is possible to interpret the recently excavated burials as representative of a distinct social group buried in a separate zone of the cemetery, evident from the cohesive burial treatment, it is impossible to provide an estimate of the spatial extent of such a group. A tentative Christian link may be suggested with other west-east burials lacking grave goods in the area (28 of the 32 burials with details of orientation listed by Maull) and the plaster-packed lead coffins some 35m to the north-west.

The distribution of lead coffins demonstrates a distinct clustering in the Newark street area, with nine of the fourteen examples from Leicester proximally located to the north, west and east of the site. Eight of the lead coffins contained west-east burials with no grave goods (the orientation of the remaining burial was not recorded). The other five lead coffins were found close to the East Gate (two from Humberstone Gate and three from Charles Street) and, together with other burials in that area, have been (erroneously) taken to indicate the line of the Garthlee Road (Esmonde-Cleary 1987, p.104). The line of this road as it approaches the town is still unconfirmed, but an observation during the construction of Waterloo Way suggested that it was heading in the direction of the south gate (Leics. Museums’ SMR). The Newark street cluster was interpreted by Esmonde-Cleary as indicating the disposition of the wealthy close
to the Tripontium Road which, due to its connection with Watling Street, would have been the principal route to the south (1987, p.104). This interpretation can be slightly adjusted and amplified, seeing the burials as clustered near to the intersection of two important link roads with the south of the province. Indeed, as the Newark Street lead coffin burials flank the modern (and medieval) road, it is tempting to speculate that the line of the Gartree Road became fossilised where it entered the town, in a similar manner to the Tripontium Road with Oxford Street/Southgates.

**Phase 4: Medieval** (illus.11)

Group 16: Ditches (16.1-16.6)
Group 17: Miscellaneous features (17.1-17.20)
Group 18: Soil layer
Group 19: Trench

Group 16 comprises five ditches observed in plan and a possible ditch (16.6) recorded from the section of the service trench near to the site entrance. With the exception of 16.1 the observations were limited and recorded during watching brief conditions. The dating evidence is limited to 12 pot sherds and a floor tile fragment. Pottery of 12/13th century date was recovered from 16.1, 16.2, 16.3 and 16.4, with the latter also producing later 14th/15th century material.

Group 17 comprises twenty small pits and irregular cut features. Many were recorded as post holes, but their identification is questionable. Due to their irregularity and lack of spatial patterning they should not be seen as evidence of structural activity. Dating evidence is limited to medieval pottery (43) and ridge tile fragments (4), with a predominance of 12th/13th century material.

Group 18 comprises eleven observations of a medieval soil, mostly surviving as a slumped layer into the upper portions of the phase 1 and 2 ditches. Dating evidence is limited to medieval pottery (65) and ridge tile fragments (14), with a range from the Saxo-Norman to the late medieval period.

Group 19 comprises three recorded segments of a large trench extending across the southern half of site. Only the northern edge of the feature was within the limits of excavation. This was a near vertical edge cutting into the southern edge of ditch G2, breaking very gently to a flat base. It effectively terraced into the natural subsoil to a depth of 0.30m. The fill was of a loamy matrix but mixed with pockets of re-deposited natural clay, with abundant small pebbles in areas. In section there were indications of a laminated fill, possibly tip lines, dipping from north to south. At the base of the feature there appeared to be a dirty interface with the natural, possibly a trample layer. It appears that a large cut feature had removed a considerable amount of earth, and was some time later filled with dumped material. The area may have been a quarry, possibly removing an earlier surface, but this remains uncertain. Clay extraction would not seem feasible as this would be expected to produce a deeper more irregular pitting. Dating evidence is limited to medieval pottery (38) and ridge tile fragments (5), with a range from Saxo-Norman to the late medieval period.

**Phase 5: Early post-medieval** (illus.11)

Group 20: Bedding trenches (20.1-20.21)
Group 21: Miscellaneous features (21.1-21.32)

Group 20 comprises twenty-one sub-rectangular features grouped either by their regular layout or similar shape and fill descriptions. They contained fills of a dark charcoal stained loamy matrix with pockets of redeposited natural clay and frequent charcoal inclusions. Dating evidence for the group was limited (29 pot sherds, 1 tile fragment and 1 ridge tile fragment) and
comprises medieval and post-medieval material. A 16th to 17th century date seems likely for the group. Group 21 features include many ephemeral features and a few small pits, some of which were recorded as post holes, but are unconvincing as such due to the lack of any discernible structural function. They could well represent other horticultural features such as irregular planting holes.

**Phase 6: 17th century onwards** (illus.11)

Group 22: Pits (22.1-22.5)

Group 22 comprises four pits and a possible post hole producing pottery from the mid 17th century onwards.
Phase 7: 19th-20th century (illus.11)

Group 23: Structural features, scaffold pits and service trenches (23.1-23.19)

Discussion of Post-Roman Activity (Phases 4-7)

The earliest post-Roman material comprised ten sherds of Saxo-Norman pottery residual in later features. The Phase 4 ditches are not securely dated due to a paucity of finds and lack of stratigraphic sequence but, taking the ceramic evidence at face value, at least three of the ditches could represent 12th to 13th century activity. This probably represents plot layout in the area between the medieval precursors of Oxford Street and Newarke Street. The predominance of earlier medieval material as a proportion of the whole post-Roman ceramic assemblage might suggest unrecognised activity associated with this layout. The function of the large trench G19 is uncertain, but does appear to represent removal and dumping of deposits.

The Group 20 features have been identified as 16th to 17th century bedding trenches (P. Courtney, pers. comm.), probably cut to receive manure or compost. Similar dated features at Usk were thought to represent small-scale production of garden produce following the adoption of more intensive horticultural techniques from models developed in the Low Countries together with the adoption of new crops during this period (Courtney, forthcoming, pp.14-16). The general lack of typical backyard features, such as pits, wells and latrines, throughout the medieval and post-medieval period could be due to the distance of the site from buildings fronting onto Oxford Street and Newarke Street, rather than indicating an absence of occupation in the area.

Conclusion

The inevitable focus of past study into Roman Leicester has tended to be upon the area enclosed by the late second century defences with some notable, but rare, exceptions mainly in the western and northern extra-mural areas (Lucas, forthcoming; Finn 1993, p.93-5). The recent excavations at Newarke Street and Bonners Lane (Finn, forthcoming) have provided an opportunity to investigate a relatively unknown area outside the historic town.

The earliest structural evidence is from the late first-mid second century, and appears to indicate settlement activity in the area. Due to the poor understanding of the Roman urban topography in this area it is not certain whether such evidence points to a more extensive settlement to the south of the town, prior to the construction of the defences, or to some ribbon development along the Gartree Road. The activity is bounded by a ditch line to the south which is maintained by re-cutting throughout the Roman period. The excavations provide little evidence from the late second to early fourth century apart from the maintenance of plots, but it would be dangerous to draw any firm conclusions regarding settlement decline from the small area investigated. The area was used as a burial ground from the latter half of the fourth century, possibly indicating a southern expansion of the cemetery in this area. The cemetery activity is also bounded by the established ditch line. The recorded burials provide a record of burial treatment for a section of the later fourth century urban population of Leicester, and provide rare evidence of the people themselves. The graves display many attributes that could indicate a Christian identity, comparing well with other elected Christian sites. Skeletal analysis has provided information about the structure of the sampled population, and important evidence regarding their health, diet and physical characteristics. A rare example of the surgical procedure of trephination was identified.
Esmonde Cleary (1987, p.104), in a consideration of the extra-mural areas of Roman Leicester, stated that ‘as with evidence for occupation, the cemeteries have been much disturbed by later developments, and little can be usefully said about them.’ The recent results from Newarke Street and Bonners Lane demonstrate that this can be refuted.

**Specialist reports**

**Skeletal Analysis**

Jennifer Wakely with a dental report by Robert Carter

The report covers aspects of the demographic structure of the population, metrical and non metrical variations, health and disease (Palaeopathology) and a report on the dentitions by Mr R. Carter. The original site context numbers are used in the report for recognised graves and for other contexts yielding human bone. A full catalogue of skeletons and other contexts with human bone is lodged with the archive. Age and sex estimates have been presented in the previous grave inventory. Concordance of context number and grave sub-group number can be gained from the inventory. Abbreviations in the report: M=Male, F=Female, I=Indeterminate, J=Juvenile

**The Structure of the Population**

The excavated material consisted of 30 complete or almost complete skeletons, and eight fragmentary skeletons from recognised graves. In addition, several post-Roman contexts contained human bone residual from disturbed burials. Some of this could be related to the complete burials, but most of it could not, and must therefore represent burials disturbed or destroyed during the use of the site prior to excavation. From the skeletons and the charnel material, the remains of a maximum of 54 individuals were identified: 11 adult males, 12 adult females, 20 skeletons whose sex could not be determined due to incompleteness or fragmentation (indeterminates) and 11 children (aged 17 years or less). In general the bone condition was poor. The ends of bones were often missing, and their external surfaces eroded away. Unfortunately this limited the possibilities both for measurements, sex and height determination and the identification of disease and injury. The teeth were better preserved than the bones and a detailed dental report was possible (see below pp.44-9). Little valid demographic analysis is possible on a small sample such as we have from Newarke Street. Age was determined in adults by assessment of the degree of wear on the molar teeth and by the appearance of the joint (pubic symphysis) between the two halves of the pelvis (Brothwell,1981; Katz and Suchey,1986). The ages of individuals dying before the age of 18 were estimated from the eruption of the teeth and the stage of development of the bones, especially the fusion of the epiphyses (ends) to the main body of the bone (Brothwell, 1981). The practicability of all these techniques was reduced by the state of the bones and only 33 specimens could be assigned to age groups (Table 1).

<table>
<thead>
<tr>
<th>Age Range (years)</th>
<th>Number of Skeletons</th>
<th>Age Range (years)</th>
<th>Number of Skeletons</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>12</td>
<td>21-25</td>
<td>M 0 F 4</td>
</tr>
<tr>
<td>3-5</td>
<td>1</td>
<td>26-30</td>
<td>M 2 F 5 J 2</td>
</tr>
<tr>
<td>6-10</td>
<td>3</td>
<td>31-35</td>
<td>M 1 F 0</td>
</tr>
<tr>
<td>11-14</td>
<td>3</td>
<td>36-40</td>
<td>M 0 F 1</td>
</tr>
<tr>
<td>15-17</td>
<td>0</td>
<td>41-45</td>
<td>0</td>
</tr>
<tr>
<td>18-20</td>
<td>0</td>
<td>45+</td>
<td>M 5 F 1 J 3</td>
</tr>
</tbody>
</table>

Table 1: Numbers of ageable individuals dying in each range
A predominance of females dying in the younger age groups suggests a high mortality associated with pregnancy and childbirth, leaving more of the male population to survive into the later years.

**Metrical and Non Metrical Analysis**

**Height**

This could be ascertained in 17 skeletons using the formulae developed by Trotter and Glaser (1952). The heights of juveniles cannot be determined because of the incompleteness of the bones prior to epiphyseal fusion.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No.</th>
<th>Range (m)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>7</td>
<td>1.76, 1.70, 1.75, 1.70, 1.71, 1.77, 1.61</td>
<td>1.71</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>1.70, 1.61, 1.61, 1.59, 1.51, 1.58, 1.58, 1.62, 1.59</td>
<td>1.59</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>1</td>
<td></td>
<td>1.74</td>
</tr>
</tbody>
</table>

Table 2: Height of individuals

Comparison with other Romano-British cemeteries, for example, Cirencester M=1.69, F=1.57 (Wells 1982), Trentholme M=5'7" F= 5'1" (Wenham 1968), Poundbury M=1.67 F=1.57 (Farwell & Molleson 1993) shows that the people of Leicester were of similar height to the inhabitants of other Romanised settlements. Physically the males appeared from the evidence of muscle attachments on the bones to be robust and muscular, suggesting a high level of strenuous physical activity. Female skeletons on the other hand are noticeably light and slender.

**Cranial Indices**

The cranial index (maximum width x 100 ÷ maximum length) gives a measure of skull shape. Skulls are either dolicocephalic (long headed), brachycephalic (broad headed) or intermediate (mesocephalic). Many of the skulls were in pieces and so impossible to measure. No juveniles were measurable. The data from those from whom trustworthy measurements were obtained are summarised below.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No.</th>
<th>Min.</th>
<th>Max.</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5</td>
<td>68.75</td>
<td>76.08</td>
<td>74.06</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>70.94</td>
<td>78.88</td>
<td>74.91</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>1</td>
<td></td>
<td></td>
<td>73.91</td>
</tr>
</tbody>
</table>

Table 3: Cranial indices

Average indices thus fall into the dolicocephalic (long headed) range (Brothwell 1981) with some skeletons in the lower end of the mesocephalic (middle) range of head shapes. These are similar to, but slightly more dolicocephalic than those found in other Romano-British cemeteries (Wells 1982; Farwell and Molleson 1993), though this could be a product of small sample size.

**Platymeria and platychnemia**

These indices show the degree of flattening of the femur (platymeria) or the tibia (platychnemia) in either an anteroposterior or a lateral direction. Opinions differ as to the cause of flattening of the leg bones, ranging from nutritional factors (Buxton 1938) to habitual levels or directions of mechanical stress caused by movements (Lovejoy et al. 1976). Due to the poor condition of the limb bones in most of the skeletons very few were suitable for this type of analysis. Analysis was inappropriate for juveniles.
<table>
<thead>
<tr>
<th>Sex</th>
<th>No.</th>
<th>Min.</th>
<th>Max.</th>
<th>Average</th>
<th>No.</th>
<th>Min.</th>
<th>Max.</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>3</td>
<td>74.6</td>
<td>103.7</td>
<td>84.4</td>
<td>3</td>
<td>62.6</td>
<td>75.3</td>
<td>69.52</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>73.6</td>
<td>101.1</td>
<td>86.9</td>
<td>4</td>
<td>62.5</td>
<td>93.5</td>
<td>76.85</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>2</td>
<td>75.3</td>
<td>98.4</td>
<td>87.87</td>
<td>4</td>
<td>69.9</td>
<td>93.5</td>
<td>79.76</td>
</tr>
</tbody>
</table>

Table 4: Platymeric and platycnemic indices

Platymeric indices below 85 (Brothwell 1981) are regarded as platymeric, i.e. anteroposterior flattening of the upper femoral shaft. While the average male index just comes into this category the indices for females and indeterminates show no evidence of platymeria. Platycnemic indices below 62.9 (Brothwell 1981) are classified as platycnemia, showing transverse flattening of the shaft of the tibia. The skeletons from this site fell either into the eurymeric (antero-posterior flattening) or mesomeric (middle) range. These figures should be interpreted cautiously because of the small number of skeletons whose legs could be measured. In three of the female skeletons and one male there was a large difference (over 10 points) between the indices of the two legs. If we accept mechanical factors as important in the causation of variations in the shape of the leg bones, these asymmetries could be evidence of some occupation where one leg was used more than, or in a different manner to, the other.

