Northamptonshire Archaeology

Archaeological excavation at The Grange, Rothley, Leicestershire March-June 2007

Northamptonshire Archaeology
2 Bolton House
Wootton Hall Park
Northampton NN4 8BE
t. 01604 700493 f. 01604 702822
e. sparry@northamptonshire.gov.uk
w. www.northantsarchaeology.co.uk

Northamptonshire County Council

Tim Upson-Smith

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STAFF

Project Managers:	Adam Yates BA AIfA, Iain Soden BA MIfA
Text:	Tim Upson-Smith BA PG Dip
Editing:	Andy Chapman BSc MIfA FSA, Paul Mason BA AIfA
Fieldwork:	Tim Upson-Smith, Amir Bassir BSc, Peter Burns, Adrian Burrow MA, Simon Cleggit, Paul Clements BA, Damian Churchill MA, Nathan Flavell BA PG Dip, Miranda Haigh BA, David Haynes, Luis Huscroft, Paul Kajewski BA PGDip, Jennifer Kinsman, James Ladocha BA, Wallis Lord-Hart BA MSc, Emma Rae BA, Rob Smith, Angela Warner BSc, Y B Wolframm-Murray BSc PhD, Siobhan Brocklehurst, Mike Henderson & Liv Van Den Eynde
Baysian analysis:	Peter Marshall
Flint:	Y B Wolframm-Murray
Roman pottery:	Jane Timby BA PhD FSA MIfA
Medieval pottery:	Paul Blinkhorn BTech
Other finds:	Tora Hylton
Ceramic building material:	Pat Chapman BA CMS AIfA
Human bone:	Sarah Inskip BSc MA
Animal bone:	Karen Deighton MSc
Environmental evidence:	Wallis Lord-Hart
Illustrations:	Amir Bassir & Carol Simmonds BA

QUALITY CONTROL

	Print name	Signed	Date
Checked by	Pat Chapman and Paul Mason		
Verified by	Iain Soden		
Approved by	Andy Chapman Steve Parry		

OASIS REPORT FORM

PROJECT DETAILS		
Project name	Archaeological excavation at The Grange Rothley, Leicestershire, March-June 2007	
Short description	Northamptonshire Archaeology was commissioned by CgMs Consulting, on behalf of their client William Davis Ltd, to undertake an archaeological excavation in advance of development at The Grange, Rothley, Leicestershire, which lies to the immediate north of the churchyard of the parish church. Roman activity in close vicinity to the site was represented by large quantities of building material, including roof tiles and slates, together with a series of substantial post-pits, ditches, gullies and layers dating to the 2nd-4th centuries. Standing remains of Roman buildings may have still been extant when burial commenced in the late7th/early 8th century, as defined by radiocarbon dating. The burials would have lain in the northern part of a churchyard that was presumably attached to an undocumented Saxon minster church. The remains of up to 149 individuals were at least partially in situ, although many were heavily disturbed, with extensive deposits of reburied and disarticulated bone. Originally, there had been at least 161 burials. There was a single well defined primary row of burials and further partial rows, and the numerous gaps appear to be genuine and not solely a result of later disturbance. Burial in this area appears to have ceased by the end of the 10th century, indicating there was a contraction of the churchyard within the late Saxon period, perhaps reflecting a change of status for the church sometime prior to the Norman Conquest. Later medieval and post-medieval activity was represented by a small number of pits and gullies and garden features relating to the late 18th-century Grange.	
Project type	Excavation	
Previous work	Archaeological evaluation,	
Current Land use	Housing	
Future work	Unknown	
Significant finds	Roman building rubble and Christian Saxon cemetery	
PROJECT LOCATION		
County	Leicestershire	
Site address	The Grange, Rothley	
Study area ha	1.8ha	
OS grid	SK 5867 1273	
Height aOD	48m	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology & CgMs Consulting	
Project brief originator	Richard Clarke	
Project Design originator	Northamptonshire Archaeology CgMs Consulting	
Supervisor	Tim Upson-Smith	
Project Managers	Adam Yates/Iain Soden for NA, Paul Gajos for CgMs Consulting	
Sponsor	William Davis Ltd	
PROJECT DATE		
Start date	March 2007	
End date	June 2007	
ARCHIVES	**Location**	**Location**
Paper X.A52.2007	Drawings, written records	Northamptonshire Archaeology
Physical X.A52.2007	Finds, skeletal material	Northamptonshire Archaeology
Digital X.A52.2007	Photo's, mapping	Northamptonshire Archaeology
BIBLIOGRAPHY	unpublished client report (NA report)	
Title	Archaeological excavation at The Grange Rothley, Leicestershire, March-June 2007	
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ARCHAEOLOGICAL EXCAVATION AT THE GRANGE, ROTHLEY, LEICESTERSHIRE MARCH-JUNE 2007

Abstract

Northamptonshire Archaeology was commissioned by CgMs Consulting, on behalf of their client William Davis Ltd, to undertake an archaeological excavation in advance of development at The Grange, Rothley, Leicestershire, which lies to the immediate north of the churchyard of the parish church.

Roman activity both within the site and in close vicinity was represented by large quantities of building material, including roof tiles and slates, together with a series of substantial post-pits, ditches, gullies and layers dating to the 2nd-4th centuries.

Standing remains of Roman buildings may have still been extant when burial commenced in the late7th/early 8th century, as defined by radiocarbon dating. The burials would have lain in the northern part of a churchyard that was presumably attached to an undocumented Saxon minster church. The remains of up to 149 individuals were at least partially in situ*, although many were heavily disturbed, with extensive deposits of reburied and disarticulated bone. Originally, there had been at least 161 burials. There was a single well defined primary row of burials and further partial rows, and the numerous gaps appear to be genuine and not solely a result of later disturbance. Burial in this area appears to have ceased by the end of the 10th century, indicating there was a contraction of the churchyard within the late Saxon period, perhaps reflecting a change of status for the church sometime prior to the Norman Conquest.*

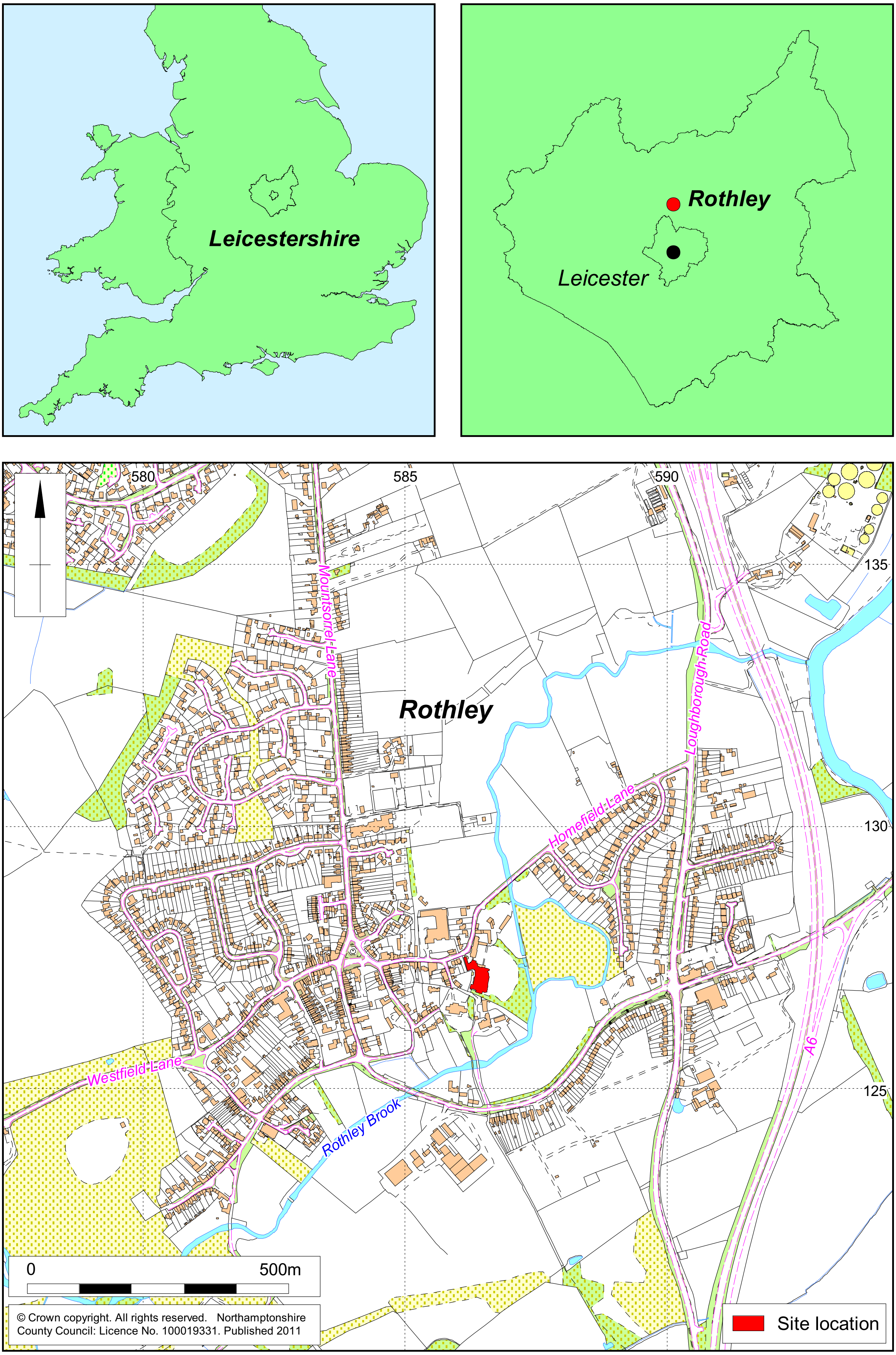
Later medieval and post-medieval activity was represented by a small number of pits and gullies and garden features relating to the late 18th-century Grange.

1 INTRODUCTION

Northamptonshire Archaeology was commissioned by CgMs Consulting, on behalf of their client William Davis Ltd, to undertake an archaeological excavation in advance of development at The Grange, Rothley, Leicestershire. The site is situated to the east of Fowke Street, Rothley (NGR SK 5867 1273, Figs 1 and 2).

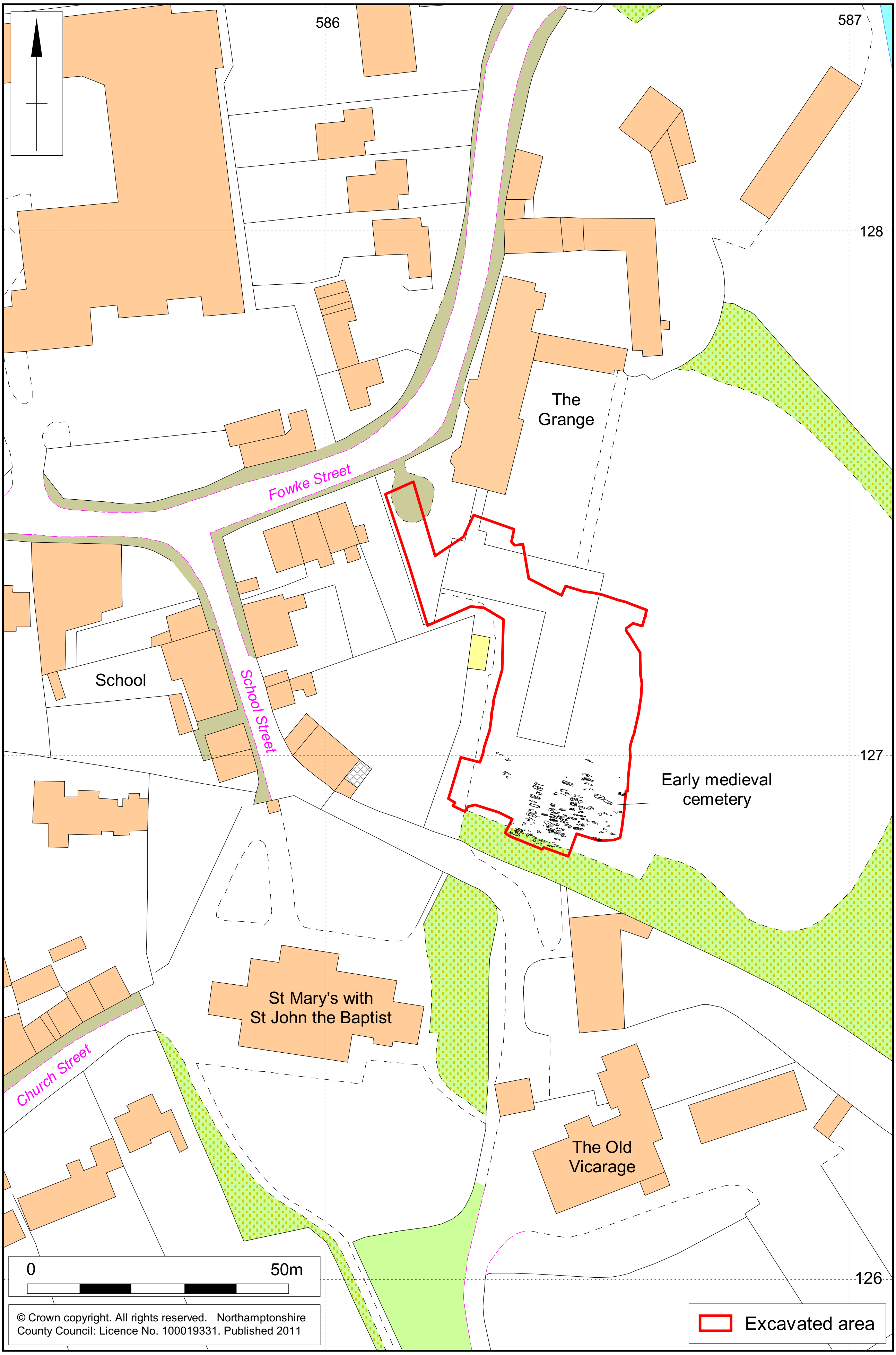
William Davis Ltd made a planning application to Charnwood Borough Council for the construction of apartments and for converting the Grange to residential use (Application ref P/05/1550/2). An Archaeological Desk-Based Assessment of the site was undertaken by John Samuels Archaeological Consultants (JSAC 2004), which established that the south-western half of the site lay within the medieval village of Rothley, and therefore had the potential to contain medieval or earlier remains. The Leicestershire Senior Planning Archaeologist recommended to Charnwood Borough Council that an archaeological evaluation should be undertaken as a condition of planning consent. The archaeological evaluation was undertaken by Oxford Archaeology (OA) for JSAC in two phases in September 2005 and June 2006 (OA 2006a and 2006b).

As a result of the findings of the evaluation work, further archaeological mitigation work was required. This work, the results of which form the subject of this report, was carried out between March and July 2007. The Leicestershire Museums Accession Number is XA.52: 2007.



Scale 1:10,000 (A4)

Site Location Fig 1



Scale 1:1000 (A4)

The excavated area and its environs Fig 2

2 BACKGROUND

2.1 Archaeological and historical background

The following summary of the archaeological and historical background of the site is largely based on the desk-based assessment prepared by John Samuels Archaeological Consultants (JSAC 2004).

Prehistoric

A light scatter of Neolithic struck flint was recovered during an evaluation carried out in 2004 on land to the east of the village, approximately 400m east of the site. There is also evidence of prehistoric activity from cropmarks located 400m south of the site, which suggest the presence of a large Bronze Age ring ditch, possibly a barrow, and a rectilinear enclosure that may date from the Iron Age.

Roman

The antiquarian, Nichols (1795), refers to the discovery of Roman remains at a site north of the Swithland road, a quarter or half mile from Rothley, where stone, bricks, tiles and a pavement of tesserae were found in 1722. This appears to relate to a site noted during construction of the railway line in 1896 when an area of tessellated pavement was discovered, and also during construction of the Ridgeway in 1901, when hypocaust tiles were recorded, in association with pottery, querns and slate. The site is noted on the Ordnance Survey map of Roman Britain (4th edition, 1991) as a villa. A resistivity survey was carried out in the area in 2000, which suggested the site was a Roman villa of courtyard type, with a gated wall and outhouses. Its location is about 2km west of the present site.

