Northamptonshire Archaeology

Archaeological excavations at the former St Martin's Churchyard, Wallingford, 2003-4

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Report 10/157

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Dedicated to the memory of the late Trevor Anderson

Quality Control

	Print name	Signature	Date
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OASIS REPORT FORM

PROJECT DETAILS		
Project name	Wallingford, Waitrose site	
Short description		
St Martins was the principal church of late Saxon Wallingford. Burials within its cemetery exhibit strong pre-Conquest characteristics and while these are seen elsewhere, there are some aspects which may be peculiar to the immediate area, suggesting a range of local variations to these common rites. Use earliest use of the churchyard has been dated to the late 10th to early 11th century by radiocarbon dating, and use continued until the end of the 14th century, serving a dwindling parish population before rapidly falling out of use. No burials post-date 1412. Osteological analysis of 187 of the 211 excavated skeletons has depicted a lay population which was almost equally split between males and females, with only a slight bias towards males. Due to this and other previous disturbances, the proportion of burials in the churchyard which survived to excavation remains unknown. Their distribution showed no discrimination. A high proportion of children but a comparative lack of newborns and very young children is notable, but its significance is unclear since so many disarticulated remains were also present. The mortality profile of the site differs in this respect from most others being more even. The population was of average height for the period nationally, but with the males buried at St Martin's being slightly shorter than at Oxford, possibly because the population included fewer higher-status and monastic burials at Wallingford. Both degenerative pathologies and inherited conditions affecting bone were noted, as were noteworthy rates of trauma, some of it violent. Generally they led healthy early lives compared to other urban assemblages, although evidence of tuberculosis and iron deficiency suggest that living conditions and diet at the heart of medieval Wallingford were far from ideal. The few finds have resonance in funereal contexts as losses from clothing or personal items, such as a crucifix or a simple pilgrim badge. The late Saxon mortar mixer has added to a growing list of this distinctive early constructional feature across the Midlands. While its presence indicates the vicinity of the late Saxon church, no foundations of St Martin's church appear to have survived 1712 cellar-digging and quarrying for gravel.		
Project type	Excavation, watching brief	
Site status	None	
Previous work	Cultural Heritage Assessment (CHA - JSAC), Evaluation (NA)	
Current Land use	Retail (food)	
Future work	None	
Monument type/ period	Late Saxon – medieval	
Significant finds	Human remains; funerary trappings; pilgrim badge; Brill Boarstall ware jug	
PROJECT LOCATION		
County	Oxfordshire; formerly within Berkshire	
Site address	Waitrose Ltd, St Martin's Lane, Wallingford, Oxon	
Study area	0.86 ha	
OS easting & northing	NGR: SU 8940 6075	
Height above OD	*c* 49m above OD, archaeology *c* 46m – *c* 48m above OD	
PROJECTCREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originator	Simon Johnson, former John Samuels Archaeological Consultancy (JSAC)	
Project Design originator	Northamptonshire Archaeology	
Supervisors	Simon Carlyle (Evaluation) Chris Jones, Ailsa Westgarth (Excavation)	
Project Manager	Adam Yates (Evaluation), Iain Soden (Excavation and post- excavation)	
Sponsor/ funding body	Waitrose Ltd	
PROJECT DATES		
Start date/end date	May 2002 (CHA), 2003-4 (fieldwork)	
ARCHIVES	Location	Content (eg pottery, animal bone etc)
Physical	Northampton	Human remains, pottery, other finds
Paper	Northampton, then Oxon Museums	Site records
Digital	As paper	Survey data, dbase records
BIBLIOGRAPHY		
Title	Archaeological excavations at the former St Martin's Churchyard, Wallingford 2003-4, Iain Soden, 10/157, 88 pages	

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ARCHAEOLOGICAL EXCAVATIONS IN THE FORMER ST MARTIN'S CHURCHYARD WALLINGFORD, OXFORDSHIRE 2003-4

ABSTRACT

St Martins was the principal church of late Saxon Wallingford. Burials within its cemetery exhibit strong pre-Conquest characteristics and while these are seen elsewhere, there are some aspects which may be peculiar to the immediate area, suggesting a range of local variations to these common rites. Use earliest use of the churchyard has been dated to the late 10th to early 11th century by radiocarbon dating, and use continued until the end of the 14th century, serving a dwindling parish population before rapidly falling out of use. No burials post-date 1412.

Osteological analysis of 187 of the 211 excavated skeletons has depicted a lay population which was almost equally split between males and females, with only a slight bias towards males. Due to this and other previous disturbances, the proportion of burials in the churchyard which survived to excavation remains unknown. Their distribution showed no discrimination. A high proportion of children but a comparative lack of newborns and very young children is notable, but its significance is unclear since so many disarticulated remains were also present. The mortality profile of the site differs in this respect from most others being more even.

The population was of average height for the period nationally, but with the males buried at St Martin's being slightly shorter than at Oxford, possibly because the population included fewer higher-status and monastic burials at Wallingford. Both degenerative pathologies and inherited conditions affecting bone were noted, as were noteworthy rates of trauma, some of it violent. Generally they led healthy early lives compared to other urban assemblages, although evidence of tuberculosis and iron deficiency suggest that living conditions and diet at the heart of medieval Wallingford were far from ideal.

The few finds have resonance in funereal contexts as losses from clothing or personal items, such as a crucifix or a simple pilgrim badge. The late Saxon mortar mixer has added to a growing list of this distinctive early constructional feature across the Midlands. While its presence indicates the vicinity of the late Saxon church, no foundations of St Martin's church appear to have survived 1712 cellar-digging and quarrying for gravel.

1 INTRODUCTION

In support of redevelopment proposals in 2002, Waitrose Ltd began research on the site of a proposed foodstore at the junction of St Martin's Street and High Street, Wallingford, Oxfordshire (NGR: SU 8940 6075; Fig 1). This initial work, issued by the former John Samuels Archaeological Consultants as a Cultural Heritage Assessment (JSAC 696/02/02) in May 2002, highlighted the site as the probable location of the former parish church of St Martin adjacent to the cross-roads at the historic centre of Wallingford. Previous disturbance on and around the site had repeatedly disturbed human remains.

Subsequent observation of geotechnical test pits and the discovery of further human remains led to the excavation of a series of evaluation trenches in 2003, which were the subject of an unpublished interim planning report. The range of evaluation trenches was expanded in 2004, both inside and outside existing buildings and these, upon discovery of a sequence of burials in a relatively concentrated area, were rolled

into a widespread excavation of the extent of the former St Martin's churchyard to mitigate the effect of the mechanical removal of some existing foundations from the 1960s and the substantial planned foundations of the current Waitrose Ltd food-store.

Half of the work was carried out indoors, within and around the 1960s buildings on the site, which were largely untenanted, and half was left until these buildings had been reduced to the level of their concrete ground beams.

During the course of the excavation the remains of six broad phases of inhumations were recorded. The earliest, of late Saxon origin, lay cut into the natural Thames gravels. Some early tombs had survived but there was evidence of reuse. Subsequent earth-cut graves had continued to build up the cemetery soils until up to three metres of grave-earth overlay the gravel. Human remains, comprising both articulated burials and disarticulated charnel, lay throughout this thickness, but few articulated examples displayed visible grave-cuts in the homogeneous soils. The uppermost inhumations had been disturbed by the foundations of the 1960s shops on the site. In total 211 individual burials were recorded, of which 187 were partial or complete articulated skeletons, the rest being deliberate reburials of charnel material or portions of skeletons, which although articulated, represented too little of the body for comment. Further elements of disturbed charnel were evident throughout the grave-soil, skulls being particularly noticeable. Structural remains were present, including a late Saxon mortar mixer and a wall but none was certainly a part of the former St Martin's church structure. Finds were few but some were significant in a funerary context.

The excavation archive and finds will be deposited with Oxfordshire Museum Service, with the exception of the human remains, for which a re-burial site is currently sought in accordance with the terms of the relevant exhumation license issued under Section 25 of the 1857 Burial Act.

2 ACKNOWLEDGEMENTS

Northamptonshire Archaeology would like to thank the staff of the former John Samuels Archaeological Consultants (now CgMs Consulting Ltd, Newark office), particularly their erstwhile consultant, Simon Johnson, whose cheerful demeanour was of help to all. To our clients Waitrose Ltd and their agents on site, Pearce Retail, goes our gratitude for their support and understanding during challenging fieldwork. To Margaret Bennett-Samuels our gratitude for her continued support following the death of John Samuels.

To Paul Smith and his team at Oxfordshire County Council go thanks for their support and their forbearance when this report was unavoidably delayed due to the sudden death of osteologist Trevor Anderson. I express my gratitude to Ceridwen Boston for her sensitivity, understanding and professionalism in taking up Trevor's work in a sensitive manner.

To Adam Yates, Simon Carlyle, Chris Jones and Ailsa Westgarth go my thanks for their assured site direction previous to my involvement, their supervision and recording; to Ailsa also for her compilation of the site data, matrices and consolidation of the site archive. I very much appreciate the support and interest shown by Judy and Stuart Dewey of Wallingford Museum, Colin Clarke of Wallingford Historical and Archaeological Society and Dr Neil Christie of The University of Leicester. Through Judy Dewey's good offices go my thanks to John Sims of the Wallingford Documents Research Group for his collation of six slightly different versions of Skirmer's MS

history, and the sensible understanding of it they have together promoted. Thanks also to David Pedgeley. I record my appreciation of Judith Curthoys for her help and hospitality at the marvellous archives of Christchurch College, Oxford, together with the help of staff at the Centre for Oxfordshire Studies and the Oxfordshire Historic Environment Record. Many thanks to Dr John Blair of the University of Oxford for his helpful comments. Geoff Egan would like to thank David Parrish, Conservator with Buckinghamshire Museum Service, for identifying significant aspects of a late Saxon crucifix (see below) during its cleaning.

The greatest appreciation, however, is reserved for the work of my former and greatly esteemed colleague, the late Trevor Anderson. Trevor's untimely death, in the middle of the Wallingford bench-work, robbed British archaeology of one of its best-informed and well-read osteologists. He was also a thoroughly nice chap, missed by all his colleagues. It is to his memory that this report is dedicated.

3 BACKGROUND

3.1 Historic maps

The site was not depicted in any reliable mapping before 1850, whereupon it was then depicted at regular intervals through the remainder of the 19th century and the 20th centuries. None of the archaeology, which is the subject of this report, was depicted on any of the maps, other than to note the 'Site of St Martin's Church'. Rather the maps depict the steady redevelopment of the church site which had already long since been lost from view. The following list relates the site's depiction in maps from 1850-1912 and serves to illustrate how little the buried archaeology of the St Martin's Church and churchyard site figured in the regular additions to buildings which spread across the site:

St Mary the More Tithe Map (1850; Fig 2a)
The site is shown in relatively good detail on the first properly surveyed map of the parish of St Mary the More in 1850. This shows that the site comprised a fully built-up frontage along St Martin's Street to the east, but having a protruding block to the north, which relates independently to the High Street. The layout of the plots suggests that St Martin's Street is the predominant frontage, at this time with High Street subordinate. A further frontage appears to relate to the north to south-aligned back lane, called Goldsmith's Lane, some distance west of the site, while the east to west-aligned Church Lane, leading to St Mary's Church, connects Goldsmith's Lane and St Martin's Street in a distinct rectangular planning block of plots.

Ordnance Survey 1st edition (1877; Fig 2b)
The work of the Ordnance Survey is usually credited with the first appearance of accurate mapping nationwide. However, the high quality of the 1850 map is indicated by the fact that the Ordnance Survey 1st edition hardly adds anything new, other than the depiction of numerous small outbuildings, privies etc to the rear of the frontages. The Post Office on St Martin's Street is labelled.

Ordnance Survey 2nd edition (1899; Fig 2c)
The re-survey for the 2nd edition of the Ordnance Survey shows no appreciable difference from its predecessor, although the methods of depiction mean a much clearer representation. New, if indistinct labelling has appeared, including an inn on High Street and a bank on St Martin's Street, together with a Public House (as differentiated from a residential inn) at the junction of St Martin's Street and Church Lane.

Ordnance Survey 3rd edition (1912; Fig 2d)
There is no appreciable difference in this depiction over those which preceded it. Two inns are labelled, one on High Street, one on St Martin's Street, together with the bank noted previously. The Post Office has relocated to St Mary's Street, adjacent to the Town Hall and St Mary's Church, although later the function would remove once more to a St Martin's Street address, although not that shown in 1877.

The site on the eve of development (2002; Fig 5)
The 1960s saw massive commercial redevelopment of the corner block, comprising no 1 St Martin's Street. To either side stood the adjoining premises of 2a and 2 St Martin's Street and 31, 33 High Street. Each of these components would be demolished to become part of the new Waitrose development of 2002-4, the former also being contiguous with the Listed Building of no 4 St Martin's Street, an early 18th-century town-house. Both Goldsmith's Lane and Church Lane retained independent frontages (including Listed Buildings), but the remainder of the traditional High Street frontage with its piecemeal 16th- to 20th-century development had gone.

3.2 Documentary evidence

The early history of Wallingford and its hinterland in the context of Oxfordshire and Berkshire has recently been summarised in the synthetic volume by Booth *et al* (2007, 136-8). Equally relevant to specific studies is the recent volume on the origins of the Borough (Keats-Rohan and Roffe 2009). What follows is a general overview of the relevant documentation, some published, some not, which sets the scene for the history of St Martin's Church before and after the Norman Conquest and ties it to the documented steep decline of Wallingford's fortunes in the 13th, 14th and 15th centuries.

Wallingford grew from the foundation of the Saxon burh, probably in the late 9th or early 10th century. Its immensely regular earthwork defences remain visible in the townscape today (Fig 1). The circumstances and early evidence for its origins have been discussed in the *Origins of the Borough of Wallingford* (Keats-Rohan and Roffe and contributors 2009). As a measure of its early importance, it has been noted that its defended area was second only to Winchester in the 10th century (Hassall 1978, 291). At the Norman Conquest and in the years following, the *burgh* retained its strategic value as a major Thames crossing point and its defences remained very much intact. This defensibility and a thriving mercantile base attracted the construction of a motte and bailey castle, later translated into stone. The Domesday Book records the vitality of late Saxon Wallingford, noting 276 closes here on the eve of the Conquest, reduced by 13 in 1086, of which 8 had been destroyed (whether against opposition or not is unknown) by the construction of the castle. Such was Wallingford's mercantile standing that by Domesday in 1086 it had attracted a small but notable Norman French immigrant population which held 22 messuages (Williams and Martin 2002, 135). The multiple baileys and outworks of the castle made Wallingford a major stronghold which was fought over during the Anarchy of Stephen and Matilda (1135-54), against which a siege castle was also built on the opposite, eastern bank of the Thames.

Alongside the Norman state stood the parallel institution of the distinctively Norman church. Sometime between 1077 and 1093, the Norman Lord Robert d'Oyley founded the Benedictine Holy Trinity Priory in Wallingford, bringing in Abbot Paul of St Alban's Abbey as prime mover, who set it up as a cell of St Albans (VCH Berks II, 77). This stood at the centre of a town which ranked as one of the 18 largest towns in England at Domesday (1086) when Wallingford supported 545 properties. By then the town may have been served by as many as eleven parishes (Fig 3).

It is possible that St Martin's Church is to be associated with a church in Wallingford held by one Roger, Priest of the Bishop of Salisbury's manor of Sonning in 1086, although the evidence is not conclusive (VCH Berks III, 544). In any case it seems likely that the church did not exist before the establishment of the burgh of Wallingford in the late 9th or early 10th centuries.

The earliest dedication of an English church to St Martin may be that of St Martin's in Canterbury, attested by Bede as being Roman but traceable to about 597 AD (Blair 2005, 70-71). Although Oxford's oldest church in the *burh* is also dedicated to St Martin (at Carfax), and Wallingford's example predates the Norman pre-Conquest (confirmed by the extensive archaeological evidence, below), a Roman date for any of them is almost certainly premature and part of Bede's propaganda, since St Martin himself only died in 401 AD (Clarke 1968, 287-90). His cult was centred on the town of Tours by the River Loire in France, where Martin was Bishop from 371 AD and where he was buried. His Saint's day is celebrated on 11th November. Other principal dedications to St Martin are known in other late Saxon settlements and *burhs* (with known pre-Conquest remains) such as at Wareham in Dorset and Norwich (St Martin-at-Palace-Plain). In any case, when the early dedication and the position of St Martin's close to the central crossroads of Wallingford, a notably focal location it shares with St Martin's in Oxford and St Martin's in Norwich, are both taken into account, St Martin's may arguably be regarded as the primitive church of Wallingford, with a greater claim than that of St Mary the More on the Market Place (Field 1925, 77). The location of St Mary the More might suggest that it was a sentinel in the market place, a preferred location in Norman England, but there is also documentary evidence for a Saturday Market under Edward the Confessor (Blair 2005, 335n).

Although St Martin's Church may have been one of Salisbury's early episcopal gifts to the new Norman priory, on the evidence of the Sonning reference (above), that ownership was not fully confirmed until 1160, when Joscelin, Bishop of Salisbury (1142-1184) ratified its gift to Wallingford (Holy Trinity) Priory (Dugdale, Mon Angl III, 280).

It is still unclear which of Wallingford's churches was of Saxon origin, and which was Norman. Excavated evidence is sparse although observations suggest St Leonard's and St Rumbold's are both pre-Conquest, bearing dedications which were to admired Saints in Saxon England. Their origins, along with St Lucian's seem to be confirmed by the work of Keats-Rohan and Roffe (2009, 38). Holy Trinity and St Nicholas are certainly post-Conquest as was the chapel of St Mary Grace on the bridge over the Thames. The others may be said to be the subject of continued debate (Fig 3).

Throughout the Norman period the new Royal castle was a major stronghold. It was pivotal during the Anarchy when it was besieged, siege castles being raised against it. Considerable monies were expended upon it in the 1170s under Henry II and the early 1190s under Richard I's Justiciars (Allen Brown 1955, 392-3). For a brief period it lay on the frontier of the civil war between John and a French-led rebel army in 1216-18 and was held for the loyalist forces by Ranulf de Blondeville, 6th Earl of Chester, who may have built a new hall there (Soden 2009). The earl handed back Wallingford to the young Henry III in 1224 which he subsequently gave in 1231 to his own younger brother, Richard Earl of Cornwall, who thereafter was said to have regularly kept up a sustained level of well-regarded hospitality there (VCH Berks III, 524-5). The same earl of Chester died there in 1232, where his body was eviscerated, probably under the auspices of Holy Trinity Priory, who held St Martin's advowson at the time. This period in the early 13th century is the last during which the town is associated in documents with attention, growth and prosperity.

The town suffered considerably in the Baronial war of 1266 and the population went into decline soon after (VCH Berks III, 534). In 1291, when Pope Nicholas IV took a tax assessment of the entire church in England (Records Commission 1803), the churches of Wallingford were in a woeful state, and already St Lucian's church had been united with St Leonard's and St Peter-in-the-West (adjacent to the Kinecroft) had disappeared. St Martin's too was found to have suffered, mentioned specifically by name and being valued at only 5 shillings per annum (VCH Berks III, 541-3). It was returned as untitheable, suggesting that its parishioners were virtually landless and penniless or that their numbers were too small to scrape together a tithe of any note (ibid 544). At that time it is stated that the chaplain (or vicar) lived in a house in the churchyard (Riley 1877, Appendix 1: 5δ 8b).

In 1316 Wallingford suffered from the plague. Again in 1349 the Black Death struck. On this occasion, just like everywhere across Europe, Wallingford was badly affected, perhaps losing between a third and a half of its people, but the effects of this latter plague should not be overstated as records do not seem to suggest a particular drop in trade as a direct result of this alone.

Amid the tribulations of the 14th century St Martin's appears twice in surviving indentures, showing that throughout it remained a notable landmark and St Martin's continued to remain a distinct parish, although it is the churchyard which is noted, not the church:

> *'Indenture by which the Prior and Convent of Wallingford lease to Richard le Iremonger and Juliana his wife, for seven years, a tenement with the houses thereon* ***near the cemetery of St Martins****. Rent 4s 6d. Witnesses Richard Moryn, Mayor, John Mariot, John of Blebury, John le Gredare, Richard Gratard, William of Meleburn. Given at Wallingford 21 December 1336,'* (Denholm-Young 1931, 153).

Furthermore:

> *'Roger Cole of Wallingford grants to Henry Redynge and Richard Coket of Abingdon, a tenement with curtilage adjacent* ***in St Martin's****, between the messuage of Thomas Horspath on the south, in which Nicholas Kyng lives, and the garden of Roger Milburne on the north. Witnesses: Thomas Benshaf, Mayor, Richard Atte Field, Nicholas Tannere, Roger Armiat, Robert Batty. Given at Wallingford 9 August 1377,'* (ibid, 153).