Non metrical variations or traits

Non metric variations or traits are minor anatomical variations between individuals. They are not abnormalities but represent the genetic variability of any human population. Cranial and postcranial traits are recognised and recorded as either present or absent. Most only appear in adolescence. They may sometimes give an indication of family relationships, e.g. if two or more skeletons are buried in a common grave. This was not possible in the Newark Street material, where very few traits, shown by few individuals, were recorded. An illustrated description of the cranial and postcranial traits normally recorded is given by Brothwell (1981). The tables below show the numbers of cases recorded of each cranial and postcranial trait present. Commonly one individual showed more than one trait.

<table>
<thead>
<tr>
<th>Cranial non metric trait</th>
<th>Affected Skeletons (context)</th>
</tr>
</thead>
<tbody>
<tr>
<td>metopic suture</td>
<td>176</td>
</tr>
<tr>
<td>lambdoid ossicle</td>
<td>352, 488, 567</td>
</tr>
<tr>
<td>ossicle at lambda</td>
<td>176, 567</td>
</tr>
<tr>
<td>epipteric bone</td>
<td>449</td>
</tr>
<tr>
<td>sagittal ossicle</td>
<td>567</td>
</tr>
<tr>
<td>parietal foramen</td>
<td>424, 449, 488, 526, 530</td>
</tr>
<tr>
<td>supraorbital foramen</td>
<td>176, 341, 585</td>
</tr>
<tr>
<td>double mental foramen</td>
<td>574</td>
</tr>
<tr>
<td>mastoid suture</td>
<td>598</td>
</tr>
<tr>
<td>mylohyoid bridge</td>
<td>488</td>
</tr>
<tr>
<td>variations in foramen ovale</td>
<td>538</td>
</tr>
<tr>
<td>torus palatinus</td>
<td>449</td>
</tr>
<tr>
<td>torus maxillaris</td>
<td>176</td>
</tr>
<tr>
<td>torus mandibularis</td>
<td>176</td>
</tr>
</tbody>
</table>

Table 5: Incidence of cranial non-metric traits
<table>
<thead>
<tr>
<th>Postcranial non metric trait</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sternal foramen</td>
<td>311</td>
</tr>
<tr>
<td>Atlas posterior bridge</td>
<td>488</td>
</tr>
<tr>
<td>Atlas lateral bridge</td>
<td>176, 341, 488</td>
</tr>
<tr>
<td>Spina bifida occulta</td>
<td>423*</td>
</tr>
<tr>
<td>Transverse foramen double</td>
<td>488</td>
</tr>
<tr>
<td>Sacralisation of vertebrae</td>
<td>L5: 308, 574</td>
</tr>
<tr>
<td></td>
<td>Co: 567</td>
</tr>
<tr>
<td>Septal aperture (humerus)</td>
<td>247, 308, 427, 484, 567</td>
</tr>
<tr>
<td>3rd trochanter (femur)</td>
<td>567</td>
</tr>
<tr>
<td>Poirier's facet (femur)</td>
<td>425, 567</td>
</tr>
<tr>
<td>Squatting facets (tibia)</td>
<td>247, 308</td>
</tr>
<tr>
<td>Os trigonum (talus)</td>
<td>308</td>
</tr>
<tr>
<td>Anterior calcaneal facet</td>
<td></td>
</tr>
<tr>
<td>1.absent</td>
<td>423, 424, 574</td>
</tr>
<tr>
<td>2.double</td>
<td>247, 352, 427, 484</td>
</tr>
<tr>
<td>Distal epiphysis metacarpal 1</td>
<td>447</td>
</tr>
<tr>
<td>Bifid rib</td>
<td>176</td>
</tr>
</tbody>
</table>

Table 6: Incidence of postcranial non-metric traits

* Spina bifida occulta is a condition which lies on the borderline between a non metric trait and a pathological condition. It represents abnormal growth of the lower spine, but is normally asymptomatic.

**Palaeopathology**

The study of skeletal evidence of health and disease in the archaeological record can provide a variety of information about past living conditions. Much of the total burden of disease and injury in a population is invisible to the palaeopathologist. People in the past, as in Third World countries today, would most often have died from infectious diseases such as typhoid, other gastrointestinal infections, respiratory infections such as influenza and virus infections such as measles. These have no effect on the skeleton, and are of short duration. Therefore after death neither the cause of death nor the nature of the individual’s last illness can be deduced. For injuries similarly, most of the trauma encountered in daily life does not affect bone, only soft tissues, and leaves no traces on the skeleton.

However a number of conditions do affect bone, and are available for analysis. These include joint diseases e.g. osteoarthritis, fractures, weapon injuries, surgical interventions that involve bones, infections that spread to bones or their coverings and the effects of malnutrition. All of these were represented in the Newarke Street cemetery. Undoubtedly in this particular collection much was lost because of the poor condition of much of the material, especially the outside surfaces of the bones on which many of the changes produced by disease or injury would normally be visible.
<table>
<thead>
<tr>
<th>Pathology</th>
<th>Skeleton (contexts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutritional &amp; metabolic</strong></td>
<td></td>
</tr>
<tr>
<td>Cribra orbitalia</td>
<td>247, 310, 311, 341, 427, 505, 530, 540/542</td>
</tr>
<tr>
<td>Rickets</td>
<td>309</td>
</tr>
<tr>
<td><strong>Trauma</strong></td>
<td></td>
</tr>
<tr>
<td>1. Fractures</td>
<td></td>
</tr>
<tr>
<td>Upper limb</td>
<td>567 (ulna?)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>425 fibula</td>
</tr>
<tr>
<td>Ribs</td>
<td>567</td>
</tr>
<tr>
<td>Spine</td>
<td>530, 567, (crush fractures)</td>
</tr>
<tr>
<td>Hand/foot</td>
<td>574 (metacarpal)</td>
</tr>
<tr>
<td>Skull/face</td>
<td>534 (nose?), 424 (skull vault)</td>
</tr>
<tr>
<td><strong>2. Other</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>308 (exostosis humerus)</td>
</tr>
<tr>
<td></td>
<td>574 (dislocated shoulder)</td>
</tr>
<tr>
<td></td>
<td>567 (exostosis ulna)</td>
</tr>
<tr>
<td></td>
<td>424 (trephination, exostoses tibia)</td>
</tr>
<tr>
<td><strong>Infectious disease</strong></td>
<td>427 (?TB), 352, 424, 498 (maxillary sinus)</td>
</tr>
<tr>
<td><strong>Joint disease</strong></td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>424, 425, 567, 598</td>
</tr>
<tr>
<td>Knee</td>
<td>247, 530, 593</td>
</tr>
<tr>
<td>Shoulder</td>
<td>247, 530, 574, 576</td>
</tr>
<tr>
<td>Elbow</td>
<td>593</td>
</tr>
<tr>
<td>Hand/foot</td>
<td>424, 425, 567</td>
</tr>
<tr>
<td>Jaw</td>
<td>602(?)</td>
</tr>
<tr>
<td>Spine/ribs</td>
<td>247, 308, 424, 425, 427, 488, 530, 567, 598</td>
</tr>
</tbody>
</table>

Table 7: Catalogue of non-dental pathologies

Nutritional and metabolic disease

Many methods exist by which the content and quality of the diet can be assessed from human bones. Most require sophisticated chemical techniques and are beyond the scope of a general skeletal report, but simple observation still provides useful information.

General malnutrition, as well as infectious disease, leads to an interruption of growth. Evidence of this can be seen archaeologically in the form of lines or grooves across the teeth (enamel hypoplasias), where there was a temporary interruption of growth during tooth development. This was seen in some of the adult population, indicating that during their childhood these individuals were subject to one or more episodes of malnutrition or severe illness. For the details of the incidence of hypoplasias see the dental report p.45.

Anaemia is the term used to describe a reduction in the number or quality of the red cells of the blood that carry oxygen to the body’s cells. It may have many causes, but one of the more common is a lack of iron in the diet. Iron is found in highest quantities in green vegetables and red meat. Iron deficiency may also occur if there is enough iron in the diet but blood is constantly being lost e.g. from parasite infections (Stuart Macadam 1991). Evidence of anaemia is indicated by a pitted area in the roof of the eye sockets (cribra orbitalia). If the anaemia occurred in youth these persist into adult life. Eight skeletons showed cribra orbitalia; 2 male, 3 female, 1 indeterminate and two children.
Rickets is another nutritional deficiency which affects the skeleton. Deficiency of vitamin D during childhood interferes with the process of bone development, leaving the bones in a softened state. When the child starts to move about the limbs become bowed. Vitamin D is also needed for normal development of the teeth. One juvenile skeleton, 309/316 showed slight bowing of the long bones of the legs, as well as severe enamel hypoplasia completely distorting the shapes of the teeth (see dental report). It was identified as a possible case of rickets.

Trauma

In all societies where the main power source is human muscle and human effort there is a risk of accidents and injuries in the course of most everyday occupations. One need not invoke the possibility of deliberately inflicted violence to account for the majority of skeletal injuries.

Fractures are the most obvious injuries to bone. They can only be identified positively as having happened during the individual’s lifetime if they show signs of healing in the form of a raised or roughened fracture callus at the fracture site. Eight fractures were identified, in 2 males and 4 females (see catalogue of pathology). The fracture of the ulna in 567 was well-healed, and near the distal end, a site known as a ‘parry fracture’ because it can be the result of placing an arm over the face to ward off a blow. There was in addition an expansion and flattening of the distal end of the bone, and the triangular bone of the wrist with which the ulna articulates across a cartilage disc in the wrist joint. This may be a consequence of the fracture, or it may reflect a continuous abnormal posture of the wrist, perhaps resulting from a nerve injury in the forearm (illus. 12). It is difficult to reach a definite answer. Since this individual also showed a crush fracture of a lumbar vertebra, and a rib fracture, both healed, he may have suffered a serious accident such as a fall from a height, receiving all his injuries in the same incident.

Injuries other than fractures may also be detected. One adult male 308 appeared to have suffered from a dislocated shoulder which had not been reduced properly. The head of the humerus could not be placed in the shoulder joint in the correct orientation, but appeared to be

12. The distal end of the ulna of an elderly male, showing a healed fracture and flattening of the extremity.
displaced downwards. There were well developed bone outgrowths or exostoses, around the margins of the joint, longer and more irregular in shape than the osteophytes associated with arthritis (see below). These frequently form as a result of damage to muscles, tendons and ligaments, as bone forms in them as they heal. Similar processes can account for the exostoses found around the elbow and ankle joints in two other male skeletons. One female skeleton, 534, appears to have suffered a fracture of the nose. The bridge of the nose is depressed, the nose as a whole is deviated to the left, while the septum inclines to the right (illus. 13).

One male skeleton, 424, is of particular interest. On the left parietal bone, towards the back of the skull, there is a healed depressed fracture, seen as a saucer-shaped hollow in the outside of the skull vault. If the endocranial surface of the bone is examined at the same point, and behind it on the occipital bone around the grooves for the large veins, there is evidence of deposits, extending over a distance of 46 mm, of new bone formation on the surface. These can be caused by infection or haemorrhage inside the skull. On the left side of the frontal bone, 24mm to the left of the midline and 29mm in front of the coronal suture there is a neat circular hole, 9.4mm in diameter (illus. 14). The sides of the hole are flat and slightly bevelled. There is no evidence of healing or other bony reaction around the hole, showing that it was made either at or shortly after the death of the person. Its regularity and smooth sides preclude damage by stones or tree roots in the grave. Allowing for the poor condition of bone surfaces in this case, the hole resembles in almost every detail a Romano-British trephination described by Brothwell (1974).
The technique used employs a ‘modiolus’, a circular cutter (rather like a modern pastry cutter) which can be rotated on the bone to remove a circular piece of skull. Trephination is probably the oldest surgical operation in the world, and examples exist as far back as the Neolithic period in England. A few Romano-British and Iron Age examples exist (Brothwell 1974; Parker et al. 1986). Reasons for opening the skull vary from culture to culture and vary from a true surgical procedure aimed at removing damaged bone from skull wounds, or relieving later symptoms of head injury such as coma, severe persistent headache or movement disorders, to less understandable (to us) motives such as curing insanity.

In the case of 424 the operation was probably intended to treat symptoms resulting from the depressed fracture. Unfortunately the patient did not survive. The evidence for the practice of trephination in Leicester points to the presence there of a surgeon capable of undertaking such a heroic procedure. Whether this person was a resident of Leicester, or an itinerant specialist as existed in other fields of medicine in the Roman Empire (Jackson 1990), cannot be determined.

**Infectious disease**

While infectious disease must have been the most common cause of death in Roman Leicester, evidence for it on skeletons is always elusive because of the non specific changes it produces on
bones, if indeed it attacks bone at all. Infection or other inflammation in tissues adjacent to bone induces a reaction known as periostitis in the bone surface. A fine encrustation is deposited on the surface of the bone. It is easily lost post-mortem due to taphonomic processes. Sometimes its distribution can be used to deduce the possible nature of an infection.

Periostitis was seen inside the maxillary sinus in three individuals (M1, F1, J1) suggesting a sinus infection, commonly associated with living in damp cold, ill-ventilated housing, breathing smoke from the hearth (Wells 1982; Lewis and Roberts 1995). In one female skeleton there was a patch of periostitis on the inner aspect of one rib. She also showed an erosive lesion on an upper thoracic vertebra. These changes are generally associated with a chronic chest infection, often tuberculosis (Wakely et al. 1991). In one male skeleton there was an area of periostitis on one tibia. This a common finding, and would probably have been seen more frequently if preservation had been better. It may derive from an infected cut, but trauma such as a kick on the shin will also produce it.

Degenerative joint disease (osteoarthritis)

This is usually the most commonly observed pathological process in osteoarchaeological material. It is a general finding in the skeletons of individuals aged as ‘45+’. Indeed there is some debate as to whether it is actually due to wear and tear on the skeleton resulting from a long, physically strenuous life, or whether it is a normal ageing process, or both (Manchester 1983).