Roman remains are also noted on 25″ Ordnance Survey maps of 1885-1929 and on the 1:2500 Ordnance Survey map of 1956, centred to the east of the vicarage, south of the present site. The 1903 map specifically notes a ‘Roman pavement, found AD 1722’; the concordance of this date with those remains mentioned by Nichols is thought by the author to be purely coincidental.

The only other evidence of Roman activity within the vicinity of the site is the findspot of a bronze coin of Constantine the Great, recorded from Fowke Street, approximately 50m west of the site.

Anglo-Saxon and medieval

Although Rothley is not mentioned in any Anglo-Saxon charters, it is noted in the Domesday Book of 1086 that:

‘The king holds Rothley. King Edward held it. There are 5 carucates of land. In demesne are 2 of these and there are 2 ploughs; and 29 villains with a priest and 18 bordars have 6 ploughs. There is a mill rendering 4s, and 37 acres of meadow...This vill is worth 62s a year’ (Williams and Martin 1992, 628)

Rothley thus appears to have been a substantial settlement by the late Saxon period when it was a royal manor and had a priest. The presence of a priest indicates that there was a church pre-Conquest. This is also indicated by the survival of a late Saxon cross still standing in the churchyard of the parish church of St Mary and St John Baptist (SM 21646). English Heritage considers the cross to be late 8th or 9th century in date. It was originally a monolith, but has been broken into four stones at some date and subsequently reassembled. It stands on an earthen mound 3.9m diameter and 0.6m high at centre, within which the socket stone is partly buried. Each face of the shaft is divided by doubled mouldings into four ornamental panels with elaborate low relief carved decoration. The cross is considered to stand in its original location (http://www.pastscape.org.uk/hob.aspx?hob_id=317180). It has been suggested that the cross is a funerary monument rather than a preaching cross (Stafford 1985, 174).

The pre-Conquest status of the church at Rothley has been considered in the past by Parsons (1996, 26) and more recently in an unpublished thesis (McLoughlin 2010, 208-210). Parsons cited the status of Rothley as a royal soke, as an indicator that it could have been a minster of some importance, with its large parish forming part of an extensive *parochia*. McLoughlin has taken up this suggestion by examining in greater detail the extent of Rothley parish and by seeking comparisons with contemporary documented minsters. It is concluded that by analogy with documented minsters Rothley fulfils many of the expected conditions for minster status, but lacking the documentary evidence it remains an interesting but unproven hypothesis.

The present church dates mainly from the 13th and 14th centuries and was restored in 1878; however, there is compelling evidence for a Norman foundation to the present fabric. The pier bases of the north and south arcades are considered to be of Norman date and, during drainage works undertaken in the nave in 1977, it was observed that they rest on large rafts of limestone which are thought to date to the same period (http://www.pastscape.org.uk/hob.aspx?hob_id=964928). The church also possesses a Norman font.

Post-medieval and Industrial

Rothley Grange was built in 1774. A plan of Rothley, dated 1782, shows the vicinity of the site. The vicarage is shown, and the plan notes that it was occupied by the Rev Babington, brother of the lord of the manor, so a vicarage of high status would be expected. Holmefield Lane had been built by this date, and the Grange is shown, with a range of outbuildings to the north, which may have formed stables, and extensive grounds to the east, stretching down to Rothley Brook, which formed a large meander. The plan notes that Sir J Danvers owned it, along with a moderate amount of agricultural land in the vicinity. It is possible that it was one of the 'hunting seats' referred to by Throsby (1790).

The First Edition 1″ Ordnance Survey map of 1835 shows the Grange with additional outbuildings to the north of those shown in 1782. Subsequent editions map extensions and outbuildings. The grounds are also shown in more detail, with paths and a greenhouse, and paddocks to the east with a mixture of deciduous and evergreen trees.

Modern

The Grange has latterly been used for offices but had been vacated at the time of the excavation.

Recent archaeological work

In September 2005 and June 2006, Oxford Archaeology carried out field evaluations at the site (OA 2006a and 2006b). The evaluations revealed evidence for a cemetery of probable early medieval date within the south-western corner of the development area. Fragments of later Roman pottery and ceramic building material were also recovered, suggesting the presence of nearby settlement activity. There was also evidence for the use of some of the land as permanent pasture or flood meadows. No evidence was encountered for the extent of the medieval village of Rothley.

2.2 Geology and topography

The overall site covered an area of approximately 1.8ha, and lay at an average height of *c*48m AOD, sloping gently down to the south and east, towards Rothley Brook, which formed the eastern boundary of the original garden to 'The Grange' (Figs 1 and 2). The site was bounded to the west by the gardens of the properties fronting onto School Lane. The southern part of the site was scrub woodland, beyond which was a driveway dividing the site from the northern boundary of the churchyard for the Church of St Mary and St John the Baptist.

The underlying superficial deposits comprise alluvium overlying Triassic mudstones (http://www.bgs.ac.uk/geoindex/)

2.3 Original and updated aims and objectives

The original aims and objectives can be found in the specification (CgMs 2007). These were updated as follows in the Updated project Design (NA 2009):

- To mitigate the effect of the development on the archaeology, through analysis and publication of the results in a suitable academic journal;
- To present the significance of the site at local, regional and national levels;
- To suggest locality and focus of Roman occupation;
- To summarise the nature of the Roman features which lay partly on the site;
- To define the chronology of the Saxon cemetery;
- To analyse the organisation and development of the cemetery;
- To summarise the burial practices;
- To use osteology as a guide to the community, their age, health, diet and living conditions
- To look at comparative sites to put the site into context;
- To assess the nature of the site's use in the medieval/post-medieval periods;
- To assess whether and how this usage takes into account of the former cemetery.

2.4 Methodology

In response to the results of evaluation, an irregularly-shaped open area, measuring around 55m north-south by 26-45m east-west, approximately 1,450sq m, was excavated in the south-western portion of the development site (Fig 3).

Topsoil and overburden were removed by mechanical excavator using a toothless ditching bucket, under constant archaeological supervision. The spoil generated during the excavation was mounded away from the edges of the excavation.

Mechanical excavation ceased at either undisturbed natural deposits or when archaeological features were identified. The nature of these deposits was assessed by hand excavation.

The excavation area and spoil heaps were scanned with a metal detector to ensure maximum finds retrieval.

Hand excavation and recording proceeded following the methodologies set out in the agreed project specification (CgMs 2007).

Scale 1:500 (A4) General plan showing archaeological features and the cemetery Fig 3

3 PREHISTORIC ACTIVITY AND ROMAN OCCUPATION

3.1 Flints by Yvonne Wolframm-Murray

Prehistoric remains were limited to a scatter of residual flints dating to the late Neolithic or early Bronze Age (*c*2500-1500 BC). All were residual and therefore reflect background late Neolithic/early Bronze Age activity. No related features of this period were present.

3.2 Roman occupation

A number of postholes to the south and an adjacent area of possible wall tumble, as well as a number of pits and at least two ditches in the northern part of the site, are dated to the Roman period. In addition, there were also considerable quantities of Roman roof tile and slate. Much of this material was residual in later contexts, and there was an extensive a spread of roof tile on the western side of the site.

Unfortunately none of these elements are complete enough to indicate the full nature of Roman occupation in the environs of the site. Although the spread of roof tile and the postholes would appear to indicate the presence of substantial buildings (see below).

Pits and ditches

The earliest Roman features were two separate ditch systems in the northern part of the site, both aligned east-west and dated to the 2nd/3rd centuries AD (Fig 5).

Near the northern edge of the site there was a pair of parallel ditches. The northern ditch [331] was 1.2m wide by 0.21m deep, with a narrow, shallow gully [329] to the immediate south, perhaps a hedge-planting trench.

Further south there was another ditch [177]/[282], 1.7m wide by 0.48m deep (Fig 6; Section 10). Its western end was truncated by modern concrete footings and it continued eastward beyond the excavated area. The two ditch systems may have defined the limits of a trackway some 9m wide (Fig 5).

Towards the centre of the excavated area there was a group of inter-cutting pits that cut through the largest patch of compacted gravel surface. They contained Roman roof tile, but no pottery, leaving it unclear whether they were of Roman or later date.

In the north-western part of the site, there was a further narrow shallow gully [245] and a layer (255) which contained Roman tile fragments, but no pottery (Fig 3)

In addition to these features, there were a number of small shallow pits in the north-western part of the site that contained Roman tile or slate, and may be of Roman date, although such material was also noted in a number of later contexts.

Structural evidence

The evidence for Roman buildings having stood within the site and nearby was compelling. On the western edge of the excavated area there was a series of post-pits [7], [340], [285], [218], and [318] (Fig 5 and Fig 6; Sections 1 and 25), which were *c*1.0m in diameter by *c*0.4m deep. The best preserved example [7] had a recognisable post pipe [9], and within the fill (8) large fragments of granite post packing (Fig 4). The pits may form the eastern end of a structure *c*8m wide, north to south; with the western end of the building lying outside the excavated area. The post-pits produced pottery dated to the early 3rd century.

Within the middle part of the site there were patches of a compacted gravel metalled surface. The largest spread was cut by a series of pits containing Roman roof tile, indicating that the surface predated these pits and may have been Roman, perhaps a yard surface associated with a building lying to the west of the excavated area.

Post-pit [7], showing post-packing, looking west Fig 4

Demolition deposits

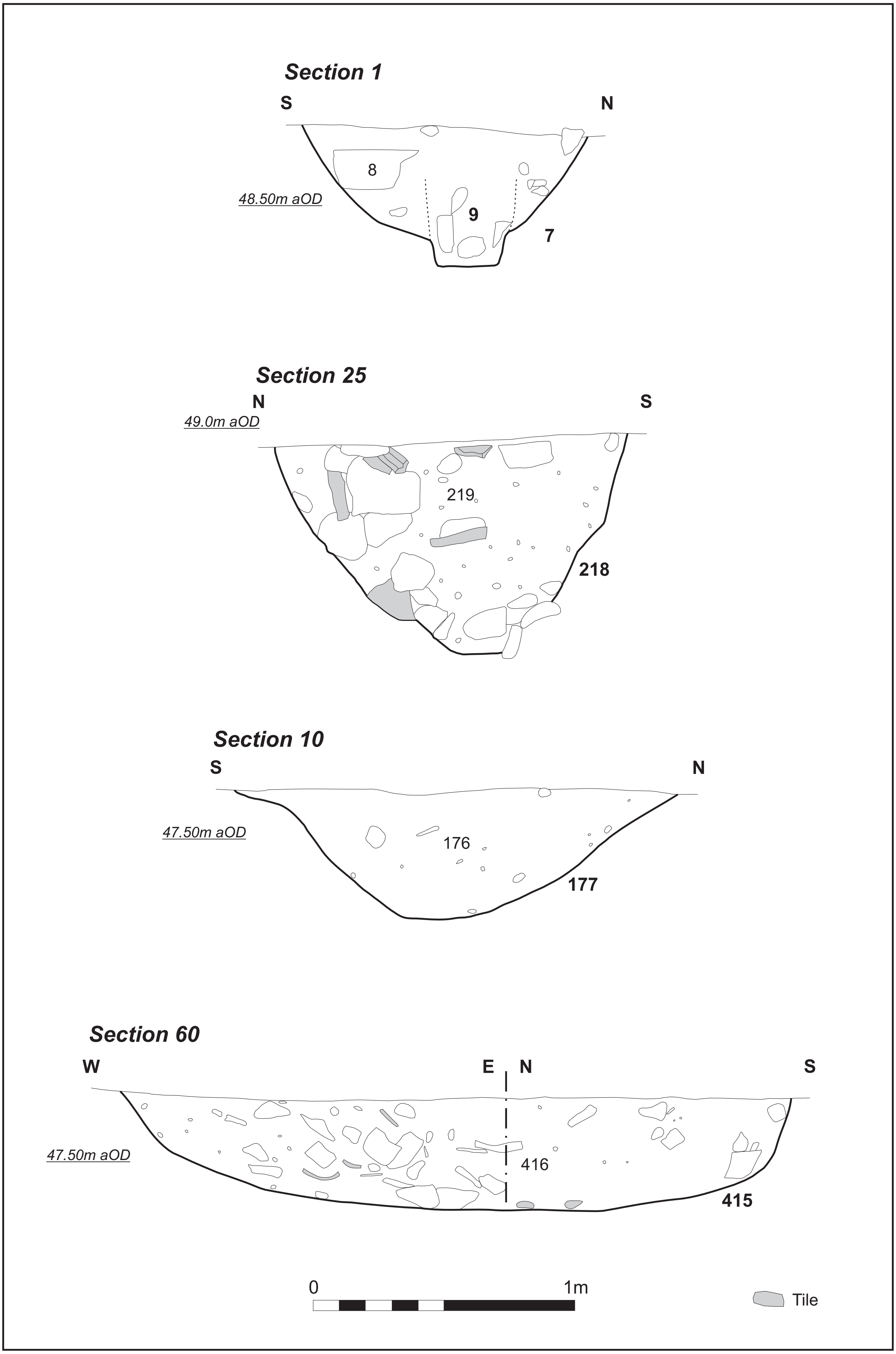
Immediately to the north of the post-pits there was an extensive spread, layer (97), of Roman roof tile (tegula and imbrex), and mortar, *c*250mm thick, extending 10m north-south and more than 7m east-west. This deposit is likely to be the result of the collapse, demolition or robbing of a nearby building.

This was further evidenced by a spread of granite rubble (120), immediately to the north of the roof tile. Within the rubble there were no ashlar blocks but some of the granite fragments had the appearance of being faced. The associated pottery dates these two layers to the 4th century.

On the eastern side of the excavated area there was a large sub-rectangular pit [415], 2.7m wide by more than 3.7m long and 0.4m deep (Fig 6; Section 60). Within the firm mid orange-brown sandy clay fill (416) was a complete Roman floor tile with mortar bedding still adhering to its underside, and a fragment of hypocaust flue tile with plaster still adhering to it. Although not *in situ*, they are indicative of a building with a hypocaust heating system in the vicinity.

Scale 1:250 (A4)

The Roman features Fig 5



Scale 1:20

Sections of Roman post-pits and pits Fig 6

3.3 Romano-British pottery by Jane Timby

The excavation recovered 314 sherds of Roman pottery weighing 17.9kg. In general terms the assemblage is in very good condition, as reflected by the overall average sherd weight of 57g. However, this figure is somewhat skewed by a number of amphorae sherds, their parent vessels being large and robust.

The pottery derived from 60 separate contexts. The quantity of material present per context was thus generally very low with just four contexts producing in excess of 20 sherds; the remainder less than ten and in many cases just single pieces. This clearly affects the level of confidence that can be placed in the dating.

Overall the assemblage appears to mainly date to the later Roman period and comprises a mixture of imports, both continental and regional and local wares.

Finewares and amphorae represent continental imports. Four sherds of Central Gaulish Samian are present (Dragondorf forms 31, 79). Some 48 sherds of Baetican olive oil amphorae were present, mainly from two post pits, which may in effect be from a single vessel.

Regional imports include a number of Lower Nene Valley products, both whiteware mortaria and colour-coated wares, four sherds of Dorset black burnished ware, and three colour-coated wares and a whiteware mortaria (Young 1977, type M21) from Oxfordshire.

A variety of vessels feature from the Nene Valley industries including plain walled dishes, a copy of a Samian Dragondorf 36, flanged bowls, boxes, beakers and jar or flagon.

The local wares dominate the assemblage accounting for 61% by count. These largely comprise well-fired grey or black sandy wares and shelly ware. Of note is a part of a small cheese press.