Unfortunately neither lies close enough to record the churchyard of St Martin's as an abuttal and aid any reconstruction of the contemporary street frontages.

As has been seen, the notably steep decline of the town in the 14th century was marked even as early as the reign of Edward I (1272-1307). Society's difficulties brought about by the Black Death may have had an immediate effect on St Martin's since in 1354 the then vicar, William Henreth (also called Westenreath in 1351) obtained Papal provision (Innocent VI) to exchange the St Martin's living with William Brown, who was previously vicar of Cotesdon, in the diocese of Lincoln (Bliss and Johnson 1897, 529). There is no indication as to the reason for the exchange, but the impetus came from Henreth for the move. Ongoing ecclesiastical difficulties in Wallingford may be inferred from a Papal move in July 1368 (6 Urban V) to remit 100 days of penance to any penitent who would visit St Peter's church in the town on the principal feast days for a period of ten years (Bliss and Twemlow 1902, 75). This is unusual for such a backwater, unless in order to raise money quickly by diverting penitent pilgrims to the town. Certainly the nearby church of St Mary-the-Less on the

east side of the Fish Market (Fish Street, now St Mary's Street) was also in dire straights and in 1374 its nave roof collapsed with the church left ruinous. (Dewey and Dewey 1977, 52). A similar fate overtook St Michael's in that year (VCH Berks III, 543). It was in this year that St Mary-the-Less was united to, or subsumed in, the parish of St Peter's (Field 1916, pt 2: 25).

The town was already seriously in arrears to the Crown by 1305. Poverty may have been the cause of civic riots in 1323 (VCH Berks III, 534). An inquiry of 1384-7 reported that the revenues of Wallingford Castle were so diminished that it could no longer support itself (ibid, 527). Soon after, in 1396 the fee farm of Wallingford was reduced by the Crown '*in consideration of impoverishment by the late Queen's death* (Anne of Bohemia in June 1394)*, by pestilence and by other misfortunes'* (Op cit, 534). In 1417 the town was said in State Papers to be '*depressed by great changes and impoverished*' (Cal Pat R. 1416-22, 60).

In fact the economic effects on the churches were nothing short of disastrous. At the height of its fortunes in Wallingford there had been eleven thriving parishes. In 1428 the tithes of St Mary the More amounted to only 6 marks, an identical amount to the tithes of St Peter's, formerly taking in three parishes but by then consolidated. Surprisingly, both had still enjoyed a reasonable living in 1291 (VCH Berks III, 541-2). St John-on-the-Water was amalgamated with St Mary's in 1419. The loss of successive parish churches through the later 14th and early 15th centuries did not stop the rot, however. In 1428 both St Leonard's and All Hallows/All Saints each contained 10 householders or less in their parishes within the walls (VCH Berks III, 542-3). .So great was the seemingly unending downward spiral in Wallingford's fortunes that in 1438 only 44 householders remained in the town as a whole. Between eleven parishes, this dwindled population would have made the town's entire stock of churches untitheable.

When the travelling commentator and antiquary John Leland visited in 1542 he noted that '*at this time there be but three poore Paroch chirches in the town*' (VCH Berks III, 536). Since its parlous state was recorded in 1291, St Martin's fortunes had been inexorably downwards and it had been one of those lost by 1542.

The demise of St Martin's has left a sparse but distinct trail after 1291. Although it has been noted hat there was no record of a presentation of a vicar or rector after 1386 (VCH Berks III, 544), in 1397 Hugh Roches was presented as Rector of St Martin's (David Pedgeley, pers comm.). The Victoria County History took its record down to 1386 from the antiquary John Hedges, who listed the institution of vicars between 1298 and 1386. However, the last four (covering the period 1362-86) all then exchanged their benefice, perhaps indicating that by then it was a useless job (Hedges 1881: II, 415). Further research has pushed these exchanges back to 1354 (above). Hedges attributed the demise of the town and the loss of its churches to the Black Death, quoting an Inquisition (ibid 337). However, the pattern is more complicated and for St Martin's, the malaise had set in during the 13th century.

Hugh Roches' presentation in 1397 was probably the last of its kind. In 1412 Robert Hallum, Bishop of Salisbury, granted a license to the appointed proctors of nearby St Mary le More to repair their church, using the timber and stones of St Martin's church '*which collapsed long ago and is ruined, without a rector and almost entirely without parishioners, provided that the patron and any parishioners agree and that the churchyard is suitably enclosed on all sides*'. Future responsibility for the churchyard was then vested in the parish of St Mary. (Horn 1982, 150; My thanks to David Pedgeley and Judy Dewey for independently drawing my attention to this reference).

Thus there is episcopal sanction to rob a ruined St Martin's of its stone and timber to repair St Mary's (itself in need of care), and to transfer responsibilities for the upkeep of the churchyard to the neighbouring parish. This brings an unequivocal end to the story of St Martin's Church. The parish had seriously ailed for well over a century, been untitheable as early as 1291 and had succumbed totally to Wallingford's malaise of a dwindling population in the 14th century, finished off by plague. In relation to St Martin's churchyard, there was no one left to bury.

Given the recorded nadir in Wallingford's fortunes in 1438, difficulties even for the surviving St Mary's may have run in parallel. In 1443 it was recorded by Papal authority (13 Eugenius IV) as being held (already for some years) by the Rector John Woborne, whose principal rectory was that of Peesmere, Berkshire (Twemlow 1912, 373). Such pluralism was not uncommon in the 15th century, but did often draw comment and require special dispensation. Woborne was allowed to hold St Mary's, even though it might be 'incompatible' with his Peesmere rectory. In his particular case, the original 1439 grant of Peesmere along with others he might wish to acquire, (probably soon after followed by St Mary's), lay within a distinct run of such grants which were largely made by virtue of the second or subsequent churches being ruinous or lacking a cure (ie parishioners) (ibid 60-62). Although not specifically labelled as such, it is reasonable to think St Mary's was just such a lost case.

After its use from 1412 as a stone quarry, the location of the erstwhile Parish Church of St Martin was lost, presumably after its superstructure was reduced and its foundations robbed, its churchyard closed by circumstance to new burials.

In a survey of part of Wallingford in 1550, the layout of the properties on the south side of the High Street re-emerges and the name of an inn, *The Bell*, is mentioned for the first time. This inn name was to become connected as an abuttal to St Martin's before the name migrated to another site on the north side of High Street about 1709 (Field 1916, pt 1: 113; pt 2: 21-5). *The Bell* was re-named *The Lamb* 'at the same time. This corner property in 1550 was said to belong to William A'Deane and comprised a tenement called *The Bell*, with a garden and curtilage and land of 1 acre (Fig 4). The acre of land is likely to have been the former church and its churchyard. How it was being used is open to question since an ordinance of 1549 (2 Edward VI) records a penalty of 12d on all persons '*laying dead carrion or other vile thing in the streets, noisome to the inhabitants, particularly at ...Bell Dunghill'* (Hedges 1881, II: 95). It is a distinct possibility that as open ground, lying next to the Fish Market, the site had attracted waste and had quickly become nothing more than a rubbish dump in the centre of town. Certainly none of those who in the 1540s might have known it had once been a churchyard would remember the last burials taking place long before, prior to 1412.

In the mid-16th century the whole town of Wallingford was still in the economic doldrums. Certainly ruinous tenements on the High Street (see Fig 4) do not normally reflect a buoyant or recovering economy. In 1550 the castle was being stripped of its lead roofs to repair and supply Windsor castle. Its reputation as a sleepy backwater remained although the castle was re-fortified and garrisoned in the Civil War. The town (and principally surviving buildings on the old castle site) were being used as a retreat for the staff and students of Christchurch College Oxford, when that city was beset by plague in 1665 (Christchurch College Archives; thanks to Judith Curthoys for making all their Wallingford archives available).

The church and churchyard of St Martin's seems only to have re-emerged, almost by accident, in 1712 as recorded by the local antiquarian Richard Skirmer (compiled by John Sims from slightly differing manuscripts):

> *'There stood a church upon the garden ground between the Black Boy and The Lamb, formerly called The Bell; bones and skulls were lately dug up there, half a dung-cart full at least. It was probably called St Martin's. The lane going by it being so called in the records of the town. In the year 1712 a cellar and gravel pit were opened in part of the ground aforesaid, where they found a great quantity of bones lying in order in tombs made in the ground with stones and mortar, they also found foundations of the church.'* (Richard Skirmer MSS History and Antiquities of Wallingford, written between 1712 and 1716, when he died).

The 19th-century historian John Kirby Hedges quoted Skirmer some 170 years later and agreed with the location that he had given (Hedges 1881: II, 414). Another generation on and one of Hedges' able successors wrote in 1925:

> *'St Martin's Church stood on the west side of St Martin's Street*,…(and quoted Skirmer once more).. *The mention of "The Lamb" indicates that the church was near the end of St Martin's Street, not far from the High Street. A short distance south of this point, in the garden behind the house which was lately the Post Office, the remains of burials have frequently been found, and there is a small but ancient yew tree. The church, therefore, seems to have stood on the south-west of the central crossing.'* (Field 1925, 76-7).

Since then, the townscape has been substantially redeveloped and none of the topographical features mentioned by earlier commentators survive. More recently Judy and Stuart Dewey, revisiting Wallingford's history in the modern plan, noted that *The Red Lion Inn*, which had been *The Bell*, lay at 4 High Street, while *The Black Boy* was arguably what became 9 St Martin's Lane (Dewey and Dewey 1977). The Post Office was depicted on the 1877 Ordnance Survey map as lying at 7 St Martin's Street. By 1905 it had moved to a new address on St Mary's Street, where it was depicted on the 1912 Ordnance Survey. That same Ordnance Survey began the tradition of noting the former 'Site of St Martin's Church' exactly where the current excavations have taken place.

3.3 Archaeological background

Prior to 2003, very little concerted fieldwork had been carried out in close proximity to the supposed site of St Martin's. In 1966 groundworks did expose human bones and medieval pottery at 4 Market Place (Oxfordshire HER 7780) while similar remains were exposed at 20/21 Market Place in similar circumstances in 1972 (Oxfordshire HER 7782). Neither is very close however, and it is likely that they do not relate to St Martin's but rather to St Mary's.

In 1967/8 possible medieval human remains were said to have been dug up actually on the site (Berks Archaeol Jn 1967/8), but the details are not sufficiently clear to be sure. They may have been conflated with Oxfordshire HER site 7780. Skirmer's rather inelegant ' half dung-cart of bones' remained by 2003 the most graphic and arguably the best sight of St Martin's churchyard which anyone might rely upon.

Of those set-piece excavations nearby, if not on the site, many took place in the early 1980s and are reported in Council for British Archaeology Regional Group 9 annual roundup: South Midlands Archaeology 13, 148-50. Although none shed light upon St Martin's church specifically, some may be said to be in its locality or relate to late medieval economic woes shared in common with St Martin's. These are as follows:

9-11 St Martin's Street (1982-3)
NGR: SU 606 892, excavations revealed a late Saxon horizon with a sunken-floored building and a well. There was also a 17th-century horizon.

12-13 St Mary's Street (1983)
NGR: SU 607 893 digging of foundation trenches uncovered a thick post-medieval soil with probable medieval pits beneath.

Goldsmith's Lane (1983)
Extensive excavation and watching brief located the probable site of the (like St Martin's) 'lost' St Rumbold's Church and its cemetery at the junction with Mill Lane at NGR: SU 606 815. Here the human burials were variously cut into or overlain by a number of pits containing 12th- and 13th-century pottery, suggesting a lax regime of cemetery keeping. The church was last referred to in documents of 1352 and the site was noted by the excavator as containing a dearth of 14th-century material, indication of some early contraction of the site.

Subsequently further groups of excavation have taken place in 2003-6. Once again these are reported in the Council for British Archaeology Regional Group 9 annual roundup: South Midlands Archaeology (SMA) 35 and 37 as follows:

Thames Street (2004)
A watching brief at NGR: SU 6088 8939 revealed early medieval and post-medieval pits but a hiatus of occupation suggested abandonment between the 13th and later 16th centuries (SMA 35, 53).

60 High Street (2004)
A watching brief at NGR: SU 6055 8952 uncovered a substantial chalk wall and some medieval pottery (SMA 35, 88).

Church Lane (2003-4)
Medieval and post-medieval deposits located to the rear of the former Post Office. Most were left *in situ* in a design solution, but enough was characterised to identify evidence of a late medieval hiatus (SMA 35, 89).

1 Market Place (2006)
Evaluation at NGR: SU 6078 8941 suggested that the entire site had been quarried for aggregate. No remains were found predating the 19th century (SMA 37, 33).

3.4 Geology and topography

The site is recorded as lying on River Terrace Gravels (SSEW 1983). The local soils are of the Sutton 2 Association (571v), well drained and of a coarse, loamy consistency.

At the time of excavation the site was either outside, covered in concrete and tarmac hardstandings, or lay under concrete floors within existing shops. In total it covered approximately 0.9 hectares and the modern ground surface at the time of excavation was broadly level at *c*49m above Ordnance Datum.

4 OBJECTIVES, METHODOLOGY AND THE LIMITATIONS OF THE EVIDENCE

4.1 Objectives

The objectives of the archaeological excavation strategy were set out in a Written Scheme of Investigation prepared by Northamptonshire Archaeology for John Samuels Archaeological Consultants and agreed with Oxfordshire County Council.

The specific aims of the strategy fell into two parts:

- Determine the date and character of any medieval and Saxon activity at the site
- Determine the date and origin of human remains on the site
- Determine the date and character of remains of other periods surviving on site
- Obtain a chronological sequence for human activity on the site
- Take appropriate measures to mitigate the impacts of the development.

This latter aim, in practice, included a mixture of archaeologically sustainable foundation design, towards the sustainable long-term physical preservation of deposits, combined with preserving by record significant deposits adversely affected by the development.

Upon completion of evaluation, further works were designed to address human remains and the pre-cemetery town and agreed with Oxfordshire County Council:

- Realise the demographic and osteological potential of the cemetery remains and the contribution they may make to the understanding of (potentially) late Saxon and medieval Christian burial rites and rituals
- Contribute to understanding of the loss of St Martin's church and the late medieval economic stagnation of Wallingford
- Following excavation of the cemetery, to record (before re-covering and preservation) any pre-cemetery layout of domestic remains exposed and tie the layout to the remains as characterised and dated in the foregoing trial excavation.

4.2 Methodology

An evaluation which comprised eight trenches was carried out in 2003 across the whole site (Simon Carlyle, unpublished site data summarised below in the present report). Trenches 1, 5-7 lay outside buildings while Trenches 8-11 lay within standing structures. Trenches 2, 3 and 4 were proposed but not dug due to site constraints (Fig 5).

In 2004 further evaluation in three trenches took place (Trenches 12-14), around where human burials were suspected from previous geotechnical works, works which (after the confirmation of the presence of human remains) rolled straight on into wider excavation of Trench 12 and finally, when demolition of the existing buildings had taken place, the addition of Trench 15. In effect Trenches 12, 13, 14 and 15, although dug at different stages and sometimes with standing walls or concrete foundation beams between them, ended up as almost-contiguous compartments and together defined the extent of known burials from all previous evaluation, providing for their excavation in two campaigns before the construction of the Waitrose building took place (Fig 5).

In all cases excavation began, once concrete floors and hardstanding had been broken out, with the aid of a range of 360-degree mechanical excavators, fitted with toothless ditching buckets. The choice of machine-size and bucket-width dictated by whether works were inside or outside buildings. In practice this meant a range of between 5-ton and 20-ton machines utilising buckets between 1m and 1.8m wide. These removed the sub-base and homogeneous topsoils down to the uppermost archaeological horizon. Thereafter excavation continued by hand, the machine returning only to remove undifferentiated garden soils or cemetery soils, within the compartments created by the presence of 1960s concrete ring-beams.

It quickly became apparent that the remediation measures necessary to demolish the existing buildings and the groundworks required to build the new store would combine to damage utterly the human remains within the site. The exact number of bodies was not known in advance and eventual knowledge of the physical extent of burials in plan was achieved by the siting of Trenches 12-15. As evaluation of a 3m x 3m interior area within Trench 12 uncovered 16 articulated skeletons or portions thereof within a thickness of up to 3m of burial earth, it quickly became apparent that the site would contain a large number of bodies. That total eventually reached 211, of which 187 comprised enough bones and were sufficiently well preserved to warrant osteological analysis. A simple head-count and separate counts of left and right humeri and left and right femora were carried out amongst disarticulated and disturbed material recovered from grave fills. These noted that between 114 and 334 further individuals were represented. This brings the evidence of surviving elements, both articulated burials and disparate disarticulated individual bones, to a representation of between 325 and 545 persons buried.

4.3 Limitations of the evidence

The 18th-century gravel-digging had removed bones by the 'dung cart'. As if this had not been destructive enough of the archaeology, it was clear that the construction of the row of 1960s shops fronting High Street had made no concessions to surviving archaeological remains. The destruction or scattering of an unknown further number of burials at this time had gone virtually unrecorded, others being damaged to varying degrees.

While the evaluation of 2003-4 was conducted in challenging but surmountable ground conditions, the mitigation measures of 2004 were even more affected by these same conditions. Thus, those same massive 1960s foundations which had disturbed many of the uppermost burials lay directly above further bodies. Their sheer size, comprising ring-beams of sometimes in excess of 1m x 1m cross-section, precluded their removal during archaeological works (or after), while the excavation depth, at up to 3m below the modern ground surface or interior floor level, meant that they could not be substantially undermined to retrieve underlying bones. Thus, while bones protruding could be retrieved, some skeletal parts, which lay fully beneath such beams, remained unseen and had to be left *in situ* (28 bodies were thus noted in this manner but could not be excavated). There is no way to know what proportion of the original buried population the 211 recorded burials, or the possible maximum number of 545 individuals present (211 articulated and 334 charnel together) actually represents of the Saxo-Norman and medieval parishioners of St Martin's. The destination of the dung-carts full in 1712 was not recorded, nor of any of the subsequent disturbances up until the present day. Thus the proportion of the original cemetery as excavated remains unknown.

The present report represents the first occasion that all of the cemetery remains as excavated have been seen together by anyone, including the excavators. Since Trench 12 was dug within a number of different rooms in the derelict but standing

1960s buildings and outside the same, no one could at any point physically see all of the areas at the same time due to restrictions in the line of sight. At about this time Trenches 13 and 14 were also dug. Later, with these buildings demolished, the archaeological team returned some months after to excavate Trench 15 and clear the areas which the previous buildings had rendered inaccessible. In essence this was a new site, devoid now of buildings but covered with crushed concrete, the old excavation areas backfilled. Survey throughout was using traditional methods of tape and dumpy level and related to mapped interiors. From the start GPS was unusable within buildings as no satellite coverage was possible.

Each room, area or compartment which was separated by ground beams (noted on all the Phase-plan figures) had to be treated almost as a separate excavation and a burial matrix was subsequently prepared for each and then linked together. In a number of cases a head excavated in one area could be related to feet in another to link together the matrices (although in the absence of grave cuts or a clear stratification visible in the grave soil, many could not). Many part-graves did not extend far under the beams and their other end was never seen at all. Other than this the levels taken during the excavation aided the construction of the wider matrix and phasing. With so many graves in a relatively small area, the levels were combined with the plans and a physical relationship formed between the bodies in each portion of each trench.

Each area was eventually excavated down to the natural gravel.

5 TRIAL EXCAVATIONS IN 2003

5.1 Trench 1

Trench 1 was located in the car park of the former King's Head public house at 2 St Martin's Street (Fig 6*)*. It was aligned from east to west and covered an area of *c* 21m x *c*5-6m. It was excavated to *c* 1.6m deep. A stepped sondage, with a maximum area of 3m x 4m, was later excavated in the centre of the trench, taking the maximum depth of excavation down to 2.85m below the modern ground surface. Once the excavation had been completed a small machine-cut sondage was excavated down to *c* 4.5m below modern ground level to confirm the nature of the basal deposits.
The natural substrate, which was revealed in the base of the sondage, was a bright, mid orange silty sand with irregular patches of white chalky marl. Machine excavation demonstrated that this deposit was at least 1.5m thick and became increasingly gravelly with depth.

The natural sand and gravel was modified by a complex sequence of layers and inter-cutting pits, which were revealed at the eastern end of the trench and in the sondage. Many of the features and deposits contained a moderately high input of cess, ash and charcoal, indicative of domestic waste, although lumps of slag-like material recovered from the south-east corner of the trench suggest some industrial activity on or near the site. The pottery from these deposits dates to the medieval period, probably to the late 13th and 14th centuries. One of the pits, [107] / (fill 127), contained two plain copper alloy balance-pans, possibly relating to an assay function (Fig 6, Fig 28.6-7) and from a deposit (105) just above this came a complete green-glazed Brill Boarstall-ware pitcher of the mid-late 13th-century (Fig 26 and rear cover)

The medieval pits and layers were sealed by a dark soil horizon that formed the base of the trench along most of its length. This layer probably dates to the late medieval period. In the centre of the trench it was cut by a large, straight-sided pit,

approximately 3.8m in diameter and 2.2m deep, which contained cess and other domestic waste and pottery of the late 15th or early 16th centuries.