The numbers of affected skeletons are listed in the Catalogue of Pathology above (Table 7). Osteoarthritis affects the joints in three main ways. Spikes and frills of newly formed bone (osteoarthrodontes) may appear at the joint margins. When the cartilage that covers the bone ends at a joint becomes worn away the two bones rub together, and the opposing surfaces become pitted, or even polished (eburnation) (illus.15). All of these processes were observed in the osteoarthritic joints of the Newarke St skeletons. It is risky to generalise from small samples, but

15. Part of the femoral head (right of picture) and acetabulum of an adult male, showing osteoarthritis in the hip joint. Opposing surfaces on the bones are polished to a shine (eburnation), the joint surfaces are pitted and the upper right margin of the femoral head shows osteophytes.
there does appear to be a male predominance among the affected individuals. Six skeletons (M5, F1) showed evidence of osteoarthritis, and in the majority more than one joint was affected.

As can be seen from the catalogue above (table 7), the joints between the vertebrae of the spine are the most commonly affected. A detailed breakdown of spinal palaeopathology can be seen below. In any activity, such as lifting heavy weights, the spine is under stress which can affect the vertebrae and the ligaments that hold them together.

**Spinal pathology**

As well as being the most frequent site of degenerative joint disease (osteoarthritis) in the sample the vertebrae of the spine showed a number of other pathological changes (illus. 16 and 17). Most of the skeletons with evidence of disease in the spine showed more than one process simultaneously. As with osteoarthritis, generally males were the most frequently affected. A number of different conditions are specific to the spine:

**Schmorl's nodes**

These are rounded or oval indentations in the upper or lower surfaces of the bodies of the vertebrae. They are usually attributed to bulging of the intervertebral discs, followed by an adaptation of the bone shape to the protrusion. One factor that may cause them to form is strenuous lifting and carrying, putting a heavy load on the spine at an early age before the vertebrae have matured. They often cause no problems to the individual. Their predominance in males, along with other spinal pathology, probably relates to the heavy demands placed on the male skeleton by occupations involving moving heavy weights, e.g. transporting goods and laborious work in agriculture or building.

Nine examples of Schmorl's nodes were identified (M6, F3). As in other cemeteries, Romano-British (Wells, 1982), medieval (Stroud and Kemp 1993), and the modern population,

![Cervical vertebra](image)

16. A cervical vertebra from an elderly male, showing osteophytosis of the vertebral body and marginal osteophytes around an articular facet (top left of picture) indicative of osteoarthritis.
17. The first lumbar vertebra from an elderly male. There is osteophytosis of the vertebral body, especially on the left of the picture. The round depression near the centre of the vertebral body is a Schmorl’s node.

they were found distributed in the spine from mid-thoracic to lumbar levels. This would be expected because the middle to lower back is the most frequently overloaded part of the spine.

Osteophytosis

In the skeletons of older individuals it is common to see frills of bone protruding from the margins of the bodies of the vertebrae. These also occur around joints affected by osteoarthritis, in the spine and elsewhere. In extreme cases the osteophytes of consecutive vertebrae may fuse together so that a portion of the spine may become rigid. No spines affected as severely as this were found, but milder degrees of osteophytosis were present in three male skeletons.

Osteoarthritis, facet joints

The changes are the same as those seen in joints outside the spine. It was found in four males.

Other spinal pathologies

- Osteoarthritis of the atlanto-axial joint (M1).
- Osteoarthritis of costovertebral or costotransverse joints (M2).
- Trauma, crush fracture (M2): In each of these skeletons the fifth lumbar vertebra is compressed and osteophytes and osteoarthritis of the facet joints are present, most severely in the third and fourth lumbar vertebrae, but elsewhere in the spine as well. A lower back injury is indicated.
• Spina bifida occulta (J1, age 12-14): Here the bony roof of the sacrum is open due to a developmental failure. In life the defect is closed by fibrous tissue and covered by the skin. Normally it causes no symptoms. More severe cases of spina bifida, with disorganised spinal cord, and its coverings and nerves exposed on the surface, would have been fatal within a few days of birth in the fourth century.

• Exostoses on the spinous processes of thoracic vertebrae (M1): These are bony outgrowths which may form in the attachments of muscles tendons and ligaments after injury in which the ligament etc. is partly pulled away from the bone. A back injury is the most likely cause in this case.

• Unknown: One female skeleton (427, aged 17-25) was observed showing a broad crescent shaped erosion with irregular boundaries, laterally situated on the body of an upper (not precisely placed because fragmented) thoracic vertebra, just inside the margin. The position is wrong for a Schmorl’s node, as these are centrally placed. The lesion could not be identified positively. Such erosions have been associated with the early stages of spinal tuberculosis (Miles 1989). Since this skeleton also showed a patch of periostitis on one rib fragment (see Infection above p.41) tuberculosis could be a reasonable supposition for this particular skeleton.

**Dental Report**

**Introduction**

There were dental remains from twenty-seven skeletons. Of these, twenty-four were adult and three were children (defined by the lack of permanent dentition). Among the adults it was possible to determine sex by cranial characteristics. Of the fourteen specimens where this was well defined, seven were male and seven were female. The remains of adult jaws were not very well preserved and consisted of twenty-two mandibles and twenty-two maxillae (lower and upper jaws).

Jaw relationships could be classified into three categories:

- Normal, where the first lower molar rests in occlusion half a unit in front of the upper first molar.
- Pre-normal, where the lower molar occludes in front of this position, associated with a prominent lower jaw.
- Post-normal where the molar rests behind its opposite number sometimes resulting in a ‘weak chin’.

Where the relevant molars were not present the jaw relationship could be deduced from the wear patterns on the incisor teeth. Of a sample of nineteen, thirteen were classified as normal, four pre-normal and two post-normal. This is a distribution within normal ranges.

The full human dentition comprises thirty-two teeth and therefore a possible 704 tooth positions should have been available for study. A tooth position was defined as: a tooth with its socket; a socket without its tooth; or, an isolated tooth. Because of post-mortem damage only 585 tooth positions could be recorded (83% of total).

**Developmental abnormalities**

**Congenitally missing teeth**

In a modern population the teeth most commonly missing are the wisdom teeth, the second premolars and the upper lateral incisors. In this sample 12% of wisdom teeth (seven of fifty-eight) and 2.7% of premolars (one of thirty seven) were missing. No lateral incisors were absent.
**Impacted teeth**

Only one lower wisdom tooth was impacted (2.6% incidence) which compares with a 15.2% incidence in the modern population. This is a common observation. Impaction of wisdom teeth indicates lack of space in the jaws for their eruption. This may be due to modern humans having smaller jaws, perhaps because of a less demanding diet or the mixing of western European tribes so that large teeth are appearing in standard or smaller sized jaws.

One specimen (526) had both lower canines impacted, a rarity even in modern times.

**Crowding**

Three specimens showed signs of crowding of the teeth; a very low incidence compared with modern populations but compatible with other groups from the same period.

**Hypoplasia**

Hypoplasia is a deficiency in the structure of the tooth enamel. It may be present as a smooth discoloration, which may be associated with, for example fluoride in the water supply; or as serious pitting and deformation.

All forms of hypoplasia were rare. Where smooth hypoplasia occurred it could not be distinguished with certainty from degradation of the enamel through post-mortem environmental damage.

There was one interesting case of severe pitting hypoplasia in the remains of the left maxilla of a young adult, (316), (illus. 18). The parts of the teeth affected were those already formed at birth so the condition is likely to be related to the metabolism of the mother rather than any nutritional deficiency in the child after birth.

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18. Enamel hypoplasia of lateral incisor, canine and first molar.
Variations in form

Earlier studies have examined the teeth for trends in which the shape of teeth have consistently departed from the norm. Therefore the following characteristics were studied: the cusp patterns of upper and lower molars; the incidence of cusps of Carabelli (a variable additional buccal cusp on upper molars) and incisal pits and tubercles. No conclusions could be drawn from this information, there being a very low incidence of the alternative forms.

Torus

The torus mandibularis is a bony outgrowth from the lingual surface of the mandible near the lower premolars. Only one case was discovered and the sample is too small to make valid comparisons with other groups.

Other developmental abnormalities

Skeleton (574) had a curiously deformed bifid mental process on the mandible and double mental foramina (illus. 19). Skeleton (427) had a central supernumerary tooth between the upper central incisors which had resulted in a diastema of 4mm.

Pathology

Tooth loss and dental caries

Of the teeth available for study 20% were either lost or decayed; significantly lower than in modern populations (40-60% decayed, missing or filled). 9.7% of teeth available had been extracted and this had been done efficiently, there being a very low incidence of retained roots. This compares with 8.5% at Cirencester.

10.1% of teeth available were decayed which compares with 5% at Cirencester: an increased incidence but compatible with other Romano-British populations e.g. Pooled (Emery 1963) with 11.4%.

19. Unusual bone formation in mental region of mandible.
<table>
<thead>
<tr>
<th>Cavity Position</th>
<th>No. of Cavities</th>
<th>% of Total Carious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I (occlusal cavities)</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Class II (interdental cavities between posterior teeth)</td>
<td>23</td>
<td>39</td>
</tr>
<tr>
<td>Class III (interdental cavities abinteriorly)</td>
<td>8</td>
<td>13.6</td>
</tr>
<tr>
<td>Class IV (large Class III involving incisal edge)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Class V (cervical cavities)</td>
<td>4</td>
<td>6.8</td>
</tr>
<tr>
<td>Gross caries</td>
<td>14</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Table 8: Distribution of caries

The typical features of dental caries in a group from this period were all displayed in the current sample.

Occlusal (biting surface) fissures in the molars, which are often deep and defective, were worn away by the grinding of a coarse grit contaminated diet before decay could become established. This left Class II interproximal decay as the most commonly observed form (illus. 20). Cervical caries, decay at gum level, was rare. However, this group displayed a variety of cervical lesions which were believed to be of post-mortem origin but which mimicked dental caries in two ways. Firstly, the lesions predominated on the buccal (cheek) surfaces of the teeth and secondly, the structure of the root surfaces was disrupted in a way very similar to decay. Against this, the caries were on parts of the roots which would have been below gum level; a fact made more certain by the lack of significant gum disease interdentally. Also, tartar, where present, lay at the junction of gum and tooth and in cases where tartar and ghost cavities coexisted the latter were again indicated to be under the gum margin of the living subject and therefore in an area not susceptible to genuine decay. There was also no increase in other classes of decay in the affected specimens and, finally, in all cases the adjacent bone showed signs of post-mortem deterioration.
These remaines are an important record of a characteristic which may produce false results in the assessment of dental disease in future excavations.

Attrition

Dental wear was seen on every specimen increasing with the age of the subject and greatest on the occlusal surfaces of back teeth and the incisal surfaces of front teeth. The more heavily built skulls exhibited more prononce wear, indicating a relationship with muscular power. Three females were determined to have an age in excess of 35 years (from the degree of closing of the cranial sutures), and yet the wear on the teeth was minimal. It could be concluded that the method of predicting the age of a subject from the relative wear of the molar teeth should be used with caution. The dental pulp, the central live core of the teeth, was only exposed by attrition on one tooth, demonstrating that in general the rate of wear was not so fast as to overtake the pulps' natural ability to retreat behind a barrier of secondary dentine.

Where teeth had been lost, the wear on the remainder became heavier, resulting in abnormally severe attrition. Interstitial abrasion (wear in between the teeth) was present in all cases, caused by the flexing of the teeth against each other through biting and chewing pressure. It has been proposed that this would gradually reduce the tightness of the contact between teeth causing food trapping and a rise in the number of interdental (Class II) cavities. This theory cannot be supported from the evidence of this sample. Some Class II cavities have definitely been caused by food packing, but these food traps were mostly associated with slight abnormalities in the occlusion of the teeth.

Periodontal Disease

The following scale was used to assess periodontal disease, the process by which germs attack the supporting bone around the teeth, gradually eroding it so that eventually teeth become loose and drop out.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Condition</th>
<th>No. of cases</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no apparent disease</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>2a</td>
<td>loss of alveolar crest of interdental septum</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>2b</td>
<td>up to 1/3 of root denuded by bone loss</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>2c</td>
<td>1/3-1/2 of root denuded</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2/3 plus of the root denuded</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 9: Periodontal Disease

Considering that cleaning of the teeth was probably minimal, the results showed a healthy picture. It must be remembered however that this was a population who died relatively young and there may not have been time for the disease to establish before death.

Tartar was variable on the teeth. The distribution was such as to indicate that much may have been lost either post-mortem in the ground or during the post-excavation cleaning process.

Dental abscesses and other pathologies

Twelve dental abscesses were recorded with another four possibilities. All but one were related to dental caries. The exception was associated with attrition of the teeth. A dental abscess is not necessarily acute and life threatening. Many lie dormant or gradually work their way to the surface forming a gumboil as a pressure release valve and therefore cause little trouble. One peri-apical abscess (skeleton 449) on an upper right first molar had perforated the right maxillary sinus which would have been more serious.

Skeleton 176 had a bony epulis 5mm in diameter in the palate, associated with a peri-apical abscess on the carious, upper right second molar.
Skeleton 311 showed a good example of parafunctional tartar (illus. 21). The lower right second and third molars had lost their opposing teeth and acquired much heavier tartar deposits because they were not being used for chewing. This observation has been made in other similar situations.

Skeleton 341 had a deformed right mandibular condyle of unknown origin.

**Summary of skeletal and dental analysis**

The remains of the people buried at the Newark Street site are those of a community who had led physically demanding lives, and sometimes experienced real hardship. They were of medium height, and the skeletons of the men showed a high level of muscular development, indicating that they were strong. The skeletons of women on the other hand showed that they were mostly of slender build.

Their diet was hard and coarse, wearing their teeth severely. They were subject to tooth decay, and their teeth also provide evidence that some of them suffered recurrent episodes of ill health or malnutrition during childhood. Their diet appeared to be lacking in some essential nutrients causing some of them to become anaemic.

Female mortality was greatest in the childbearing years. While it is important not to attribute all female mortality to reproduction, it is likely to be a major factor. However women may have been deprived of resources e.g., the best food, or been expected to meet impossible demands on their time and stamina, which could have undermined their health and made them more susceptible to disease. Proportionally, more of the males lived into and beyond middle age, and showed more of the conditions associated with ageing.
A lifetime of hard labour creates a high level of wear and tear on the joints, and most of the older individuals, especially the males, showed signs of osteoarthritis in one or more of their joints, and of stress on the spine. A life in which the main source of power is human muscle and human effort is associated with a risk of injury much higher than in those leading a sedentary existence. This was evident in the number of fractures and other injuries seen in the skeletons, predominantly males. Except for the skull fracture (424) and the possible female with a fractured nose (534), all of the injuries observed can be the result of falls or other accidents, and do not provide evidence of violence.

Infectious disease was almost certainly the most common cause of death, but is largely lost to the palaeopathologist. One possible case of tuberculosis was seen, and three skeletons provided some evidence of infection of the maxillary sinus. This is normally associated with living in an enclosed smoky atmosphere (Lewis and Roberts 1995) and poor housing. It is not fatal, but does indicate that respiratory infections may have been common in the community, and that living conditions were poor and overcrowded so that infection could spread by coughing and sneezing.