Potentially the earliest pottery in the assemblage comes from the fill (281) of a ditch aligned east-west across the northern part of the site [282] with two lid-seated jars normally associated with the 2nd century AD accompanied by a Lower Nene Valley whiteware mortarium sherd and a slightly micaceous greyware. The only other lid seated jar came from a later burial and is therefore residual. The remainder of the assemblage with diagnostic material appears to be mainly later 3rd-4th century AD.

3.4 Roman building material by Pat Chapman

Ceramic tile

All the ceramic tile was scanned and roughly quantified on site, with a representative sample and the more complete examples of all types being retained for study and archiving. The total assemblage comprised 815 fragments, weighing 521kg, consisting of 175 tegulae, 142 imbrices, 100 brick type, 19 box flue tile and 379 body sherds. The assemblage retained for analysis comprised 360 tile fragments (44% of the total viewed on site), consisting of 118 tegulae, 66 imbrices, 108 brick-types tiles, 19 box flue tiles and 49 body sherds.

The majority of the fabrics conformed to a single type: very hard, slightly coarse clay fired to an orange red, sometimes with a brown surface, or just brown.

Within the tegulae, some flanges have a cutaway feature and some nail holes were noted. Quite a few tiles have various swirl marks across the surface, which have been interpreted as tally or tilers' marks, and other deliberate markings. A few body sherds have dog and cat footprints, and there is one possible deer slot.

A range of sizes for the imbrices were noted, the largest of which might be part of a ridge tile.

Most of the brick/tile fragments are probably from bessalis and/or pedalis tiles, however, a complete lydion tile also survived. It may also be the case that some of the larger fragments are also from lydion tiles.

Tesserae

Twenty-eight tesserae came from eleven contexts, all associated with ceramic roof tile. They were found either singly, in threes or fours and one group of six. Twenty are ceramic, in the roof tile fabric. The other eight tesserae are stone. They are typically 21mm square, although there is a single larger piece 32mm square. They have presumably come from a polychrome tessellated pavement in at least two colours; red, and white.

Plaster

There are three small residual fragments of plaster, but with no traces of paint.

Concrete

This assemblage, weighing 4.3kg, comprises fragments varying in size from large lumps of *c*0.7kg down to small fragments. Some fragments have the impressions from the tiles or other structural elements that they were used in conjunction with, including one piece still adhering to a fragment of slate roof tile.

The use of limestone to make mortar and water-resistant cement and then concrete (*opus caementicium*) with the addition of sand and other materials was common throughout the Roman Empire, and the earliest recorded limekilns in England date from this period (Williams 2004, 3-4).

Stone

A small piece of worked granite, probably from Charnwood, Leicestershire, has been facetted with one face fairly smooth, but has been broken so only a portion survives. It was residual in a grave fill.

Slate tile

The tiles were examined to ascertain shape, dimensions, presence of perforations and any other details. The total assemblage comprised 180 slate roof tiles, weighing 163kg. The majority of the tiles come from context (220), the fill of pit [303].

There are two colour variations: about one third are distinctly green, while the rest are a variant of blue or grey or reddish. Virtually all the complete tiles have single perforations, although in some cases the slate had broken at the perforation and another hole had been made below. This may have happened when the tile was being manufactured, but may also have been a repair at a later date.

The majority of the retained tiles are diamond-shaped. The others are triangles and either rectangles or more irregular but with one long straight edge. The diamond-shaped tiles (Fig 7) are designed to hang on their long axes, although one has a perforation on the shorter axis and another has had the top cut off to a straight edge (Fig 8).

Diamond roof tiles Fig 7

Sideways' diamond with broken perforation and flat top diamond' Fig 8

(Scale 100mm)

The triangular slates have the long side horizontal and the top edge rounded with a single perforation between 30mm and 50mm below the top, giving a bell shape (Fig 9).

Triangular slate roof tiles Fig 9

Rectangular tiles Fig 10

(Scale 100mm)

The rectangular tiles vary from the two smallest at 115mm by 85mm and 15mm thick, to the two largest measuring 250 and 260mm long by 150mm wide by 30-35mm thick, but only four have a surviving perforation (Fig 10).

The quantities of the various shapes of slate is very similar to that of Causeway Lane with a large number of diamonds to a lot smaller number of the other shapes (Table 1).

Table 1: Comparison of roof tile with Causeway Lane, Leicester

	Causeway Lane, Leicester	**Rothley, The Grange**
Small tile	Up to 230 x 190mm	Up to 230mm x 180mm
Midsize tile	Towards 280mm x 230mm	Towards 280mm x 220mm
Midsize tile	Towards 300mm x 230mm	Towards 300mm x 215mm
Large tile	Up to 360mm x 300mm	Up to 360mm x 310mm

Gnanaratnam (1999, 305) describes the manufacturing process by which post-medieval Swithland slates began as quarry blanks about 20mm to 30mm thick, the blank illustrated has not been flaked but may have been discarded (Fig 11). The blanks were then shaped by flaking on one side, giving the slate a plano-convex profile. The Roman techniques may well have been similar.

The perforations were made by using a sharp point to create a depression in the surface and then a sharp blow with the point to make the hole, leaving a flake scar on the reverse Gnanaratnam (1999, 305) (Fig 12).

On the flat side of one tile faint lines had been scored as to mark out the desired shape and size of tile, these were ignored for some reason, these can be seen coming to a point above the scale bar lying on the tile (Fig 13).

Slate with unflaked rough out Fig 11 (Scale 100mm)

Flake scar made by perforation tool Fig 12 (Scale 10mm)

The variations in the size of the diamonds were probably for grading on the roof. The smaller slates would be near the ridge with the size increasing towards the eaves, which would most likely be edged with the triangular tiles, while the rectangular and other straight-edged tiles could be used down the gable ends of the roof. The overall appearance would be that of fish scales with different colours, glittering in the rain (Fig 14).

Marking-out lines on the reverse side (Scale 20mm) Fig 13

Tiles laid as they may have appeared on the roof Fig 14

3.2 Other Roman finds by Tora Hylton

There are thirteen other finds which may be dated to the Roman period. Nine objects were recovered from stratified Roman deposits and four are objects which stylistically date to the Roman period, but were recovered as residual finds in later deposits.

The assemblage comprises a small group of portable items which may have been casually lost, and includes items reflecting trade and personal possessions. All five coins date to the 4th century, two were recovered from Roman layers (98, 240), one residual within a medieval charnel pit and two from subsoil deposits. Other objects associated with trade include two lead weights for use with a steelyard, both were recovered from a Roman layer. The weights are biconical and still retain the corroded remains of the iron suspension loop. Items for personal use include a small copper alloy brooch, a bone pin and an iron knife. The brooch is a ‘Harlow’ type brooch which dates to *c*40/45-75/85 AD was recovered from topsoil and is therefore unstratified.

Part of a worked bone shaft, probably from a hair/dress pin, was recovered from a Roman layer. A tang and blade fragment from a single-edged knife was recovered from a medieval pit, but the blade form suggests that it may be Roman in date, with similarities to Mannings Type 11a/b (1985, fig 28).

Other objects from Roman deposits include an undiagnostic fragment of copper alloy plate with convex surface from ditch [177] and three iron nails, one each from layer (118), (fill 416) and spread (188), which lack any specialist use.

4 THE EARLY MEDIEVAL CEMETERY

4.1 The organisation and use of the cemetery

At the southern end of the open area excavation were the remains of up to 149 individuals still at least partially *in situ* (Fig 15) together with large quantities of re-deposited or disarticulated remains (see Fig 18). The total number of skulls, 161, provides the estimate for the minimum number of individuals that had been buried here. All of the burials were extended supine inhumations, with the head to the west. There was a high level of disturbance of individual graves, with only 12 individuals more than 75% complete. Bone preservation was also only poor to fair, with the major limb bones often degraded and the minor bones; ribs, vertebrae and digits often absent or so degraded as to be unrecoverable.

Burial numbers were issued to all individuals *in situ* and to all discrete groups of disarticulated material. A total of 298 deposits of bone were collected during the excavation of the cemetery.

Row structure and family plots

The earliest burials were those which formed a row on the western side of the main group of excavated burials, with radiocarbon dating indicating a late 7th/early 8th century date for the commencement of burial in this area (Table 2). Burial 38 (Fig 16) at the northern end of the row has been radiocarbon dated to 650-780 Cal AD (95% confidence, 1300+/-40 BP, Beta-263409), whilst at the southern end of the row Burial 54 has been dated to 650-810 Cal AD (95% confidence, 1280+/-40 BP, Beta-270604.

Seven of the burials in this primary row (46, 38, 45, 44, 51, 49, and 50) were in deeper graves, which cut the mottled sandy clay natural geology (120). This is the only row that appeared to have ordered burials in graves excavated to a depth which cut the natural geology; further burials also cutting the natural geology were interspersed around the cemetery but with no apparent pattern. This was also the only extensive and fully occupied row, with some 13 burials along a length of 9.5m. The dislocation at the southern end of the row may denote the southern margin of this northernmost burial zone, see below.

Multiple, overlapping partial rows are discernible to the east (using nearest neighbour analysis to link skulls close to common row lines), but these typically comprise small groups of four or six burials over row lengths of some 4m to 6m, and in one instance only 1.5m. The shortest row length could be seen as marking a family group, rather than part of a formalised row structure. However, the longer lengths of 4-6m do seem to belong to a more extensive row system, even though some of these are only partially occupied with gaps that could contain one or two further burials, although at least some of these gaps may derive from burials totally lost to later disturbance. The degree of overlap between these partial rows, suggests that there was a sufficiently long period of usage for later burials to transgress onto earlier rows or groups, with at least three phases of use indicated through the 250-300 year lifetime of the cemetery.

In parts of the most densely occupied central area of the cemetery, there were also instances of two, three or even four burials almost directly overlying each other in a very shallow grave soil. This suggests the presence of family plots, or at least family graves. It was also a practice that led to much truncation and disturbance of the earlier burials (Fig 17).

Scale 1:100 (A3)

The early medieval cemetery Fig 15

Burial 38 Fig 16

The general indication is, therefore, that the primary row did provide a structure to the usage of this area of the cemetery, but perhaps other factors, such as the provision of family plots, was as important as the maintenance of a row structure. There are also small groups and even isolated burials to the north-west, the north and the east. These indicate that the churchyard extended well beyond the main grouping of burials, but with these extremities only occasionally used for burial.

As already noted, the southernmost burials showed no respect for the primary row alignment or for the partial rows to the east. It is suggested, therefore, that these burials lay at the northern margin of a separate burial zone, with a different basis to its organisation. If we assume that the pre-Conquest church lay close to the same site as the present church, then the excavated area comprised the northernmost zone of a much more extensive cemetery.

To both the north-west and the north-east, the northernmost burials presumably lay close to the northern margin of the cemetery, but there is no ditch or other evident contemporary feature that may have formed a cemetery boundary. The northern extent of burial lies 50m north of the present church.

Burial practices

All of the articulated burials were extended supine inhumations, however, there were some variations involving the positioning of the arms and legs. The majority of burials, where the positioning could be identified, had their arms by their sides. However, seven examples had the right arm over the pelvis, seven had both hands over the pelvis, two had left arm over right over the pelvis and one had its left arm over pelvis.

Three individuals had their right lower leg over the left, one of these also had their right arm over their chest, and two further burials had their left lower leg over the right. Burial 276 was unusual in that as well as having the arms crossed over the pelvis, right over left, the legs were also crossed but in this case it was the left over right. The burials with their lower legs crossed were at the northern end of the row to the east, which included the dated Burial 123, 780-980 Cal AD (95% confidence, 1150+/-40 BP, Beta-263410) (Fig 15).

Burial 53 from the southern end of this row had stones placed around the head suggestive of pillow stones, a burial practice associated with the late Saxon period. Burial 5, within the central area of the cemetery, was the only other burial to exhibit a trait associated with Saxon burial practice; this individual had a stone in the mouth.

General view to show density of burial Fig 17

Scale 1:100 (A3)

Charnel deposits within the cemetery Fig 18

4.2 Charnel and other disarticulated bone

Disarticulated remains were distributed fairly evenly through the grave soil amongst the *in situ* burials (Fig 18). Disarticulated bone from earlier burials was sometimes placed within the new grave (Fig 19), but sometimes material was collected for deposition in specially dug charnel pits, although cuts for these were rarely visible in excavation. It is clear that over the life of the cemetery successive grave diggers had no qualms about disturbing earlier burials and the idea of physical bodily resurrection come the day of judgement was not one that they subscribed to.

In addition to disturbance during the lifetime of the cemetery, it is evident that there has also been frequent disturbance during the later use of the site. There are few deep recent intrusions that would have removed burials, but as the remains were so close to the modern ground surface, even routine gardening activities posed a threat to their integrity and a percentage of the scattered disarticulated bone within the general grave soil has come from more recent turning over of the ground.

Burial 188, showing the disarticulated remains of another individual (Burial 187) moved to the side of the grave Fig 19

Finds

The earliest datable object, and the only one of Saxon date, is the worked bone point from Grave 132. Although incomplete it appears to be part of a double-pointed pin-beater, a tool used during the process of weaving to separate coarse threads that catch on each other when the shed is changed. Such tools would have been for use with warp-weighted looms, which are common on settlement sites of early/middle Saxon date.

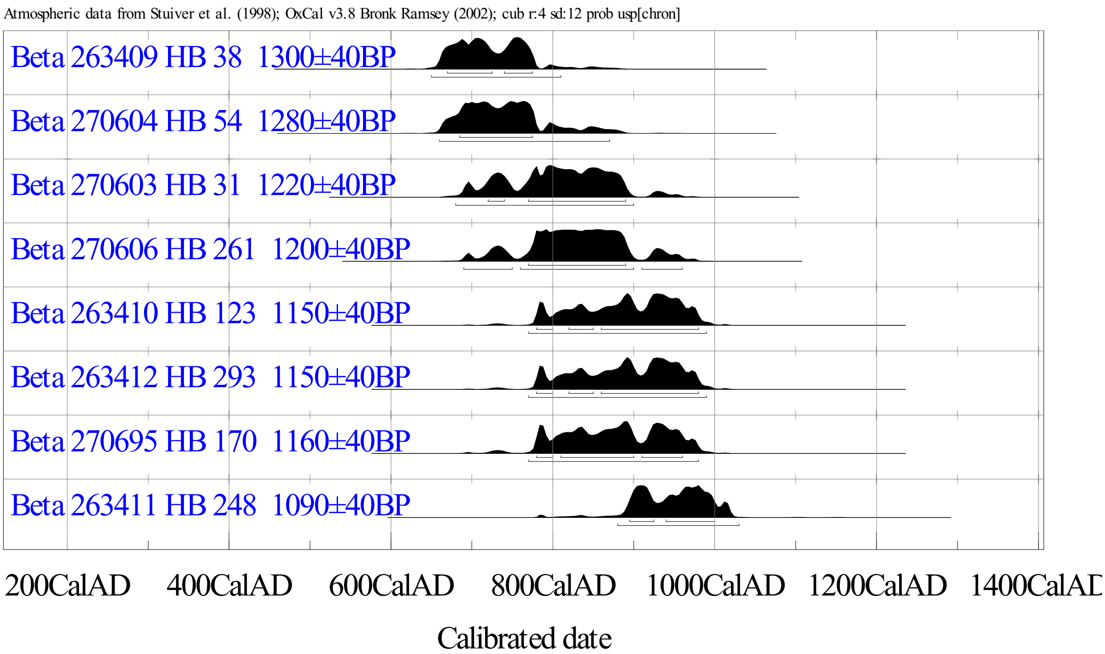
4.3 Scientific dating

Eight burials were selected for radiocarbon dating and the resultant dates (Table 2) indicate that the excavated part of the cemetery had probably come into use in the early to mid 8th century AD and continued in use through the 9th and 10th centuries. There is no indication that the area had remained in use for burial post-Conquest.