Sealing the large pit and extending the full length of the trench was a succession of soil horizons, typical of garden soils in an urban environment and containing 18th and 19th-century pottery and glass, brick and tile fragments, and clay tobacco pipe stem. These layers were cut by various pits of a similar date, particularly at the eastern end of the trench. A number of 19th-century brick walls with foundations of soft chalky cobbles (known locally as 'clunch') were recorded, sealed by a layer of demolition material which formed the sub-base of the tarmac surface of the car park.

5.2 Trenches 2, 3 and 4

For reasons of prevailing site constraints it was not possible to excavate these trenches (which lay near Trench 1) and by agreement they were dropped from the schedule at the start. Subsequent trench numbering remained unaffected.

5.3 Trenches 5, 6 and 7

These three trenches were located to the west of Trench 1, in the area formerly occupied by a garage, and previous to that, a number of 19th-century brick cottages and ancillary buildings (Fig 3). Trenches 5 and 6 were situated in the position of two proposed pile caps. Trench 7 excavated a proposed lift shaft pit.

Almost without exception the general sequence of deposits was the same in all three trenches. This consisted of buried soil horizons, typically garden soils, containing 18th- to 19th-century pottery, glass and clay tobacco pipe stems. Above these were layers of modern demolition material and the remnants of modern buildings, largely comprising brick and concrete block walls, brick floors, drains and a brick culvert.

5.4 Trenches 8, 9 and 10

These three conjoined trenches lay at the junction of High Street and St Martin's Street (Fig 3). They were excavated within the 1960s shops. The work revealed concrete foundations to these shops together with brick and flint wall foundations, probably of the 19th century, amidst deep, dark humic soils. No earlier remains were encountered.

5.5 Trench 11

This trench lay within the frontage of the shops onto St Martin's Street (Fig 3). Deep garden soils were encountered but nothing else.

No further work was undertaken in any of the evaluation trenches 1 and 5-11, since where remains did survive, they lay below the level of proposed maximum disturbance. Therefore, following the limited characterisation mentioned above, excavation ceased and significant remains were covered over.

6 EXCAVATIONS IN 2004: ST MARTIN'S CHURCHYARD

Trenches 12 to 15 were dug over a prolonged period either side of the demolition of the shops which occupied the site, and eventually comprised a coherent whole comprising numerous interior compartments separated by concrete foundation beams (Fig 3). As a result no specific reference to (particularly) Trenches 12 and 15 follows, except where a distinction is felt helpful. Feature or context numbers do, however, continue to indicate where one element or another lay. These are all parts of the far more important sum, the cemetery deposits of St Martin's churchyard.

Trenches 13 and 14 were dug to locate the southern edge of the churchyard, where possible (Fig 3). Trench 13 proved to lie within a 4m-deep concrete-shuttered basement which was very extensive and filled with modern rubble. Trench 14 uncovered a sequence of post-medieval layers and a well. It contained a buildup of soils and domestic deposits similar to Trench 1, but evidence relating to the churchyard was largely absent but for a massive but featureless flint and mortar raft (Fig 7).

6.1 The earliest, late Saxon, graves and the beginnings of the church and churchyard (Phase 1 - late 10th to early 11th century)

At the base of the excavations, some 2.5-3m below the modern ground level, lay the natural sand and gravel geology (1249). Into this had been dug some of the earliest graves, which were also generally the deepest from a modern perspective, bearing in mind the subsequent accumulation of grave-earth above them (Fig 7). It is highly likely that in the first instance, many of the graves would have been close to their contemporary ground surface, of which no trace was discernible.

The majority of these early graves were to be found close to the St Martin's Street frontage, although this may be misleading since the greatest concentrations of later graves were in the middle of the site, where there were few early graves present. Thus it may be a matter simply of graves in one area surviving intact the disturbances of successive grave-diggers.

A total of twelve inhumations belong to this initial phase of burial (Fig 7). These were burials 61, 62, 71, 93, 98, 169, 170, 191, 193, 194, 208, 210 and 211. Of these only 61, 98 and 211 were substantially complete, the rest being damaged either by later graves, beyond reach beneath concrete beams or, in the case of 170, cut through by a post-medieval cellar close to the St Martin's Street frontage. All were earth-cut inhumations, five of which retained the vestiges of their grave-cut in the natural sand (61, 169, 193, 208 and 211), while the rest lay in the remnants of a former subsoil over the natural sand. Burials 170 and 210 were the subject of Radiocarbon dating (see below).

Burials 170, 210 and 211 lay on beds of mostly finely comminuted charcoal, including some chopped briar sections and twigs up to 15mm diameter from coppicing (Fig 8).

6.2 Early occupation features (Phase 1)

The southern extent of the former St Martin's churchyard had been indicated by the medieval pits found in Trench 1 (Fig 3). The northern western and eastern extents remained to be delineated.

Along the north side of the cemetery plot lay a 0.6m-wide wall, which consisted of two surviving courses made of roughly-cut and unevenly-faced chalky local stone, commonly-called 'clunch', together with flint and other, rougher packing stones, set

into a matrix of grey lime mortar [12235] (Fig 7). This wall, traced at most places and in various states of dilapidation, along the northern edge of the successive areas of Trenches 12 and 15, marked the northerly extent of burials in this and every successive phase of the cemetery and is thus considered to be the cemetery boundary as originally conceived and which pertained throughout the life of St Martin's. The lower surviving course rested upon the natural sand and gravel geology. No construction trench was visible in the highly churned earth on the southern, cemetery side. However, neither was there one on the north side, where soils simply built up against it over the succeeding centuries. It is this, and the integrity of its line with regard to burials, which suggest both its original purpose and its longevity.

The wall returned south at the western end of the excavation, forming the western end of the churchyard plot [12312] (Fig 7). Again, work just outside it found no burials, while there were additionally no burials at any depth within *c* 4 metres of its eastern face, creating a swathe of unused burial space at the western end of the churchyard. At the foot of the wall (on both sides) lay a sterile buried soil up to 0.6m thick, overlying the natural gravel (12311 and 12318), the point at which the wall had been built. On the eastern (churchyard) side the ground had then been built up by the deposition of numerous layers (12310 12307, 12308, 12309 and 12306). Into the latest of these a pit had been dug (12305) which may have been a planting hole. Topsoil layers had formed or had been deposited over the pit (12326). For this and the following sequence, see Figure 9.

Outside the western end of the excavation, the extra-mural sequence of layers was different, indicating a different planning history for this plot above the initial topsoil (12318). These layers were not investigated further (12317, 12316, 12315, 12314, 12313). Between layers 12313 and 12314 was a common soil deposit which was indistinguishable from 12326. Later on a final soil accumulated over both sides, smothering the churchyard wall (12303).

6.3 Late Saxon mortar mixer

Towards the west, cut by later graves, lay a formerly circular deposit of thick mortar, in layers interleaved with patches of sand, soils and more mortar [12276]; (Figs 10 to 12). The original circular shape of the feature, 2.2m in diameter, was altered by the portions removed by later graves, but to both west and east the outer lip of the feature was present. In the centre of the circle lay a large, rectangular (300mm x 200mm) post socket [12279] filled with grey/brown silty soil and about 400mm deep. Around this central socket lay concentric grooves and shallow markings in the mortar, some deeper than others, some wider, others narrower, extending in a series out to the raised edges of the circle.

This is a very distinctive and recognisable late Saxon mortar mixer, its ergonomic shape dictated by the efficient circular motion of paddles dropped from a beam pivoting around a central post and turned together by men (or possibly a beast) at each end of the beam. This is discussed in greater detail at the end of this report where it is compared to other examples at Northampton and Eynsham Abbey.

This mortar mixer lay a short distance from the nearest of the early graves (Burials 61 and 62), with which there was no stratigraphic link (Fig 7). However, while it is of a form known from elsewhere as late Saxon, dating is provided by a 10th to 11th-century lead devotional crucifix from the very first occupation layer beneath it (12294; see Geoff Egan, this volume, below; also Fig 12).

Close to and above the mortar mixer were further patches of burial soils, the layers interleaved, and some being very ephemeral (12295-12298). Another nearby, (12111), sufficiently compact to have once been a floor surface, produced a hooked tag while a second came from layer 1512. Both may have been lost at grave-side ceremonies, perhaps during a ritualised rending of clothes amongst mourners, or may represent disturbances from early graves by later inhumations.

6.4 Late Saxon growth of the cemetery (Phase 2 early-mid 11th century)

A second phase of graves was found which had a greater geographical spread across the cemetery (Phase 2; Fig 13). Since many of these newer burials did, however, focus on a majority of the graves already present, it seems reasonable to suggest that the ongoing and unbroken process of interments owed something either to at least some familial groups or to concentrations nearest to the St Martin's Street frontage, and perhaps the structure of the church.

The 18 graves which belong to this phase of burial are 56, 73, 78, 89-91, 118, 138, 141, 156, 159, 178, 183, 191, 197-9 and 201-2. Burial 56 was subjected to Radiocarbon dating. In many ways this is the most distinctive and notable phase of interments, simply because it displays the widest variety of burial rites, mostly associated at other sites with the late Saxon period, although it is never very certain how much such rites survived in social memory and liturgical practice - whether sanctioned or not - into the post-Conquest period.

The following lists the rites present. Comment and discussion on their prevalence elsewhere and their possible significance may be found later in this report.

- Burials 56, 86, 89, 90, 91, 131, 156, 201 and 202 had their heads supported to either side by one or more stones, commonly called ear-muffs or, more generally, pillow-stones. These were usually flint. Burial 56 was also interred with a scallop-shell, a probable pilgrim badge, once hung on a thong around his neck (Figs 14 and 15)
- Burial 78, in a makeshift manner had had his head supported by ear-muffs formed of two disarticulated skulls from an earlier burial (Figs 16 and 17)
- Burial 78 also had a large flat stone slab placed carefully across its chest, just under its chin. Placing of a later burial (77), possibly familial, had carefully avoided this stone during interment (Fig 22).
- Burials 138, 141, 178, 197, and 199 were placed in 'clunch'-built tombs or cists, over which stone slabs, mortared-on or placed dry, had been placed as a cover (Figs 18, 19 and 20)
- Burials 73, 90, 118, 155, 164 (= 159), 191, 198 lay in stone-built cists without a cover, allowing of the possibility that they represent re-use of a tomb which had once incorporated a cover over a previous, cleared-out incumbent. Burial 164 also contained pottery of the 11th century.

These particular burial rites actually relate to all but one grave of this second, early phase of burial. Only Grave 183 contained a simple earth-cut burial.

6.5 Ongoing burial (Phases 3-6, post-Conquest)

Phase 3 (mid 11th-12th century)
Burial now became more concentrated towards the middle of the site, the extreme eastern end, perhaps closer to the church, maybe having been considered (for the time being at least) to be already full up. Most of the remaining burials of this phase were extremely fragmentary (only number 14 was complete) as, by comparison with earlier phases of interments, they were relatively high up in the grave-earth and they

lay in areas popular with subsequent burials. The nineteen burials belonging to this phase were 14-18, 52, 62, 66, 69, 70, 86, 116, 117, 126, 127, 163, 172, 173, 177 and 181 (Fig 21).

The overwhelming majority of all interments from now on, dispensed with distinctive burial rites and are subsequently simple, earth-cut graves, with little attempt to achieve great depth. However, one of the late Saxon burial rites already noted was possibly employed into Phase 3.

Burials 69 and 70 included sufficient blocks of clunch to suggest happenstance re-use of former cists or tombs. It is probable that this represents nothing more than expedient use of a known burial space as and when re-discovered by the sexton.

Phase 4 (12th century)

A fourth phase of 28 burials can be discerned as the middle of the site filled up (Fig 22). This comprised burials 19, 54, 65, 67, 68, 77, 80-2, 84, 94, 95, 97, 105, 106, 115, 119, 121, 122, 124, 125, 166, 167, 171, 189, 203 and 204.

All were simple earth-cut graves, many incomplete due to the depredations of subsequent graves. Some damage had occurred in cellar-digging to those at the eastern end of the graveyard, nearest St Martin's Street.

Right up to this point the patterns of burial (although rows were not apparent anywhere) had totally eschewed an area along and close to the western churchyard boundary. In recent times it has been the northernmost reaches of Christian churchyards which have assumed a rather gloomy reputation, on no real liturgical basis, but perhaps because they are always furthest from the traditional south entrance to the church and the passage of worshippers. The north side is often also in the physical shadow of the church building. Since here at St Martin's the formerly un-buried area formed a long narrow plot just inside the western boundary wall (not the north and therefore not part of any widespread dislike), it may be that it had hitherto been used as a pathway or had become planted up or otherwise become overgrown with vegetation. On a liturgical basis is also furthest from the high altar, the physical religious centre of the church's existence.

Only one grave draws any comment concerning burial rites. However such 'rites' are almost certainly not intentional by this stage but rather a matter of happenstance.

Burial 106 included sufficient blocks of clunch to suggest haphazard re-use of a former cist or tomb. By this late stage in the cemetery's development, it seems likely that, like in Burials 69 and 70, this represents nothing more than expedient use of a known burial space as and when re-discovered by the grave-digger.

Phase 5 (Medieval, 13th century)

A fifth phase of 39, simple, earth-cut graves spread over much more of the site and comprised graves 7, 11, 13, 22, 33, 34, 38, 39, 40, 42, 48, 50, 51, 53/58 across a beam, 55, 57, 60, 63, 64, 68, 92, 96, 99, 104, 108, 109, 110, 123, 128, 130, 134, 144, 145, 148, 149, 158, 174, 175, 178, 180, 182-5, 200 and 205-7 (Fig 23). More than ever before at this site, this phase contained graves in which a grave-cut was discernible, although even now this amounted to only twelve, less than one third of the total. The greatest concentration of these occurred in the discrete area above and through the former mortar mixer, around which the re-deposition of mortar and sand into the otherwise homogeneous grave-earth, facilitated the distinction of a cut. The new use of the area close to the north churchyard wall continues through this phase, with burials spreading east along this line, while this area began to be deliberately used for the re-interment of charnel right up against the wall (205).

None of the graves of this phase draw especial comment for their mode of interment but one. Burial 174 was provided with a 'pillow' of chalk under its head. This has been seen at a number of other sites (see below for discussion).

In this phase can be seen the first real semblance of an attempt to dig graves in rows. While such attempts may have been present before, the incomplete nature of many of the bodies and the relatively few numbers of preceding burials (by comparison) precludes positive identification. Ironically it is this new, greater tidiness and attempts at uniformity in burial which may have done the greatest wholesale damage to the earlier, more culturally-distinctive graves.

Phase 6 (Medieval, 14th century)
The final, sixth phase of burial and the end of the graveyard's use contained a spread of 40 graves, comprising nos 1, 3-6, 10, 21, 25, 28, 30-2, 37, 41-3, 46, 75, 87, 100, 101, 107, 111, 114, 130, 133, 135(=26), 136, 139, 150-2, 157, 159-60, 162, 168, 179, 188, 196, 202 (Fig 24).

These graves covered all parts of the site previously used for burial and continued to bury right up to the northern churchyard boundary. Some lines continue to be distinct within the overall pattern although the last pieces in this particular jigsaw show that the extreme, western end of the graveyard was never used for burials. Here even residual disarticulated bone or charnel was absent.

All of the later burials lay in very simple, earth-cut graves with little sign of a cut. As in previous phases, grave cuts were not generally apparent, the exception continuing to be those areas where repeated digging had introduced quantities of residual mortar and sand into the grave-earth, principally around and above the former mortar mixer.

6.6 Unphased remains

A few graves have not been included in the above presentation of phased data. These constitute two simple groups.

First and foremost are those burials which were seen in section as lying primarily within the concrete-topped baulks which could not be undermined preventing the majority of each skeleton being excavated (20, 35, 36, 44, 45, 59, 79, 83, 102-only apparent in a localised section-collapse, 112, 120, 129, 132, 137, 140, 142, 143, 146, 154, 176 and 209). Most comprised the head alone or the feet, or shins and feet being visible and excavated. Thus all of these burials remain under the 1960s concrete foundations on the site. The details relating to the small portions recorded as visible or excavated are in archive.

Secondly five were given burial numbers by the excavators before it became apparent that they constituted merely the happenstance re-interment of charnel, usually the skull, when a new grave was dug (2, 8, 9, 12, 103). While most charnel was almost instantly recognised as such, these few progressed as far as they did in records usually because the skull appeared to lie in the correct supposed alignment and angle before its full exposure revealed it to be disarticulated and in no proximity to a lower jaw and a body.

Together these burials constitute the most fragmentary skeletal remains reported below, usually because only a tiny proportion was available for scrutiny by specialists. For the majority, their remains still lie interred below the new store, more inaccessible now than they were for the archaeologists on site.

6.7 Dispersed neonate and infant burials

On six occasions excavators located the articulated or dispersed remains of what were thought at the time to be small infants or newborns (neonates). In every case they lacked grave cuts. These were given burial numbers and lifted in a block for ease of recovery and with the intention of sieving the material to promote good bone recovery. In fact all six proved to be remains of infants at varied levels of dispersal. Even in relation to the most dispersed remains, locating them within the cemetery was thought to be a significant aim and the result can be seen in Figure 25. These comprised burials 15, 62, 72, 88, 111/113, 161, 187, 192 and 195. Their significance is discussed later in the report.

7 THE SKELETAL ASSEMBLAGE by Trevor Anderson and Ceridwen Boston

7.1 Introduction

Analysis of 187 skeletons from the churchyard afforded an unprecedented opportunity to explore the composition of Wallingford's Saxon and medieval population, the longevity of individuals, their health and the diseases that they suffered. From this, it is possible to achieve a much fuller understanding of the lives of this small but notable sample of lay people of the Saxon and medieval town.

Burial took place over three to four centuries. Although some burials could be dated or phased, the number recognised as late Saxon was small in comparison to the later, probably post-Conquest burials. The former group was too small to undertake meaningful separate analysis, and so the skeletal assemblage was analysed as a single unit. Although a large quantity of disarticulated bone was recovered during excavation (from disturbed graves), this report only includes articulated skeletons or disarticulated remains that confidently could be assigned to a discrete individual. Osteological analysis was undertaken by the late Trevor Anderson, and this report includes passages from his assessment reports and his bench-work compiled shortly before his sudden and untimely death.

Osteological methodology

The sex of adults was determined from the morphology of the skull and hip bones (or pelves). A number of landmarks on these bones develop distinct characteristics under the influence of the sex hormones during puberty, allowing osteologists to identify adult skeletons as male or female. Before puberty, male and female skeletons do not generally display sexual diagnostic features. Blind studies on skeletons of known age and sex have revealed considerable accuracy in sexing adults, but sexing subadults (immature individuals) has been shown to be very unreliable (Mays 1998). Hence, no attempt was made to sex subadult skeletons of this assemblage, in accordance with accepted practice. Even in adults, some sexually diagnostic traits may be ambiguous (especially those of the skull), introducing degrees of confidence in sexing some skeletons. In this analysis, adult skeletons were categorised as male or female (where sexually dimorphic traits clearly indicated the sex of the individual and/or where a range of traits could be consulted); or as possible male or female (where morphological traits were more ambiguous for sex, and/or where a limited number of traits were present). Males and possible males, and females and possible females were grouped together for analysis purposes.

The age of subadults was determined by stages in the growth and development of their bones and teeth. This included development of the deciduous (milk teeth) and permanent dentition (Moorrees *et al* 1963a and b), fusion of the epiphyses of a range of bones (Ferembach *et al* 1980), and the length of major long bones of the arms and

legs (Maresh 1955). Adults were aged from degenerative changes to the symphysis pubis (Brooks and Suchey 1990) and auricular surface joint surfaces (Lovejoy *et al* 1985) of the hip bone, ectocranial suture closure of the skull (Meindl and Lovejoy 1985), and wear to the molars (Miles 1962). Under the influence of both genetic and environmental factors, some individuals age more rapidly than others, and in a single individual, different parts of the body age at different rates. Hence, it is impossible to assign a specific age to a skeleton, only an age range.

There are limitations in the accuracy of most osteological ageing methods, which tend to underage older adults, and become increasingly inaccurate with advancing age. Most methods cannot age skeletons beyond 50- 60 years. These limitations need to be borne in mind when considering the age distribution of the St Martin's assemblage, particularly in the 'older adult' category, in which it was not possible to distinguish between sectogenerians, septogenerians or octogenerians. Many historical accounts chronicling the upper classes do indicate that some medieval individuals did live well into old age. As in poorer countries today, longevity would have been heavily influenced by wealth and lifestyle, the affluent generally far outliving the peasantry.