It is rare to find skeletal evidence of sophisticated medical or surgical treatment, but the trephination in skeleton 424, with associated evidence of previous head injury, provides one example of a patient who had been operated on, but unfortunately had not survived. The skill of the operator and the courage and faith of the patient both deserve our admiration.
The Roman pottery: samian

Richard Pollard, with a report on the stamps by Brenda Dickinson

Abbreviations: CG, SG - Central and South Gaulish; MV - Les Martres-de-Veyre. S & S - Stanfield and Simpson 1958

The illustrated decorated samian (illus. 24)

S1. Drag 30, MV. The small cup is S & S Fig. 3.3, characteristic of the potter X-2. The satyr, O.624, is figured on S & S Pl. 7.96, and attributed solely to him amongst the Trajanic potters (S & S, p. 63). c. AD 100-120. Finds No. {.1379}, (264), Group 8.3, Phase 1; ext. {.1247}, (59), Group 10.2, Phase 2.

S2. Drag 37, CG. The ovolo resembles Rogers’ B14, although the tongue is a little short. The fabric is not that of Trajanic MV, so that a bowl in the style of Sacer - cf. S & S Fig. 22.1 - is a possibility. c. AD 125-145?, on the dating in S & S 1990. Finds No. {.1296}, (187), Group 12.4, Phase 2.
The samian stamps

The catalogue is presented in phase order. Each entry gives: potter (i, ii, etc. where homonyms are involved), die number, form, reading of the stamp, published example (if any), pottery of origin, date. This is followed by the site finds number, context, group, and illustration number if applicable.

(a), (b) indicate:
(a) Stamp attested at the pottery in question;
(b) potter, but not the particular stamp, attested at the pottery in question.

Phase 1


2. Patricius i 3d, Drag 33a (near-complete) )FPATRICI (Hartley 1972, S82) La Graufesenque (a). c. AD 70-90. {1323}, (213), 8.1; {1363}, (191), 8.1, illus. 25.15.


4. ]IO, Drag 29, SG. c. AD 70-85. {1366}, (191), 8.1

Phase 2


Phase 3


Post Roman/unstratified

7. Felix i 4b', Drag 15/17 or 18 [•OF·F]EICI (from a die originally giving OF·FEICI) Le Rozier (a). c. AD 65-75. {1351}, (1), unstratified.


Discussion

A total of 283 sherds of samian, weighing 1.895 kg, was recovered, amongst which were the 9 stamps and 2 decorated vessel fragments (illus.24). The pottery from significant Roman groups was catalogued, and the remainder scanned for links and unusual pieces, by the author. This embraced material from environmental samples. The catalogue is held in the site archive.

The assemblage spans a wide range, from pre-Flavian to late second century. Amongst the earliest pieces are a Ritt 8 (161; a pre-Flavian piece) and a Ritt 9 (§ 185 + 233: rare after c. 60 Webster 1996). These are rare finds for Leicester, and together with the Le Rozier stamp (no. 7) they hint at early activity of a more than mundane nature in the vicinity, assuming rubbish was disposed of locally. The pair of Drag 33a cups from Group 8.1 are an unusual find, the 33/33a type never being common in Britain in the first century (Webster 1996). Their completeness, and that of associated ‘coarse’ pottery, suggests disposal shortly after discard, directly into the pit from the place of usage.

The latest samian includes a fresh mortarium body sherd (487) of c. 160-200; a ‘cut glass’ beaker sherd of the second half of the second century (478); at least one Walters 79 (1); and two stamped vessels (nos. 5-6). Two Drag 31 bowls in orange fabric (c. 160-200+), unstratified, and a plate (443) may be from East Gaul (the Argonne?), and a bowl sherd from Rheinzabern (111) of the late second-early third century. In between these two extremes of date is the usual array of Flavian SG and Hadrianic to Antonine CG, with a little MV including the illustrated Drag 30.

The representation of later second/early third century ware parallels the situation at Bonners Lane to the south west, but there first century material was relatively scarce. The numbers of stamps and of closely datable decorated pieces from the southern suburb are too few at present to permit a statistically valid pattern to be detected for comparison with the city’s western suburb, represented by the Great Holme Street site (Pollard forthcoming b).

The Roman pottery: other wares

Methodology

Patrick Marsden

The pottery was analysed using the LAU form and fabric series. A combination of macroscopic and microscopic (x 20) fabric analysis was used. Sherd count and weight were recorded. In the text % weight figures are cited. Analysis was undertaken to fabric level for pottery from Roman contexts and all traded wares, and to ware group level for contexts of a post-Roman nature. Shape was recorded to form, and type level if possible, for material from Roman contexts, and to vessel class for that from post-Roman contexts and unstratified pottery: the LAU Form Series is hierarchical, descending from Class through Form to Type. Group 8 features of phase 1, particularly pits 8.1 and 8.3, were targeted for further analysis as they seemed to represent primary deposition (see above p.7.). EVEs (estimated vessel equivalents) were used in analysis of pits 8.1 and 8.3 so as to allow comparison with other Leicester sites (details of the EVEs analysis is retained in archive). Decoration, stamps, graffiti, re-use, and sooting were all recorded, together with ceramic links across the site. This information was entered onto the computerised database. Illustration was only selective, due to the existence of large numbers of drawings from previous sites in Leicester (Kenyon 1948, and Pollard 1994) and well established typologies for wares such as samian and BB1. The illustration undertaken concentrated on pits 8.1 and 8.3 in Phase 1.
**Abbreviations**

Wares

C Colour-coated ware  
MO Mortarium fabric  
AM Amphora fabric  
WW White ware

WS White slip ware  
OW Oxidised ware  
GW Grey ware  
BB Black-burnished ware

CG Calcite gritted ware  
GT Grog tempered ware  
DS Derbyshire ware  
MC Miscellaneous coarse ware

For fabric descriptions see Pollard 1994 (p.112-114).

**Results**

A total of 1,378 sherds, weighing 20.174 kg was recovered from Roman levels. A total of 917 sherds, weighing 9.222 kg, was found in unstratified and post-Roman contexts.

<table>
<thead>
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<th>Post-Roman and Unstratified</th>
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<td>14.2</td>
<td>40.0</td>
</tr>
<tr>
<td>% Weight</td>
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<td>9.7</td>
<td>31.4</td>
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Table 10: The percentage of total sherd count and weight by phase for Roman pottery

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<th>Weight (g)</th>
<th>Group</th>
<th>Sherd Count</th>
<th>Weight (g)</th>
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<td>29396</td>
</tr>
</tbody>
</table>

Table 11: Roman pottery totals by Group (sherd count and weight)

**Phase 1**

**Group 1: Late first-fourth centuries**

A soil layer which contains a wide range of datable pottery from late first century SG samian ware to third-fourth century Oxfordshire mortaria and calcite gritted forms. This suggests the introduction of pottery fragments into the soil throughout the Roman period (see above pp.5-6 for discussion of the possible formation processes for this layer).

**Group 2: Roman (?first century)**

This group only contains 50g of GW. The rouletted sherds present are perhaps of a first century date.
Groups 3, and 6-9: Early second century

See below for detailed discussion of the two pits (8.1 and 8.3) which constituted the bulk of the pottery from Group 8. In these five groups fabric proportions suggest an early second century date. WW and GT wares are well represented (9% and 5% respectively of the total pottery from the five groups). In addition the Verulamium region as a source for mortaria over Mancetter-Hartshill (3% to 1% respectively). An MO4 mortarium flange from the latter industry does have at least a second century date. BB1 products (including second century 'pie-dishes') and C wares are only present in very small quantities (2% and 1%), suggesting a date of not later than the 120s-130s. The samian dates to the first century (SG) but there are also small quantities of second century pieces of MV and CG origin, including a possible Drag 38 fragment. The GW from the two pits is discussed elsewhere. GW forms from other contexts include the necked jar (Sub-group 3.1) which may be first century; angular everted and necked jars with squared off angled lips, (Sub-groups 6.7 (illus. 25.3) and 8.3) of late first to early second century date; an everted rim beaker with barbotine decoration (late first-mid second century); and 2 wasters (Sub-groups 6.3 and 6.4, illus. 25.1 and 25.2), including a jar with a short curved everted rim (late first to early second century date). The approximately equal quantities of rustication and barbotine are also consistent with an early second century date (Pollard 1994, p. 77).

Early second century pits (Group 8.1 and 8.3)

Both pits produced ceramic groups deposited in the first quarter of the second century. The pottery amounts to 7.82 Kg (26.6% of all Roman pottery, 38.8% of that from Roman levels) and includes two complete vessels (illus. 25.7 and 25.14). The value of the assemblage for ceramic analysis is enhanced by the fact that pits 8.1 and 8.3 cut natural, not any earlier features, so the potential for residual pottery being present is diminished. Samian is mostly SG, with only a small amount of MV, and one possible CG vessel present. Both BB1 and C are present in small quantities. Verulamium region products (MO7 and MO10) dominate the mortaria, with the very late first-first half second century Mancetter/Hartshill fabric MO12 also present. More datablle calcite gritted sherds are in fabric CG1A. Other wares present in reasonable quantities are WW, OW, and WS. The most numerous ware is GW, which constitutes around 50% of the EVEs recorded.

These broad ceramic trends are mirrored at other Leicester sites. Parallels based upon EVEs and weight by fabric are apparent with comparable ceramic groups at Causeway Lane F 711 Group 332.001 Phase 1.40 (Clark forthcoming); West Bridge area Site 1 F5 60 and 63 and Site 2 Phase 4 (Pollard 1994); and Group 1 at the Forum site (Mellor forthcoming).

GW is dominated by jars with angular everted rims and the CG1A fabric has ledge rim neckless jars, both of these forms being common in the late first to early second century, this date range encompassing most of the forms from the two pits. The MV samian Drag 27 and CG Drag 18/31 place the group into the early second century, as does the BB1 jar.

Phase 2

Groups 4 and 5: Mid second-early third century

The phase contains residual late first-early second century pottery, disturbed from Phase 1. The BB1 (12% of pottery from both Groups) includes a jar with obtuse lattice (probably third century), a late(? Antonine CG samian (18)/31R, and C2, likely to be from the lower Nene Valley, dating from the mid second to fourth century. Amongst the GW, barbotine and burnished lines dominate the decoration, rather than rustication. A proposed date for these ditches, based on the pottery and stratigraphic relationships, is one of mid second to
early third century. Two sherds re-worked into discs were recovered from Group 5.2 (illus. 26.23 and 26.24).

**Group 11: Late second-early third century**

This group may contain intrusive later material. The majority of the diagnostic sherds are late first to mid second century. However, a late second-early third century Rheinzabern samian bowl, and Derbyshire ware (mid/late second-fourth century) are present. In addition, a BB1 obtuse lattice jar form may take the material into the third century. This ditch also cuts Group 4. Therefore the later date is suggested for the ditch.

**Group 10: Third-fourth century**

Residuality and intrusion are both significant. But given the fact that the ditch cuts Group 5 and the presence of later Roman utilitarian C pottery, along with a CG vessel displaying horizontal rilling in Group 10.1, the evidence points towards a date in the third-fourth century.

**Group 12: Late third-early fourth century**

A C flagon can be dated to the fourth century. Third-fourth century BB1 forms are present; these include a plain rim dish (Gillam 329, dated 190-340 AD), an oversailing everted rim jar (mid third to late fourth century), and a flanged dish (Gillam 228, 290-370 AD). Amongst residual earlier material is a short-necked everted rim bowl/jar with vertical combing on the body in a GT1 fabric (illus. 26.25)

**Groups 13 and 14: Third century**

C and BB1 give the key dating evidence for these two groups. Amongst the C, the Trier 'Rhenish' ware is present (mainly third century) along with a fragment of a beaker with white painted lines and rouletting (Howe et al. 1980, Fig. 5, No. 50). The quantities of C in both groups also suggests a date in the third century at least. In addition, the BB1 everted rim jar of the mid third to late fourth century is represented. Collectively this pottery, along with the lack of definitely fourth century vessels, points toward a third century date.

**Phase 3**

**Group 15: Fourth century (second half?)**

The pottery in the grave fills includes earlier Roman material, but also some later pottery, including diagnostically fourth century forms. BB1 constitutes 16% of the pottery and late BB1 forms are present. These include the flanged dish (Gillam 228) and an oversailing everted rim jar. The Cs constitute 6% of the pottery from the graves. Fourth century forms include a flagon/jug; a lower Nene Valley lid (Howe et al. 1980, Fig.6, No.73); and a flanged neck flagon (Howe et al. 1980, Fig.7, No. 87) in Group 15.19 (Illus. 26.26). White painted decoration is also present, this also being of a later Roman (third to fourth century) date. Other later pottery includes some CG3B (mainly late second-third century) (Group 15.14) and a Mancetter MO4 mortarium (Gillam 282) of a 230-340 AD date. In addition, Much Hadham ware (OW9) represents only 1.0% of the pottery (Groups 15.3 and 15.11). However in Leicester this ware does not come in until the fourth century, and perhaps not until the second half. If it is taken that the cemetery activity was short-lived, a late Roman date for Phase 3 is suggested by the pottery evidence. This is corroborated by the site stratigraphy and coin evidence.
Post-Roman and unstratified levels

Pottery dating from throughout the Roman period was recovered from the post-Roman phases and unstratified. Of note was third century and later Roman pottery, probably from Roman features truncated in subsequent periods. Mancetter mortaria (MO4/18) include a hammerhead form (illus. 26.27), probably dating between 270-400 AD and others, including reeded, hammerhead vessels of a mid third to late fourth century date. An Oxfordshire MO3 mortarium is datable to 240-400+ (Young 1977). Third to fourth century C utilitarian vessels, likely to be of a lower Nene Valley origin, are also present. The Cs also include a rare collared rim flagon form (illus. 26.28), and an imitation Drag. 38 bowl (Howe et al. 1980, fig. 7, no. 83) of a late third to fourth century date. An Oxfordshire C13 hemispherical flanged bowl has a date range of 240-400+ AD. BB1 vessels include everted rim jars of a mid third to late fourth century date and the bead-and-flange dish form (Gillam 228), dating from the late third to late fourth century. One sherd of Much Hadham ware (OW9) is also present.