The earliest date comes from Burial 38 at the northern end of the single well-defined row on the western side of the cemetery; and Burial 54 at the southern end of this row was a close contemporary (Fig 15). This would suggest that this row was perhaps part of the primary setting out within the northern area, probably occurring in early 8th century, but possibly as early as the final decades of the 7th century. This suggests that the outermost limits of the cemetery were probably defined at the same time as the construction of the church to which they belonged.

Table 2: Radiocarbon dates for the burials

Lab No	Context	Sample details	dC13 15N/14N	Conventional Radiocarbon Age BP	Cal AD intercept 68% confidence 95% confidence
Beta – 263409	Burial 38	Human bone	-19.8 +11.2	1300+/-40	680 660-720 & 740-770 **650-780**
Beta – 263410	Burial 123	Human bone	-20.5 +11.5	1150+/-40	890 870-900 & 920-960 **780-980**
Beta – 263412	Burial 293	Human bone	-19.8 +12.3	1150+/-40	890 870-900 & 920-960 **780-980**
Beta – 263411	Burial 248	Human bone	-19.8 +11.6	1090+/-40	980 900-1000 **880-1020**
Beta – 270604	Burial 54	Human bone	-19.9 +10.3	1280+/-40	690 670-770 **650-810**
Beta – 270603	Burial 31	Human bone	-19.7 +10.5	1220+/-40	780 720-740 & 770-780 **680-890**
Beta – 270606	Burial 261	Human bone	-20.0 +11.0	1200+/-40	810 770-890 **690-900 & 920-950**
Beta – 270605	Burial 170	Human bone	-20.0 +11.0	1160+/-40	890 810-900 & 920-950 **770-980**



The later development of the northern area appears to have been less well organised. The single radiocarbon date from the northern extremity of the area (Burial 123) indicates usage through the 9th and 10th centuries.

Burial in the postulated southern burial zone was also occurring during the 9th and 10th centuries (Burial 293), but this area also contains Burial 248 that has given the latest radiocarbon date, indicating that usage of the area continued to at least the later 10th century. This provides some support for the suggested presence of a separate southern zone, perhaps continuing in use to the end of the 10th century or even just into the 11th century, while burial in the northern zone may have ceased before the end of the 10th century. However, in neither area is there evidence for continued use for burial post-Conquest. The model is therefore one of cemetery contraction occurring by the end of the 10th century, and therefore pre-Conquest in origin, with perhaps a further contraction post-Conquest.

The eight radiocarbon dates provide a coherent model of cemetery development, and a model that is consistent with the postulated structure of the cemetery. This model is also consistent with other excavated evidence. At the Saxon minster at Wing, Buckinghamshire (Holmes and Chapman 2008) an outlying area of the cemetery had come into use in the mid-8th century and the majority of the excavated burials were pre-Conquest in date. However, at Wing, a well organised row structure was abandoned and there was a scatter of later burials, indicating that the area had declined but was still in use for occasional burial until the later 12th century.

The analysis of the carbon and nitrogen isotope ratios has provided a minor insight into the diet of the population at the time. The ratios are all closely consistent and within the ranges that would be appropriate for people living of a mainly temperate terrestrial diet, as would be expected for a population living in this part of the country, far away from the sea.

As part of the programme of analysis, it was suggested by the English Heritage Regional Science Advisor and Leicestershire County Council's Principal Planning Archaeologist that Bayesian analysis should be applied to the set of eight radiocarbon dates to test the efficacy of this programme and to determine whether a more extensive programme of dating might significantly improve the dating of the use of the cemetery. The application of Bayesian principles was felt to be a better guide to the quality of the selection.

On the basis of the Bayesian analysis by Dr Marshall, as summarised below, he recommended that the existing set of eight radiocarbon dates were sufficient for dating the parameters of the site and that the provision of more radiocarbon dates, short of a significantly high number of dates as to be impractical, would be unlikely to significantly improve the reliability of the date ranges suggested. The limitations which the site placed upon the Bayesian approach were cited as the lack of a vertical stratification together with the very poor preservation of the bodies.

Bayesian analysis and interpretation *by Peter Marshall*

A Bayesian approach has been adopted for the interpretation of the chronology from Rothley (Buck *et al* 1996). Although the simple calibrated dates are accurate estimates of the dates of the samples, this is usually not what archaeologists really wish to know. It is the dates of the archaeological events, represented by those samples, which are of interest. Absolute dating information in the form of radiocarbon measurements can be combined with the relative information provided by relationships between samples to provide estimates of the dates of the activities.

Fortunately, methodology is now available which allows the combination of these different types of information explicitly, to produce realistic estimates of the dates of archaeological interest. It should be emphasised that the posterior density estimates produced by this modelling are not absolute.

They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives.

The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the program OxCal v4.1 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001; 2009).

The model shows good agreement between the radiocarbon results and prior information (Amodel=86.9%). We have assumed a uniform rate of burial in the cemetery, ie, that once burial started it continued at an approximately uniform rate until it stopped (Buck *et al* 1992). This prior information acts to counteract the statistical scatter on radiocarbon measurements (Bayliss *et al* 2007a; see above).

The model provides an estimate for the start of burials of cal AD 590-860 (95% probability) and probably cal AD 650-770 (68% probability). The end of the burial activity is estimated to have taken place in cal AD 805-1080 (95% probability) and probably cal AD 885-1010 (68% probability). The number of years for which the cemetery was in use is estimated at between 1-430 years (95% probability) and probably 130-355 years (68% probability).

5 THE HUMAN BONE by Sarah Inskip

In 2008 the 287 individually numbered groups of human remains were received at the University of Southampton for osteological reporting, with this including remains from articulated burials and deposits of disarticulated bone, sometimes from more than one individual.

5.1 Methods and comparative sites

In general, the methods selected for this project are those of Buikstra and Ubelaker (1994) and Brickley and McKinley (2004). Specific methods are found within the relevant pages of this report.

Comparison sites chosen for Rothley are Phase 1 and 2 individuals at Wharram Percy, Yorkshire (Mays 2007), Raunds, Furnells, Northamptonshire (Powell 1996), North Elmham, Norfolk (Wells 1980), Empingham II, Leicestershire (Mays 1990, 1996) and early phase individuals (phase C- E) from Barton-upon-Humber (Waldron 2007).

5.2 Preservation, completeness, MNI and elemental representation

Preservation and completeness

Bone preservation was scored using four categories: poor, fair, good and excellent. These correspond to the weathering stages of Behrensmeyer (1978) as follows: Poor (stages 4 and 5), no cortical bone surfaces remaining. Fair (stages 2 and 3) refers to few cortical bone surfaces left for analysis. Good (stage 1), most surfaces available for analysis and excellent (stage 0), all bone surfaces available for analysis. Table 3 displays the number of burials recorded in each category. Over 90% of the material was recorded as fair to poor in preservation severely limiting macroscopic analysis.

Table 3: Preservation of the burials

Preservation	Good	Fair	Poor	Total individuals
Total	14	217	67	298*

*Note 298 is derived from multiple burials in some of the articulated graves

For each articulated burial an inventory of elements was completed following the recommended guidelines (Brickley and McKinley 2004: appendix 4 60-61). Disarticulated material was recorded by element in order to calculate MNI (minimum number of individuals). Subsequent to this, the quantity of remains for each articulated burial was recorded in four categories, <25%, 25% – 50%, 50% - 75% and >75%.

Table 4: Completeness categories for adults and juveniles

Completeness	<25%	25-50%	50-75%	>75%	Total
Adults	66	11	4	2	83
Males	7	11	3	8	29
Females	6	4	3	0	13
Juveniles	13	5	4	2	24*
All burials	92	31	14	12	149

*5 subadults are included in male and female categories.

Table 4 highlights the extreme incompleteness of the skeletal material. Females are less complete and generally appeared to be more fragmented than males. Juveniles show a similar pattern of incompleteness to females, with most individuals (54%) in the <25% category. The incompleteness of female and juvenile skeletons is consistent with males processing larger, denser, more robust elements, which survive the soil conditions and fragmentation.

The number of burials and MNI

There were 287 numbered deposits of bone, of which 65 groups contained multiple individuals. Burial 167 was discounted as it was animal bone.

To obtain a more accurate estimation of the number of individuals buried at Rothley the minimum number of individuals (MNI) was calculated from each sided element (see Table 5). The most common element was skull with an estimate of 161 individuals. The skull is easily recognized as it has a great number of landmarks which are observable even when highly fragmented. The left femur was the most frequent appendicular element recovered, providing an MNI of 139 individuals. Having one of the highest bone densities in the skeleton (Galloway *et al* 1997), it is unsurprising that the femur survived the taphonomic processes at Rothley. Under representation of the ulna, radius and fibula is due to difficulties in siding poorly preserved and broken shaft fragments. Bones with high trabecular content, such as the vertebrae, sternum and some tarsals, were prone to fragmentation and disintegration. Further to this, particular regions of long bones were at risk; epiphyses were frequently damaged preventing osteological examination of joint surfaces.

All of the MNIs and in particular, both the femur and skull estimates, are far lower than the number of burials. This is caused by the high level of disarticulation and incompleteness, as highlighted by Table 4. Furthermore, the large disparity between the MNI's and the burial number is likely to be compounded by the fact that some individuals may be found in multiple graves, as appeared evident with Burials 211 and 212.

Table 5: MNI taken from major bone elements. L= left, R= right

Element	MNI
Skull	161
L femur	137
R femur	124
L tibia	107
R tibia	91
Os coxae	89
L humerus	88
R humerus	84
Feet	58
L ulna	56
Hands	53
R ulna	50
R radius	43
L radius	40
L fibula	36
R clavicle	32
L clavicle	27
R fibula	26

Elemental representation

The pattern of element preservation is similar to Wharram Percy, where the skull was also the most common element observed (Mays 2007, 82). The ulna, radius and fibula were substantially less represented than the femur, tibia and humerus. Galloway *et al* (1997, 314) highlight that, out of the six major long bones, the ulna, radius and fibula have the lowest bone densities, thus, their poorer recovery rate is unsurprising. Generally, the smaller the element the least likely it was to be recovered and identified.

This is certainly true of the Rothley assemblage with the clavicles and fibula faring poorly. Although the hands and feet appear more frequently than the ulna, radius and fibula, hand or foot was scored as present if just one bone was remaining regardless of side. In fact, the hands and feet were highly incomplete. Taking the above observations in to consideration, the elemental distribution and survival of the Rothley remains is normal allowing for the taphonomic history of the site.

5.3 Demography

Ageing methods

Seven methods were used to estimate age. However, the fragmentary nature of the assemblage, resulted in some individuals being aged using a single indicator. This is not an ideal circumstance and means that the assigned ages come with a high level of uncertainty. To accommodate this, adult individuals were placed into one of three broad categories: young (under 35 years), middle (35–50 years) and old (50 years +). Adult was defined as m2 erupted and in occlusion with all major epiphyses fused (approximately 22 years +).

Methods used to age adult individuals were based on increasing degeneration with advancing age. The auricular surface was aged following the method of Lovejoy *et al*. (1985). The pubic symphyses was scored following Brooks and Suchey (1990). These methods were chosen as they have demonstrated accurate results despite wide age categories (Schwartz 1995). After the teeth, the auricular surface was the most frequently preserved indicator.

Dental age estimation followed Brothwell (1981) as the method was derived from a British Anglo-Saxon population and could be deemed the most appropriate population comparison. In fact, Brothwell (1981) has suggested that molar wear patterns have remained fairly stable in British populations from the Neolithic to the Middle Ages. Insufficient numbers of ageable juveniles were available to calibrate following Miles (1963). Furthermore there were too few individuals with all other age features (auricular surface, pubic symphysis and cranial suture closure) to calibrate an attrition pattern specific to the population.

Rapid body growth during childhood and adolescence results in many developmental stages in the first 20 years of life. Accordingly, with the use of known age standards, ageing subadults and infants is far more accurate than adults. Epiphyseal closure ages were taken from Buikstra and Ubelaker (1994) and Scheuer and Black (2000). Tooth development ages were taken following Buikstra and Ubelaker (1994). Long bone length was used to estimate age in juveniles when no other indicator was available. The ages were taken from the relevant element data from Fazekas and Kosa (1978) cited in Scheuer and Black (2000).

Similar to its use as an indicator of adulthood, the absence of m3 is not used as an indicator of subadulthood. Immature individuals were classified as adolescent, child and infant. Adolescent describes ages between approximately 12–22 years and corresponds to individuals with occluding M2 but unfused long bones and iliac crest. Child is an individual aged between 3-12 years. Infant is classed as an individual below 3 years of age.

Sexing methods

The pelvis is the most sexually dimorphic region of the skeleton (Krogman and Iscan 1986) and as such, sex estimation from the pelvis was undertaken whenever possible. The greater sciatic notch was scored from 1 female, 2 female?, 3 uncertain, 4 male? and 5 male, following Buikstra and Ubelaker (1994). The dimorphic regions of the pubis were scored following the method of Phenice (1969). These were graded as 1 female, 2 unknown and 3 male.

The skull, being the second most dimorphic region of the skeleton was sexed in addition to the pelvis. The features chosen for sex assessment are those set out by Standards (Buikstra and Ubelaker 1994). In line with the sciatic notch, the features were graded 1–5. Mastoid size, mental eminence, glabella, supra orbital margins and the nucheal crest were analysed, with final sex estimations based on the overall appearance of the skull. Additional features considered included the presence of gonial flaring and the slope of the forehead (Schwartz 1995). Attention was also paid to the stature and robusticity of the individuals.

Table 6 displays the number of adults and juveniles in the articulated burials (n=149) divided by sex.

Table 6: Age and sex of the Rothley assemblage

Age	Male	Female	Unknown	Total
Infant (0-3 years)	-	-	2	2
Child (3-12 years)	-	-	6	6
Adolescent (12-21 years)	-	-	7	7
Young	5	2	6	13
Middle	11	5	4	20
Old	4	3	3	10
Unknown Juvenile	-	-	10	10
Unknown	8	3	70	81
Total	28	13	108	149

Due to the high level of incompleteness, a large proportion of the assemblage consisted of unageable and unsexable adults. Sexing was problematic because the pubic region of the pelvis, the most reliable indicator (Black 1978), was scorable in only three individuals. The high trabecular bone content of the os coxae resulted in this portion of the skeleton being fragmented. Reconstruction of the sciatic notch and other features was thus unreliable. Accordingly, sex determination relied largely on the skull. The results in Table 4 indicate that there are far more males (19%) than females (8%). Of the sexable individuals, males make up 68% and females 32%. This is unusually high when compared to other non-monastic and medieval sites (see Table 7). The quantity difference between males and females is significant when using a chi squared test as the value for x2 (5.48) exceeds the critical value 3.84 at p 0.05.

Two main explanations could be proposed: that there was a genuine inequality in the population or preservational factors have led to a preferential identification of males. While studies have indicated that sex should not influence preservation (Bello *et al* 2006), bone density research indicates that females, at all stages of life, have lower bone mineral densities than males (Galloway *et al* 1997:313). However, the vast number of unsexed adults makes interpretation of the imbalance among those that could be sexed highly problematic.

Table 7: Sex ratios at medieval sites in England

Site	Males %	Females %
Empingham II, Leicestershire (Mays 1996)	53	47
North Elmham, Norfolk (Wells 1980)	52	48
Raunds, Furnells, Northamptonshire (Powers 1996)	55	45
Rothley, Leicestershire	68	32

Juvenile Age distribution

Of the articulated burials (n=149) twenty nine (20%) of them could be classed as younger than 22 years, only nine (6%) under the age of 12 years and just over 1% aged below 3 years.

Table 8: Juvenile percentages for Saxon and medieval sites

Site	Proportion of juveniles	Age
Barton-upon-Humber	33%	<15 years
Wharram Percy	45%	<17 years
Empingham II	40%	<18 years
Raunds	47%	<17 years
Rothley	20%	<22 years

In terms of infants and children at the site, Rothley has fewer children when compared to the early phase at St Peter's, Barton-upon-Humber, Wharram Percy, Raunds and Empingham (see Table 8). According to Hewlett (1991) both modern and ancient populations without modern medical care are likely to have 20–56% of individuals die before reaching 16 years. This demonstrates that a substantial loss of the infants and younger children has occurred at Rothley. In fact even at Wharram Percy, where preservation was good to excellent, it was still thought that some infants and children were lost to taphonomic processes (Mays 2007).