In order to analyse patterns of age at death in the St Martin's population, the assemblage was subdivided into age categories. Subadult skeletons were categorised into five age groups: neonate (late foetus to 1 month after birth), infant (2 months- 2 years); young child (3- 5 years), older child (6- 12 years), and adolescent (13- 17 years). Adults were divided into four main age categories: young adult (18- 25 years); prime adult (25- 35 years); mature adult (35- 45 years) and older adult (over 45 years). Those adult skeletons that could not be accurately aged were classed as 'adult'.

Adult stature was estimated from the maximum length of the major long bones of the upper and lower limbs, using formulae devised by Trotter and Gleser (1958).

Preservation and completeness of the skeletons

Bone preservation and the completeness has considerable influence on the amount of information that may be gleaned from skeletons. Within the St Martin's assemblage, there was considerable variation in preservation (judged from the condition of the cortical bone or outer bone table), with 25 % classified as poor to destroyed, 55% as fair, and 21% as good to excellent (Table 1). Over half of the total assemblage had suffered fragmentation and required considerable reconstruction prior to analysis. These repairs undoubtedly would have introduced a small margin of error into measurements of bone dimensions, affecting stature estimation, and the assessment of cranial shape and build. Nevertheless, it was possible to estimate the age, sex and stature of a very high proportion of the assemblage.

Table 1: Summary of bone preservation (N = 187)

Categories	Bone preservation	Number	%
a	destroyed	10	5.35
b	poor	33	17.65
c	fair	100	53.48
d	good to excellent	40	21.39
Not recorded		4	2.14
Total		**187**	**100**

Table 2: Summary of completeness of skeletal assemblage (N = 187)

Completeness	% complete	Number of skeletons	%
1	near complete	3	1.60
2	70-80%	23	12.30
3	50-69%	42	22.46
4	40-49%	29	15.51
5	30-39%	50	26.74
6	20-29%	35	18.72
7	<20%	1	0.54
Not recorded		4	2.14
Total		**187**	**100**

Overall, a large proportion of skeletons was incomplete, principally due to truncation by later grave digging and modern foundations, but with a large proportion comprising bodies which could only be partly retrieved, the remainder lying beneath massive concrete foundations. Only 14.9% was largely intact (over 70- 80 % of the skeleton recovered) and 48% of the sample was represented by less than 40% of the skeleton (principally comprising isolated skulls and articulated legs and feet). There was no significant difference in either completeness or bone preservation between adult and subadult skeletons.

Assemblage composition

The distribution of age-at-death and the sex of skeletons in a burial population is central to understanding many aspects of health and disease, longevity, and fertility, as well as social structure and burial practices within that community (Chamberlain 2000). In the St Martin's assemblage, males and females were fairly equally represented, indicating that the assemblage comprised a lay population. The high proportion of children also supported this interpretation. It is probable that the burial population principally comprised townsfolk of Wallingford, such as shopkeepers, servants, traders and retainers employed in the castle. Peasantry of surrounding villages may also account for some of the population.

7.2 Age distribution

In all known human populations, age-specific mortality follows well-defined patterns, with the greatest variation between populations lying in mortality rates of the very young and in longevity of adults (ibid; Weiss 1973). Most modern non- Western and past populations suffer high infant mortality rates, as a result of birth trauma, infection and malnutrition in early life. Once children have weathered the first few most dangerous years of life, there is a fairly high probability of survival into adulthood (Chamberlain 2000). The lowest mortality in any age group is normally in adolescence. Female mortality increases in young and prime adulthood, due to the increased health risks associated with pregnancy and childbirth. Similarly, male mortality often rises in early adulthood, associate with risk-taking behaviour, violence and warfare (colloqually known as the 'testosterone surge'). Death in middle and old age does show considerably more variation between populations, depending on living conditions, nutritional state, occupation, and accessibility to healthcare.

It was possible to osteologically age and/or sex 187 skeletons of the St Martin's assemblage (Table 3). Subadults constituted 28% of the total population. Unusually for a pre-modern population, there was a very low proportion of newborns and infants in this group, with only one newborn (0.5%), and seven infants aged less than 2 years (4%) recovered. Increasing mortality was evident from five years to adulthood, with

young children comprising 5% of the total population; older children 8%, and adolescents, 11%.

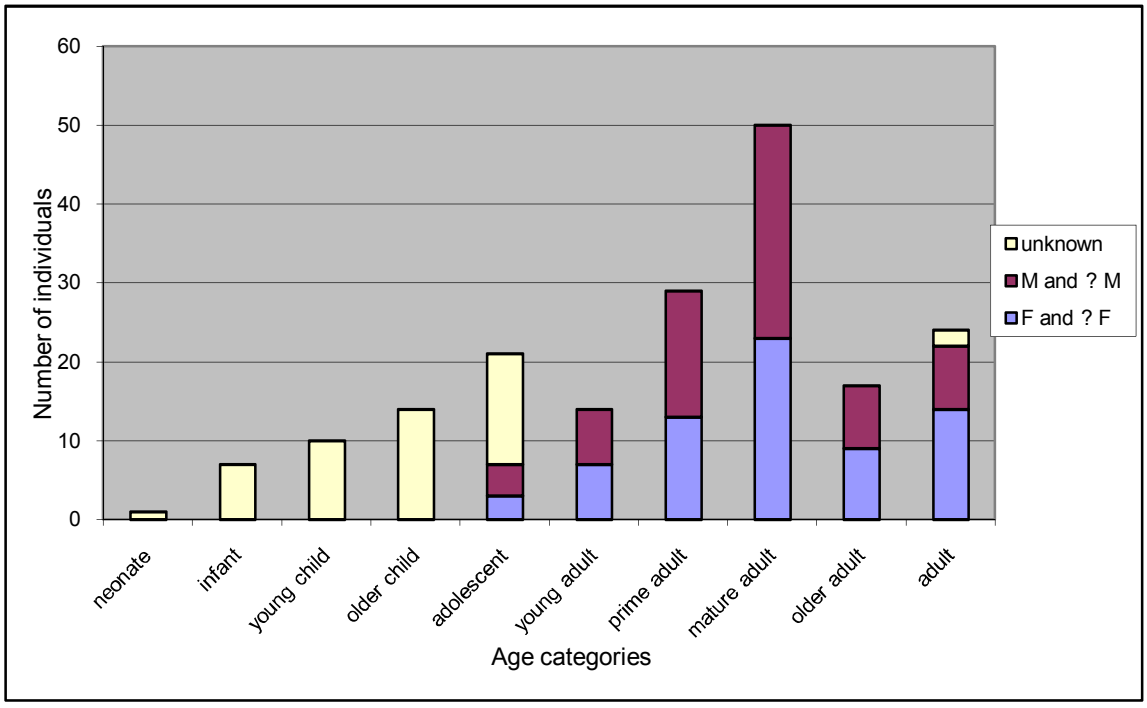
One hundred and thirty-four skeletons were adult (72%), of which few were in the young adult age groups (7%), with males and females evenly distributed. This is interesting as female mortality associated with child-bearing and male mortality from trauma commonly rise in early adulthood in skeletal populations (Grauer 1991, 69). Mortality rates rose in the prime adult category (16%) and peaked in the mature adult category (27%). From 45-50 years onwards, there was a marked drop in mortality, comprising only 9% of the total population. It is important, however, to take into account the limitations of osteological ageing techniques when considering the age distribution of a skeletal assemblage, particularly when ageing older adults (see discussion on methodology above).

Table 3: Summary of age and sex distribution in the total assemblage (N = 187)

Sex/ Age at death	Female & Female?	Male & Male?	unknown	Total	% population
Neonate	0	0	1	1	0.53
Infant	0	0	7	7	3.74
Young child	0	0	10	10	5.35
Older child	0	0	14	14	7.49
Adolescence	3	4	14	21	11.23
Young adult	7	7	0	14	7.49
Prime adult	13	16	0	29	15.51
Mature adult	23	27	0	50	26.74
Older adult	9	8	0	17	9.09
Adult	14	8	2	24	12.83
Total	69	70	48	187	-
% population	36.90	37.43	25.67	-	**100.00**

So why did the population from St Martin's churchyard differ so markedly from the general pre-modern mortality curve described by Chamberlain (2000) and Weiss (1973)? The dearth of newborns was very marked; there was a higher than expected proportion of older children and adolescents, and there was a lower than expected proportion in the young adult age group (particularly of females).

Chart 1: Age and sex distribution (N=187), M = male; F = female



Bone survival after burial

At this point, one needs to consider the extent to which the skeletal assemblage analysed represented the total original burial population of the churchyard. Bias may be introduced in a number of ways. Firstly, the assemblage comprises only those skeletons that have survived from antiquity, and those buried within the excavated area. Although many skeletons were incomplete and fragmented, bone preservation was generally good, indicating favourable burial conditions. Hence, destruction of bone due to soil conditions (eg soil acidity, availability of water, drainage and

temperature) was not a significant factor in explaining the under-representation of some parts of the population, particularly of subadults. In general, the thinner and more delicate bones of infants and children are more vulnerable to degradation in the burial environment than more robust adult bone (Weiss 1973, Mays 1998, 21), and in some assemblages may account for their under-representation. At St Martin's, this effect is unlikely to have been significant, given that surviving subadult bone was generally well preserved, albeit fragmented.

Considerable disturbance of burials occurred at different occasions in the past, with many skeletons being partly or completely destroyed. In the later medieval period, considerable disturbance of earlier graves occurred during later grave digging, particularly as subadult burials were often shallower than those of adults, and their small size is more likely to lead to their complete destruction. The large quantity of charnel dispersed across the site is evidence of grave disturbance. Large-scale destruction of burials in the 18th century, and in the modern era, foundations of 1960s shops and modern services disturbed further burials.

Zoning of burials within the churchyard

Zoning of burials within the churchyard may explain the assemblage's mortality pattern. Uneven spatial distribution of individuals according to age and sex is well recognised in medieval burials grounds (Gilchrist and Sloane 2005, 66). For example, clustering of very young infant burials (under 40 days old) under the eaves of the church have been found in the late Anglo-Saxon churchyards of Raunds, Northamptonshire; Whithorn, Galloway; and Jarrow, Northumbria (Crawford 1999, 87). The drip of rainwater from the roof, sanctified on contact with the church building, was thought to 'bless' the infants prematurely taken from this world (ibid). This practice survived into the later medieval period. Although the excavations of St Martin's, Wallingford, did not include the entire churchyard, some sense of such clustering is suggested, as will be seen in discussion, below. By the late medieval period, burial of unbaptised infants within consecrated ground was prohibited (Gilchrist and Sloane 2005).

At St Helen's, Fishergate, zones within the burial ground not adjacent to the church also contained high concentrations of infants and children, whilst other areas contained very few. Adult males and females were fairly evenly distributed across the site, and females were not buried with their children (Holst 2005). At St James's Priory, Bristol, in one of two excavated areas, females predominated, whilst in the other, a significant concentration of males was recovered. Neither area was exclusive to one sex, however (Jackson 2006). At Wallingford no particular zones demarked one sex from another and they are spread throughout.

Medieval social perceptions of life stages

In most pre-modern populations, there is a high mortality of children below two years of age, but infants that do survive exposure to infection and the effects of weaning from the breast, have a high probability of surviving into adulthood (Weiss 1973). Thus, mortality curves show a relatively low number of deaths from 3-17 years. This pattern was not present at St Martin's, where mortality steadily increased from early childhood through adolescence. This higher than expected child mortality has been noted in other late Anglo-Saxon (Crawford 1999) and medieval assemblages and may be associated with perceptions of childhood and children's roles in their society. Children over five years received relatively little adult supervision, often being placed in the care of older siblings or relations, whilst parents went about their daily work. This lack of parental supervision may well have resulted in greater mortality from accidents and poorer nursing care when ill. Historical documents suggest that the most common cause of accidental infant deaths was domestic house fire. An

unsupervised swaddled baby placed by the hearth was easily overcome (Cunningham 2006, 38). When children were more mobile, death by drowning in ditches, ponds and wells appeared the most common cause of accidental death (ibid). Such deaths would leave no trace on the skeleton, however.

From a fairly young age children were expected to contribute economically, undertaking activities within their physical and cognitive abilities such as vegetable and fruit picking, weeding, helping with food preparation, caring for younger children, herding smaller domestic animals and collecting firewood (Snell 2006). Due to these economic activities, older children were spending more time with adults, and probably as a result, experienced fewer accidents (Cunningham 2006). Such activities rarely comprised a large portion of the day, however, and considerable time was spent in play (ibid) and amongst the more affluent, at school. Explanation for the high proportion of adolescent deaths in the St Martin's assemblage is not easily made. Children's workloads and responsibilities increased with increasing years, and by adolescence, less affluent individuals were expected to work the farm, assist in the family business (if in trade), enrol as an apprentice, or work as a servant in another household. The high prevalence of spondolysis in the rural medieval assemblage of Wharram Percy, Yorkshire, is strongly indicative of heavy labour early in life (Mays 2007), and is discussed more thoroughly later in the text.
Formal schooling was originally the sole preserve of male noblemen or clergy, and involved literacy, Latin grammar, lessons in comportment, including swordplay, hunting, riding and the general preparation for war (Snell 2006). By the 12th century, schools had opened to those who could afford it, being run by secular clergy rather than monks and nuns (Cunningham 2005, 51), with lessons concentrating on literacy and Latin grammar. These schools included both the aristocratic and tradesman classes, but considerable hurdles were placed in the way of peasants seeking to read and write (Cunningham 2006, 56). Education for girls of all classes was very limited.

Neither Anglo-Saxon nor later medieval society conceived of adolescence as a life stage (Crawford 1999; Snell 2006), merely categorising teenagers and young adults as 'youths' who were expected to undertake adult occupations and responsibilities, but who were granted some laterality in view of their relative inexperience of life (ibid).

In the St Martin's assemblage, the high mortality rate in adolescence is unlikely to be due to complications of pregnancy and childbirth. Although Canonic and customary law set the age of marriage for women at 12 years and for men at 14 years, historical texts (such as Hildegard of Bingen) indicate that the age of menarche was recognised as 15 to 16 years in noble women (Labarge 1986, 22). Historical records of noble families do show exceptions, however, one being Betrada d'Evreux (a cousin of Henry II) who was married (to the 5th Earl of Chester) and had her first child by 13 years, and by 25 years was widowed with five children and two step-children (Dimmock 1864, 174). Amongst peasants and less affluent townswomen where poorer nutrition, greater disease load and strenuous physical work were the norm, such early childbearing would have been uncommon given that menarche is later in less advantaged populations.

Nobles married principally for dynastic reasons, the bride's dowry bringing land and wealth. From the 12th century, the dowry system also operated in less affluent classes of medieval society, and the necessity of saving for a dowry resulted in considerably older age at marriage and consequently, maternity (Labarge 1986; Yalom 2001, 47). It has been estimated that by the late Middle Ages most women married in their mid-twenties, and only very rarely in their teens. It is thus highly unlikely that many adolescents and young adult females buried in St Martin's churchyard died as a result of pregnancy or childbirth. Perhaps more deaths in prime

adult females may be accounted for in this way.

Men and women appear evenly distributed across the adult age categories, indicating similar mortality patterns, and that one sex did not enjoy markedly better health than the other, at least on a level that would impact significantly on survival. These findings contrast with Grauer's (1991) work on the broadly contemporary urban assemblage of St Helen-on-the-Walls, York. She noted a peak in mortality in females aged 25-35 years (possibly related to childbirth complications) and a steady decrease with increasing age. By contrast, males at St Helen-on-the-Walls followed a similar pattern to the St Martin's, Wallingford assemblage in that mortality rates peaked between 35-45 years.

In general, longevity and women's health improved significantly over the course of the Middle Ages (Bullough and Campbell 1980). Changes in agricultural practices increased agricultural productivity by 50% over the period (Kiple 1993), which benefited both the peasantry and their lords, greatly increasing the former's access to meat, and hence, their intake of iron and protein. Cultivation of beans and legumes also increased availability of these two dietary components. Iron requirements of women during the years of menstruation and childbirth is approximately two to three times greater than men, and dietary insufficiency leaves women particularly vulnerable to anaemia and a higher predisposition to early deaths (Bullough and Campbell 1980). Improvement in medieval female longevity was thus more marked than in men, and towards the end of the period, females outlived males for the first time in history (ibid). In the St Martin's assemblage no such differences were noted.

7.3 Sex distribution

The osteological sex of 157 skeletons was estimated, although given the incomplete nature of many skeletons, a significant proportion of the population was sexed using metrics- not generally recognised to be the most accurate method (Mays 1998). A total of 47 females, 25 possible females, 69 males and 16 possible males were identified. Seven adolescents are included in this group, with three identified as female or possibly female, and four as male or possibly male. As discussed above, sexing sub-adults, even adolescents, is somewhat tenuous, given that secondary sexual characteristics reflected in cranial and pelvic morphology are still developing over this period, and should be borne in mind when including these individuals in these groups.

The slight preponderance of males (54% of sexed individuals) over females (46%) is interesting as a more even distribution is expected in a lay population. Several reasons may explain this anomaly. Firstly, there is a slight tendency to over-diagnose males in osteological analysis (Weiss 1992), although this is not significant enough to account for the above difference. The apparent disparity might have evened out if the entire churchyard had survived to be excavated.

Alternatively, it may well truthfully reflect the proportion of men and women living in the parish. Medieval Wallingford was a busy administrative and commercial centre of the region, and foreign traders (often male) settling in the town are known from the Domesday Book (Haslam 1984). Males comprised by far the greater proportion of the households of courts and castles (Labarge 1986), and it is probable that the majority of retainers of Wallingford Castle were male. On the other hand, both Labarge (1986) and Goldberg (1986, 19) comment that historical records (eg poll tax rolls) of later medieval towns and cities (such as Hull, Carlisle and York) often reveal a higher proportion of females to males. This was due to the greater urban migration of unmarried and widowed women looking for employment, either in service or as independent traders. If the sex distribution of the St Martin's assemblage was indeed

representative of Wallingford's townsfolk, such a disparity was not present. Indeed, the converse was true.

7.4 Stature estimation

Adult and childhood stature is determined by the interplay of inherited and environmental factors (King and Ulijaszek 1999). Whilst we all have a maximum genetic potential to reach a certain adult stature, physical and emotional stressors during childhood and adolescence may prevent us achieving this potential. If such stressors (such as malnutrition, infection or chronic illness) are too severe or prolonged for the growing body to 'catch-up' growth later, the individual will become permanently stunted. Thus, stature has been used as a rough yardstick to indicate the overall health of individuals and of populations, provided the genetic component of a population does not alter, as would happen, for example, with an invasion of taller or shorter people.

It was possible to estimate the stature of 78% of adults in the St Martin's assemblage. Average male stature was 1.704m (5 foot 6 inches), with a range 1.55-1.80m, whilst average female stature was 1.579m (5 foot 2 inches), with a range of 1.477m - 1.770m. (Chart 2).

When the mean stature of the females and possible females, and the males and possible males were compared, considerable disparity was apparent between the two (Table 3). This reveals that females of more ambiguous sex were considerably taller than securely sexed females, and similarly, possible males were shorter than their securely sexed counterparts.