Discussion of Roman pottery assemblage (except samian)

Mortaria

Mancetter/Hartshill is by far the most common source for mortaria (71% of all mortaria by weight). Most of these are of fabrics MO4 or MO18. Included are the hooked flange second century forms, although most vessels are the later Roman (third to fourth century) hammerhead types, including the reeded, and the scratched/incised groove variations. There are no stamps, apart from one vessel in pit 8.3, in MO12, the fragment displaying a stamp edge, but with no letters visible. Other sources are the Verulamium region (23%) dating between AD 50-140, but in Leicester mainly AD 60-125, all apart from one sherd being from Phase 1. Oxfordshire is the other source (6% by weight): sherds from the same vessel, dating 240-400+, are present in post-Roman levels and Phase 1.

Amphora

Most common are the Dressel 20 amphora, in AM9A, constituting 74% of the total. AM12/13 (probable South Gaulish Pelichet 47) amounted to 7% of the amphorae. Also present are two sherds of AM3, an oxidised fabric possibly of Italian origin, which is rare to Leicester. The known form is Dressel 2-4 (Pollard forthcoming c). In addition, there is the rim of a fish-sauce amphora (AM7) from southern Spain in Phase 1. This vessel is of the form Peacock and Williams (1986) Class 18/Beltran IIA/Cam 186C, dating from the early Flavian to Antonine period.

Other wares

The pottery from the first-second century AD activity is discussed above under the Phase 1 and 2 Group headings, and is mostly represented by Groups 8.1 and 8.3. These two pits produced a range and quality of pottery from the early second century indicating status comparable to sites excavated within the urban core of Roman Leicester. Outside these groups, early second century activity is represented by extremely small samples (see Table 11) so few conclusions regarding status can be drawn.

Third century pottery such as BB1 obtuse lattice jars and incipient flange dishes, colour-coat scale and folded beakers and Trier products, are all present. Approximately half of this material came from Roman levels, notably the ditch fills. The rest, including all the third century colour-coat beakers and a BB1 incipient flange dish were found in post-Roman levels.

Much Hadham ware (OW9) was recovered from Phase 3. Oxfordshire red-brown colour-coated ware and red-brown colour-coat mortaria (C13 and MO3) are present, mainly in post-Roman levels. This may imply truncation in the post-Roman period of third and fourth century Roman levels.
In relation to the pottery as a whole, for such a small sample the range of fabrics is reasonably wide. This compares to other Leicester sites within the Roman town, such as the West Bridge group (Pollard 1994) and Causeway Lane (Clark forthcoming), and Norfolk Street (Pollard forthcoming a) and Great Holme Street (Pollard forthcoming b) outside the urban core.

The diversity of wares, including continental imports, throughout all the phases at the site, and especially amongst the two pits in Phase 1, implies that the activity at the site was closely related to the settlement inside the Roman town in terms of trade and status. This is reflected at the site, irrespective of whether this pottery is from pits, ditch fills or the later Roman graves.

<table>
<thead>
<tr>
<th>Fabric</th>
<th>Sherd Count</th>
<th>Weight (g)</th>
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Key: Oxon : Oxfordshire     Manc : Mancetter-Hartshill     Ver : Verulamium region
M Had : Much Hadham

Table 12: Totals of Roman pottery fabrics by sherd count and weight

Catalogue of illustrated pottery (illus. 25 and 26)

Phase 1
1 GW  Waster, form uncertain. Finds No. {.1129}, context (92), subgroup 6.3.
2 GW  Waster, everted rim jar. Parallel from St Nicholas Circle (Pollard 1994, Fig. 54.65). {.1142}, (329), 6.4.
3 GW  Necked jar. {.1056}, (349), 6.7. Part of vessel present in subgroup 17.8, {.1005}, (255).
4 GW  Short everted rim jar. {.1373}, (191), 8.1.

5  GW  Platter with radiating burnish pattern on base interior. Parallel from St Nicholas Street (Pollard 1994, Fig. 51.19). {.1327}, (213), 8.1 and {.1373}, (191), 8.1.

6  GW  Platter with beaded rim and convex walls. {.1327}, (213), 8.1.

7  GW  Complete bowl with everted rim and sinuous body curve. {.1355}, SF 94, (213), 8.1.

8  GW  Angular everted rim jar with barbotine decoration. {.1373}, (213), 8.1.

9  GW  Everted rim beaker (?) with panelled barbotine decoration. Silver and shiny surface, perhaps in an attempt to copy metal (?). {.1378}, (191), 8.1.

10 WW  Ring neck flagon. {.1369}, (191), 8.1.

11 WW2  Ring neck flagon. {.1325}, (213), 8.1.

12 OW  Angular everted rim jar with white paint decoration. {.1372}, (191), 8.1.

13 BB1  Everted rim jar with acute burnished lattice. {.1328}, (213), 8.1.

14 Samian  South Gaulish Drag 33a cup, complete. Stamped (report no. 1). {.1364}, (191), 8.1.


16 GW  Hemispherical carinated bowl with reeded flange. {.1392}, (264), 8.3.
17  GW  Angular everted rim jar, with patches of oxidation. Possible rustication at lower edge {1392}, (264), 8.3.
18  GW  Angular everted rim jar {1392}, (264), 8.3.
19  GW  Necked jar {1392}, (264), 8.3.
20  GW11 Beaker with beaded rim, white paint on rim and body {1400}, (264), 8.3.
21  WW1  Ledge/everted rim jar at very sandy end of WW1 fabric range {1387}, (264), 8.3.
22  WW9  Flagon with thick beaded rim, cupped internally {1419}, (264), 8.3.

Phase 2
23  AM9A Amphora fragment re-worked into disc shape {1267}, (82), 5.2.
24  WW2 Base re-worked into disc {1269}, (82), 5.2.
25  GT1 Short-necked everted rim bowl/jar with vertical combing on body {1260}, (65), 12.1.

Phase 3

Post-Roman / Unstratified
27  MO4/18 Hammerhead mortarium {1233}, (413), 16.1.

The post Roman pottery and ridge tile

Deborah Sawday and Siân Davies

A full report was submitted for inclusion but due to space constraints this has been archived separately.

Results

The material was not only very abraded and fragmentary, but the mixed nature of the pottery from the groups in terms of dating, suggested that the assemblages were the results of activity such as manuring and rubbish deposition in the area over a long period of time. All the phase groups also produced Roman pottery, whilst some post-Roman pottery was intrusive in Roman levels, phases 1 to 3.

The fragmentary nature of the pottery meant that there was virtually no evidence of vessel forms or of the pattern of manuring or rubbish disposal, represented by joining sherds, across the site.

The evidence for the dating of the first phase of medieval activity, represented by the four ditches, is minimal with only 12 sherds of pottery and a single fragment of ridge tile recovered in total from the ditch fills. The earliest material, dating to the 12th or 13th centuries was recovered from 16.1 and 16.3, with 16.4 containing pottery and tile dating from the 12 or 13th centuries, through to the 15th, or possibly, 16th centuries. A similar date range may be attributed to the post holes and pits in phase 4, group 17, though the two sherds of Stamford ware recovered from 17.9 and 17.17 are evidence of some Saxo-Norman activity, perhaps manuring, in the area. The cultivation horizon, phase 4, group 18, also provides evidence of possible manuring activity from the Saxo-Norman through to the late medieval period, the most intense period of activity occurring in the early medieval period, judging by the quantity of Potters Marston pottery present. Group 19, phase 4, produced pottery with a terminal date in the late medieval period, but once again a wide range of earlier pottery is present dating from the Saxo-Norman period onwards.

The horticultural trenches in phase 5, group 20, produced very little pottery, predominantly dating to the late medieval period, but four of the trenches contained pottery dating to the 16th and 17th centuries, confirming an early post-medieval date for this phase group. The post holes in the same phase also contained minimal dating evidence, but in terms of the pottery present, could be
<table>
<thead>
<tr>
<th>Fabric/Phase 1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>4/18</td>
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<td>15/252</td>
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<td>1/20</td>
<td></td>
<td>7/287</td>
<td>5/57</td>
<td>1/15*</td>
<td>1/43</td>
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<td>MS*</td>
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</table>

Table 13: Post-Roman pottery and ridge tile/tile (*) by sherd number/weight (g) per phase

divided into three subgroups: early medieval - 21.9, 21.24, and 21.28; medieval - 21.4, 21.10 and 21.26; and late medieval - 21.7, 21.8 and 21.16. Unfortunately the stratigraphic evidence was not sufficient to confirm these groupings and the dating evidence provided by the pottery is open to question owing to the residuality apparent across all the post Roman phases on the site.
Phase 6 produced pottery generally dating to the mid 17th century with some modern material and some residual material also. Phase 7 produced only residual pottery.

**Conclusion**

The site produced post Roman pottery dating from the Saxo-Norman to the post medieval period, with a notable dearth of evidence for any Saxon activity in the vicinity. An examination of the relative proportions of the major ware groups gives some indication of the most intensive periods of activity notably those represented by phase 4.

<table>
<thead>
<tr>
<th>Fabric</th>
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<th>%</th>
<th>weight</th>
<th>%</th>
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<td>31</td>
<td>1.7</td>
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<td></td>
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<tr>
<td>PM</td>
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<td>58.4</td>
<td>875</td>
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<td>(subtotal)</td>
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<td>(51.5)</td>
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<td>(subtotal)</td>
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<td>(18.1)</td>
<td>(272)</td>
<td>(15.4)</td>
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<td>1.7</td>
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<tr>
<td>(subtotal)</td>
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<td>(16.2)</td>
<td>(551)</td>
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<td>99.5</td>
<td>1761</td>
<td>99.5</td>
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</table>

Table 14: Phase 4 - major fabric groups by sherd count and weight, expressed as a percentage of the total of those fabrics (see archive report for fabric codes)

Potters Marston is clearly the dominant fabric present both in terms of sherd numbers and weight and there is the greatest amount of surviving evidence of activity during the early medieval period, c.1100-1250+. However, the figures must be treated with caution, as there seems to have been a hiatus in the production and usage of pottery in the later medieval period generally. Furthermore, the nature of the patterns of medieval rubbish disposal may affect the nature of the deposits, but if these represent back yard activities, they would not have been controlled by municipal regulation whether within or, as in this case, without the town walls.

The range of pottery, tile and ridge tile fabrics present does not suggest that this extra-mural assemblage is in any way significantly different from assemblages found within the city. Pottery from Stamford, Chilvers Coton, Lyveden/Stanion, Nottingham and ?Ticknall is found in assemblages both within (Sawday 1989) and without the town walls, for example at Sanvey Gate, some 50 metres north of the medieval town walls (Finn 1993), where a similar range of Saxo-Norman and later pottery was found.

Only the sherd of decorated Cistercian ware, fabric CW2, is relatively unusual, the decorated examples of this fabric being found in most quantity, locally, to date, on the monastic site of the Austin Friars, Leicester (Mellor and Pearce 1981). Even the
presence of the Surrey whitewares, fabric TG1, and the continental imports represented by the a sherd of Rhenish stoneware, fabric FR, is not in any way exceptional, both wares being marketed and distributed on a fully commercial, national, and in the case of the latter, international scale - and being commonly found on both urban and rural sites (Moorhouse 1984; Allan 1983, pp.43-44).

<table>
<thead>
<tr>
<th>Fabric</th>
<th>sherd nos.</th>
<th>%</th>
<th>weight</th>
<th>%</th>
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<td>Saxo-Norman</td>
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<td>1.5</td>
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<tr>
<td>PM</td>
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<td>1104</td>
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<td>(55.8)</td>
<td>(1145)</td>
<td>(46.2)</td>
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</tr>
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<td>13.1</td>
<td>258</td>
<td>10.4</td>
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<td>(19.6)</td>
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<td>(896)</td>
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<td>99.6</td>
<td>2477</td>
<td>99.5</td>
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</table>

Table 15: Occurrence of major fabric groups by sherd count and weight, expressed as a percentage of the total of those fabrics for the whole site.


The Illustrations (illus. 27)

<table>
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<th>Illus</th>
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<th>Phase/Grp/ Context</th>
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<th>Fabric</th>
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<td>.2131</td>
<td>4/19.2/(292)</td>
<td>bowl</td>
<td>LY2</td>
</tr>
<tr>
<td>27.2</td>
<td>.2017</td>
<td>4/19.2/(37)</td>
<td>cup</td>
<td>CW2</td>
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</table>
The small finds

Dawn Harvey

Introduction

A total of 174 small finds (excluding glass) were recovered from the excavation. A full computerised database and paper record is lodged with the archive. The following catalogue includes finds of intrinsic interest or useful for the functional and stratigraphic interpretation of the site.

Two main groups of small finds will be discussed; those from pits 8.1 and 8.3, and all the graves in phase 3 (see p.7 for reasons for selection of these two groups).

Phase 1: pits 8.1 and 8.3

Pit 8.1 has indications that it may have been used as a latrine or cesspit. It produced a particularly interesting group of sixteen iron studs (catalogue number 11) though their function is unknown. They may be associated with the construction of the latrine/cesspit, perhaps a lining, or represent box fittings. The pit also contained a spindlewhorl (cat. no. 16) and a coin (SF 90) which provided a date of AD 103-111, corresponding with ceramic dates.

Pit 8.3 contained a coin of late Iron age date SF 128 (see above p.69), a bone object similar to SF 23 (cat. no. 13) and the small key (cat. no. 2).

Phase 3: The graves

Of the finds associated with the graves only ten are non-ferrous; these are listed below in grave order. Provenance details for the nails and grave finds are included in the grave inventory (above pp.12-19).

15.2 (565) Fragment of bone pin stem (not illustrated)
       (566) Fragment of quern, part of stone lining (not illustrated)
15.3 (583) Coin, SF 248, AD 364-378 (not illustrated)
15.7 (536) Coin, SF 217, AD 347-348 (not illustrated)
15.8 (532) Coin, SF 219, AD 268-270 (not illustrated)
15.15 (246) Fragment of quern (not illustrated)
15.18 (415) Brooch, AD 125-225, (cat. no.1)
15.24 (351) Nail cleaners, (cat. no.10)
15.35 (592) Furniture nail/stud, SF 247 (not illustrated - see archive for details)
15.36 (589) Bone needle (cat. no.15)

In phase 3 a total of 26 graves produced 60 nails, whose positions were located by three-dimensional co-ordinates. Analysis showed no standardisation of nail size, either in head diameter or stem length, across the site. However, those from two graves, 15.28 and 15.20, show a degree of similarity. The head diameter of the nails from the former range between 11mm and 15mm, and the length of the one complete nail is 59mm. The incomplete lengths of the other three nails range from 31mm to 40mm, and if their full length was projected they would be comparable. Of the four nails from 15.20, one had a head diameter of 16mm, the others between 20 and 21mm; the two complete nails had a length of 71 and 79mm.