5.4 Measurement

Skeletal measurements were taken following the guidelines in Buikstra and Ubelaker (1994). Due to the fragmentary nature of the assemblage, no cranial measurements were taken. Postcranial measurements focussed on obtaining long bone lengths to attempt stature reconstruction. Estimations were made using long bone lengths and formulae produced by Trotter and Gleser (1952 and 1958) and Trotter (1977), reproduced in Brothwell (1981).

Stature

Unfortunately different skeletal elements were used to calculate stature, as few long bones were complete or undamaged. Stature estimates and ranges are presented in Table 9a.

Table 9a: Average adult stature for males and females from Rothley

Sex	n	Mean (m)	Stature range (m)
Male	10	1.75	1.70-1.81
Female	2	1.58	1.56-1.59

Table 9b: Mean stature from other Saxon sites

Site	Mean male stature (m)	Mean female stature (m)	Source
Empingham II	1.74	1.64	Mays 1996
Rothley, the Grange	1.75	1.58	
Raunds, Furnells	1.67	1.62	Powell 1996
North Elmham Park	1.72	1.58	Wells 1980
Wharram Percy (phases 1-2)	1.69	1.57	Mays 2007
St Peter's, Barton (phases C-E)	1.70	1.59	Waldron 2007

Just two females could be analysed making comparisons with other sites unreliable. Regardless, they fall with the range of statures produced for Saxon England (see Table 9b).

The men appear to be taller for the period when compared to other contemporaneous sites (see Table 9b). However, they are similar in height to Empingham II (Mays 1996, 26), geographically the closest to Rothley, albeit a little earlier in date (5th–7th century), where the men are also taller. Therefore the stature is not unusual for the location, even if a little tall for the period.

Considering the fragmentation and preservation of the site, this perceived difference might be artificial. The larger more robust individuals may have increased probability of recovery due to higher bone densities. Studies have shown that bones with higher densities are more likely to survive (Bello *et al* 2006, Inskip *et al* forthcoming). This would produce an overall greater stature average. This is certainly supported by the lower quantities of females and children. As tempting as it is to infer that there may be integration of a taller population or some kind of selection, potentially reinforced by the higher frequency of males, caution has also to be exerted due to the low number of individuals available for analysis and significant biases introduced by taphonomy.

Meric and Cnemic indices

The dimensions of the proximal femur have been heavily studied in archaeology. The meric index describes the shape of the proximal portion of the femoral shaft based on measurements taken below the lesser trochanter (Capasso *et al* 1998). Originally thought to reflect nutritional stress (Buxton 1938) it is now thought platymeria is related to activity, in particular mediolateral relative to antero-posterior bending strength (Ruff *et al* 1984). It is postulated that sedentary lifestyles have led to a decrease in anterior posterior flattening in the femur with the greatest degree of rounding identified in urban populations (Ruff and Hayes 1983; Ruff *et al* 1984). A common observation is that females, from no matter what period and site type, have flatter proximal femoral shafts than males. Greater pelvic width is thought to increase medio-lateral stress (Capasso *et al* 1990, 114). Femoral index is calculated using the following formula taken from Schwartz (1995): Femoral index=Subtrochanteric antero-posterior diameter x100/subtrochanteric transverse diameter.

Table 10: Meric and Cnemic index for Rothley

	Means			Range
Sex	**L**	**R**	**L+R**	
Male	78.3	77.1	77.7	69.4-88.9
Female	78.9	80.1	79.5	71.9-88.9

Meric indices are presented in Table 10. Twenty-six individuals were observable at the subtrochanteric region, with a total of 32 femurs examined. Twenty-five of the femora were platymeric. The overall level of playtmeria is comparable to the results from urban Barton-upon-Humber, where 95% of the early phase femora platymeric (Waldron 2007, 46). As demonstrated by Table 10, Rothley is also similar to rural Wharram Percy; phase 1–2 (Mays 2007, 117) and North Elmham Park (Wells 1980, 255). An extreme individual (Burial 170) had a mediolateral diameter nearly twice that of the anterior posterior. The femur was analysed for any pathological changes. Except for a small amount of active periostitis on the left femur, no significant pathology was observed. This femur probably represents an extreme example of activity related change, but problems arise in isolating the exact cause. It is widely accepted that action can be identified but not specific activity. A multitude of activities can be carried out in a single posture. As the individual was unsexed, the inclusion of the measurements into the unknown category increases platymeria in this group.

Tibial index (measured below the nutrient foramen) refers to the shape of the proximal part of the tibial shaft. As with the femur, research has indicated that the shape of the proximal tibia is sensitive to activity. Hyperplatycnemic, or an extremely flat proximal tibia scores lower than 55. Platycnemic (very flat) between 55–and 62.9, Mesocnemic 63–69.9 (moderately flat) and Eurycnemic or a broad wide proximal tibia is anything that scores above 69.9.

Cnemic index is calculated using the following formula (taken from Schwartz 1995).

Cnemic index = mediolateral diameter x 100/anteroposterior diameter.

Cnemic indices for Rothley are presented in Table 11. Twelve of the tibia (70%) (n=17) were eurycnemic and a single individual had a platycnemic tibia (individual 156). The average measurement is 72.6 (Eurycnemic), similar to other Saxon sites including Wharram Percy (Mays 2007, 117) and North Elmham Park (see Table 12)

Table 11: Cnemic indices for Rothley

Sex	**Means**			**Range**
	L	**R**	**L+R**	
Male	69.8	74.4	71.4	60.9-83.6
Female	74.3	80.7*	76.4	73.3-80.7

n=1

Since it was discovered that bone adapts to mechanical stress (Larsen 1997) studies focussing on bone morphology have been undertaken to inform about the stresses placed on them during life. Long bone morphology and indices have frequently been studied with the aim of revealing changes in human behaviour including subsistence and increasing urbanisation (Larsen 1997; Ruff and Hayes 1983). The similarities between Wharram Percy, Rothley and North Elmham (see Table 12) are unsurprising given that they are all rural sites. What is interesting is that Rothley does not conform to the pattern of increased platymeria in females. This may signify that the males were undertaking an activity which significantly affected anterior posterior bending strength. It may also indicate that the males were generally more mobile than the females. Preservational factors can not be ruled out as the producer of this phenomenon. A greater number of individuals would be required to confirm the difference observed, particularly females.

Table 12: Meric and cnemic indices for Rothley and comparison sites.

	Meric		Cnemic	
Site	**Male**	**Female**	**Male**	**Female**
Rothley	77.7	79.5	71.9	76.4
Wharram Percy	79.3	76.3	71.3	72
North Elmham	74.8	72.1	69.2	70.9

5.5 Non-metric traits

Few non-metric traits were observable and information presented here is limited to providing comparison data for use with other sites (see Table 13). Non–metric traits were scored as present or absent. Frequent recovery of the proximal femora made it possible to record incidences of third trochanter following Finnegan (1978) and hypertrochantic fossa according to Brothwell (1981). In addition, squatting facets were sought on the distal tibia and tali following Barnett (1954).

The hypertrochantic fossa was found on 85% of the femurs of Rothley. At present the exact aetiology of the hypertrochantic fossa is not known but identification in foetal material indicates that activity related factors do not fully explain their occurrence (Anderson and Andrews 1997) and indicates inheritability. Only four out of the 29 observable individuals had no hypertrochantic fossa. This high frequency is close to that reported in Eskimos (89.6%) but no reason for this occurrence is proffered (Aiello and Dean 1990, 464). The Anglo-Saxon site of Mill Hill had hypertrochantic fossae in 75% of juveniles, 26.3% in adults (Anderson and Andrews 1997). Great Chesterford presented similar results (Waldron 1994). Unfortunately, few researchers publish values for the hypertrochantic fossa, so the importance of this finding is unclear as it can not be compared to contemporaneous proximal sites.

Third trochanters and the gluteal tuberosity are gluteus maximus attachments (White and Folkens 1991, 223). The third trochanters are particularly prominent rounded gluteal tuberocities. The third trochanter is described in 11.5%-43.4% of modern humans (Aiello and Dean 1990, 465). The gluteal tuberocity was present in 18 of the 19 (94%) observable individuals and found on 83% of femurs (n=29). The third trochanter scored high being observed in 42% of femurs. Burials 27 and 170 have particularly large prominent third trochanters and were platymeric. Aiello and Dean (1990) note a relationship between the third trochanter and platymeria. Turner (1887) and Cameron (1934) suggest that platymeria can be caused by the pulling of the gluteus maximus on the femoral shaft. As the third trochanter and gluteal ridge are sites for gluteus maximus attachment, the frequent observation of gluteal tuberocity and third trochanters unsurprising considering the platymeria at the site.

As the hypotrochantic fossa and third trochanters are linked to muscle development, an activity involving the lower half of the body can be suggested, particularly when taken into consideration with the platymeric femurs. Capasso *et al* (1999, 119) suggests that when the trunk is in a vertical yet unstable position, it can lead to platymeria and development of the lesser trochanters as the gletues muscles are used to stabilise body weight; for example sitting on the back of a horse. Unfortunately, as a whole host of activities can be undertaken in this position, it is not possible to speculate further. Again, it is not possible to rule out taphonomic agents as the producer of this pattern.

Although caused by squatting, facets on the anterior distal tibia are thought to be related to other locomotive actions requiring ankle hyperdorsiflexion (Trinkaus 1975). Eleven individuals were analysed for tibial squatting facets and seven for talar facets. Just two (29%) individuals had squatting facets on the talus and five (45%) on the tibia. This frequency is high when compared to the early period of St Peter's at Barton-upon-Humber (3.4%) (Waldron 2007). At Wharram Percy (Mays 2007, 127), the frequency of tibial facets was similar or higher depending on sex (males 45%, females 69%). The frequency at Raunds was 58% in females and 45% in males (Powell 1996, 117). The results suggest that Rothley is comparable to contemporaneous rural sites. The very low St Peter's frequency of inter observer variation.

Table 13: Non metric traits

Trait	Observable	Present	Percentage
Squatting facets tibia	11	5	45%
Squatting facets talus	7	2	29%
Third Trochanter	19	8	42%
Gluteal tuberocity	19	18	94%
Hypertrochantic Fossa	29	25	85%

5.6 Pathology

Flaking and destruction of cortical bone severely limited palaeopathological observation. For example, it was difficult to observe signs of localised inflammation, periostitis, and fragmentation made it difficult to assess for peri-mortem fractures.

Infections

Within the Rothley skeletons there were very few cases of infectious disease. There were no infections that could be definitely attributed to specific pathogen.

Osteomyelitis is caused by the invasion of bacteria into the bone and bone marrow from either the bloodstream, trauma (ie open fractures) or adjacent infected tissue (Aufderheide and Rodriguez-Martin 1998). Two femurs had changes consistent with osteomyelitis, one from disarticulated Burial 294 and one from individual 139. A severe midshaft compound facture affecting individual 139's right femur (see Fig 26) had probably provided the opportunity for bacteria to enter the body via the open wound.

Periostitis is an inflammation of the periosteum (Aufderheide and Rodriguez-Martin 1998) which can be the result of infection and trauma among other ailments. Accordingly it can be very difficult to ascertain the exact cause of the bony changes. Inflammation results in deposition of new bone on the periosteal surface. Very few individuals with periostitis were observed. Individual 139 had periostitis, both active and remodelled, on the midshaft of the fractured femur, a likely result of trauma and subsequent infection. Individuals 170 and 276 had active periostitis on the proximal shaft of the right femora. Individual 44 had active periostitis on the 1st, 4th and 5th metatarsals. In comparison to other medieval sites, Rothley has a very low level of periostitis (3% of articulated individuals) Wharram has 8.4% (Mays 2007, 169) and Barton-upon-Humber between 5.9–8.7 % (Waldron 2007), inferring low levels of infection and trauma at Rothley. However, the relationship between health and lesions is multifaceted and further interpretation of this maybe flawed, particularly due to the poor preservation of the site.

Trauma

Five cases of trauma were identified in the skeletons. Burial 139 had a severe ununited fracture on the midshaft of the right femur. A large well-remodelled callus has formed over the two ends of the diaphysis. The inferior 2/3rds of the femur are medially posteriorly displaced. There is a substantial amount of overlap between the two diaphysis sections, which will have led to a marked degree of shortening. Unfortunately it was not possible to measure the amount of shortening due to the absence of the distal femur. The presence of woven bone on the callus and the remaining shafts provides evidence of periosteal inflammation and osteomyelitis, indicating active infection at the time of death. Severe osteoarthritis diagnosed by extensive eburnation of the right and left hips was noted and is likely to be the result of the fracture to the femur, which would have significantly altered the individual's gait. The cortical bone of the affected femur is markedly thinner than the unaffected leg. This suggests disuse atrophy and or nerve/blood supply impingement, unsurprising considering the severity of the fracture and the extent of the osteoarthritis in the hips.

In addition there were two individuals (265 and 35) with well-healed fractured metacarpals. No sign of inflammation was observed. Individual 293 had a well-healed fracture of a rib.

Burial 13 (disarticulated) had a well-healed depressed fracture measuring 19.2 x 10.4 mm on the right parietal.

No perimortem trauma was identified, unusual for the period and number of individuals observed. Although this may indicate a peaceful and accident free population, it is more likely to be the result of the preservation. Due to the truncation and disarticulation to the material, it was not possible to use colour of fragments as an indicator of old breaks. In addition, fragmented surfaces were eroded and flaky.

5.7 Degenerative joint disease

Osteoarthritis (OA)

Osteoarthritis is a degenerative joint disease caused by the breakdown of articular cartilage (Mays 2007) synovial joints. Osteoarthritis was scored following Säger (1969), cited in Brothwell (1981). Four types of change were sought. This included new bone growth, pitting, eburnation and sclerosis. As eburnation is the only pathognomonic osteoarthritic change, when it was observed it was an automatic diagnosis. Without eburnation, two of the other three indicators were required to confirm OA (Rogers and Waldron 1995).

Spinal

Twenty-nine individuals had four or more observable neural arches. The degeneration of the apophyseal facets was recorded in the same fashion as osteoarthritis on any other joint. Nine individuals had significant changes in the apophyseal facets, two of which (Burials 44 and 234) had eburnation. Individuals with OA of the spine included four males, three females and two of unknown sex.

Degenerative disc disease.

Degeneration of the intervertebral disc causes two types of change in the vertebral column; formation of osteophytes around the vertebral margins and changes to the superior and inferior vertebral body surfaces. Roberts and Manchester (2005, 140) state that these changes are a result of integral chemical and structural changes in the intervertebral disc. Morphological alterations in disc shape places pressure on the annulus fibrous which stimulates new bone growth around the vertebral body margins creating osteophytes.

Vertebral bodies were available for osteophyte analysis in 28 individuals. Osteophytosis or degenerative disc disease was scored as positive when a vertebra had osteophytes at grade 2 or above. This is inline with Mays' observation that osteoarthritis can be diagnosed if osteophytes exceed Säger's (1969) grade 1 criteria (Mays 2007). Thirteen individuals had osteophytes in the vertebral column. A single individual (23) had grade 2 osteophytes.

An additional indicator of joint degeneration in the spine is the breakdown of the superior and inferior surfaces of the vertebral body. This is characterised by the surface becoming rough, pitted and irregular. Six individuals had changes to the vertebral bodies consistent with degeneration of the intervertebral disc. All of these individuals had OA in the apophyseal facets.

Overall, twenty individuals had some form of change that could be attributed to degenerative joint disease in the spine. However, only nine individuals out of 29 (31%)

had grade 2 osteophytes, eburnation or two simultaneous indicators of the disease on the apophyseal facets.