Chart 2: Distribution of adult stature estimates in the total population (N = 104)

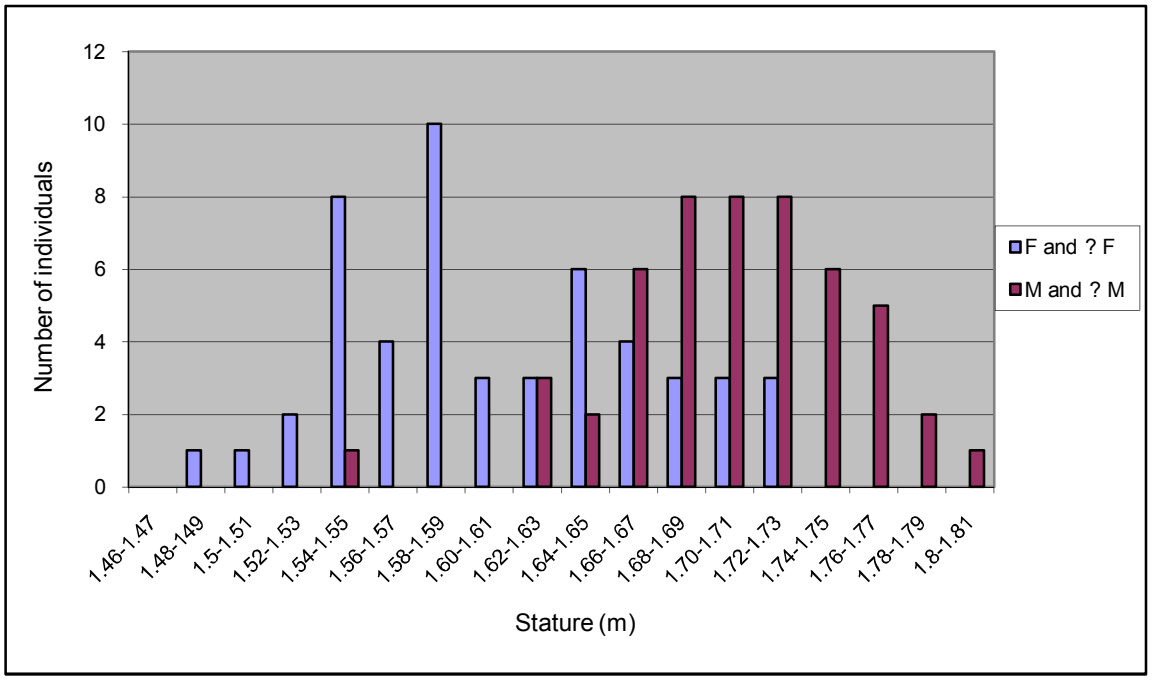


Table 4: Mean stature calculations of stature in females and possible females, and males and possible males (N = 104)

	Number	Mean stature (m)	Range (m)
Female?	15	1.638	1.549-1.714
Female	40	1.557	1.547-1.766
Male?	7	1.660	1.621-1.804
Male	42	1.711	1.546-1.715

Table 5: Summary of mean stature and range in comparative medieval assemblages

Assemblage	Date	Males			Females			
		No.	Mean stature (m)	Range	No.	Mean stature (m)	Range	Author
Lay cemeteries								
St Martin's, Wallingford	10th-14th centuries	49	1.70	1.56-1.80	55	1.58	1.48-1.77	This volume
St Helen-on-the-Walls, York	12th-13th centuries		1.69	1.54-1.84		1.57	1.45-1.73	Dawes and Magilton 1980
Wharram Percy, Yorks	medieval		1.68			-		in White 1988
The Vineyard, Abingdon	1050s-16th century		1.70	1.56-1.89		1.60	1.48 -1.77	Wakely 2006
Faringdon Road, Abingdon	12th-13th centuries	3	1.70	1.653-1.714	2	1.52	1.45-1.588	Harman 1982
Chimney near Bampton, Oxon	890-1160 AD	3	1.69	1.66-1.74	0			Crawford 1999
St Andrew, Fishergate, York	late 10th-16th centuries	205	1.72	1.55-1.90	73	1.58	1.45-1.70	Stroud 1993
St Nicholas Shambles, London	11th-16th centuries	c.50	1.73	1.59-1.874	c.40	1.58	1.50-1.73	White 1988
St Helen's, Fishergate, York	11th-16th centuries	48	1.70	1.563-1.866	42	1.59	1.437-1.683	Holst 2005
Religious institutions								
Christ Church, Oxford	7th-11th centuries	19	1.72	1.61-1.82	3	1.58	1.55-1.61	Boyle 2001a
St Aldate's Oxford	10th-14th centuries	4	1.74	1.64-1.82	1	1.59	1.59	Boyle 2001b

Using a sample of 1442 male and 930 female skeletons from various British medieval sites, Anderson and Andrews (2001) calculated the mean stature as 171 cm (5 foot 7½ inches) and 158 cm (5 foot 2¼ inches), respectively. A synthesis of 26 assemblages undertaken by Robert and Cox (2003, 248) revealed very similar

results, with mean male stature as 171 cm (5 foot 7¼ inches) and female stature as 159 cm (5 foot 2½ inches). This represented a decline in stature from the early medieval period, possibly associated with the health risks of increased urbanism and increased social stratification in this period (ibid.).

Table 4 compares stature in a number of medieval assemblages, several located within modern Oxfordshire. Interestingly, mean male stature and range from two lay cemeteries in Abingdon (Harman 1982; Wakely 2006) were identical to St Martin's Wallingford, but female stature shows more variation. Female stature from the St Aldates (Boyle 2001a) and Christ Church assemblages in Oxford (Boyle 2001b) were more consistent with St Martin's, Wallingford (although numbers were very small). Male stature, however, was significantly greater in the Oxford assemblages, probably reflecting the significant proportion of monks and high status burials (including intramural and charcoal burials) in these populations. Waldron (1984) noted that medieval monks generally achieved greater stature to their lay counterparts as a result of greater access to a better and more regular diet within religious institutions, which served to buffer these individuals against seasonal food shortages and malnutrition so prevalent in the peasantry of this period.

7.5 Dental disease

Permanent teeth were present in 152 skeletons (a total of 1813 teeth). Dentition can offer insights into age, diet, oral hygiene practices and childhood health. Trauma (particularly blows to the face) may be responsible for anterior tooth loss, and social and economic activities (such as using the front teeth as a vice in leather or textile processing) are sometimes observed in wear patterns on the front teeth.

Diet and dental disease

Whilst the diet of the wealthy in the medieval period comprised a high proportion of meat, more humble people principally existed on cereals in the form of bread or pottage of oats, rye and wheat, and ale, and to a lesser extent, on vegetables, such as leeks, parsnips, pulses, cress and cabbage (Hagen 1995). Protein was largely obtained from pulses and from 'white meat' (that is, dairy products and eggs), seasonally supplemented by nuts and berries gathered on common land, and in rural areas, by birds and small wild animals obtained by fowling and ferreting. Many households both rural and urban kept pigs and chickens, although the latter was principally for eggs. Legitimate access to meat amongst the poor did increase considerably in the latter part of the period through improvements in farming practices and the profound social ramifications of the Black Death (Grauer 1991). Religious observances prohibited meat consumption several days a week, fish often serving as an alternative. It is uncertain how much fish from the Thames was consumed in Wallingford.

In small towns, such as Wallingford, most food sold at market would have been locally produced. In the later medieval period, there was increasing regulation on the conditions under which food was sold, and the price of staples was fixed through the assizes (Roberts and Cox 2003, 243). Many townsfolk also had access to small garden plots, where they grew herbs and vegetables and often kept a few small livestock (such as chickens and pigs). Pigs were often a nuisance wandering the streets, but their scavenging made inroads into the piles of organic waste and night soil thrown into the streets.

Although townsfolk potentially had a wide choice of food in the market, as always, diet was dictated by affluence and by the degree of self-sufficiency in food production. Seasonality of food was taken for granted, the weather and natural cycles determining the availability and cost of foodstuffs throughout the year. Food was

preserved through drying, salting, pickling and smoking. Most domestic dwellings of this period had an open hearth but lacked an oven, and food, such as pies and meats, were often taken to a cook shop in the town to be prepared (Roberts and Cox 2003). This practice persisted well into the post-medieval period.

Greater variety in a rather unvarying diet was offered on the many holy days (Saint's Days) and secular 'feast' days that punctuated the annual cycle. For example, 'boon food' was awarded to the peasantry at ploughing and harvest times. How nearly this affected townsfolk is less certain. Like so many other aspects of medieval daily life, the Church dictated what food might be consumed at certain times, such as going meatless on Monday, Wednesdays and Fridays, and throughout Lent, and 'fasting' on certain Saint's days. There were 146 fast days in the Christian calendar, and whilst many did not require people necessarily to eat less, certain foods were taboo, and ordinary folk were rarely required to observe these. At Christmas, however, consumption of large quantities of food and drink was the norm with those who could afford it.

Dental disease

Permanent teeth were present in 115 individuals of the St Martin's assemblage. Diseases observed on the permanent dentition included caries, abscesses, periodontal disease, calculus and ante-mortem tooth loss.

Although multi-factoral, the most common underlying cause of dental decay is poor oral hygiene and the consumption of carbohydrates, particularly in the form of simple sugars (such as sucrose). Food residues left on the teeth following ingestion of carbohydrates rapidly become colonised by oral bacteria, and are broken down to form an acidic, corrosive plaque (Roberts and Manchester 1995). It is this plaque that is responsible for the development of carious lesions on the teeth. In more alkaline conditions (particularly adjacent to the salivary glands), plaque may mineralise, forming a hard immovable coating of calculus on the tooth surface, colloquially known as tartar.

Oral bacteria may also cause periodontal disease or pyorrhea. In this condition, the gums become inflamed (gingivitis) and destruction and loss of the alveolar bone and connective tissue attachments that anchor the teeth in the jaws (periodontitis) may occur (Levin 2003, 244-6). Periodontal disease may be localised to one or two teeth, or may be more diffuse involving large areas of the jaws. Retraction of the diseased gum exposes vulnerable tooth roots to destruction by acidic plaques, commonly resulting in caries. Infection may track down the root to the apex, causing abscess formation and ultimately, tooth loss.

In the medieval period, simple carbohydrates were rare. Sugar first appeared in Britain in the early 13th century, as an exotic and very expensive 'spice' imported from the eastern Mediterranean, afforded only by the very rich (such as royalty and the upper nobility) (Fernandez-Armesto 2001, 177). It is highly unlikely that sugar was ever tasted by the people of Wallingford, who would have relied on honey as their principal sweetener. The absence of large quantities of simple sugars in the diet probably accounts for the low prevalence of dental decay observed in this and other medieval assemblages.

Oral hygiene in this period was rudimentary to non-existent, although some medieval texts did recommend rinsing the mouth and the use of tooth powders and pastes (Roberts and Cox 2003, 256). Toothpicks were used, but not toothbrushes (ibid). Herbal remedies for toothache, including painkillers (such as mandrake and poppy) and warm poultices may have had some success in assuaging the pain, but other

treatments, such as applying the body of a dead mouse to the aching tooth, were probably less helpful (Hillam 1990, 8). Supernatural aid was often invoked using charms, magical spells and potions, as well as prayers to the saints (particularly St Apollonia, patron saint of toothache). Medieval understanding of the cause of dental disease centred on the belief in the tooth worm, and quacks were quick to produce maggots and henbane seeds from the patient's mouth as proof of a successful treatment (ibid.). 'Dentistry' was largely limited to extraction or cautery of the affected tooth with a red-hot iron (Roberts and Cox 2003).

Dental caries

Fifty individuals showed evidence of dental caries of the permanent teeth (44%). Of the 2345 permanent teeth examined, 135 (6%) displayed cavities. This is comparable to the mean percentage of 6% calculated from 41 medieval assemblages by Robert and Cox (2003, 258-9). Interestingly, medieval caries rates were considerably lower than those found in later periods, for example, the early 19th century burials from St George's church, Bloomsbury (13%) (Boston *et al* 2006) and the Cross Bones burial ground, Southwark, London (26%) (Brickley *et al* 1999) a difference probably attributable to the increased availability of sugar in the later period (Hillam 1990, 2), as discussed above.

Another difference in dental caries rates lay in the coarseness of the medieval diet. Grit became included in flour during milling, and coarse cereal inclusions in the flour were present in all but the most refined flour. Refined white bread was very expensive and hence, was not accessible to common people. This is illustrated in Chaucer's Prologue to the Canterbury Tales, where the Prioress' excessive gentility, daintiness and wastefulness is demonstrated by feeding her little dogs on '*rosted flesh or milk or wastel bread'* [fine white bread]. Most medieval people were less fortunate than the little dogs and had to make do with a much less refined fare. The effects of the coarseness of food may be observed on the occlussal surfaces of the dentition of medieval skeletons. Over the years, abrasives within food wore flat the folds of these surfaces, removing the enamel and exposing the underlying dentine. Although excessive wear did sometimes result in tooth loss, attrition was actually beneficial to dental health. Flattened occlussal surfaces trapped less food, thereby reducing the propensity to develop caries. Indeed, in the St Martin's assemblage, most caries were located on surfaces between the teeth. In later periods, as refined flour became more widespread, tooth wear reduced, resulting in a more modern picture of attrition with increased location of caries on the occlussal surface.

Ante-mortem tooth loss and apical abscesses

Ante-mortem tooth loss (AMTL) was diagnosed where a dental socket showed remodelling (that is, where new bone had infilled the space originally occupied by the tooth root). In this way it is possible to distinguish AMTL from post-mortem tooth loss where no such remodelling has occurred. AMTL was observed in the jaws of 38 individuals (33%). Prevalence was calculated per socket. Of the 2345 dental sockets present, 135 displayed remodelling (6%). This rate is considerably lower than the mean loss of 19% of teeth calculated from 19 medieval assemblages by Roberts and Cox (2003, 262-3). As AMTL is progressive with age, it is probable that the low prevalence in the St Martin's assemblage, in part, is a factor of its youth. Predisposing conditions, such as periodontal disease and caries, were likewise low, and although calculus was present it was generally slight.

Severe disease of a tooth may result in infection tracking down to root canal or around the root to the apex of the root, resulting in a dental abscess (Roberts and Manchester 1995). In untreated cases, the pressure of the inflammation and accumulated pus forces a path through the alveolar bone, leaving behind a smooth-

sided lesion or sinus in the jaw. Such lesions were observed in 31 individuals of the St Martin's assemblage (30%), and ranged in number from one to eight per individual. The prevalence per socket was 3%, a rate comparable with the 3.11% of over 46000 medieval skeletons cited by Roberts and Cox (2003, 260).

Periodontal disease

There is a direct cause-and-effect relationship between bacterial colonisation of the surface of a tooth (in the form of plaque) and localised inflammation (and consequently destruction) of the gums and supporting structures of the jaw bones and ligaments (Levin 2003, 244). This periodontal disease is the primary cause of ante-mortem tooth loss in modern populations, and becomes more severe and more prevalent with advancing age (ibid). In skeletons, the disease is identified by remodelling and resorption of the alveolar bone of the jaws. In the St Martin's assemblage, it was classified into slight, medium or considerable, according to criteria set out by Brothwell (1981).

Periodontal disease was seen on the upper and/or lower jaws of 77 individuals (76%). In 88% of these the disease was slight, whilst seven (9%) suffered moderate, and two (3%) severe disease. Roberts and Cox's (2003) synthesis of 22 skeletal assemblages found large variation between medieval populations, ranging from 6% to 100%, with a mean of 37%. This variation has been explained in terms of widely varying oral hygiene standards, diet and local fluoride levels, but inter-observer error and over-diagnosis also may be significant (Ogden 2005).

Calculus

Mineralised plaque or tartar that forms on the surface of teeth in the absence of brushing, is also a significant cause of periodontal disease and subsequent tooth loss (Levin 2003). This pattern was seen in the St Martin's assemblage with the buccal (or cheek) surfaces of the front teeth, and the lingual (or tongue) surfaces of the molars showing heaviest deposition. Although 57% of teeth showed some calculus deposition, the majority was slight. The latter is probably reflective as much of the youth of the St Martin's assemblage as the lack of oral hygiene and carbohydrate intake, as calculus formation is progressive with advancing age (ibid). Roberts and Cox (2003, 261) found the mean calculus rate per tooth in four medieval assemblages was 54% - broadly similar to the prevalence in the St Martin's assemblage.

Dental enamel hypoplasia

An interruption or slowing of normal enamel formation during tooth crown development in the first six or seven years of life causes permanent thinning of the enamel (Goodman and Rose 1990). This is known as dental enamel hypoplasia (DEH). DEH manifests on the buccal (or cheek) surface of the crowns of teeth as pits, horizontal lines or lines of pits. Each line forms as a result of a prolonged episode of stress, illness or malnutrition during childhood, lasting several weeks. Unlike bone, enamel does not remodel throughout life and so DEH acts as a permanent indicator of such an episode in the early years of life. Enamel hypoplasia is useful in understanding childhood health, when considered alongside other stress indicators, such as reduced stature and deficiency diseases, such as cribra orbitalia (discussed below).

Dental enamel hypoplasia (DEH) was observed on the permanent teeth of 23 individuals, or 106 of the 1591 tooth crowns with observable buccal or cheek surfaces (7% of teeth). Recorded rates of DEH vary between medieval skeletal assemblages, probably a result of varied recording as much as real health differences.

7.6 Skeletal pathology

A range of skeletal pathologies was noted in the assemblage, giving insights into diet, accidents, interpersonal violence and physical activities.

Degenerative joint disease

Degenerative joint disease (DJD) and associated osteoarthritis (OA) are two of the most common pathologies found in both present (Meisel and Bullough 1984) and past populations (Ortner and Putschar 1981, 419-33; Rogers and Waldron 1995, 32). DJD is a degenerative disorder, which may affect any joints of the body, but is most common in the spine, hips, shoulders and knees. Outgrowths of bone or osteophytes often occur on or around the articular surfaces of joints, but resorption of bone manifesting as porosity of the joint surface, and as subchondral cists (small cists beneath the joint surface) are also common features (Roberts and Manchester 1995). Clinical symptoms of pain and stiffness in movable joints may be present, and may cause major disability in severe cases (Denko 2003, 234). Symptoms are not necessarily proportional to the severity of bony changes on the skeleton, however.

DJD is diagnosed when the above bony changes occur, but alone these may be part of the normal ageing process, and are not necessarily diagnostic of OA (ibid.). In the present study, OA was diagnosed only if eburnation (polishing of the exposed bone surfaces of the joints following the loss of the joint's cartilage lining results from bone rubbing) was present, in accordance with recommendations set out by Waldron and Rogers (1991).

The cause of DJD and osteoarthritis is not fully understood, but its prevalence does increase with advancing age (Doyle 1986). Everyday 'wear -and -tear' over the years is believed to underlie this disorder, but may be accelerated by repeated strenuous activity, such as carrying heavy loads, throwing projectiles etc. (Gunn 1974, Jurmain 1977), which is particularly evident in the arm joints. Genetic predisposition, body mass index and sex may also influence disease development (Weiss and Jurmain 2007). In addition, OA may also develop as a secondary response to trauma (such as a fracture) or metabolic diseases (such as osteoporosis).

Spinal degenerative joint disease

In the St Martin's assemblage, the spine was the most frequently affected (SDJD), with 84 individuals (45%) displaying osteophytosis (bony outgrowths), porosity, Schmorl's nodes (discussed below) or eburnation (OA). This data is summarised in Appendix 1. The thoracic spine was most frequently involved, with 24% of these vertebrae affected, whilst 16% of cervical (neck) and 23% of lumbar (lower back) vertebrae showed DJD.

SDJD was clearly age- related, with 88% of older adults, 76% of mature adults, 76% of prime adults and 14.3% of young adults showing these degenerative changes. The only subadult to display spinal changes was older adolescent 97, who had one Schmorl's node. Schmorl's nodes are invaginations or depressions on the upper or lower surface of the vertebral bodies, which result from direct pressure exerted by herniating intervertebral discs located between adjacent vertebrae (Roberts and Manchester 1995). As such, they represent soft tissue damage to the spinal column, which in some cases has been associated with back pain and sciatica. In the St Martin's assemblage, 134 vertebrae were thus affected (5.6%).

Extra-spinal degenerative joint disease

DJD other than in the spine was surprisingly rare. The joint between the clavicle and the acromium of the scapula (collar bone and shoulder blade) was the most commonly affected site, with 23 skeletons (12 % of the total population) showing

degenerative changes, particularly porosity and enlargement of the distal clavicle. The true prevalence per clavicle was 17%. The right side was more often affected than the left (17 and 10 respectively), very tentatively suggesting handedness and a greater workload on the right arm and shoulder. A slight male bias was observed with 14 males and possible males, and nine females or possible females affected. All individuals were either adults of unspecified age (n = 3) or aged 35 years or more (n = 20). There is a strong correlation between increasing age and degeneration of the shoulder joint (Roberts and Manchester 1995, 114).

The tempero-mandibular joint (where the lower jaw articulates with the skull) showed degenerative changes in three males and possible males, and three females and possible females. In most skeletons these changes were slight, but adult male skeleton from burial 10 and a mature female skeleton from burial 98 showed more marked changes, the former including eburnation or polishing of the joint surface. In modern assemblages, a prevalence of 8% has been recorded (Toller 1973), and is rare in individuals under 40 years of age (Öberg *et al* 1971). The bone erosion and destruction seen in the St Martin's assemblage may be due to more vigorous chewing associated with a coarse diet (as discussed above). Dental attrition supports this hypothesis.

Degenerative changes were noted in the hip (n = 3), knee (n = 2), foot (n =1) and toe (n = 3) joints. Possible female skeleton from burial 189 (aged 30-40 years) suffered DJD of both hips, and marked OA of the knee joint, which involved eburnation of both joint surfaces. Considerable ossification of the patellar ligament was also present on the patellae (kneecaps). In both modern and archaeological populations, the hip and knees are most commonly affected, being the major weight bearing joints of the body (Roberts and Manchester 1995, 114). Stress placed on these joints may be exacerbated by obesity and some activities. Female skeletons 70 and 166 showed osteoarthritis of the feet, involving eburnation (polishing) and osteophytosis (bony outgrowths) of the joints of the first, second, third and fourth metatarsals. The cuneiform bones and the naviculae of the feet of male skeleton 190 showed osteophytosis (bony outgrowths) but no joint fusion or polishing.