With the exception of the coinage, the brooch and a selection of the pins, there is little datable material. The coins can be interpreted as deliberate deposits, though it uncertain if any of the other finds can be interpreted as such. The datable finds are mostly too early for the proposed late fourth century date assigned to the cemetery, and have to be considered residual (see Cooper, p.25).
Catalogue of selected small finds (illus. 28 and 29)

Catalogue entries are preceded by the following information; illustration number, small find number, context number, sub-group and, finally, phase.

Copper alloy objects (with a contributory note on the knee brooch by D.F. Mackreth)

1 SF 148; (415), 15.18, phase 3. Knee brooch, Roman, incomplete.

   The tab is more like a cast-on loop, the projection below the catch-plate is missing, but there is enamelled decoration on the bow. This is arranged as two vertical rows of cells, square in the middle and triangular top and bottom. The enamel seems to have been uniformly a pale opaque blue.

   The generally slight nature of these brooches with their very small spring-cases, and the enamelled decoration show that these are of British manufacture. There is little to distinguish in the dating of these and of the continental forms. Only the dating of the native type is given here: Zugmantel, AD 90-260 (Böhme 1970, p.7 Abb. 1,15); Canterbury, AD 100-180 (Frere et al. 1982, p.121, fig. 59, 7); Wroxeter, earlier second century (Bushe-Fox 1914, p.13, fig. 4, 6); Leicester, mid second-early third century AD (Clay and Pollard 1994, p.143, fig. 74, 17); Caerleon, AD 160-230 (Zinkiewicz 1986, p.172, fig. 55, 12); Chichester, latish second century AD (Down and Rule 1971, p.115, fig. 5.18, 228u); Baldock, AD 180-120 (Stead and Rigby 1986, p.113, fig 46, 103); Bignor, AD 190/200-225/250 (Frere 1982, p.179, fig 26, 6); Gadebridge Park, late second-early third century AD (Neal 1974, p.127, fig. 55, 25); Vindolanda, c. AD 223-5 (Bidwell 1985, pp.117-9, fig. 39, 4); Verulamium, AD 250-280 (Frere 1984, p.27, fig. 8, 43); Fishbourne, late third century AD rubble (Cunliffe 1971, p.104, fig. 39, 38); Catsgore, fourth century AD (Leech 1982, p.107, fig. 77, 22). The bar chart derived from this dating shows that the most likely beginning for the type is the earlier second century AD. The concentration in the later second and the earlier third should represent the period when most were passing out of use and any after AD 250 must have been residual in their contexts. The prevailing technique for added decoration was the use of white metal trim and a consideration of the dating of all brooches likely to have been tricked out with this (Mackreth in Jackson and Potter, forthcoming) shows that the chief floruit is from c. AD 125-225, and, while this particular kind of brooch figured heavily in the discussion, the date range was supported by the many others.

2 SF 130; (264), 8.3, phase 1. Key, Roman, complete, length 21mm, teeth 13mm across. Tumbler lock slide key, (Crummy 1983, p.125). For a small lock, possibly on a casket.

3 SF 85; (194), 18.2, phase 4. Tweezers, medieval, complete, length 58mm, width 10mm. Dated parallel from Colchester (Crummy 1988, p.26, fig. 29) dating to the late medieval period. Tweezers from the Jewry Wall excavations (Kenyon 1948), had similar decorative handle.

4 SF 67; (182), unstratified. Pin, Roman, complete, 110mm. Decorated hairpin, Cool group 3 (sub-group B) (Cool 1990). Cooper believes the distribution of this pin type is concentrated in Leicester. There are a further six examples from Leicester, Causeway Lane producing two examples (Cooper forthcoming). The length of the pin suggests a date in the first or second centuries (Cool 1990, p.173).

5 SF 48; (133), 21.11, phase 5. Pin, medieval, incomplete, length 33mm, width 0.75mm. Crummy (1988) type I. Dated to the 14th and 15th centuries, based on the longer length of the pin (Oakley and Webster 1979).
28. Small finds, scale 1:1 (Catalogue no. 11 not illustrated).

SF 138; (364), 20.15, phase 5. Pin, medieval, complete, length 30mm, width 1mm. Crummy (1988) type 2. Dated to the 14th and 15th centuries.

SF 17; (54), 21.24, phase 5. Lace end, medieval, complete, length 22mm. Crummy (1988) type 1. Date range from c.1375 to 1550/75.
SF 178; Lace end, post-medieval, incomplete, length 25mm. Crummy (1988) type 2. Fibres from this object were analysed using a scanning electron microscope. The fine degraded fibres (diameter 10 microns) were animal hair, the original material was a fine wool. Poorly preserved fibres were also found in another lace end (SF 19), which were identified as a coarse linen (Pers. Comm., Dr. G. Morgan). Date range is 1550/75 to 1700+.

SF 75; (183), 20.21, phase 5. Wire loop (eyelet), post-medieval, complete, diameter 11mm. Possibly a developed form of lace end, or clothing eyelet (Crummy 1988, p.14, fig. 16). Examples also from Northampton (Oakley and Webster 1979) and Chelmsford (Caple 1985). Date range from 16th century onwards.

SF 53; (351), 15.24, phase 3. Nail cleaners, Roman, incomplete, length 48mm. Terminal missing, though operational end is almost complete, similarity to Crummy type 3 (1983, p. 58, fig. 62).

Iron objects (not illustrated)

SF 87; (191), 8.1, phase 1. ?stud, incomplete, diameter 15-20mm. Stem is missing, only a hole remains. Also a further fifteen examples from the lower fill (213) of the same early second century pit.

Bone objects

SF 79; (190), unstratified. Counter (plain), Roman, complete, 20mm in diameter, 3mm thick. Crummy (1983) type 1. Similar example from Jewry Wall (Kenyon 1948) from the mid fourth century levels.

SF 23; (229), 18.4, phase 4. Pin, complete, 58.5mm long, 5mm at widest point. Related to Crummy's head type A/B (Crummy 1988), shaft possibly repaired. Dated to the medieval period.

SF 183; (446), 1.7, phase 1. Worked animal bone, incomplete, 103mm long. Sheep/goat metacarpus III + IV, the proximal end is weathered and the distal end is missing due to a recent break. A hole measuring 7mm in diameter (6mm on the reverse) has been drilled through the bone, front to back. Function unknown, parallels dating to the medieval period from Northampton (Williams 1979, p.312, fig. 139), examples are complete pig metapodials measuring less than 75mm. A South Shields example described as a bobbin (Allason-Jones, 1984), and is of a similar length to SF 183.

SF 243; (589), 15.36, phase 3. Needle, incomplete, length 30mm, width 4mm. Crummy type 1 (1983), highly polished, faceted point. Evidence for green staining, in imitation of copper alloy counterparts, may suggest a first or second century date, though the form is common throughout the Roman period (Crummy 1983, p.65).

Stone objects

SF 98; (213), 8.1, phase 1. Spindle whorl, diameter c. 35mm, depth 8mm, hole diameter 8mm. Dated to the Roman period.
The Celtic coin

SF 128, (264), 8.3, phase 1. Weight: 2.46g.

The worn condition and poor preservation of the coin makes precise identification tentative but it may be attributed to the coinage of Cunobelin (Allen 1968, Mack 221/ van Arsdell 1971-1).

On the reverse there is a seated figure to the left with one arm extended. The figure is winged and is likely to be a seated winged victory holding a wreath. The obverse is now almost completely plain with no identifiable characteristics but on the identification of the reverse it would have been inscribed CUNOBELINI/TASC set out in two fields.

Discussion

The type falls within the middle group of the bronze coinage of Cunobelin, probably dating to the first three decades AD (Allen 1968, Fitzpatrick 1985). Van Arsdell’s (1989, p.404) date of AD 10-20 is overly precise. The date of issue of the coin is broadly contemporary with approximately half of the Celtic coins from Leicester, including a coin of Eppius also from south-east England (Fitzpatrick 1994, p.132). The possibility that the coin reached Leicester at the time of the Roman conquest of southern Britain cannot be discounted (Haselgrove 1987, pp.36-9, 204-8), but its presence would also be compatible with the increasing evidence for the wide ranging connections of a late Iron Age settlement at Leicester (Clay and Pollard 1994, p.44).
Coins and tokens

R.A. Rutland

Abbreviations used:
RIC II...Mattingly and Sydenham 1926
RIC V (II)...Mattingly and Sydenham 1933


2 SF 77 and 78, (190), unstratified. Ae, 19 mm. Denarius of Elagabalus (?). Restored from several pieces but incomplete. Flaking and distortion, particularly on reverse, from copper corrosion within core. Obv: Laureate bust right (shoulders obscured but probably draped and possibly cuirassed). IMP [gap in edge] NINVS AVG. Rev: Obscured by distortion, flaking and corrosion. ...CO...IP...(possibly ...COS III PP...). From bust and surviving details this is probably a denarius of Elagabalus (AD 218-222).

3 SF 90; (213), 8.1, phase 1. Ae, 33 mm. Sestertius (corroded) of Trajan. Obv: Laureate head right [IMP CAES NERVAE TRAIANO AVG GER D] AC PM [TR P COS V PP]. Rev: Faint but probably Roma standing left holding Victory and spear, at her feet a kneeling Dacian [SP] QR OPTIM[O PRINCIPI S C]. RIC II p.279 Trajan no. 485, Rome mint, AD 103-111

4 SF 107; (185), 19.1, phase 4. Ae, 21 mm. Jeton (reckoning counter). One side obscured by corrosion. The other side shows traces of lozenges, probably on a shield. Late medieval to early modern (14th to 17th century).


6 SF 219, (532), 15.8, phase 3. Ae, 15 mm. (Oval) Barbarous antoninianus of Victorinus. Obv: Radiate bust right, shoulders off flan...NVS... (indistinct). Rev: Sol advancing left, holding whip [INVICTVS]. Barbarous version of RIC V (II) p.396 nos.112-14, Cologne mint, AD 268-270

7 SF 222, (546), 16.3, phase 4. Ae, 14 mm. AE4 of House of Constantine. Obv: Diademed bust right, draped and cuirassed, legend off flan. Rev: Two soldiers with one standard between legend and mint mark off flan [GLORIA EXERCITVS]. AE4 of family of Constantine issued AD 335-340

8 SF 248, (583), 15.3, phase 3. Ae, 18 mm. AE3 of Valens Obv: Diademed bust right, shoulders indistinct DNVALEN/SPFAVG (indistinct but based on number and spacing of letters) Rev: Victory advancing left and holding wreath SECVRITAS/REI[PVBLICA]. AE3 of Valens issued AD 364-378

The Glass

Siân Davies

Catalogue (illus. 30)

The following abbreviations and conventions have been used. RD = Rim Diameter; BD = Base Diameter; PH = Present Height; WT = Wall Thickness; (***) = Context; SF = Small Find No.
Period unknown

1 unstratified. Body fragment of a colourless ?beaker. Closely set, diamond shaped, mould blown decoration and wheel polished exterior. Slight iridescence. (WT 1.5 PH 21). There was also one purple tinted undiagnostic body fragment (213), wheel polished internally.

Roman vessel glass: blown

Colourless

2 SF 70, (172), 20.20, phase 5. Rim fragment of a jar or small flask. Horizontal rim folded outward and up then flattened forming tubular rim. Slight iridescence. There was also one undiagnostic body fragment from (75), 12.1, phase 2 sample 14.2.

Yellow/Green

3 SF 86, (191), 8.1, phase 1 and SF 95, (213), 8.1, phase 1. Two body fragments from a ribbed globular jar or jug. Three vertical mould blown ribs extant. Good quality glass, no iridescence. There was also one undiagnostic body fragment from (111), 11.1, phase 2.

Blue/Green

4 SF 97 SF 99 SF 101, (213), 8.1, phase 1. Five adjoining fragments of a conical unguentaria/small flask. Inward folding flattened rim, simple slightly concave base. Bubbly glass with impurities and indents. There was also one cylindrical neck fragment possibly associated with above from (1), unstratified.

5 SF 197, (358), unstratified. Rim fragment of cup or beaker. Outbent fire rounded rim, wheel polished on exterior. Slightly convex body. Good quality glass, occasional small bubbles.

6 (1), unstratified (not illustrated) Base fragment of cup or beaker. Simple slightly concave base with pontil scar. Numerous small bubbles. Wear mark present on underside of base. (BD 45 PH 11 WT 1)

7 SF 127, (264), 8.3, phase 1 (not illustrated) Body fragment of jug or jar with one mould blown rib extant. (PH 31 WT 1.5) There were also:
Two shoulder fragments from cylindrical bottles: (540), 15.4, phase 3. SF 196, (260), 13.1, phase 2.
Two flat body fragments from prismatic bottles: SF 199, (218), 18.5, phase 4. (224), 8.1, phase 1.
One cylindrical neck fragment: SF 114, (255), 17.8, phase 4.

Post Roman

A total of three undiagnostic vessel fragments of post-medieval glass were recovered: SF 198, (219), 18.5, phase 4. SF 69, (172), 20.20, phase 5. SF 92, (88), 22.1, phase 6.
Discussion

A total of 33 fragments of glass were recovered from the site. The discussion will focus on the 28 fragments of Roman glass, of which 26 came from blown vessels and one was of window glass.

A minimum of seven vessels was identified. All are common tableware and storage forms in use from the late first to third centuries.
Phase 1

This phase produced three identifiable vessels. No. 3 and 7 are fragments from a globular ribbed jug or jar (Ising 1957 form 55 or 67) in yellow/green and blue/green glass. Ribbed jugs are the most common form of glass jug found on Romano-British sites occupied during the late first and early second centuries AD (Cool & Price forthcoming). Yellow/green vessels were produced from the second half of the first century with production continuing into the second century AD (Price 1989).

The most complete vessel recovered, No. 4, was a small conical flask / uinguentia (Ising 1957, form 26) in blue/green glass of which approximately half remains. These flasks were extremely common vessels particularly during the first and second centuries AD. Complete examples have been recorded from funerary deposits in Britain (Harden 1962, Fig. 89 H.G 49) and on the Continent (Senequier 1985 Fig 175 - 177).

A fragment from a prismatic bottle was also identified.

Phases 2-3

The only identifiable vessel forms from this phase were fragments from prismatic and cylindrical bottles dating from the first to third centuries. A proportion of this material is likely to be residual.

Residual material in post-Roman contexts

This phase produced 1 identifiable vessel. No. 2 is a folded rim in colourless glass possibly from a jar or small flask (Isings 1957, form 67a) dated to the late first and second century (Price 1980). The exact vessel form is difficult to determine due to the small size of the fragment. Colourless vessels were common during the late first and early second century AD in Britain while the jar and flask form were produced throughout the Roman period.

One fragment of cast matt/glossy window glass dating from the late first to third centuries AD was recovered.