Extraspinal

The presence of OA was sought in a number of different joints of the body: temporomandibular, glenohumeral, elbow, wrist, hip, knee and ankle. A number of joints were not examined due to the paucity of bones and poor preservation. This includes the joints of the hands, feet, sternoclavicular and acromioclavicular. Table 14 shows the joints and percentage affected. OA was scored as present in a joint if one surface was affected. This is then compared to Raunds (Powell 1996), Wharram Percy (Mays 2007) and Barton-upon-Humber (Waldron 2007).

Table 14: Distribution of OA through out the skeleton

Joint	Number affected	Number of observable sites	% affected
Spine	9	29	31%
Shoulder	3	12	25%
Hip	8	33	24%
Elbow	3	19	16%
Wrist	1	14	7%
TMJ	1	16	6%
Knee	0	14	0%
Ankle	0	5	0%

After spinal osteoarthritis the most affected joint were the shoulder and the hip (25% and 24% respectively). Although there were osteoarthritic changes in the knees and ankles, no cases displayed two types of OA change simultaneously. It was very rare that the surfaces of the proximal tibia and distal femur could be observed to make a diagnosis of OA and this is probably why no definite cases were identified. Interestingly, the prevalence of shoulder OA seems high, but Rogers *et al* (1981) identified a similar level of shoulder arthritis (24%) in a Saxon sample from Trowbridge, Wiltshire indicating that Rothley is not atypical.

Rothley follows the same OA skeletal distribution pattern as the population from rural Raunds, Furnells (Powell 1996) and that identified by Mays (2007) at Wharram Percy. At the urban site Barton-upon-Humber, the spine was also the most affected region, but the hip and shoulder fell far behind other joints including the knee and the elbow (Waldron 2007). This difference may be due to variations in lifestyle between rural and urban populations. In modern studies of farming, individuals who use heavy machinery are less likely to develop hip OA than those that work long hours and with animals (Thelin *et al* 2004). Furthermore research by Thelin and Holmberg (2007) demonstrates that the modern farmers were far more likely to develop hip OA than their rural non-farming and urban peers, demonstrating that farming introduced a significant risk of developing the disease and not just residing in the countryside.

Different diagnostic techniques and interobserver error creates problems for comparing rates of OA between populations. Many studies do not publish full results and in some cases it is difficult to know how the rates have been calculated. Regardless of this, the OA frequencies and distribution patterns appear to be similar to Rothley's contemporaneous rural sites.

5.8 Dental

Due to the fragmentary nature of the assemblage, it was decided to calculate prevalence rates for dental pathologies by individual rather than tooth. Although this is less than ideal, it was felt it would give the best overview of the assemblage. In total, 50 individuals had some teeth and jaw to permit the analysis of dentition.

Caries

Just four individuals (8%) had evidence for caries. The caries rate is low for the time period especially compared to Wharram Percy (phase 1 – 2) (Mays 2007, 134) and Empingham II, 68.8% and 30% respectively. Teeth with caries tended to be broken and may have been lost from the archaeological record.

The most common area for caries was at the CEJ (cementoenamel junction), therefore individuals at Rothley conform to phases 1 - 2 at Wharram Percy. It is in the later medieval period, with the introduction of refined sugars that occlusial caries become commonplace.

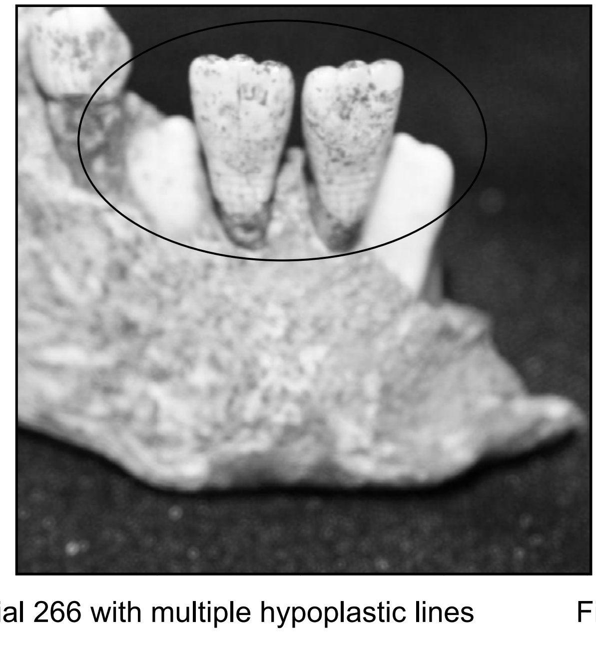
Ante-mortem tooth loss (AMTL)

Fourteen individuals had suffered AMTL representing 24% of all the observable individuals (n = 50). At Wharram Percy the prevalence was double that at Rothley with 50% of the phase 1 – 2 individuals having incurred some tooth loss. The teeth most commonly lost at Rothley were the molars; similar to those observed at Raunds (Powell 1996). There were no individuals observed with AMTL in the maxilla. This is a result of the fragility of the maxilla, and the fact that there were far fewer maxillae and maxillary teeth in general. This may explain why AMTL was half that observed at Wharram.

Linear enamel hypoplasia (LEH) is the result of temporary disruption to amelogenesis (Goodman and Armelagos 1985). Known causes include fever, disease and dietary deficiency (Hillson 1996; Larsen 1997). The most common defects are visible as furrow like banding on the outside of the enamel crown.

Hypoplasia

At Rothley eleven individuals have hypoplastic lines. The number of defects ranged from 1 per tooth to 4 per tooth (individual 266; see Fig 20) and were all of the horizontal type. No bands were observed in the deciduous dentition. In line with Hillson (1996, 167) the defects were visible on the anterior portion of the teeth as was the case at Wharram Percy (Mays 2007, 138). Similarly, like Wharram Percy and Raunds (Powell 1996), the most common tooth affected was the canines. Considering only 50 individuals had observable teeth, this works out at prevalence rate of 22%, a little lower than Wharram (31%) but higher than Empingham (12%) (Mays 1990, 15). As interobserver error rates are high for hypoplasia recognition, it is not worth commenting further on the comparisons with other sites.



Burial 266 with multiple hypoplastic lines Fig 20

Calculus

Calculus is mineralised plaque (Hillson 1996, 255), which is formed of bacteria, their deposited matrix and saliva. Calculus was scored following Brothwell's (1981) grading system of 0 – 3. The percentage of individuals affected by calculus is not presented as it is highly possible that some calculus may have been lost to taphonomy. Therefore, it cannot be certain that any rate calculated would be a true representation of the extent of calculus in the population. Twelve individuals had calculus ranging from grade 1, (small amount) through to one case of grade 3 (individual 184) where the entire tooth was nearly encased. As saliva is a key component in the development of calculus, it is unsurprising that the buccal surfaces of the upper molars and the lingual surfaces of the lower molars are the most frequently and severely affected as these areas are in proximity to salivary glands (Hillson 1996).

Other dental anomalies

Burial 9 has an impacted right 3rd molar (see Fig 21) visible due to a serendipitous post mortem break. Two individuals had rotated premolars; individual 110's lower 2nd premolars are rotated by 90 degrees distally and disarticulated Burial 15's lower left 2nd premolar rotated by 95 distally.

Within disarticulated Burial 292, a lower left 2nd molar has enamel pearls on the roots. Of 8,854 extracted molars in modern Norwegians, there were 219 macroscopically detectable enamel pearls on a total of 201 teeth (2%) (Risnes 2007). Enamel pearls were also found at nearby Empingham II on a single molar (Mays 1996).

Impacted lower right molar 3 (Burial 9)   Fig 21

5.9 Other

Cribra orbitalia is described as pitting in the orbital roof caused by a large range of conditions including parasites, blood loss, insufficient diet, diahorrea and other diseases such as scurvy (Djuric *et al* 2008). Few orbits were observable, all of which were adult. The thin nature of the orbital roof makes them susceptible to breakage and taphonomic alteration. Three out of sixteen individuals had cribra orbitalia, equal to 18.9%. At Wharram 19.2% of adults were affected (Mays 2007:172) and 29% of adults and children at Raunds (Powell 1996, 123). As preservation is so poor at this site, it causes a particular problem for the observance of pits in the bone. Nevertheless Rothley is similar to its comparison sites.

There were two individuals with button osteomas; individual 200 and disarticulated Burial 150. These are areas of dense lamellar bone found on the vault. Eshed *et al* (2002) demonstrate that it is a common finding in archaeological and modern populations.

5.10 Discussion

The preservation of the material has undoubtedly had a marked effect on the information that can be collected from the assemblage. A lack of pubic symphyses, fragmented, incomplete skulls and disarticulation resulted in most (70 out of 147) individuals being classed only as adult. More critically, it has placed limitations on interpretations and conclusions that can be drawn from the skeletal analysis.

The demography of the population is of interest. Undoubtedly of note are the few children and infants. This is not uncommon in the medieval period. Differential deposition and susceptibility to diagenesis have often been cited as causes for this phenomenon, and in this case, the cause probably lies with the latter. Walker *et al* (1988) demonstrated that infants were highly underrepresented in a known cemetery population which highlights the need to be cautious when reconstructing past populations and their histories.

In terms of the sex ratio, it is interesting to note that there were twice as many men as women. There are a number of possible explanations for this observation. Consideration has to be given to the fragmentation and preservation of the material. Studies on sex and preservation have been a lot less clear on preferential recovery of males and females than they have with age biases. While Walker (1995) and Bello *et al* (2006) demonstrated some preferential destruction of females, others (Walker *et al* 1988) suggest that males and females have equal chance of survival. It is possible that both scenarios are valid and the conflict may be the result of site differences including inter-observer error, methods and soil types. Accordingly, Weiss (1972) has suggested assessing and comparing the fragmentation and preservation between males and females should highlight whether this is a concern. The results in Section 3 demonstrate that females were both more incomplete and preserved less well than the males at Rothley. This poses the possibility that females were more susceptible to taphomonic destruction, an idea that is reinforced by bone mineral data produced by Galloway *et al* (1997). While some authors often disregard preservational causes for sex biases due to the presence of infants and juveniles on site, the author suggests here, that the low frequency of child remains in fact reinforces its influence. In addition to this, Kjellstrom (2004) suggested that bias may be introduced by differential burial practices, such as males in deeper or more sheltered graves than females. This is something that cannot be either confirmed or denied at Rothley due to the significant truncation and disarticulation.

Finally, there might actually be a genuine difference in the number of sexes in the excavated burials either resulting from a true inequality in the population, or a bias in the distribution of graves in the cemetery. Weiss (1972) had advised that genuine population differences on the scale of Rothley rarely exist in either modern or ancient populations. Furthermore, there is no indication that this is a monastic site where inflated frequencies of males would be expected.

In addition to the higher percentage of males, it was also of note that the men of Rothley appeared to be tall for the period. While data in Galloway *et al* (1997) indicates that females have lower bone densities than males, which may make them susceptible to deterioration, it is not clear how much this difference is related to size. Studies on bone morphology and musculoskeletal markers have identified the need to take body size into account as longer bones generally need to be larger to support the individual's weight and muscle mass. What might actually be observed is the preferential recovery of taller, more robust people rather than males. It is only because males are, on the whole, larger than females, that we get this sex bias.

5.11 Conclusions

This report demonstrates the pitfalls and problems with dealing with incomplete and poorly preserved material. Regardless of this, it is still important to glean as much information as possible, particularly when material comes from a location where preservation is usually poor. Although speculation about unusual trends is problematic for the Rothley material and despite low numbers of ageable and sexable individuals, it is possible to see that Rothley fits the general patterns for its location, site type and time period.

6 LATER MEDIEVAL AND POST-MEDIEVAL

6.1 Nature of activity

The final burials in the cemetery are dated to the late 10th/early 11th century, but it would appear that although the cemetery had contracted at an early date its presence was known and respected, as the area was left undisturbed until at least the 12th century. The intrusion of pits through the 13th and 14th centuries was also sparse.

The medieval activity across the entire site was limited to pits and a well (Fig 22). None of the medieval features were related to each other. This may suggest either that they were the deepest surviving examples of a wider selection of features largely subsequently lost, or that the few surviving features represent a genuine low level of use from the 12th to the 14th centuries. Roman building material was present in the medieval contexts in substantial quantities, indicating that this material was still being encountered in works carried out between the 12th and 14th centuries.

The 19th-century features relate to the site when it formed part of the formal garden to 'The Grange'.

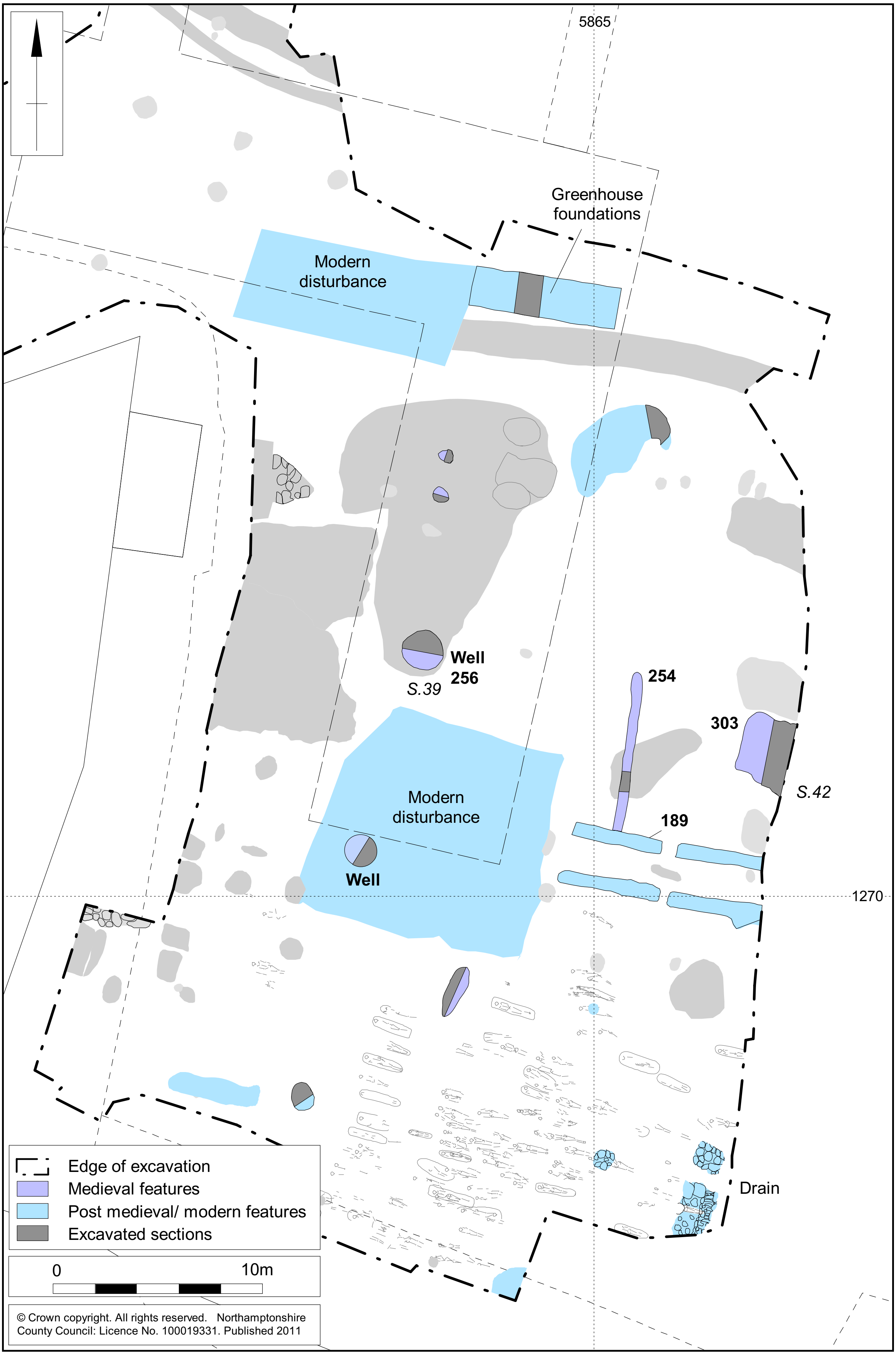
The later medieval features

The earliest medieval feature post-dating the cemetery comprised a shallow gully [254], which cut an area of probable Roman metalling. The gully was aligned north-south, 0.5m wide by 0.12m deep, and was traced for *c*7m. Its southern end was cut by a post-medieval planting trench [189]. The fill of the gully (253) contained pottery dated to the 12th century.