Whilst joint degeneration of the lower limb often relates to weight-bearing, changes in the joints of the upper limb as more likely to result from repetitive, strenuous physical activity that accelerates normal 'wear-and-tear' (Roberts and Manchester 1995, 109). DJD of the joint involving the clavicle (collar bone) and the acromial process of the scapula (shoulder blade) has been discussed above. Only one skeleton (possible female 57) showed DJD of the humeral head of the shoulder joint. Four skeletons (48, 78, 115 and 173) displayed bony outgrowths (osteophytosis) around the elbow joints, the former two involving the left and right trochlea of the humerus and the olecranon of the ulna, and the latter two the radial head and capitulum (one left and one right elbow). The elbow joint is not commonly affected in modern assemblages, except in the elderly (Meisel and Bullough 1984), and as such these changes are suggestive of abnormal occupational stress.

Trauma

A fairly high incidence of trauma was evident in the St Martin's assemblage in the form of fractures; enthysophytes (bony projections at the site of ligament and tendon attachment to the bone)) and cortical defects (shallow hollows at the site of muscle attachment), indicative of soft tissue injury to the tendons, muscles and ligaments; shoulder dislocation; two possible ossified haematomas (localised collections of blood), and one blade injury to the skull.

Fractures

Fractures were present in 17 skeletons (9%), all of whom were adult. This rate is higher than the 6.5% seen at St Andrew's, Fishergate, York (Stroud and Kemp 1993), 5.6% at St Helen-on-the-Walls, York (Dawes and Magilton 1980), 5% at St Nicholas's, Shambles, London (White 1988) and 5.3% at St Helen's, Fishergate, York (Holst 2005).

Table 6: Location and sex distribution of fractures (N = 187)

Location	Body region	Male	Female	Total fractures
Cranial vault	Skull	1	1	2
Ribs	Ribs	5	1	9
Humeral shaft	Upper arm	0	2	2
Distal radius	Lower arm near wrist	0	4	4
Midshaft radius	Lower arm	1	1	2
Distal ulna	Lower arm near wrist	2	3	4
Midshaft ulna	Lower arm	1	0	1
MCP4	Hand and ring finger	1	1	2
MCP5	Hand and little finger	0	1	1
Thoracic vertebra 8	Mid-spine	0	1	1
Femoral shaft	Thigh	1	0	1
Total		**12**	**15**	**29**

There was no significant difference in the number of males and females affected (13 and 14, respectively), unlike many other medieval assemblages where a clear male dominance was present (Anderson 1996, 27; Cardy 1998).

Ribs were the most common site of fractures overall comprising 34% of all recorded fractures in the St Martin's assemblage (Table 6). A similar pattern was present in the monastic St Faith's, Norwich (Anderson *et al*, in Soden 2010), St James's, Northampton (Anderson *et al* in Chapman in preparation) and at St Helen-on-the-Walls, York (Stroud and Kemp 1993) assemblages. In the most severe case (mature adult male skeleton 197), three rib shafts were involved. Such rib shaft fractures are sustained from a direct blow to the chest, and are commonly associated with interpersonal conflict and falling (Roberts and Manchester 1995). It is not surprising, therefore, that more males than females sustained these fractures (6 and 1, respectively). Although rib fractures in themselves are seldom fatal, they may be associated with soft tissue damage to the lungs (such as contusion or puncturing the lung with the fractured rib). Female skeleton 75 (aged 30-45 years) had suffered multiple injuries, including three rib shaft fractures and an oblique fracture of the left humeral shaft, which were both still healing at the time of death, and were probably incurred in the same event. She also displayed long-standing well healed fractures to the wrists (a left and right Colles fracture of the radius and a fracture of the stylis of the right ulna. Colles fractures are mostly incurred during falls onto an outstretched hand, commonly in older post-menopausal women with osteoporosis (Roberts and Manchester 1995).

No rib fractures in the St Martin's sample appeared to have been fatal, however, as all were healing or healed, with no significant deformities or associated infection, and clearly had occurred sometime before death.

Thirteen fractures of the upper limbs and three of the hands were present (Table 6). In modern populations, fractures of the distal forearm (particularly the radius) are

common following a fall onto an outstretched arm in post-menopausal females (Steinbock 2003, 237) and wedge-like fractures of the vertebral bodies, are associated with osteoporosis (ibid). Lower arm fractures at St Martin's followed modern patterns with all four distal radial fractures and three of the four distal ulnar fractures present in mature or older females. Similarly, the only wedge fracture (thoracic vertebra 8) was present in a female aged 45-55 years (skeleton 60).

Whilst the above fractures had healed leaving only minor deformities, the fractured ulnar and radial mid-shafts of the lower left arm of skeleton 136 displayed a long-standing failure to unite. Both bones had developed a false joint (or pseudoarthrosis) at the point of fracture, and when articulated, the lower shafts were held in markedly abnormal angulation. The degree of bone overlap and malalignment was considerable. Prior to modern internal fixation, effective repair of forearm fractures required at least ten weeks of immobilisation in a splint (Watson-Jones, 1943, 516). According to Theodoric, writing in the 13th century AD, "..when the ulna is broken, its fracture is calamitous and its healing is difficult.." (Campbell and Colton 1955, 195). Where only the ulna is fractured, the radius acts as a natural splint, but where both bones are broken (as with skeleton 136) there is no such support.

The failure of either bone to knit, and the abnormal angulation of the distal forearm indicated that the fracture had not been adequately splinted, and this unfortunate young woman is likely to have suffered considerable pain and loss of function ever after. Mid-shaft fractures of the ulna are highly suggestive of a direct blow rather than of a fall, often incurred when the victim attempts to ward off a blow to the head with the left arm (the so-called 'parry fracture'). Although in the past, fractures of the ulnar shaft have been associated with interpersonal violence, Jurmain (1999) warns that other causes may be responsible (eg a fall), and concurrent fractures of both ulna and radius are rarely associated with warding off a blow. The additional involvement of the radius makes it less probable that these were true 'parry fractures', but were more likely to have been accidental.

One adult male (skeleton 128) displayed a healed fracture of the upper left femoral shaft. Although solidly re-united, there was marked angulation of the shaft, shortening and deformation with extensive new bone formation. In part, the last was probably due to local soft tissue injury and bleeding, so-called myositis ossificans (Watson-Jones 1943, 68) around the site of the injury. Femoral shaft fractures are rare, as the robusticity of this bone imparts considerable strength to it. Hence, a fracture is indicative of a major trauma. Without internal fixation, adult femoral shaft fractures take at least four months to heal fully (Adams 1965, 216).

In medieval society, setting bones was a function of the surgeon (Rawcliffe 1999, 125). Early surgical texts of prominent surgeons, such as Lanfranc of Milan (*c* 1250-1306) and Guy de Chailiac (1298-1368), offered comprehensive guides to a vast range of surgical treatments, including setting of bones, realigning dislocations, suturing and dressing wounds. Such works were widely translated and disseminated across Europe and formed the basis of surgical practice of the day (Porter 1997, 117). Treatment of fractures included reduction (aligning the broken ends together in normal anatomical position) and fixation (immobilisation) using a splint or ligatures. Whilst the wealthy had recourse to a qualified surgeon, bone setting in rural areas and amongst the urban poor was often undertaken by empirics or 'naturals', some of whom were quite skilful (Rawcliffe 1999, 72). Bone healing was encouraged by ingestion of herbal medicines (such as knitwort), sometimes prepared by apothecaries but often by unregulated herbalists or the women of the house. With the exception of skeleton 136, fractures in the St Martin's assemblage did show evidence of successful splinting and good healing, with only limited malalignment.

Whilst splinting long bone fractures was a relatively simple task, successfully treating depressed fractures of the skull was a much more complex and dangerous undertaking, that could exacerbate the patient's condition by pressing fragments of broken bone into the underlying brain, precipitating haemorrhage around the brain and/or introducing infection (ibid). Where possible, the loose bone of a skull fracture would be left in place in the hope that it would heal without complications. This does appear to be the case with adult female skeleton 6 and adult male 156. Depressed fractures of the left parietal bone in both cases showed evidence of advanced healing, and hence, it does not appear that either individual died as a result of this injury.

Depression fractures occur when the skull is hit by a blunt object, often associated with inter-personal violence (Jurmain 1999). Location of both lesions on the left parietal bone may suggest that both blows were hit from the front by a right-handed assailant, although this is by no means certain. The crude prevalence of frontal bone fractures per individual at St Martin's was 1%, a rate roughly double to that calculated for six medieval assemblages by Roberts and Cox (1995, 238). The true prevalence at St Martin's was 2.4%.

Interpersonal violence may also be the cause of fractures of two fingers (Brickley and Smith 2006) of the right hand of female skeleton 5, although in this case she may have been the assailant. A healed mid-shaft fracture was also seen in possible male skeleton 11.

Cranial blade injury

The forehead of skeleton 8 (a male aged 40-45 years) showed evidence of two healed blade injuries. The lesion on the right frontal bone was a narrow linear injury some 59mm in length, extending from right coronal suture (at the top of the skull) to a point some 38mm above the centre of the right eye socket. A crack or radiating fracture extending from the anterior edge of the incision to the centre of the right orbit fully penetrated the bony table. The lateral edge of the linear defect displayed slight crushing and irregularity. The medial edge was clear and sharp. The second blade cut had entered the left frontal bone of the forehead, the linear defect running from just above the right nasal bone (bridge of the nose) to just medial of the centre of the left eye socket, terminating some 40mm from the socket. This lesion showed evidence of healing. The defect ended in a smooth-edged circular aperture approximately 6mm in diameter. The aperture was some 50mm anterior to the left coronal suture. Posterior to the aperture, there was a large diamond-shape of bone (length: 90mm; medio-lateral: 75mm) with faint cracking at margins. Whereas the first blade injury showed evidence of advanced healing in smooth new bone growth, the margins of the 'diamond' - shaped lesion had a ragged appearance consistent with localised necrosis of the bone. The crown of the left upper canine had also been broken.

Although excavated examples remain relatively rare, cranial blade injuries are not unknown in the medieval period, with skeletal examples recorded from St Helen's Fishergate, York (Holst 2005), St Andrew's, Fishergate (Stroud and Kemp 1993), St Mary's, Spitalfields, London (Powers 2004), Church End, Cherry Hinton, Cambridge (Patrick 2006) and St Mary's Cathedral, Coventry (Rylatt and Mason 2003, 133; Anderson and Hodgins 2001 and 2002). Like the cases above, the skeleton from St Martin's, was male. It is impossible to determine if he had been injured in the field of war, or as the result of a more everyday interpersonal conflict.

Soft tissue injury
Injury to tendons, ligaments and muscles may manifest on the skeleton as enthesophytes or cortical defects. In the former, ossification of damaged tissue appeared as bony ridges at the point of insertion (attachment) of the muscle into the bone. Cortical defects may also result from muscle damage, but here small areas of bone are removed, leaving behind shallow hollows at the point of muscle insertion. Tearing of muscle, tendon or ligaments is often in response to activity-related trauma, and hence, patterns of enthesphytes and cortical defect distribution may be use to investigate past physical activities. Other systemic conditions (both inflammatory and metabolic) have also been associated with enthysophytes, however, including DISH (discussed below) and ankylosing spondylitis (Resnick 1995).

In the St Martin's assemblage, enthesophytes were recorded in seven males or possible males, and three possible females (a crude prevalence of 5%). Seven were located in the upper limbs and three in the lower. One male adult displayed a cortical defect on the right humeral shaft of the upper arm at the insertion point of the Brachialis muscle.

Ossified haematoma
Soft tissue injury may lead to a localised accumulation of blood at the site of damage, known as a haematoma. Over time, some haematomas adjacent to bone ossify, manifesting on the skeleton as discrete roughly circular areas of smooth dense bone raised above the normal bone surface. One such lesion was present on the left humeral shaft (just below the shoulder) of an aged female, 123b, and another on the right ulnar shaft of the lower arm of male skeleton, 32.

Possible dislocation of the shoulder
The left shoulder joint of possible female skeleton, 57, displayed marked osteoarthritis, which may have been secondary to an upward dislocation of the arm. Marked porosity and eburnation (polishing) on the inferior acromium of the shoulder blade, and porosity of the humeral head were present.

Osteochondritis dissecans
Osteochondritis dissecans is a fairly common osteological disorder found on the joint surfaces of the major long bones (Aufderheide and Rodriguez-Martin 1998). Physically active young males (such as athletes) are most often affected in the first two decades of life (ibid, 81). This disease is due to a significant localised obliteration or shearing of blood vessels supplying a joint surface, resulting in the death of small areas of joint tissue (ibid., Roberts and Manchester 1995, 87). Repeated, low-grade, chronic trauma or micro-trauma is thought to play a role. The dead bone plaque breaks off from the joint surface and may remain loose in the joint (known as a 'joint mouse'), causing chronic pain and often precipitating osteoarthritis. Alternatively, the fragment may re-attach in its original position or be resorbed, and no further symptoms will be experienced.
In the St Martin's assemblage, one adult female (skeleton 145), two possible males (skeletons 86, an adolescent of 12-15 years, and skeleton 184, aged 30-40 years) and one child, aged 6-7 years (skeleton 24c) showed bony changes suggestive of this disorder. No secondary degenerative changes were observed.

Spondylolysis
Spondylolysis is the term given to separation of the vertebral arch from its body. Five adult skeletons (39, 100, 122, 185 and 195) were thus affected (3% of the total population, or 4% of adults). The former prevalence was higher than in the medieval lay assemblages of St Helen's, Fishergate (1%) (Holst 2005), St Andrew's, Fishergate (2%) (Stroud and Kemp 1993) and St Helen-on-the-Walls (0.6%) (Dawes and

Magilton 1980). Conversely, the prevalence at St George's, Canterbury, was much higher at 16%. The modern prevalence of spondylolysis is reported between 3% and 7% (Resnick and Niwayama 1981, 2253).

The site of predilection of this condition is the fifth lumbar vertebra (Mays 2006). Spondylolysis was identified in the fifth lumbar vertebra in all five individuals from St Martin's (true prevalence 5%). However, in adult female skeleton 100 both the fourth and fifth vertebrae were affected.

Formerly spondylolysis was considered a congenital anomaly of vertebral ossification but today the more favoured interpretation is a stress or fatigue fracture that fails to heal (Adams 1990, 191; Standaert and Herring 2000). The fracture is thought to result from sustained strenuous activity involving loading of the spine (Mays 2006, 352). Very few cases develop before the age of five years (Hensinger 1989). In the medieval rural population of Wharram Percy, Yorkshire, adult spondylolysis rates did not increase with increasing age, and thus, injury appeared to have been sustained in late adolescence or early adulthood. At this young age, the neural arches of the vertebrae have not reached their full structural strength, and are least able to resist the heavy biomechanical load placed on lower back during strenuous manual labour (Mays 2006). A proportion of St Martin's assemblage probably comprised peasants and townspeople involved in trade, where heavy manual labour involving carrying weights (e.g. loading and unloading heavy goods (eg corn) or raw materials) formed a significant proportion of daily work. No subadult cases were observed, the age of affected individuals ranging between 25-40 years, with a mean of 33 years.

In both clinical (Frederickson *et al* 1984) and dry bone studies (Molleson *et al* 1993, 87; Roche and Rowe 1951; Stewart 1953) there was a clear male predilection. In the Wharram Percy assemblage, however, no statistical difference between adult males and females was observed (Mays 2006). The same pattern appeared true for St Martin's, where three females and two males were affected.

Infection

Non-specific bone infection

In the vast majority of archaeological skeletons, the specific bacteria responsible for bone infection cannot be identified, and the pathology is referred to as 'non-specific' infection. Depending on the depth of penetration of the infection into the bone tissue, these lesions are categorised as periostitis, osteitis and osteomyelitis. Bone tissue response to infection involves both resorption and new bone formation. Inflammation of the periostium (periostitis) manifests osteologically as new bone formation on the surface of the bone. Penetration of infection deeper into the compact bone stimulates further bony proliferation, leading to noticeable thickening and sometimes, distortion of bone. This is known as osteitis. Where the infection penetrates into the marrow cavity, resorption causes pitting and thinning of the dense cortical bone and an enlarged marrow cavity. The pressure of accumulated pus within the infected marrow cavity may eventually burst through the thinned cortical bone, creating a smooth-sided drain or sinus (Roberts and Manchester 1995, 126). The pus is then discharged into the overlying soft tissue, spreading the infection further afield. This infection is known as osteomyelitis, and is the most severe form of bone infection. The capacity of the body's immune system to mount a defence against this infection is severely hampered by the relatively small blood supply to bone tissue. Even today, in an era of sophisticated medical care and antibiotic treatment, osteomyelitis remains one of the most difficult infections to treat. In the past, such infection could have rumbled along for years, causing chronic ill health, in some cases resulting in death.

In the St Martin's assemblage, seven skeletons (4%) showed bony changes consistent with periostitis. These included one child aged 9-10 years (skeleton 13), one male adolescent (131), two adult males (24 and 182) and three adult females (62, 75 and 166). The most common location of the lesions was the tibial shaft (shin bone), present in five skeletons. This is not surprising given that the shin bone is covered only by skin and localised skin infection in this area (often secondary to trauma or to venous and arterial ulcers) may easily spread to the underlying bone, initiating a periosteal reaction. Infection often spreads from the tibia to the adjacent fibula, as seen in skeleton 182, where new bone growth was extensive. The surfaces of the left and right fifth metatarsals of the feet of skeleton 24 also showed new bone formation. Ulceration of the feet, possibly exacerbated by ill fitting shoes, may have caused this infection.

Periostitis may also occur in response to conditions that affect the whole body (such as blood-borne infection, scurvy and some auto-immune diseases). This is suspected where periostitis is observed on a number of elements across the skeleton. For example, active periostitis was observed on the femora, fibulae and humeri (arm and leg bones) of subadults 13 and 131.

Bone infection was found in other medieval assemblages including a Gilbertine Priory (22%) in York (Stroud and Kemp 1993, 219), an Augustinian foundation (24%) at Canterbury (Anderson and Andrews 2001, 358) and St Helen-on-the-Walls, York, where over a third of all adults display tibial osteitis (Brothwell and Browne 1994, Grauer 1989). The highest prevalence occurs at St John de Berstrete, Norwich, where 45% of individuals were involved (Anderson 1996, 21). It is well recognised that levels of infection are directly related to population density and were less frequent (3%) in sparsely populated rural contexts in the medieval period (Henderson 1986).

Partly healed osteitis was observed in the tibial shafts (shin bones) of skeletons 2b, 18b and 32 (one adult male and two adult females), and in the lower jaw of skeleton 2c. The last does not appear to be the result of a dental abscess, and instead may be in due to a soft tissue injury in the cheek or jaw area. Similarly, in skeleton 112, thickening of the lower margin of the left lower jaw was present. Here a drain or sinus demonstrated that infection had spread deep within the bone.

Other non-specific infections in the St Martin's assemblage included chronic sinusitis involving the maxillary sinuses on either side of the nose, and a possible scalp infection of possible male skeleton 78; and an oral infection involving the hard palate in young adult male skeleton 130.

Fine new bone overlay the endocranial or inner surface of the skull of infant 138 (aged 12-18 months). The lesion was located on the right inferior quadrant of the occiput, just lateral to the superior internal occipital crest (at the back of the head)- the most common location for such lesions (Lewis 2007, 141). The appearance of the lesion was consistent with the 'frosted' description of Brothwell and Browne (1994). There was no evidence for lysis of the bone. The cause of this lesion is unclear, but its location suggested involvement of the meningeal blood vessels, either through shearing of these vessels in a subdural haemorrhage (bleeding around the brain), or as a result of chronic meningitis (Lewis 2004, 94; Lewis 2007, 142). The former is tentatively suggestive of child abuse, so-called 'shaken baby sydrome' (ibid). No fractures that would substantiate this interpretation were found in the near complete skeleton, however.

Tuberculosis

Tuberculosis may be spread to humans by the ingestion of infected meat and milk. The strain responsible is Mycobacterium bovis. Alternatively the disease may be spread from person to person by inhalation of airborne bacilli present in expectorated phlegm. The seat of the primary lesion in this form of tuberculosis is most commonly the lungs, and is caused by the strain Mycobacterium tuberculosis (Aufderheide and Rodriguez-Martin 1998). The latter route was the more common following urbanisation, where the spread of infection was facilitated by high population density, poor nutrition and housing, and the lack of public and personal hygiene. Tuberculosis was known historically from the medieval period, but it was really following the Industrial Revolution that it reached epidemic proportions.