No. 5 & 6 are fragments of blue/green cup or beaker produced during the first to third century AD. Body fragments from prismatic and cylindrical bottles, commonly found on sites dating from the late first to early third, were also identified.

Summary

All the Roman vessels appear to be of a domestic range dating from the late first to early third centuries AD, consistent with other glass assemblages recovered from Leicester. The presence of the colourless and yellow/green vessels may indicate, however, a date range of late first to mid second century AD.

Roman ceramic building material

The assemblage demonstrates a range of forms very similar to those recovered from excavations of Roman sites in Leicester town centre. The assemblage weighed a total of 54kg.
<table>
<thead>
<tr>
<th>Material type</th>
<th>No. of Fragments</th>
<th>Weight (kg)</th>
<th>% of assemblage (wt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall tile</td>
<td>62</td>
<td>31.8</td>
<td>59.0</td>
</tr>
<tr>
<td>Tegula</td>
<td>37</td>
<td>7.1</td>
<td>13.2</td>
</tr>
<tr>
<td>Box tile</td>
<td>15</td>
<td>1.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Imbresx</td>
<td>26</td>
<td>1.9</td>
<td>3.5</td>
</tr>
<tr>
<td>Unclassified</td>
<td>262</td>
<td>11.6</td>
<td>21.5</td>
</tr>
<tr>
<td>Fired clay</td>
<td>2</td>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Table 16: Range and quantity of Roman ceramic building material

Identification of the forms was made difficult by the fragmentary nature of the material. Initial classification of the material by tile form was undertaken in context groups, and later studied by phase.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Roof tile</th>
<th>Wall tile</th>
<th>Box tile</th>
<th>Unclass.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tegula</td>
<td>Imbresx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 1</td>
<td>3.4</td>
<td>9.9</td>
<td>1.6</td>
<td>2.9</td>
<td>17.8</td>
</tr>
<tr>
<td>Phase 2</td>
<td>1.3</td>
<td>0.6</td>
<td>9.4</td>
<td>1.0</td>
<td>14.8</td>
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<tr>
<td>Phase 3</td>
<td>0.2</td>
<td>0.02</td>
<td>1.3</td>
<td>0.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Post-Roman</td>
<td>0.4</td>
<td>0.3</td>
<td></td>
<td>2.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Table 17: Weight (kg) of Roman tile types by phase

Discussion

Incomplete finger signatures were noted on three fragments of wall tile with a further five examples of finger impressions. One wall tile placed at the head of grave 15.3 had two different dog paw imprints.

There are two priority groups highlighted by the quantity and completeness of the wall tile, ditch G5, phase 2 and Group 7 features, especially 7.1 of phase 1. Group 7 was originally interpreted as a possible hearth area. The use of wall tile in hearths and associated structures is often recorded, however in this case the tile lacked any evidence of burning and therefore could not have been in direct contact with a heat source. The features are now thought to have a structural function. In contrast, the tile from ditch G5 demonstrated extensive secondary burning. The original source of this material was not identified. The ditch is dated to c. mid second to early third century, a period with no clear evidence of occupation. Cooper (pers. comm.) has speculated that the material may have derived from the demolition of a nearby building associated with the evident occupation in the vicinity during phase 1.

From the evidence uncovered during these excavations it is impossible to relate the material to any original structural use, or even reuse.

Charred and mineralised plant macrofossils

Angela Monckton

Methods

Samples were taken from the pits, ditches and other features of the pre-cemetery phases, from the cemetery phase and from the succeeding medieval features for the recovery of plant and animal remains. The samples were wet sieved in a York tank with a 1mm mesh and flotation into a 0.5mm sieve. The residues were air dried and sorted for all remains and the flotation fractions (flots) were sorted with a x10 stereo microscope for plant remains and other evidence. A total of 36 contexts was sampled amounting to 543 litres (610 kg), mainly from the pre-
cemetery phases, but including 158 litres from the cemetery phase and 67 litres from the medieval features. The plant remains were identified as far as possible, counted and listed (Table 18).

The charred plant remains included cereal grains, a small amount of chaff and seeds. The plant remains also included mineralised material such as legumes, fruit stones and seeds, these are preserved by calcium phosphate or carbonate replacement which occurs in such conditions as found in cesspits. A third type of preservation found here, as well as at other sites in Leicester, consisted of seeds referred to as uncharred. These appear to be the remains of the more robust seed coats which are possibly partially mineralised. Radiocarbon dating of elder seeds (Sambucus nigra) of this type from the Shires showed that they were ancient (Moffett 1993) so some of these seeds are probably archaeological. However as they are indistinguishable from modern seeds this can only be argued for deeply buried deposits which did not occur on this site. Intrusive seeds of thorn-apple (Datura stramonium), which is a New World introduction, were recovered, probably originating from modern foundation trenches or the associated scaffold pits for the previous building.

Phase 1

The pit 8.1 had mineralised remains, mainly from (213), including opium poppy (Papaver somniferum) and fig seeds (Ficus carica), sloe stones (Prunus spinosa), apple (Malus sylvestris s l) and grape pips (Vitis vinifera) suggesting that the pit contained latrine waste. Fish bones were found, some of which were distorted in the same way as chewed fish bones found at the Shires, Leicester (Nicholson 1992), also suggesting the presence of sewage. This was further suggested by finds of mineralised fly puparia in a similar condition to those found in cesspits at Causeway Lane (Connor and Buckley forthcoming) and the presence of parasite ova (see Boyer, below). Other remains from the pit were mineralised legumes including peas (Pisum sativum) and lentils (Lens culinaris) which with charred cereal remains and seeds suggested the presence of domestic rubbish as well as latrine waste. Other pits, 8.3 and 8.9, the ditch segments 2.1 and 3.1 and feature 7.1 contained small amounts of charred cereal grains with a little chaff and seeds suggesting redeposited domestic rubbish.

Phase 2

The ditch segments 5.1, 10.1, 11.1, 12.1 and 14.1 had a consistent presence of cereal remains, mainly of grains with a little chaff including glumes of spelt (Triticum spelta). Charred legume fragments and hazel nut shell (Corylus avellana) were present also suggesting domestic rubbish.

Phase 3

Samples of group 15 were mainly taken to ensure the recovery of human bone but were also scanned for plant and animal remains. Only (96), 15.28 had bulk samples analysed and similar charred remains to those from the previous phases were found. These were present in small quantities in all the samples examined from this phase together with occasional mineralised fruit pips from (347) and (572). This material probably represents reworked deposits from the previous phases.

Post-Roman

The sampled medieval ditches 16.4 and 16.5 had larger numbers of uncharred seeds than the other samples examined possibly derived from reworked pit deposits or manuring. These may represent plants growing in the town near the ditches or in waste areas where plants such as elder and henbane (Hyoscyamus niger) tend to grow. Little evidence was
found from the post-medieval cultivation trench which was sampled, 20.11; this is not surprising as remains would only be preserved if burnt on the site or mineralised in cesspits.

### Results

<table>
<thead>
<tr>
<th>Phase Group</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Context</th>
<th>(Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal chaff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Triticum dicoccum</em> Schübl (gl)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Emmer</td>
<td>(213)</td>
</tr>
<tr>
<td><em>Triticum spelta</em> L. (gl)</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>13</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>Spelt</td>
<td>(224)</td>
</tr>
<tr>
<td><em>T. dicoccum/spelta</em> (gl)</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>Emmer/Spelt</td>
<td>(157)</td>
</tr>
<tr>
<td><em>Triticum</em> sp. rachis</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>Wheat</td>
<td></td>
</tr>
<tr>
<td>Grains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Triticum</em> cf. <em>dicolocum</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>cf. Emmer</td>
<td></td>
</tr>
<tr>
<td><em>Triticum</em> cf. <em>aestivum</em></td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>Bread wheat type</td>
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<tr>
<td><em>Triticum</em> sp. (p)</td>
<td>30</td>
<td>13</td>
<td>16</td>
<td>46</td>
<td>19</td>
<td>3</td>
<td>4</td>
<td>Wheat</td>
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<td><em>Hordeum vulgare</em> L.</td>
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<td>-</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>-</td>
<td>1</td>
<td>Barley</td>
<td></td>
</tr>
<tr>
<td><em>Hordeum vulgare</em> L. (hulled)</td>
<td>4</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>Hulled barley</td>
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</tr>
<tr>
<td>cf <em>Secale cereale</em> L.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>cf. Rye</td>
<td></td>
</tr>
<tr>
<td><em>Avena</em> sp.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>Oat</td>
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<tr>
<td>Cereal indet.</td>
<td>69</td>
<td>30</td>
<td>93</td>
<td>129</td>
<td>109</td>
<td>14</td>
<td>12</td>
<td>Cereals</td>
<td></td>
</tr>
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<td>11</td>
<td>3</td>
<td>7</td>
<td>22</td>
<td>8</td>
<td>-</td>
<td>3</td>
<td>Cereal/Grass</td>
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<tr>
<td>Gramineae (large)</td>
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<td>5</td>
<td>7</td>
<td>6</td>
<td>8</td>
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<td>1</td>
<td>Grass</td>
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</tr>
<tr>
<td><em>Bromus hordeaceus/secalinus</em></td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>Brome Grass</td>
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</tr>
<tr>
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<tr>
<td><em>Pisum sativum</em> L. (m)</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Pea</td>
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</tr>
<tr>
<td><em>Pisum/Lathyrus</em></td>
<td>1</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Pea/Vetchling</td>
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</tr>
<tr>
<td><em>Vicia/Pisum</em></td>
<td>-</td>
<td>1</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>Bean/Pea</td>
<td></td>
</tr>
<tr>
<td><em>Vicia/Pisum</em> (m)</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Bean/Pea</td>
<td></td>
</tr>
<tr>
<td><em>Lens culinaris</em> L. (m)</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>11</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>cf. Lentil</td>
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</tr>
<tr>
<td>Collected or Cultivated</td>
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<td></td>
</tr>
<tr>
<td><em>Papaver somniferum</em> L. (m)</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>Opium Poppy</td>
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<tr>
<td><em>Vitis vinifera</em> L. (m)</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Grape</td>
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<td><em>Rubus fruticosus</em> agg. (m)</td>
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<td>-</td>
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<td>6</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>Blackberry</td>
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<tr>
<td><em>Prunus spinosa</em> L. (m)</td>
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<td>1</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>Sloe</td>
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<tr>
<td><em>Malus sylvestris</em> s l (m)</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Apple/ Crab Apple</td>
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</tr>
<tr>
<td><em>Malus/Pyrus</em> (m)</td>
<td>11</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>2</td>
<td>4</td>
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<td>-</td>
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<td>2</td>
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<td><em>Rumex acetosella</em> agg.</td>
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<td>-</td>
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<td><em>Euphorbia helioscopia</em> L. (u)</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>1</td>
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<td>Sun Spurge</td>
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<td>-</td>
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<td>1</td>
<td>1</td>
<td>3</td>
<td>-</td>
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<td>20</td>
<td>72</td>
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<td>26</td>
<td>-</td>
<td>2</td>
<td>Thorn-apple</td>
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</table>
**Galium aparine L.**  1  -  1  -  1  -  -  Cleavers  
**Anthemis cotula L.**  1  -  1  1  1  -  -  Stinking Mayweed  
**Chelidonium majus L. (u)**  -  -  -  1  -  2  -  Greater Celandine  
**Conium maculatum L. (u)**  -  -  -  1  -  2  -  Hemlock  

**Other Wild Plants**  
**Ranunculus sp.**  -  -  -  1  -  -  -  Buttercup  
**Chenopodiaceae (u)**  10  -  -  -  -  -  -  Goosefoot family  
**Fumaria sp. (u)**  -  -  -  -  -  1  -  Fumitory  
**Urtica dioica L. (u)**  2  -  -  -  -  1  -  Nettle  
**Montia sp.**  -  -  -  -  -  1  -  Blinks  
**Stellaria palustris Retz**  2  -  1  -  -  -  -  Marsh stitchwort  
**Polygonum sp.**  -  -  1  -  -  -  -  Knotgrass  
**Polygonum sp. (u)**  2  -  -  -  -  -  -  Knotgrass  
**Lotus/Trifolium**  -  -  3  2  1  -  -  Lotus/Clover  
**Vicia sativa L.**  -  -  -  -  1  1  -  Common Vetch  
**Vicia/Lathyrus**  2  -  2  1  -  -  -  Vetch/Vetchling  
**Medicago/Melilotus/Trifolium**  4  -  2  2  7  -  1  Medick type  
**Apiaceae (m)**  1  -  -  -  -  2  -  Umbellifers  
**Plantago lanceolata L.**  -  -  -  1  -  -  -  Plantain  
**Asteraceae**  2  -  -  -  -  -  -  Daisy family  
**Carduus/Cirsium**  -  -  -  -  2  -  -  Thistles  
**Eleocharis sp.**  -  -  -  1  2  -  -  Spike Rush  
**Carex sp.**  -  -  -  -  1  2  -  -  Sedges  
**Cynosurus cristatus L.**  -  -  -  -  1  -  -  Crested Dog's-tail  
**Gramineae small**  2  -  3  2  6  -  1  Grasses  
**Indet seeds**  3  -  4  1  3  -  -  -  
**Indet seeds (m)**  10  -  -  1  2  -  -  -  

**Other Remains**  
**Mineralised fragments**  ++  -  -  4  2  -  -  
**Fungal parts**  2  -  -  5  2  1  -  
**Woody buds**  -  -  2  2  -  -  -  
**Bark fragments**  -  -  10  -  2  -  -  
**Stem fragments**  -  -  -  1  1  -  -  
**Stem fragments (m)**  ++  -  -  -  -  -  -  
**Culm small**  -  -  2  3  1  -  -  
**Culm small (m)**  14  -  -  -  -  -  -  
**Culm large**  -  -  -  1  -  -  -  
**Culm large (m)**  22  -  -  -  -  -  -  

**Total Remains**  349  79  265  387  258  98  40  1476 items  
**Number of samples**  1  1  8  8  15  2  1  36 samples  
**Volume (litres)**  72  35  85  126  158  24  43  543 litres  
**Weight (kg)**  82  22  102  141  186  27  50  610 kg  
**Flot volume (ml)**  153  52  225  265  309  89  90  1183 ml  

All remains are seeds in the broad sense except where stated. Remains are charred unless stated.  
Key:  
(gl) = glume base;  
(m) = mineralised;  
(u) = uncharred.  
(++) = abundant;  
Other = other contexts of phase 1.  