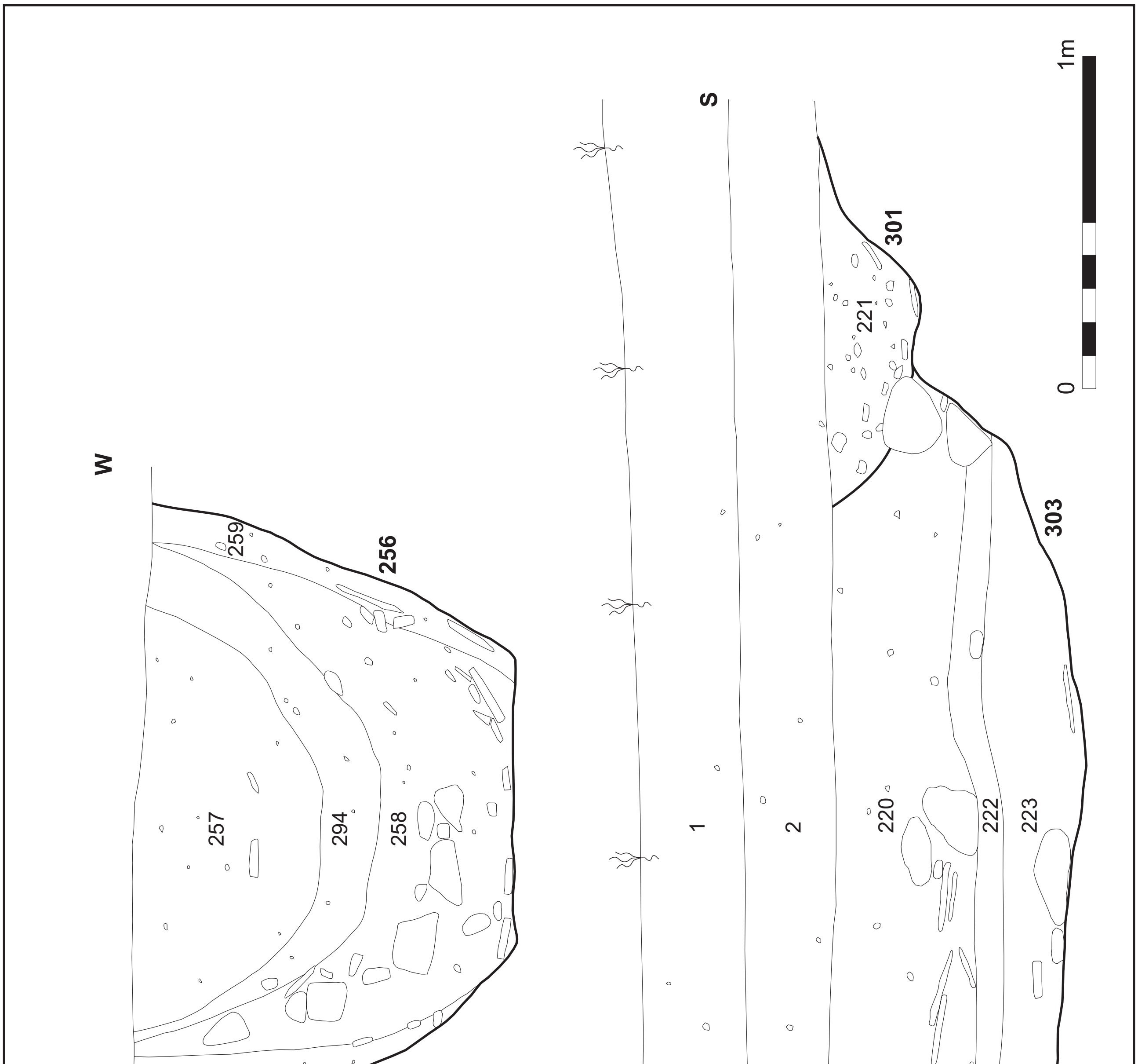
In the centre of the site, also cutting an area of probable Roman metalling, was a sub-circular well [256], *c*2.0m in diameter and 1.16m deep, which had been backfilled in the mid 13th century (Fig 23; Section 39 and Fig 24). Within the lower fill (259) there was an almost complete Potters Marston ware pot of 12th century date, while the middle fill (258) contained pottery dated to the mid 13th century. The middle fill and the upper fill (257) contained finds of Roman date including roof and floor tile, slate, as well as tesserae, hypocaust flue tile fragments, and pieces of mortar.

A sub-rectangular pit [229], which cut some of the burials in the northern part of the cemetery, was dated by pottery to the 13th century. This feature was isolated and its purpose is unclear. (It had been seen in Trench 7 context [722] of the 2005 evaluation, Oxford Archaeology 2006.) The pit was 2.7 long by *c*0.6m wide; the full depth of the pit was not established but it exceeded 0.9m, where excavation stopped due to ingress of water and health and safety constraints.

Pit [303] lay to the north of the cemetery, and partially beyond the eastern limit of excavation (Fig 23; Section 42). It measured 3.5m wide, in excess of 2.5m long and was 0.75m deep. The primary fill (223), which contained only Roman pottery, dated to the 4th century, was overlain by a sterile sandy fill (222), 0.1m thick. The upper fill (220) contained a large rim sherd from a late medieval reduced ware pot dating to the 14th/15th century, but the rest of the finds from this fill, however, were Roman. It was from this deposit that the majority of the Roman diamond shaped slate roof tiles were recovered.



Scale 1:250 (A4) The later medieval features Fig 22



Scale 1:20

Sections of medieval well and pit Fig 23

A well pit, 256, dated to the12th-century, looking south Fig 24

The post-medieval and modern features

The post-medieval and modern features relate to the use of this area as the formal garden of 'The Grange', the house located further to the north. They comprised disparate and isolated post-medieval garden features, which included a pair of parallel, interrupted, 19th-century ribbon planting beds, a Victorian brick-lined well and the brick footings of a Victorian greenhouse.

However, unlike the medieval predecessors, the post-medieval features were more widespread and included some within the cemetery, including two areas of rubble packing and a short length of stone-lined drain, which truncated at least two graves in the south-eastern corner of the excavation. A small number of animal burials were noted, but not retained, from the southern end of the excavation; these were likely to have been the remains of family pets from the time when 'The Grange' was a family home. As previously noted, the burials were so near the modern ground surface that even routine gardening operations may have resulted in further disturbance of burials.

In the modern period, 'The Grange' was used as offices and was extended to the south with a prefabricated L-shaped building set on a concrete raft (over the central part of the excavation area). The demolition and removal of this building took place prior to the excavation, consequently much of the centre of the excavation area was truncated, along with areas of very regular, deeper truncation related to landscaping (Fig 3).

6.2 Medieval pottery by Paul Blinkhorn

The Saxon and medieval pottery assemblage comprised 87 sherds with a total weight of 3.34kg. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference was 1.80. It was recorded using the conventions of the Leicestershire County type-series (Sawday 1994), as follows (the alphanumeric codes refer to those used in the archive database):

F1: Early/Middle Saxon Grano-Diorite ware, AD450-850. 5 sherd, 110g, EVE = 0.10.

F100: LI2: Lincoln ware, 850-1050. 1 sherd, 30g, EVE = 0.18.

F205: ST: Stamford ware, 900-1150. 7 sherds, 38g, EVE = 0.

F300: PM: Potter's Marston ware, 1100-1300. 29 sherds, 1,792g, EVE = 1.28.

F301: CC1: Nuneaton 'A' ware, AD1200-1400 . 1 sherd, 10g, EVE = 0.

F302: CC3: Nottingham Ware 2, 1230-1300. 1 sherd, 4g, EVE = 0.

F303: CC2: Chilvers Coton ‘C’ ware, 1200-1475. 16 sherds, 333g, EVE = 0.

F330: LY4: Shelly wares, 1100-1400. 1 sherd, 18g, EVE = 0.

F360: MS1: Medieval Sandy ware, 1100-1400. 6 sherds, 75g, EVE = 0.04.

F365: RS: Late Medieval Reduced ware, late 14th-15th century. 1 sherd, 303g, EVE = 0.20.

F403: MP1: Midland Purple ware, 1375-1550. 4 sherds, 208g, EVE = 0.

F414: EA3: Staffordshire Mottled ware, 1650-1780. 1 sherd, 2g.

F426: EA6: Post-medieval Blackware, late 17th century +. 6 sherds, 113g.

F1000: EA10: Fine white earthenware, 19th century+. 8 sherds, 301g.

The pottery occurrence by number and weight of sherds per context by fabric type is held in archive. Each date should be regarded as a *terminus post quem*. The range of fabric types is typical of the area, and indicates that there was low-level activity at the site from the later 11th or early 12th century onwards, as well as a small assemblage of early/middle Saxon pottery, although it is impossible to date these wares other than to within the period AD 450-850. The single sherd of Lincoln ware shows that there may have been some activity at the site in the late Saxon period, although it could be as late as the Norman Conquest and date to the start of medieval occupation.

All the sherds were in good condition, and show little evidence of abrasion. The mean sherd weight is fairly large, although this is somewhat influenced by the presence of a near-complete Potter’s Marston ware jar and a large rimsherd from a late medieval Reduced Ware storage jar.

6.3 Medieval finds by Tora Hylton

Finds from medieval deposits were dominated by nails (29). They were recovered either as individual finds from the grave soil (17) or as group/individual finds from medieval features (12). Other finds of medieval date include a silver coin and a knife.

A Scottish silver penny, Alexander III (1249-1286) was recovered from the subsoil.

A whittle-tang knife was recovered from Pit (220) and a fiddle key horseshoe nail with large semi-circular head came from the grave fill of Burial 158.

7 FAUNAL REMAINS AND ENVIRONMENTAL EVIDENCE

7.1 Faunal remains by Karen Deighton

A total of 13.3 kg of animal bone was recovered by hand from a range of contexts during the course of excavation. The material was assessed to determine the *taxa* present, the level of preservation and the potential contribution to the understanding of the site.

The material was scanned and species, preservation, potential ageing and metrical data, modification and butchery were noted. Metrical data is after von den Driesch (1976). Butchery and gnawing are after Binford (1981). Ageing data is comprised of fusion information, bone morphology and tooth eruption and wear. Material recovered from samples is also included in the assessment.

Results

Fragmentation was fairly heavy with few complete long bones observed; abrasion was high in several contexts which was possibly due to soil conditions. Ten instances of canid gnawing and nine examples of butchery were noted including evidence for the removal of cattle horn cores. A cattle scapula with knife marks could indicate the removal of meat. No evidence of burning was observed which suggests this was not a preferred method of disposal. Evidence of antler working was noted (context 220); this consisted of saw marks indicative of the removal of a branch from the burr.

Table 15: Animal bone from Roman contexts

Fill/cut type	Horse	cattle	Sheep/ goat	Pig	Deer	Goose	Large ungulate	Small ungulate
97 layer	---	--	2	1	--	--	--	--
98 layer	3	--	2	--	--	--	--	--
176/177 Ditch	--	6	3	1	--	1	--	--
179/203 Hollow	3	9	2	--	--	--	3	--
220/303 Pit	--	10	3	3	2	--	9	2
223/303 Pit	--	1	--	--	--	--	1	--
240 Buried soil	--	6	1	1	--	1	4	1
276 layer	1	--	--	--	--	--	--	--
281/282 Ditch	--	2	1	--	--	--	--	--
383/382 Ditch	--	1	--	--	--	--	--	--
416/415 pit	--	4	--	1	--	--	3	--
437/438 pit	1	--	--	--	--	--	--	--
Total	**8**	**39**	**14**	**7**	**2**	**2**	**20**	**3**

Table 16: Animal bone from medieval contexts

Fill/cut	Horse	Cattle	Sheep/ goat	Pig	Dog	Fowl	Goose	Large ungulate	Small ungulate
226/227 pit	--	1	1	--	--	--	--	2	--
257/256 well	--	2	6	4	--	--	--	1	1
258/256 well	1	7	6	19	1	2	2	--	6
Total	**1**	**10**	**13**	**23**	**1**	**2**	**2**	**3**	**7**

Cattle were the most abundant species, followed by almost equal numbers of sheep/goat and pig. Wild species were limited to red deer (in Roman and burial contexts); although the presence of limb bones suggests not just the collection of shed antlers. A pathology was noted - exotosis on a large ungulate vertebra.

Ageing and metrical data

Neonates were present including a possible partial neonatal pig skeleton (context 258) in the medieval well.

Tooth data was present for cow, sheep/goat and pig and fusion data was available for all species. Unfortunately data would be too sparse for meaningful interpretations to be made.

Evidence for the sexing of pigs (tusks) is also available, however, the same problem as above is encountered. Some pigs appeared very large; however, there is little metrical data available to explore this observation.

Discussion

The majority of the assemblage was from Roman and medieval contexts where the species observed are typical for those periods. Unfortunately due to the small amount of material present (95 fragments from Roman contexts, 62 fragments from medieval contexts) little can be said of the animal economy of the site beyond a brief description of the species present.

7.2 The environmental evidence by Wallis Lord-Hart

Seven soil samples were taken from Roman and medieval layers, pits and a well in order to identify macroscopic plant remains. All samples were processed by flotation with a 1mm sieve used for the residue in a modified siraf tank, and then agitated in order to assist in separation. The floating fraction (flot) was collected into a 500 micron mesh. This fraction was then dried and scanned using a binocular microscope with a magnification of up to x 20. Seeds were then identified using Zohary and Hopf (2000), Cappers *et al* (2006), with terminology from Stace (1997).

Results

Charred seeds were recovered from each of the seven soil samples. Several types of cereal grain were present, including barley, wheat, spelt and oat. Only a few chaff fragments were found in the form of spelt glume bases, and one barley rachis fragment. The most fruitful samples came from context 220, a medieval pit (Sample 2), with close to 70 cereal grains present and context 240, a Roman layer (Sample 7), with 50 cereal grains. There were also a number of weed seeds present. Due to the poor preservation of a large number of the seeds identification was difficult and many of the seeds could only be identified down to family.