Although known from the fourth millennium BC (Formicola *et al* 1987; Anderson 2001; Cox 1989; Stirland and Waldron 1990), only a few cases from the Anglo-Saxon and medieval periods have been recognised from skeletons (Roberts 1999). Twelve cases were identified in two urban assemblages from York (Brothwell and Browne 1994, 470-473; Stroud and Kemp 1993, 220-223) and a case of tubercular knee is known from Coventry Charterhouse, Coventry (Cole 1995, 72).

Prior to antibiotics, only 5-7% of modern tuberculosis sufferers displayed skeletal involvement (Steinbock 1976, 175; Aufderheide and Rodríguez-Martín 1998, 133), and hence, most cases of tuberculosis in the past undoubtedly go unrecognised. Of those modern sufferers with skeletal changes, lesions involving the spine have been reported in 25-50% of cases of skeletal tuberculosis (Roberts and Manchester 1995, 138). These lytic lesions in the vertebral bodies are caused by tubercular abscesses, which may result in compression fractures of the vertebral bodies, and spinal collapse which often manifests as a profound hunchback (kyphosis).

Such advanced pathology was not present in the St Martin's assemblage, although six skeletons (21, 64, 131, 148, 186 and 188) showed bony changes suggestive of the disease. Differential diagnosis was problematic in most cases, however. Adolescent female skeleton, 188, showed bilateral new bone growth on the inner surface of eight mid-thoracic rib shafts, which was active at the time of her death. In the past it was suggested that such costal changes are indicative of pulmonary tuberculosis (Kelley and Micozzi 1984; Wakely *et al* 1991), especially when bilateral (Roberts *et al* 1994). This was supported by an analysis of over 1,000 skeletons where the cause of death was known, which revealed that 61% of those recorded as dying of tuberculosis displayed rib lesions, as opposed to 15% of those dying from other causes (Roberts *et al* 1994). However, rib lesions alone have also been identified in other pulmonary diseases, including pleurisy, chronic obstructive airways disease and cancer (Roberts *et al* 1998), and hence, are not specific to tuberculosis.
Spinal lesions in two older children, 21 and 186, and one young adult female, 64, at St Martin's showed the lysis and smooth-walled lesions characteristic of tuberculosis. Less typically, they were located in the lumbar spine. In skeleton 186, cavities and a sinus (drain) were also present in the third metacarpal of the right hand. Widespread infection (possibly tuberculosis) was seen in a young female, 148. Like skeleton 188, active new bone was present on the inner surfaces of six ribs on the right side. The vertebrae were very fragmented, but no pathological changes were seen. However, both hip joints showed evidence of septic arthritis, with marked degeneration of the joint surfaces of the hip sockets and femoral heads. Both deposition and resorption of bone was present. Smooth, healed new bone and areas of active new bone suggested that the infection were of long standing. Woven bone was also present on the right pelvis adjacent to the hip joint. Although differential diagnosis was problematic, the association with rib lesions strongly suggested that this joint infection was tubercular in nature.

Metabolic disease

Iron deficiency anaemia

Iron deficiency anaemia in childhood may be observed in bony changes to the eye sockets (cribra orbitalia) and the skull (porotic hyperostosis). The former is known as cribra orbitalia, a term coined by Welcker in 1885 from the Latin cribrum, meaning a sieve or strainer, due to the sieve-like appearance of the socket in advanced cases.

Cribra orbitalia is widely thought to occur in response to a deficiency of iron in childhood. Although there are numerous causes (Von Endt and Ortner 1982; Walker 1986), iron deficiency is most commonly due to an inadequate dietary intake of iron, and/or as a result of severe intestinal parasite infestation (Hengen 1971; Kent 1987; Stuart-Macadam 1991, 101).

Iron is a central component of haemoglobin, the molecule necessary for the transportation of oxygen in the red blood cells of the blood. Red blood cells are produced within the red bone marrow of a number of bones of the body, which include the diploë (or spongy bone) of the skull, the sternum (breast bone) and the pelvis. In childhood, the diploë are particularly important, but become a secondary site of red blood cell production later in life. In iron deficiency anaemia, the body attempts to compensate for low serum iron levels by the thickening of these bones. Cribra orbitalia may be used as a generic indicator of physical stress in childhood. The physical symptoms of anaemia may be shortness of breath, fatigue, pallor and palpitations (Roberts and Manchester 1995, 167).

In the St Martin's assemblage, 24 skeletons showed evidence of iron deficiency anaemia (13%; or 19% of skulls). Cribra orbitalia was present in nineteen skeletons (10%; or 31% of eye sockets) and nine skulls showed changes consistent with porotic hyperostosis (5% of skeletons; or 7% of skulls), of which five occurred in the absence of eye socket lesions. Cribra orbitalia ranged in severity from mild (minor pitting seen in 11 cases), moderate (more defined pitting and porosity in three cases) to severe (marked exposure and outgrowths of the underlying spongy bone in three cases). The lesions were active in four individuals and healed in seven. Unsurprisingly in a disease of childhood, active lesions were found principally in younger individuals. The higher subadult rate was also probably due to remodelling of the bone of the eye sockets over time, during which the lesions were obliterated.

Table 7: Age and sex distribution of cribra orbitalia (N = 19) (Percentages are CPRs)

Age categories	Male	Female	Unknown (subadults)	Total
1	0	0	0	**0**
2	0	0	0	**0**
3	0	0	2	**2**
4	0	0	4	**4**
5	0	0	1	**1**
6	2	1	0	**3**
7	2	2	0	**4**
8	2	1	0	**3**
9	2	0	0	**2**
10	0	0	0	**0**
Total	**8** *(11.43%)*	**4** *(5.78%)*	**7** *(13.21%)*	**19** *(10.16%)*

Subadults showed the highest prevalence of the disease (13%), with the greatest number in children aged between four and six years. This peak was also found in the larger medieval assemblages of Wharram Percy, St Helen-on-the-Walls, York, and Raunds Furnells (Lewis 2002, 46). Subadult prevalence was as high as 64% at Fishergate, York (Lilley *et al* 1984) and 70% at St John de Berstrete, Norwich (Anderson 1996). Interestingly the age at which cribra orbitalia peaked in the St Martin's assemblage corresponds with the peak in mortality in the this age group suggesting that this age group experienced the greatest ill health in the growing years.

The prevalence of pitting in subadult skeletons where eye sockets were present was compared to three other medieval subadult assemblages (Table 8). Whereas a third of subadults of St Martin's were affected, more than half of subadults from the other sites showed these changes. The true prevalence of cribra orbitalia and porotic hyperostosis combined in the total lay assemblage of Abingdon Abbey was 56% (Wakely 2006) -almost three times higher than at St Martin's. Cribra orbitalia was found in 20% of the total population of St Helen's Fishergate, or 40% of eye sockets present (Holst 2005). This suggestes that the population of St Martin's enjoyed better general health during childhood than many of their rural and urban contemporaries.

Table 8 Prevalence of cribra orbitalia from four comparative sites (Comparative data taken from Lewis 2002, 82)

Assemblage	Individuals with eye sockets affected	No. affected	True prevalence rate (%)
St Martin's, Wallingford	6	18	33
Raunds Furnells	84	46	55
Wharam Percy	200	112	56
St Helen-on-the-Walls	87	49	56
Total	**377**	**225**	**60**

Interestingly, adult males from St Martin's showed twice the prevalence of adult females, suggesting a poorer diet and/or greater intestinal parasite load in male children. The sample size was fairly small, however. At Blackfriars, Ipswich, cribra orbitalia was more frequent in males (3:2) than females (Mays 1991). However, at many sites, including Whithorn (Cardy 1998, 546); York (Lilley *et al* 1994) and St John de Berstrete, Norwich (Anderson 1996, 19), the converse was true.

Miscellaneous pathology

Freiberg's Infraction

Adult female skeleton 166 with osteoarthritis of the second metatarsal of the left foot presented with localised bone destruction (osteonecrosis) of the upper aspect of the adjacent metatarsal head. The affected third toe was contracted. This condition is known as Freiberg's infraction (Freiberg 1914). Normally, the longest metatarsal (the second) is the site of predilection (ibid) but the third and the fourth metatarsal heads may be implicated (Resnick and Niwayama 1981, 2885). Typically, the condition affects the growing subadult skeleton and is three to four times more common in females than males (ibid.). The condition appears to be related to repeated stress and strain on the metatarso-phalangeal joints (Freiberg 1914). Indeed, it has been suggested that such stress may be related to the wearing of high-heel shoes (Resnick and Niwayama 1981, 2889). It is highly unlikely that this was the underlying cause for this, or an early medieval case from Kent (Anderson and Carter 1993), as medieval shoes were made without raised heels. It was only in the late 16th century that the

raised heel made a tentative appearance in Western European footwear (Carlson 1999). Even then it is doubtful that the heel was sufficiently high to induce Freiberg's infraction.

Congenital anomalies

A range of anomalies observed in the St Martin's population was developmental in nature (Table 9), most commonly involving the midline of the body, but occasionally also including elements of the appendicular skeleton, such as the hands and feet. Such anomalies result from a wide range of variables, including environmental conditions within the womb whilst the embryo or foetus is developing, and/or genetic predisposition to a particular trait. In the vast majority of cases, these anomalies do not affect the wellbeing or survival of the individual.

Midline defects or anomalies

One adult male (skeleton 196) and two adult females (skeletons 5 and 210) displayed non-fusion of the neural arch, known as spina bifida occulta (2% of the adult population). In skeleton 196, the first and second sacral segments were involved, whilst sacral segments 4 and 5 were affected in the females. Unlike spina bifida aperta or cistica (which include the lumbar vertebrae), this condition generally has no functional effects on the individuals concerned. It has a strong hereditary component, and may tentatively suggest familial relationships between skeletons. The prevalence of this condition is relatively high, from 5-25% in modern populations (Aufderheide and Rodriguez-Martin 1998). Wakely (unpublished) comments on the relative rarity of this defect in pre-industrial populations. She recorded the presence of spina bifida occulta in 18 adult skeletons from the medieval assemblage of Abingdon Abbey (5% of all individuals, or 13% of those adult skeletons with complete spines present). Only one case was recorded by White (1988) from the total population of St Nicholas's, Shambles, London (0.5%), and 9% of the total population, or 18% of the adult population of Fishergate House, York (Holst 2005). Hence, the percentage of affected individuals from St Martin's was fairly low, half the adult prevalence of the nearby Abingdon Abbey assemblage.

Other anomalies of the lower back found in the St Martin's assemblage included sacralisation (when the lowest lumbar vertebra (L5) fuses with the sacrum); and the presence of a sixth lumbar vertebra (where all five sacral segments are present but an additional lumbar vertebra is present). In skeleton 130, L5 appeared to be fused to the first sacral segment, although the sacrum was incomplete. In skeletons 11 and 207, an additional sixth lumbar vertebra was partly fused to the sacrum, whilst in skeleton 127 a completely separate sixth lumbar vertebra was present. Although only the first sacral segment was present, this was morphologically normal.

An additional thirteenth thoracic vertebra was present in the spine of skeleton 13. Hypoplastic (under-developed) 13th ribs were also present (additional to the normal 12 per side). In female skeletons 6 and 188, the first lumbar vertebral had a facet for articulation with a thirteenth rib; whilst in female skeleton 64 and male skeleton 122 these facets were absent, as were the twelfth ribs. In male skeleton 107, the right twelfth rib was hypoplastic (under-developed).

In the lower neck region of skeleton 11, a rudimentary cervical rib was attached to the sixth cervical vertebra. Cervical rib formation has a genetic component and is familial (Barnes 1994). Whilst this condition is not uncommon (Ortner and Putschar 1981), cervical ribs may have functional sequele to the individual. In 10% of cases, particularly where the rib is large, constriction of the blood and nerve supply to the arms and shoulders may result, causing coolness, tingling and loss of sensation in

the upper limb (Aufderheide and Rodriguez-Martin 1998). Symptoms usually appear at about 30 years of age (ibid). In extreme cases, limb asymmetry and even gangrene of the fingers may develop (Finnegan 1976). Given the small size of the cervical rib of skeleton 11, such symptoms are unlikely to have been significant.

Table 9 Summary of congenital anomalies in the St Martin's population

Skeleton	Sex	Age (years)	Midline variants	Appendicular variants
5	female	35-45	S 4 & 5: Spina bifida occulta	
6	female	35-45	L1 facet for R rib. T10 absence of L CT facet	
11	? male	35-45	L6: partial sacralisation, C6: rudimentary cervical rib attacjed to transverse process	
32	male	28-35	R mastoid process: rudiments of bifid process	
60	female	45-55	C1: bifid anterior arch	
64	female	22-26	T12: absent costal articulating facets, absent 12th ribs	
76	? female	35-45	T13: additional vertebra with hypoplastic ribs	
101	?male	35-45	C1: posterior bifid arch	
107	male	50-60	R 12th rib: hypoplastic	
114	-	5-6	C3 & 4: L arches fused	
117	-	13-16		L femoral proximal shaft: distinct a-p bowing (c. 20 degrees), narrowed midshaft M-L, deep a-p
120	male	37-32	C2: L posterior bridge not ossified	
122	male	30-40	L 12th rib: absent; T12: no costal facet	
125	-	adult	T2: additional inferior facet articulates with T3 below- facet here	
127	female	27-32	L6: present	
130	male	20-25	L5: fused to S1 (sacrum incomplete)	
141	male	35-45		L and R metastyloidium: capitate and styloid fused
146	male	35-45	T1: L transverse process reduced	
155	male	adult		L MCP 3: metacarpal fused to capitate- Os metastyloideum
156	male	40-45	C1: bilateral anterior bars not ossified anterior to foramen	
180	female	40-50		L hand: Os metastyloideum, lip fused to trapezoid
195	female	30-35	R 3rd rib: abnormal curvature lateral to CT facet	
196	male	40-50	S1-2: spina bifida occulta	L navicular: Os tibiale with possible cavity for ossicle
203	-	14-17		L MC3 fused to capitate
207	male	30-40	L6 fused to sacrum- attempted separation (5 x S vertebrae present). Manubrium and sternal body markedly wide.	
210	female	35-45	S4-5: Spina bifida occulta	

Non-metric traits

Non-metric traits are minor variations that are too minor to influence the biological success of the individual. These traits have been used in archaeology to indicate genetic relationships between skeletons. However, their value has been questioned, as many traits may be environmentally produced (for example, muscle pull of bone during strenuous exercise may cause traits such as plaques and bony outgrowths of the femoral head and neck to develop). Gruneberg (cited in Tyrrell 2000, 290) also postulates that the expression of a genetically inherent trait requires certain environmental factors to coalesce and overcome a certain threshold before the trait may be expressed. These studies do cast some doubt on the value of non-metric traits as indicators of familial relationships. Sjovold's 1984 study of a European post-medieval sample with known familial relationships indicated that overall, non-metric traits of the skull were more heritable than traits on the rest of the skeleton (cited in Start and Kirk 1998, 171).

All the skeletons from St Martin's were examined for non-metric traits, but due to the influence of growth and development on many features, only the adults (N = 139) were included in prevalences presented below (Table 10).

Metopism was present in 10 skeletons (7%) and 73 skulls (14%). During development the skull of the forehead (frontal bone) comprises two plates joined centrally by the metopic suture. In the majority of cases, this suture fuses in the second to third year of life (Hauser and De Stefano 1989, 41). Where the suture is not obliterated is known as metopism. This is one of the more heritable traits and has been used to suggest familial relationships between individuals of a population. The prevalence at St Martin's was high compared to a prevalence of 3% in 182 modern adult skulls from London examined by Berry (1979).

Another very unusual and highly heritable trait in British populations is the os inca of the occipital bone. Four skulls at St Martin's (2c, 32, 35, 188 and 212) showed this feature (5% of skulls), and may be genetically related to one another.

Interestingly, two skulls (skeletons 35 and 202) from St Martin's had an additional small bone or ossicle at the junction of the saggital and coronal sutures (3% of skulls), known as the bregmatic bone. Skeleton 35 also had an unfused metopic suture, whilst the second skeleton did not. The bregmatic bone, a highly uncommon trait, is strongly suggestive of a familial relationship. In a modern London population, 0.7% of skulls showed this trait (Berry cited in Hauser and De Stefano 1989, 97).

More common ossicles are Wormian bones, small additional bones found within the lambdoid suture at the back of the head. In the St Martin's assemblage, 43% of skulls showed this trait. There appeared to be a strong tendency for individuals with open metopic sutures also to have lamdoid ossicles (80%), whilst no association was observed between metopism and the presence of other ossicles.

Some non-metric traits are caused by environmental factors, although it does appear that some individuals have a greater genetic predisposition than others. One example is the palatine torus, found in four individuals of St Martin's churchyard (7%). This trait is thought to be a strong bony response to irritation associated with the chewing of coarse food (Hauser and De Stefano 1989, 176).

Another trait that has been associated with activity is squatting facets on the distal tibiae of the ankle joint, which are thought to form in response to repeated and prolonged hyperdorsiflexion of the foot (Ubelaker 1999, 103). Modern adults who spend a large amount of time squatting develop these facets, whilst in archaeological

populations, a high prevalence has been found in societies where furniture was lacking (Boulle 2001), in monastic communities where kneeling was prolonged (Ullinger *et al* 2004), and in rural agrarian populations where ploughing was practised (Ari *et al* 2003, Mays 1998). Adults from St Martin's displayed a high rate of medial squatting facets (51%), but lateral facets were uncommon (3%). The significance of this difference is unclear but may relate to a specific movement of the ankle joint.

Table 10a: Summary of true prevalence rates (TPR) of cranial non-metric traits in adults (N = 139)

Trait	Number with traits present	Number of landmarks present	TPR (%)
Metopism	10	73	13.70
Bregmatic bone	2	70	2.86
Coronal ossicle	3	64	4.69
Saggital ossicle	2	71	2.82
Lambdoid ossicle	33	76	43.42
Os inca	4	73	5.48
Ossicle at asterion	9	74	12.16
Parietal notch bone	7	75	9.33
Squamous-parietal ossicle	1	63	1.59
Epiteric bone	5	48	10.42
Os japonica	0	61	-
Frontal notch	40	66	60.61
Supra-orbital foramen	20	65	30.77
Parietal foramen	26	80	32.50
Mastoid foramen absent	31	70	44.29
Mastoid foramen extra-sutural	33	54	61.11
Zygomatic -facial foramen	22	69	31.88
Accessory infra-orbital foramen	2	33	6.06
Anterior ethmoid foramen	1	25	4.00
Posterior ethmoid foramen	2	24	8.33
Hypoglossal canal patent	15	67	2.39
Foramen ovale incomplete	0	53	-
Foramen of Huschke present	6	77	7.79
Condylar facet double	1	68	1.47
Post-condylar canal patent	31	64	48.44
Precondylar tubercle	2	67	2.99
Mental fossa multiple	0	69	-
Maxillary torus	0	60	-
Palatine torus	4	57	7.02
Mandibular torus	0	72	-
Mylo-hyoid bridge	1	66	1.52

Table 10b: Summary of true prevalence rates (TPR) of post-cranial non-metric traits in adults (N = 139)

Trait	Number with traits present	Number of landmarks present	TPR (%)
Atlas facet double	7	70	10.00
Atlas posterior bridge	4	67	5.97
Atlas lateral bridge	0	69	-
Accessory sacral facet	11	75	14.67
Sternal foramen	0	35	-
Os acromiale	1	54	1.85
Supra-scapular foramenn/ notch	1	50	2.00
Humeral septal aperture	7	74	9.46
Humeral supra-condylar spur	1	79	1.27
Innominate acetabular	8	64	12.50
Poirier's facet (femur)	4	73	5.48
Plaque (femoral head)	10	76	13.16
Allen's fossa (femur)	13	76	17.11
Third trochanter	5	81	6.17
Hypotrochanteric fossa	13	83	15.66
Patella vastus notch	2	45	4.44
Emarginate patella	0	44	-
Medial squatting facet (tibia)	1	37	2.70
Lateral squatting facet (tibia)	20	39	51.28
Calcaneal facet form A	16	37	43.24
Calcaneal facet form B	19	36	52.78
Calcaneal facet form C	0	36	-
Calcaneal facet form D	0	35	-
Calcaneus secundarium	2	33	6.06
Cuneiform/metatarsal double facet	2	29	6.90

7.7 Discussion and conclusion

The distribution of males, females and subadults indicated that the St Martin's assemblage was composed of laymen, and probably included ordinary townspeople, such as traders, servants, and retainers at the castle. The presence of cists and charcoal burials indicated that at least some individuals might have been of high social standing. The age distribution was slightly unusual, in that there was a low incidence of newborns and infants, and a larger than expected proportion of adolescents. Longevity in adulthood was much lower than the modern day with a peak in mortality in the mature adult age category (35-45 years). Although this peak may in part be due to limitations in osteological ageing methods, the marked difference between this category and older adults makes it probable that it does reflect a real mortality pattern. This pattern did not appear markedly different between males and females. The cause of death could not be recognised in any individuals with certainty. Most would have been carried off by diseases that leave no trace on the skeletons, such as infection, accidents and some chronic diseases (e.g. of lungs). Given the younger age of this population, it is unlikely that diseases associated with old age, such as coronary heart disease and cancer, would have caused as high a proportion of deaths as they do today.