Table 18: Charred and mineralised Plant Remains
Discussion

The wheat from the Roman period was spelt, identified from the chaff (glumes), with a little emmer (*Triticum dicoccum*) and bread wheat (*Triticum cf aestivum*). Bread wheat is the only free threshing wheat known from the Roman period but there was no diagnostic chaff to confirm this in the samples from this site. The charred seeds included arable weed seeds such as stinking mayweed (*Anthemis cotula*) and cleavers (*Galium aparine*) as found on other sites in Leicester (Moffett 1993, Monckton forthcoming). Oat grains (*Avena* sp) were found, although there was too little to suggest that this was a crop; it was probably an arable weed together with brome grass (*Bromus hordeaceus* or *secalinus*). Other cereals represented included barley (*Hordeum vulgare*) and possibly rye (*cf Secale cereale*). Other charred seeds may also be arable weeds or weeds of disturbed ground in the town.

Other cultivated plants included peas, apples or crab apples, opium poppy and grapes all of which may have been grown in the area, although the latter two may have been imported. Sloe and hazel nuts are food plants and were possibly collected from hedgerows. Figs and lentils were well represented and are possibly imported foods, although both can grow in this country.

Conclusions

The condition and range of remains found in the phase 1 pit [210] suggest that this was a cesspit similar to those found at Causeway Lane, Leicester (Connor and Buckley forthcoming). Evidence for the consumption of fruit, legumes, nuts and cereals was found and nearby domestic occupation is strongly indicated in phase 1 and probably phase 2. The remains from the cemetery phase are probably reworked from earlier phases as may be those from the medieval deposits which contained very few remains.

Parasite ova

P. Boyer

Method

Material from two contexts, pit 8.1 (phase 1) and ditch 5.1 (phase 2), were tested for the presence of parasite ova. Four sub-samples were analysed from pit 8.1: two from raw sediment samples of (213), two from 'cess' recovered from (213) during wet sieving, and one from the contents of a whole pot SF 94 recovered from (213). One sub-sample from (279), ditch 5.1 was also analysed. Samples were prepared to a known mass and volume to allow counts of parasite ova per known mass of sediment.

Results

Identified ova were most abundant in the two 'cess' samples with a dominance of *Trichuris* sp. in each. The size range of complete ova in each sample (52.7-57.8 x 24.7-29.8 um) indicated that these were of the human whip worm *T. trichuria*. The abundance of *Trichuris* ova (700 and 800 ova per gram of sediment equivalent) suggests a strong likelihood that the 'cess' was human derived waste. Further weight is added to this with the occurrence of two *Ascaris* sp. ova in one of these samples, probably *A. lumbricoides*, the human maw or round worm.

The raw sediment and pot contents from (213) yielded one *Trichuris* sp. ovum each (probably *T. trichuria*), suggesting a concentration of c. 100 ova per gram of sediment, thus suggesting at least a background human waste element within this context. The sample from (279), 5.1 was the least productive, yielding what appeared to be one unfertilised *Ascaris* sp. ovum. The small size of this specimen did not permit positive identification.
Overall the preservation of the ova was quite good with complete *Trichuris* ova (both polar plugs preserved) observed in both ‘cess’ samples and in the pot contents sample.

**Animal bone**

**Method**

The animal bone was collected by hand supplemented by wet sieving of 5-10kg soil samples using 1mm mesh. Full data, recording methods and bone measurements are available in the archive. The bone was in generally good condition with little evidence of weathering. With the possible exception of small mammal and amphibian remains, the animal bone from the phase 3 cemetery is probably residual from earlier phases.

**Results**

**Species representation**

<table>
<thead>
<tr>
<th>Domestic species</th>
<th>Phases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse</td>
<td>2, 3, 4, 7</td>
</tr>
<tr>
<td>Cattle</td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>Sheep/Goat</td>
<td>1, 2, 3, 4, 5, 7</td>
</tr>
<tr>
<td>Pig</td>
<td>1, 2, 3, 4, 5, 7</td>
</tr>
<tr>
<td>Dog</td>
<td>2, 3, 4, 7</td>
</tr>
<tr>
<td>Fowl</td>
<td>1, 2, 3, 4, 5, 7</td>
</tr>
</tbody>
</table>

**Wild species**

<table>
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<th>Phases</th>
</tr>
</thead>
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<tr>
<td>Indeterminate Deer</td>
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</tr>
<tr>
<td>Hare</td>
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</tr>
<tr>
<td>Weasel</td>
<td>2</td>
</tr>
<tr>
<td>House Mouse</td>
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</tr>
<tr>
<td>Water Vole</td>
<td>1</td>
</tr>
<tr>
<td>?Field Vole</td>
<td>1</td>
</tr>
<tr>
<td>Bank Vole</td>
<td>2</td>
</tr>
<tr>
<td>Mole</td>
<td>2</td>
</tr>
<tr>
<td>Common Shrew</td>
<td>4</td>
</tr>
<tr>
<td>Goose</td>
<td>2</td>
</tr>
<tr>
<td>Frog</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Toad</td>
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</table>

**Species abundance**

Results are presented in detail in accompanying tables listed below. Quantities of bone are shown as numbers of recorded fragments (NRF) for hand-collected and sample bone.
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<thead>
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<th>Taxon/Phase</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<td>43</td>
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<td>0</td>
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| Total        | 187| 276| 69 | 233| 79 | 3  | 32 | 879   |

Table 19: All taxa: hand-collected: NRF

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<th>3</th>
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</tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
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<td>0</td>
<td>1</td>
</tr>
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</tr>
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<td>5</td>
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</tr>
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<td>0</td>
<td>1</td>
</tr>
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<td>13</td>
<td>17</td>
<td>6</td>
<td>2</td>
<td>83</td>
</tr>
</tbody>
</table>

| Total        | 235| 35 | 38 | 13 | 8  | 329   |

Table 20: All taxa: Sample Bone: NRF

Quantities

A total of 879 identifiable bone fragments were recovered by hand and 329 from sifted soil samples making a total of 1208 fragments in all. Of these 840 (69.5%) were from Roman contexts with 733 (60.7%) fragments recovered from features pre-dating the Roman cemetery.

Relative taxonomic abundance

In all phases except phase 7 the main identified taxa are cattle, sheep/goat and pig. For most purposes Large Mammal equates with cattle and Medium Mammal with sheep.
Cattle fragments are much more frequent than sheep in phase 2 but numbers are more equal in the hand-collected bone from phases 1, 3-5. Pig is the third most common among the domestic food species in phases 1-5 accounting for 13.5% over all. In terms of meat yield, cattle would have been more important than sheep/goat in all phases with one cattle carcass approximately equivalent to 10 sheep (Harcourt 1979). The relatively high numbers of sheep/goat and pig fragments in the phase 1 samples are due to unusually large numbers of foot elements (mostly sesamoids) recovered from pit 8.1.

Notes on the species

Horse

Horse remains occur in the backfill of the Roman ditch cuts of phase 2, with a probably residual fragment in a phase 3 grave. An isolated upper second incisor from ditch 12.1 indicates the presence of an animal approximately 4.5 - 10 yrs old, and a lower third premolar from ditch 11.2 came from a 3 - 3.5 year old (Levine 1982). No long bones were complete enough to provide withers height estimates. Fragments of the cranium, vertebral column and pelvis of a horse were found in a modern service trench (phase 7).

Cattle

The bones of cattle account for 30% of identified bone in phases 1 and 2, 62% if combined with Large Mammal (most of which, if not all, is cattle but without diagnostic features). A single complete metatarsus from pit 8.1 phase 1 gives an estimated withers height of 1.18m using the multiplication factor given by Fock (1966) where the sex of the animal is unknown. Fragments of 14 horn cores were found in a ditch section 5.2, phase 2. Most of these have been chopped, with chop marks from one third to two thirds from the base. These probably represent a deposit of horner’s waste. Only two horn cores from the site were complete enough for the outer length to be measured. These are shorthorn in the classification of Armitage (1982) and all derive from adult beasts at least 7-10yrs old. No attempt to estimate sex was made from horn core proportions, partly due to a shortage of complete specimens and partly due to doubts about methodological procedures (A.J. Gouldwell pers. comm.; Grigson 1982). A left innominate fragment from ditch 5.2 would seem to be male according to Lemppenau’s (1968) criterion of a thicker medial wall of the acetabulum in bulls. A phalanx II from ditch section 13.3 is very expanded proximally, possibly a case of high ring bone (Baker and Brothwell 1980), and the complete metatarsus from 8.1, phase 1 has an ossified haematoma on its distal medial shaft. A cattle horn core fragment from layer 18.5, phase 4, is larger than those from the Roman deposits and must have had an original length of approximately 250mm. This is mediumhorn in the classification of Armitage (1982).

Sheep/Goat

No systematic attempt was made to distinguish the bones of goats from those of sheep. However, no goat was recognised and the two metatarsi complete enough to permit height estimates derive from sheep. This is the case both on qualitative morphological grounds and in terms of Boessneck’s (1969) index, which was over 63 in both specimens. The metatarsals from pit 8.1 and ditch section 13.4 derive from animals approximately 0.58m and 0.61m high at the withers (based on the multiplication factor given by Teichert (1975). Sheep/goat bones account for 15% of identified hand-collected bones from phases 1 and 2, 26% if combined with Medium Mammal. Of 60 sesamoids found in samples from pit 8.1, phase 1, which belong to both sheep/goat and pig, sheep/goat seem to account for about one third. The foot elements of immature sheep/goat and pig were also recovered in the same samples.

A medieval sheep/goat left mandible fragment from 18.5, phase 4, has a dental abnormality affecting P3, P4 and M1 (illus. 31). An object seems to have been habitually wedged between
P4 and M1 resulting in wear on the distal and mesial surfaces respectively of these teeth. P4 has been pushed forwards against P3 which is also abnormally worn. The mandible wear stage (Grant 1982) is around 48-49 which indicates an old animal.

Pig

Pig bones account for just under 8% of the animal bones from the Roman deposits in phases 1 and 2. It does not seem that a significant proportion of the Medium Mammal category is represented by otherwise unidentified pig remains, with the exception of the 8.1 sesamoids, where approximately two thirds are probably pig. Lower canines of males and females were found in equal numbers, in pit 8.3 and ditch sections 12.2 and 13.4. Two astragali, from pit 8.1, give withers height estimates of 0.74m and 0.81m using the multiplication factor of Teichert (1966,1969). The pigs are typical long snouted, long legged animals.

Dog

The dog remains are scattered elements from lightly built small to medium sized animals. No long bones were complete enough to provide height estimates, but a small toothless left mandible from ditch 13.3 is similar in size to mandibles found with crania, and in one case a complete skeleton, at Great Holme Street. The Great Holme Street animals had fox sized heads (cranial length 144.3mm and 157.6mm) and a shoulder height in the region of 42cm (Baxter et al. forthcoming; Gouldwell forthcoming). The mandible from Newark Street has lost its second premolar in life and the alveolous has resorbed. The teeth were crowded with

31. A medieval sheep/goat left mandible fragment with dental abnormality resulting from the wedging of an object between P4 and M1 (scale in cm.)
the molar sockets encroaching on the vertical ramus. The partial skeleton of a small dog of indeterminate breed in the LAU reference collection has a mandible of similar size and an estimated stature of 37cm using the multiplication factors of Harcourt (1974).

A right tibia fragment found in grave 15.11 below the human skeleton has a haematoma caused by traumatic injury on the medial mid-shaft. The bone is too damaged to be measured accurately but came from a lightly built animal over 40cm high at the shoulder. This tibia has two parallel cut marks running lengthways on the lateral side from near the proximal break to near the level of the nutrient foramen. The proximal shaft seems to have been gnawed. Tooth punctures occur on a left scapula fragment from 13.1 and a proximal right femur fragment from grave 15.14. These seem to have been caused by dogs rather than foxes. Dog bones with cut marks are also known from Causeway Lane (Baxter et al. forthcoming; Gidney forthcoming).

Domestic fowl

More than 80% of the domestic fowl bones are wing and foot elements from samples taken from pit 8.1. Only the tips of the wing are represented (phalanges I and II of digit III), together with ulnar and radial carpals. Most of the foot bones are claw bones (terminal phalanges). A total of five ulnaae gives a minimum number of individuals (MNI) of three birds. The two indeterminate bird bone fragments from Roman deposits probably belong to domestic fowl rather than wild species.

Wild species

The remains of wild species account for 15% of the Roman animal bones. A goose tarsometatarsus shaft fragment was found in ditch section 13.1, but is too incomplete to assign to either domestic or wild species. Three bones of hare, presumably brown hare, were found in pit 8.1 and ditch section 13.4. These could represent food items as the hare was a favourite Roman animal of the chase and was also kept in game reserves or leporaria during the Republic (Toynbee 1973, pp.200-202).

The humerus of a mole was found in a primary ditch fill sample from 10.2. This is probably contemporary with the deposit rather than intrusive. An upper molar tooth belonging to a weasel was recovered from a sample from ditch 12.1. Infrequent remains of house mouse, water vole, and probable field vole were found in samples from phase 1, and bank vole in phase 2. Eighty bones belonging to anuran amphibians were found in various features in the Roman deposits. Pelvic elements indicate the presence of both frogs and toads. These were assigned to species using the illustrations in Gasc (1966) and Holman (1985). Although the numbers of small mammals from the Roman levels at the site are not great, their presence at Newark Street and absence from contemporary deposits at the nearby Bonners Lane site suggests that either the environmental or taphonomic processes were different at the two localities (Baxter forthcoming).

A metatarsus III+IV shaft fragment of fallow deer (Dama dama) and two burnt antler fragments, probably from fallow deer, were found in the medieval ditch 19.1. The only other deer remains from the site are an, unfortunately, unstratified roe deer (Capreolus capreolus) metatarsus fragment.

Summary and conclusions

Although the numbers of bone fragments from any phase are relatively small, it is possible to identify different activity related taphonomic processes affecting the deposition of animal bones in the three Roman phases. The phase 1 bone mostly derives from pits, at least one of which (8.1) has a cess element in its fill. The relatively light fowl wing and foot bones, together with the small sheep and pig sesamoids, may have arrived in the pit via a drain outflow. This would explain the
presence of these light elements and the absence of heavier and larger bones from the wings and feet.

The cattle horn cores from the ditch section 5.2 of phase 2 probably represent a deposit of horners waste. The small mammal bones from phase 1, belonging to house mouse, water vole and (possible) field vole, may indicate proximity to human activity and open land. The bank vole and weasel in phase 2 suggest an increase in ground cover coincident with a change from refuse dumped in pits to the dumping of material from off-site in the ditches. Phase 3 is represented by the cemetery and the animal bone from this phase is probably residual, with the exception of small mammals and amphibians. The medieval deposits are consonant with backyard and later horticultural activity but are otherwise uninformative.

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