Table 17: Seed Quantification

Sample	**2**	**3**	**4**	**5**	**6**	**7**
Fill/cut	**220/303**	**223/303**	**257/256**	**258/256**	**259/256**	**240**
Feature and Date	**13th-15th century pit**	**10th century pit**	**12th-14th century well**	**12th-14th century well**	**14th century well**	**Roman layer**
Volume of Sample (litres)	**20**	**10**	**10**	**20**	**10**	**20**
Wheat *Triticum aestivum*	2	1	4	8	1	7
Spelt *Triticum Spelta*	--	--	--	--	--	7
Spelt *Triticum Spelta* (glume bases)	--	--	--	--	--	3
Barley *Hordeum sp.(hulled)*	2	--	--	--	1	1
Barley *Hordeum sp.(naked)*	--	--	--	--	1	1
Barley *Hordeum sp (rachis fragment)*	--	--	--	--	--	1
Six-rowed Barley *Hordeum vulgare*	--	--	--	--	--	4
Oat- *Avena Sativa*	--	--	--	--	--	2
Indet Cereale	60		3	5	6	24
Cereal total	**64**	**2**	**7**	**13**	**9**	**50**
Daisy family *Asteraceae* sp	4	--	--	--	--	--
Stinking Mayweed *Anthemis cotula*	--	--	--	1	6	2
Carrot type *Apiaceae sp*	--	--	--	--	--	--
Wild Radish *Raphinus Raphistrum*	1	--	--	--	--	--
Cabbages type *Brassica sp*	--	--	--	--	--	3
Common Chickweed *Stellaria media*	1	--	--	--	--	--
Goose Foot type *Chenopodium sp*	3	1	--	--	--	1
Sedges type *Carex sp*	--	--	--	1	--	1
Pea Family *Fabaceae sp*	--	--	1	--	--	--
Bromes type *Bromus sp*	8	--	--	2	4	13
Grass Family *Poaceae sp*	--	--	--	--	1	--
Dock type *Rumex sp*	2	--	--	--	--	2
Knotweed type *Persicaria sp*	2	--	--	--	--	--
Buttercup Family *Rununculaceae sp*	1	--	--	--	--	--
Indet seeds	6			6	3	11
Total seeds	**91**	**13**	**9**	**24**	**23**	**83**

Discussion

Samples were taken from features dated to the Roman and medieval periods. Sample 7 from layer 240, dated to the Roman period, is demonstrative of the detritus from the storage of grain. Weed seeds recovered, such as *Bromus* (Bromes) and *Rumex* (Dock) are typical crop contaminants. There was a moderate number of various cereal grains entering this area as detritus although not a large enough number to reveal for certain that grain processing was occurring on site, as there were few chaff fragments found. The seeds recovered in this area help to support the idea that this layer is from the Roman period as spelt, a seed common to this period, was found here. It was rarely used during the medieval period (van Zeist 1991). As the number of seeds recovered was minimal though, any interpretation is difficult to make.

The remainder of the samples have been recovered from medieval contexts, dated between the 12th and 14th centuries when the cemetery was no longer in use. The pits and well that were sampled from this period each contained several grains of wheat (*Triticum aesitvum*) and some barley (*Hordeum*) as well as a few types of weed seeds. The limited number of seeds recovered from these features is not sufficient to demonstrate economic activity; they are more likely to be simply the native weeds and detritus from neighbouring houses/land.

A medieval pit fill (Sample 2) produced a medium quantity of cereal grains. As there is no chaff associated with this feature it is likely that the grain was of a partly processed crop where the chaff has already been separated out. It would seem that this fill contains evidence for the storage of processed barley and wheat.

8 DISCUSSION

8.1 Prehistoric and Roman

Prehistoric

Evidence for prehistoric activity was limited to a scatter of residual flints, which serve only to demonstrate that there was limited activity in the area during the prehistoric period.

Roman

The ditch system at the northern end of the site may have formed a boundary as early as the 2nd century. However, the Roman period was largely represented by building material, in the form of an extensive layer of roof tile on the western side of the site, with further deposits, including stone slates, in pits to the east, all associated with pottery dated to the 3rd-4th centuries. Much of this material may have been deposited in the 4th century, at the abandonment of the Roman buildings, but at least two pits of medieval date also contained quantities of Roman building material. In one instance this comprised both building material and mortar, suggesting that this was a primary deposit of debris. If so, this might imply that Roman building materials were being salvaged for reuse as late as the 13th century, and we may speculate as to how much this involved digging out material or whether there may still have been standing walls of the derelict Roman buildings.

To the south-west there were two lines of substantial post-pits, set 5m apart, indicating the presence of a substantial Roman timber building, perhaps an aisled hall? These features and the pits to the east were separated by an area of metalling, indicating that in the Roman period the majority of the excavated area lay within an open yard.

Recorded on the 25” first edition Ordnance Survey map and re-noted on the 1956 map, was the presence of Roman remains (a pavement) located to the east of the vicarage, which is to the south and south-east of the excavated area. It had previously been assumed that this record on the Ordnance Survey maps had been a mix up between another Roman Villa found in 1722, 2km west of the development area (Historic Environment Record, (HER) LE891), as the 1903 Ordnance Survey map referred specifically to a Roman pavement being found on the vicarage site also in 1722 and it was thought unlikely that two Roman pavements were discovered in Rothley in the same year (JSAC 2004). Also, the HER records only a single find spot of a Roman bronze coin of Constantine the Great (306-337AD) on Fowke Street, some 50m to the west of the site (HER LE7775).

However, the evidence from the present site has provided compelling evidence for the presence of Roman buildings in the vicinity of the development area, with these including a building with a tesselated pavement and a hypocaust system. The lack of finds recorded on the HER could be due to the presence of the church and churchyard covering a large part of the area where these buildings were located.

8.2 Early medieval

A minster church?

The presence of a standing Anglo-Saxon cross in the churchyard and a priest recorded at Domesday, leaves no doubt that there was a pre-Conquest church at Rothley. The radiocarbon dating of the excavated burials has also shown that the origin of the church was no later than the late 7th/early 8th century. The churchyard had then contracted at around the end of the 10th century.

Unfortunately, there is no further early documentary evidence, but it has been suggested both by Parsons (1996, 26) and more recently in an unpublished thesis (McLoughlin 2010, 2008-210), that as a royal soke with an extensive parish Rothely could have been a minster of some importance.

The excavation of an outlying northern zone to the cemetery, where burial had ceased by the early 10th century, has added further weight to the argument that Rothley was probably a minster church.

Why, though, was it built here? Blair (2005) suggests that the builders of early churches in England were influenced by Biblical descriptions of Jerusalem. In Revelations 21, 12-24, Jerusalem is described as having a great high wall with 12 gates, a city of God. The only things in the English landscape at this time which even remotely resembled these Biblical descriptions were the ruins of Roman buildings and towns, which would have still contained lengths of standing, if overgrown, walls. 'Roman towns re-born as Bishoprics or minsters embodied a transfer of meaning from old (abandoned) cities to new (revitalized and holy) ones' (Blair 2005, 249). Was this site chosen for the minster in Rothley because of the presence of the remains of a substantial Roman building?

Minsters are also often associated with being near the bends in rivers and on higher ground. The Church in Rothley could hardly be described as being on higher ground, but it does sit in the angle of a bend in the Rothley Brook, with a meander to the east, subsequently straightened (Fig 1).

Without further excavation in the area of the churchyard and the Old Vicarage, it is not possible to confirm that there were Roman buildings preceding the construction of a Church on the same site, but the evidence is compelling enough to suggest that the builders of the minster church, perhaps in the late 7th/early 8th centuries, may have been drawn to the site by the presence of a 'great high wall', which, whilst not exactly matching the Biblical descriptions of Jerusalem, may have been sufficiently impressive in its locale to determine the site chosen for the minster church.

The origin and development of the cemetery

When burial commenced on the site in the late 7th/early 8th century, the possible presence of standing remains of Roman buildings may have influenced where the cemetery was located. In this northernmost area, the cemetery stopped short of the main areas of Roman debris and features but no contemporary physical boundary, such as a ditch was present. Perhaps it was the still evident limits provided by the Roman ruins to the north that formed the boundary.

The earliest radiocarbon dates come from burials within the single well-defined row on the western side of the cemetery (Fig 15), which was perhaps the primary setting out within the northernmost part of the cemetery. Whether this area was defined and set out at the same time as the construction of the church to which they belonged, or was a slightly later extension to the cemetery is unknown, but it is suggested that the southernmost group of burials did not share a common row structure with those to the north, and lay at the margin of a separate burial zone.

The later development of the northern area appears to have been less well organised. There were partial rows that may have been set out in relation to the row to the west, but any such organisation may have been localised and of short-term duration, so that no other rows extended for more than six burials or around 6m in length. The single radiocarbon date from this central area, Burial 123, indicates usage during the 9th/10th centuries.

Burial in the southern zone was also occurring during the 9th and 10th centuries (Burial 293), but this area also contained Burial 248, which has given the latest radiocarbon date, indicating that usage of the area continued to at least the later 10th century. This provides additional support for the suggested presence of a separate southern zone, with it perhaps continuing in use to the end of the 10th century and maybe beyond, while burial in the northernmost area may have ceased before the end of the 10th century.

However, there is no evidence for continued use of this northern area for burial post-Conquest. The model is therefore one of cemetery contraction occurring by the end of the 10th century, and therefore pre-Conquest in origin, with perhaps a further contraction post-Conquest.

The model of cemetery development provided by the set of radiocarbon dates is also consistent with other excavated evidence. At Wing, Buckinghamshire (Holmes and Chapman 2008) an outlying area of the cemetery had come into use in the mid-8th century and the majority of the excavated burials here were also pre-Conquest in date. At Wing the organised row structure broke down and there was a scatter of later burials indicating that the area had declined, but was still in use for occasional burial until the later 12th century. Also at Wing, there was a curving length of ditch providing a very clear boundary to the early cemetery.

Burial practice

Burial practice within the cemetery followed the accepted Christian alignment of head to the west and feet to the east, in an extended supine position. The excavated burials were without grave goods, with the only possible exception being Burial 132 where an incomplete bone pin beater (SF 40) was recovered from the fill of the grave. However, it was not clear if this was a deliberate deposition or a residual find. Other finds which came from the grave earth were residual, and mainly consisted of Roman roof tile and pottery. Several nails were also recovered from the area of the cemetery; none of these relate to coffins and would appear also to be residual. There were some variations within the standard burial practice: Burial 5 had a stone its mouth and Burial 53 had stones around the skull, but these were the only surviving examples of ‘special’ graves, as seen at other contemporary sites.

There were minor variations involving the positioning of the arms and legs of the individuals. The majority had their arms by their sides, but seven examples had the right arm over the pelvis, seven had both hands over the pelvis, two had left arm over right over the pelvis and one left arm over pelvis. Three individuals had their right lower leg over the left, one of these also had their right arm over their chest, and two further burials had their left lower leg over the right. Burial 276 was unusual in that as well as having the arms crossed over the pelvis, right over left, the legs were also crossed but in this case it was the left femur over the right femur. The burials with their lower legs crossed were at the northern end of the row containing Burial 123 (Fig 15).

The significance of having the lower legs crossed is not clear although it has been suggested that they may have been individuals who have completed a pilgrimage (Hadley 2001). The other variations on position were spread with no special grouping.

Despite nails being found in the grave soil, none of the burials had direct evidence for being buried in wooden coffins, although coffins do not necessarily have to have nails as they can be held together with dowels. The exception was Burial 153 (Fig 25) an old male, who exhibited possible evidence of having been a coffin burial in that the right arm was articulated but had moved away from the shoulder, as had the lower left arm suggesting either that decay had been advanced at the time of burial or that there had been space for bones to become displaced within a coffin. No shroud pins were present in any of the burials.

If indicative of pre-burial decay, the condition of Burial 153 would suggest that bodies were being transported over distances (therefore time) to be buried at Rothley, which may indicate that burials were being received from outlying parishes to the mother/minster church. However, further evidence would be required to support this.

The early medieval community: age, health, diet and living conditions

The pre-Conquest community of Rothley, despite the generally poor survival of the burials, seem to compare favourably in terms of stature and general health with other communities of a broadly similar date, such as Raunds, Northamptonshire, Empingham, Leicestershire and North Elmham, Norfolk. At Rothley there is a higher than average percentage of males within the cemetery, but this may be due to bias of preservation.

Ageing the population was problematic due to the poor preservation. However, fewer children than average were present, although again this may be due to a bias of preservation or due to the fact only a small proportion of the cemetery was actually excavated. At Raunds, Northamptonshire, where the burials date to the 10th-12th centuries, it was shown that there was a marked concentration of infants and young children immediately around the church (Boddington 1996).

The stature of the population was also difficult to determine as only ten male skeletons and two females were complete enough to estimate height. The mean male stature was 1.748m (5'9") and the mean female height 1.577m (5'2"). Although the results cannot be relied on due to the small number of available samples, the results fall within the averages from the period.

The health of the population as observable from the bones was again limited in its determination due to the poor preservation of the burials. However healed fractures were observed in some individuals. Burial 139 had a severe midshaft compound fracture of the right femur, the presence of woven bone on the break provided evidence of inflammation and osteomyelitis, indicating an active infection at the time of death, perhaps even the cause (Fig 26). The individual would have been in great pain but that said they had possibly lived for several years after the accident as evidenced by the build up of new bone, which would suggest that they had been well looked after. Unfortunately it was not possible to attribute age or sex to this individual.

Burial 153 showing the displaced right arm and lower left arm Fig 25

The analysis of the carbon and nitrogen isotope ratios carried out as part of the radiocarbon dating, has indicated that the population were living off a mainly temperate terrestrial diet, as would be expected for a Leicestershire population.

The minimum number of burials *by Andy Chapman*

Given poor preservation and a high level of disturbance, estimating the original number of individuals that may have been buried within the excavated area presented several difficulties.

The number of recorded bone deposits, at 287, does not provide a reliable estimate, as this total includes *in situ* articulated remains and also more than 100 deposits of disarticulated bone, many of which contain bones from more than one individual. A simple count of recorded bone deposits with an additional allowance for deposits containing more than one individual yields a grand total of 368 bone deposits (see Inskip, Table 5).

Burial 139, showing the femur midshaft break and bone growth Fig 26

This total is far in excess of the likely minimum number of burials. The number of individuals present as articulated inhumations is perhaps as high as 149. There are some 137 individual where enough remains *in situ*, with both the correct orientation and the presence of articulating joints, to be certain, and in a further 12 instances articulating joints are absent but there are bones in the correct orientation suggesting the probability that these remains were also *in situ*.

From the analysis of the bones, the minimum number of individuals present is 161, based on the presence of 161 skulls, the most common single skeletal element (Inskip, Table 5). Of those 161 skulls, 82 are from *in situ* inhumations. This leaves 79 disarticulated skulls and 67 *in situ* inhumations lacking skulls. There are, therefore, 13 skulls more than the likely maximum number of *in situ* inhumations. This implies that there are at least 13 individuals (8% of the total) where no remains had survived *in situ*.

The total number of skulls, at 161, does therefore provide the best estimate for the minimum number of individuals that had been buried in this part of the cemetery, with the true figure unlikely to have been significantly higher than this.

8.3 Comparative sites

Comparative sites in the region with the same early burials as at Rothley and the compelling evidence for the reuse of a Roman site for the minster church are few and far between. The cemetery excavated further afield at Wing in Buckinghamshire is broadly contemporary; its start date is a little later and some burials were still taking place in an outlying zone into the 12th century. Like Rothley, the cemetery started with a well defined row system which would appear over time to have broken down (Holmes and Chapman 2008). With regards to 'special' burials, Rothley had only two examples: one of burial with a stone in the mouth and one of possible pillow stones. Examples of the latter are relatively common in the later Saxon period, with numerous examples recorded at Raunds Furnells (Boddington 1996) in burials dating to the 10th-12th centuries. Two examples of this particular type of burial were also identified during the excavation of a small late Saxon cemetery at Ketton, Rutland (Meadows, pers comm).

8.4 Later medieval and post-medieval

Clearance of the site

The evidence from the medieval features indicates that quantities of Roman material were still being unearthed and re-deposited in the 13th and 14th centuries. Several of the medieval pits contained quantities of Roman roof tile and one in particular contained the bulk of the assemblage of roof slate from the site.

Formal gardens

The Grange was built in the late 18th century and the site would appear to have been landscaped and turned into an area of formal garden with paths and planting trenches. Later in the 19th century a brick lined well and greenhouse were constructed towards the northern end of the site. The only feature to disturb burials from this phase was a stone drain in the south eastern corner of the area.

Council offices and truncation

Latterly the Grange had been developed into offices and an L-shaped extension was built over the development area. This building had caused the central part of the site to be truncated. A drain pipe aligned east-west across the southern part of the site, probably dates to this latter period of use and its construction disturbed several burials; bone was found to the side of the pipe trench. Although this work was carried out in living memory, it is interesting to note that there was no local remembrance of human bones being found.

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Northamptonshire County Council

Northamptonshire Archaeology

Northamptonshire Archaeology
2 Bolton House
Wootton Hall Park
Northampton NN4 8BE
t. 01604 700493 f. 01604 702822
e. sparry@northamptonshire.gov.uk
w. www.northantsarchaeology.co.uk