Overall, the general health of this assemblage compared favourably with that of other medieval populations in England. Indicators of general health in the first two decades of life are reflected in adult stature, rates of cribra orbitalia and dental enamel hypoplasia. Adult stature was comparable with other lay populations, both locally and further afield. Male stature in the Wallingford assemblage was considerably lower than two assemblages in Oxford, however, in which there were a high proportion of monks and high status burials. This reflected similar findings to Waldron (1984), who noted the greater male stature of monks over laymen. There was no consistent difference in stature between urban and rural populations.

Dental enamel hypoplasia reflects prolonged episodes of malnutrition and ill- health in the first 12 years of life. The rate recorded for the St Martin's assemblage (7%) was considerably lower than the prevalence of 35% calculated in 28 medieval assemblages in Britain (Roberts and Cox 2003, 264). Cribra orbitalia and porotic hyperostosis rates were also considerably lower in the subadult population of St Martin's compared with nearby Abingdon Abbey's lay assemblage, urban assemblages from York (Holst 2005) and Norwich (Anderson 1996), and the rural assemblages of Raunds Furnells and Wharram Percy (cited in Lewis 2002). This suggests better general health of the Wallingford assemblage than many of its medieval counterparts. The reason for this difference is unclear, but may lie in the general prosperity of the town in the immediate post-Conquest period. In addition, the population would have principally comprised townsfolk, with only a small proportion being of the disadvantaged peasantry. Living conditions within the town were probably better than some larger cities of the period, lacking the extremities of public health failures of contaminated drinking water and food, and vast accumulations of uncollected rubbish and nightsoil, with their associated spread of disease. Nevertheless, to modern eyes, medieval Wallingford would have been far from sanitary.

One predominantly urban disease, tuberculosis, was evident, however, with at least three skeletons showing lesions characteristic of the disease. Chronic respiratory disease (possibly pulmonary tuberculosis), involving only the ribs, was seen in a further two skeletons.

Everyday life in medieval Wallingford was not without its accidents, assaults and injuries. The prevalence of fractures was slightly higher than other medieval populations, with rib fractures, parry fractures of the ulna of the forearm, and fractures of the metacarpals suggestive of interpersonal conflict (although other accidents should also be considered). One undoubted case of assault was the dramatic blade and blunt instrument injuries to the skull of skeleton 8. He certainly survived this attack, as both wounds showed evidence of advanced healing.

Other fractures and soft tissue injuries to the muscles and ligaments suggested that at least a proportion of the St Martin's population was involved in strenuous and sometimes dangerous physical activity. Osteochondritis dissecans affecting long bone joints, and spondylolysis of the lumbar vertebrae suggested that this strenuous activity began young in some individuals- in their teens or twenties. This is not surprising given that adolescents were expected to work as adults, and where many jobs involved considerable physical activity (e.g. loading and unloading corn or other trade items). Undoubtedly, such activities would have accelerated the wear-and-tear on some joints, manifesting as degenerative joint disease and/ or osteoarthritis. In the St Martin's assemblage, the spine was worst affected, but DJD and ostearthritis in the rest of the skeleton was surprisingly rare, and may reflect the youth of this assemblage.

Conclusion

Osteological analysis of the assemblage of St Martin's churchyard, has offered fascinating insights of the lives of ordinary townspeople of Wallingford. Unfortunately, as only a proportion of the total burial population was excavated and examined, and hence, it is impossible to be certain that this assemblage was representative of the whole. Overall, this assemblage showed many characteristics of other medieval populations, but displayed a better general health.

8 THE POTTERY by Paul Blinkhorn

The pottery assemblage comprises 348 sherds (of which 117 come from the churchyard) with a total weight of 8669g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference was 3.44. The majority of the pottery dates to the mid 11th- to the 13th centuries, although small quantities of residual late Saxon material was also present, along with small amounts of post-Civil War material. The group is a useful addition to previously somewhat restricted corpus of knowledge regarding the pottery of the town.

8.1 Analytical methodology

The pottery was initially bulk-sorted and recorded on a computer using DBase IV software. The material from each context was recorded by number and weight of sherds per fabric type, with featureless body sherds of the same fabric counted, weighed and recorded as one database entry. Feature sherds such as rims, bases and lugs were individually recorded, with individual codes used for the various types. Decorated sherds were similarly treated. In the case of the rimsherds, the form, diameter in mm and the percentage remaining of the original complete circumference was all recorded. This figure was summed for each fabric type to obtain the estimated vessel equivalent (EVE).

The terminology used is that defined by the Medieval Pottery Research Group's Guide to the Classification of Medieval Ceramic Forms (MPRG 1998) and to the minimum standards laid out in the Minimum Standards for the Processing, Recording, Analysis and Publication of post-roman Ceramics (MPRG 2001). All the statistical analyses were carried out using a Dbase package written by the author, which interrogated the original or subsidiary databases, with some of the final calculations made with an electronic calculator. Any statistical analyses were carried out to the minimum standards suggested by Orton (1998-9, 135-7).

The pottery was recorded utilizing the coding system and chronology of the Oxfordshire County type-series (Mellor 1984; 1994), as follows (the alphanumeric codes prefixed with an 'F' are those used in the site database):

8.2 Fabrics, chronology and occurrence

Fabrics

F100: OXR: St. Neots Ware type ware, AD850-1100. 6 sherds, 132g, EVE = 0.36
F101: OXB: Oxford Ware. Late 8th– early 11th centuries. 1 sherd, 30g, EVE = 0.12
F200: OXAC: Cotswold-type ware, AD975-1350. 9 sherds, 143g, EVE = 0.04
F202: OXBF: North-East Wiltshire Ware, AD1050-1400. 35 sherds, 549g, EVE = 0.18
F301: WA38: Wallingford ware, AD1050-1250. 196 sherds, 3068g, EVE = 1.60
F302: OXAG: Abingdon/Ashampstead ware, mid 11th-14th centuries. 41 sherds, 1118g, EVE = 0
F352: OXAM: Brill/Boarstall ware, AD1200-600. 11 sherds, 1608g, EVE = 1.14
F425: OXDR: Red Earthenwares, 1550+. 8 sherds, 807g

F451: OXFH: Border wares, 1550-1700. 1 sherd, 2g
F414: OXBEW: Staffordshire manganese wares. *c* 1700-1800. 2 sherds, 56g
F410: OXCE: Tin-glazed Earthenware, 1613-1800. 3 sherds, 120g
F433: OXFM: Staffordshire White-glazed English Stoneware,1720-1800. 1 sherd, 2g
F438: OXEST: London stoneware. *c* 1680 plus. 3 sherds, 535g
F418: CRM: Creamware, mid 18th-early 19th centuries. 10 sherds, 230g
F419: PW: Pearlware, 1770-1900. 2 sherds, 93g
F1000: WHEW: Mass-produced white earthenwares, 19th-20th centuries. 16 sherds, 156g

In addition, the following wares, not included in the Oxford type-series, were also noted:

F303: 'M40' type ware, ?Late 11th–14th centuries (Hinton 1973). Hard, flint and limestone unglazed ware, with a possible kiln sources at Camley Gardens near Maidenhead (Pike 1965) and Denham in Buckinghamshire (op cit Mellor 1994, 86). Known at numerous sites in south Oxfordshire and Berkshire. Some vessels have distinctive vertical combing on the body. So-called due to it first being noted at sites excavated along the line of the M40 motorway. 2 sherds, 26g, EVE = 0.

F361: London-type ware, late 12th–14th centuries (Pearce *et al* 1985). Manufactured at unknown source(s) near London. Reddish brown sandy fabric with occasional sandstone, shell, organic and iron ore fragments. Vessels mainly glazed jugs, some highly decorated. The material is found in small quantities throughout eastern southern England, especially in the earlier medieval period, when many local glazed ware industries had yet to be established. The sherd from this site was from a vessel with white slip stripes and a green glaze, a decorative scheme typical of the industry (ibid). 1 sherd, 4g, EVE = 0.

This range of fabrics is typical of medieval sites in Wallingford, and can be paralleled at a number of sites in the town. The pottery occurrence by number and weight of sherds per context by fabric type is shown in Table 11. Each date should be regarded as a terminus post quem.

Chronology

Each context was given a seriated ceramic phase date, based on the wares present, as shown in Table 11, which also has the pottery occurrence per ceramic phase. The data show that the bulk of the activity at the site took place in the medieval (AD1050-14th century) period, and, to a lesser extent, from the late 17th century onwards. There was no pottery deposited in the period AD1400-1550, despite earlier wares being noted in post-medieval contexts (see Table 12, below). In addition, the defining wares of that period which common occur at other sites in the region, ie German Stonewares (Oxford fabric OXST), 'Tudor Green' (OXBN) and Cistercian ware (OXCL), are entirely absent from this site. Later Brill/Boarstall wares were similarly not present. It is likely therefore that there was an hiatus in activity here during the later medieval period, rather than deposits of that date having been removed by post-medieval activity.

Table 11: Ceramic phasing: defining wares and pottery occurrence per phase by number and weight (g) of stratified sherds and EVE, all fabrics

Ceramic Phase	Date	Defining Wares	No	Weight (g)	EVE
CP1	AD1050-1200	OXAC, OXBF, OXAG, WA38	159	3009	1.15
CP2	AD1200-1400	OXAM	110	3141	2.29
CP3	AD1400-1475	OXBN	0	0	0
CP4	AD1475-1550	OXCI	0	0	0
CP5	AD1550-1600	OXDR, OXFH	1	87	0
CP6	AD1600-1680	OXCE	0	0	0
CP7	AD1680-1720	OXEST, OXBEW	29	1320	0
CP8	AD1720–1760	OXFM	1	2	0
CP9	AD1760-1800	CRM, PW	22	819	0
MOD	AD1800+	WHEW	17	165	0
Total*			**339**	**8543**	**3.44**

*Eight sherds (86g) were unstratified

Pottery occurrence

The pottery occurrence per ceramic phase by weight (major fabrics only), expressed as a percentage of each phase assemblage, is shown in Table 12. The medieval assemblage is dominated by Wallingford ware in ceramic phase CP1, along with Ashampstead ware, and with North-East Wiltshire ware also common, but in CP2, only Wallingford ware continues to be well-represented, with the other fabrics largely falling from use, and Brill/Boarstall replacing them. The last of these is perhaps somewhat over-represented (see below) due to the presence of a complete jug (Fig 26 and rear cover photo) from context [105].

Only one sherd could be dated to the period CP3 – CP6, although the CP7 assemblage is fairly large. This was dominated by English Stoneware, with Red Earthenware also common. Residual medieval pottery was also present in this phase, making up 19.5% of the total phase assemblage. This suggests that that there have been considerable disturbance of the medieval strata during this period. Red Earthenware was the main fabric in the CP9 assemblage, although both Pearlware and Creamware were quite common, suggesting that the occupants of the site were of perhaps somewhat wealthier than average at that time. Residual medieval wares were again present, but this time they comprised only 14% of the assemblage.

Table 12: Pottery occurrence per site phase by fabric type, main fabrics only, expressed as a percentage of the phase total by weight (in g)

	CP1	CP2	CP3-4	CP5	CP6	CP7	CP8	CP9	MOD
OXR	2.3	0.4	0	0	0	0	0	0	0
OXAC	4.0	0.8	0	0	0	0	0	0	0
OXBF	15.3	1.8	0	0	0	2.0	0	0	0
WA38	45.6	46.1	0	0	0	11.5	0	1.8	0
OXAG	32.8	3.0	0	0	0	2.8	0	0	0
OXAM	-	46.7	0	0	0	3.2	0	12.0	0
OXDR	-	-	-	100	0	28.2	0	42.5	0
OXFH	-	-	-	0	0	0	0	0.2	0
OXCE	-	-	-	-	0	8.4	0	0	5.5
OXBEW	-	-	-	-	-	4.2	0	0	0
OXEST	-	-	-	-	-	38.0	0	4.0	0
OXFM	-	-	-	-	-	-	100	0	0
CRM	-	-	-	-	-	-	0	28.1	0
PW	-	-	-	-	-	-	-	11.4	0
WHEW	-	-	-	-	-	-	-	-	94.5
Total	**3009**	**3141**	**0**	**87**	**0**	**1320**	**2**	**819**	**165**

8.3 The assemblage

Ceramic Phase LS, c AD900-1050.

No sherds of this Phase were in stratified, undisturbed contexts on the site so this cannot be strictly called a ceramic phase of the site. These may have been imported with soil or other material. Six sherds of St Neots ware were noted, but all were redeposited in later contexts. They were all jar rims, and are likely to be from the later end of the life-span of the industry, as most had rim diameters *c* 200mm, which is quite large for such pottery. Early St Neots ware jars are usually much smaller (Denham 1985). A single rimsherd of mid-late Saxon Oxford Shelly ware also occurred but had been re-deposited.

Ceramic Phase CP1, c AD1050 - 1200 *(159 sherds, 309g, EVE = 1.15)*

This assemblage was dominated by wares from fairly local sources. The most common type was Wallingford ware (WA38; 95 sherds, 1363g, EVE = 0.69). It mainly comprised plain bodysherds, although nine rimsherds were also present. Seven of these were from jars, one from a bowl and one from a skillet. The jar rims were mainly simple upright beaded forms, although a single thumbed 'piecrust' example was also present. The bowl rim was a simple upright form. The skillet was represented by quite a large sherd. Such vessels are somewhat unusual in pottery assemblages of this early date, and it is possible that it is from a 13th-century context which lacks the defining ware.

Ashampstead ware (OXAG; 28 sherds, 987g, EVE = 0) was also common at this time. No rimsherds were present, but the bodysherds all appear to be from glazed and slip-decorated jugs. The North-East Wiltshire ware (OXBF) assemblage (26 sherds, 461g, EVE = 0.18) was dominated by plain bodysherds, probably from jars, and rimsherds from three jars were present, as was a single example from a bowl.

The minor wares comprised St Neots ware (OXR; 4 sherds, 69g, EVE = 0.28). All were rimsherds from jars, and were fairly large, with rim diameters = c 200mm. It is entirely possible, given the size of the vessels, that these are contemporary. The rest

of the phase assemblage comprised six plain bodysherds (199g, EVE = 0) of Cotswolds ware.

Of the following, only a small proposrtion derives from the churchyard, but is mainly associated with the sequence in Trench 1.

Ceramic Phase CP2, c AD1200 - ?1400 *(110 sherds, 3141g, EVE = 2.29)*
This phase sees the arrival of Brill/Boarstall ware (OXAM) and a sharp decline in the use of Ashampstead and North-East Wiltshire wares. Brill/Boarstall ware is the major ware by weight (6 sherds, 1468g, EVE = 1.14), but this is largely due to the presence of a near-complete, highly-decorated, pear-shaped jug (Fig 26 and rear cover photo). The vessel is very typical of the mid-late 13th-century Brill/Boarstall tradition, with another near-complete vessel of this form with very similar decoration known from Oxford (Mellor 199, fig. 61, 5).

The rest of the Brill assemblage comprises relatively small glazed and decorated bodysherds, apart from a single small rimsherd from a jug. Sherds of Wallingford ware (WA38) were more numerous (80 sherds, 1498g, EVE = 0.91), but the assemblage was more fragmented. Plain bodysherds apart, 13 rimsherds were present, one of which was from a jug, the rest jars. The jar rimforms were all of the same basic types as those of the preceding phase, and a single 'piecrust' type was noted.

The minor wares included residual material in the form of single rimsherds in St. Neots ware and Oxford Shelly ware. Three sherds (24g) of OXAC were present, including a small fragment of a rimsherd, with the rest of the phase assemblage consisting of six plain bodysherds (55g) of OXBF, 11 sherds (94g) of OXAG including a handle, and a bodysherd with rouletting, a small sherd of 'M40' ware with scratch-marking, and a small sherd of glazed London-type ware.

The following derive primarily from Trench 1, and none derives from the churchyard.

Ceramic Phase CP5, c AD1500 - 1600 *(1 sherd, 87g)*
The only pottery from this ceramic was a single sherd from a Red Earthenware vessel, probably a bowl or pancheon.

Ceramic Phase CP7, c AD1680 - 1720 *(1 sherd, 87g)*
This phase sees the first large deposit of pottery since the 13th century, although the entire phase assemblage consists of material from just two contexts. Residual medieval wares, in the form of Wallingford Ware, North-East Wiltshire ware, Brill/Boarstall ware and Ashampstead ware make up 19.5% (by weight) of the assemblage, suggesting that there was considerable ground disturbance at this time.

Most of the contemporary pottery came from a single context, [39], which produced a small number of large sherds. It is dominated by English Stoneware (OXEST; 2 sherds, 502g), largely due to the presence of one sherd (488g) from the base of a very large Lambeth-type dipped tankard. The rest of the context group consists of three large sherds of Red Earthenware (372g), including fragments of a colander and a cauldron and two good-sized fragments of Tin-Glazed Earthenware (111g), one of which is from a chamber-pot. The only other contemporary pottery is two sherds (56g) of Manganese Mottled ware (OXBEW) from context [4]. This is a typical late 17th to early 18th-century assemblage, and is most likely domestic in nature, or from an inn or similar.

Ceramic Phase CP9 c AD1760-1800 *(22 sherds, 819g)*
This assemblage, as with that of the previous phase, is from just two contexts. Residual medieval material is again present, in the form of Wallingford ware, Border ware and Brill/Boarstall ware, comprising 14% (by weight) of the group. The major type is fragments of utilitarian vessels in Red Earthenware (4 sherds, 348g), with the bulk of the rest of the assemblage comprising fineware soup-bowls, plates and chamber-pots in Creamware (10 sherds, 230g) and Pearlware (2 sherds, 93g). A single sherd of English Stoneware (33g) is also present. Again, it is typical of a domestic assemblage of the period.

Ceramic Phase MOD, c AD1900+ (*17 sherds, 165g)*
This assemblage comprised entirely transfer-printed, mass-produced white earthenware, apart from a single sherd of residual, plain Tin-Glazed earthenware

Catalogue of illustrations (Fig 26)
Near-complete jug. fabric OXAM, CP2. Salmon pink fabric with an apple-green, copper speckled exterior glaze. Applied rouletted strips in body clay and a reddish-brown firing, iron-rich clay. Context 105, See also rear cover photo

8.4 Overview

This assemblage is a useful addition to the corpus of pottery from Wallingford, and is one of the largest groups of medieval pottery excavated in the town in recent years. The ceramic sequence here is perhaps less well-understood than other centres in Oxfordshire such as Oxford, Chalgrove and Abingdon, with Mellor (1994, 93) noting that well-stratified sequences were needed to increase the understanding of the pottery of the town. This group has helped in this regard, and reflects very well the sharp decline in Wallingford's economic fortunes from the 14th century onwards.

The late Saxon pottery, such as it is, appears to reflect Mellor's earlier findings (ibid 1994, fig 9) that St. Neots ware is the dominant pottery type at that time. The medieval pottery assemblage is similar in that Wallingford ware is the major ware between *c* AD1080-1250, along with OXAG and OXBF (ibid fig 24). Mellor did not have much data for the 'high' medieval period due to the lack of sites, as she noted, but the data from this site offers useful information in this regard. Superficially, it would appear that Wallingford ware and Brill/Boarstall ware were used in about equal measure at the site, but, as noted above, the data is skewed by the presence of a near-complete Brill/Boarstall jug (Fig 26 and rear cover photo). This vessel aside, just ten other sherds of this pottery type were noted from the entire site, whereas nearly 200 sherds of Wallingford ware were noted. The economic decline of the 14th century in the town cannot be entirely to blame, as Brill/Boarstall ware had been in common use for nearly a century by that time. It would appear that the reason for this is that Wallingford was on the edge of, or beyond the main distribution range of this particular pottery type. Certainly, from Mellor's earlier work (ibid fig. 36), Brill/Boarstall ware is not as common at Chalgrove as it is at more northerly sites near the production site, such as Oxford, and at sites to the south of Wallingford, and hence further still away from source, such as Newbury, Reading and Henley, it is very rare indeed (ibid).

The pattern of pottery distribution here, mainly from Trench 1, south of the churchyard, is reflected in other recent excavations in the town. For example, at 17A Castle Street (Blinkhorn in print), there was no late medieval pottery, and just one sherd of Brill/Boarstall ware out of an assemblage of 100 sherds of medieval pottery, and a number of other small assemblages from the town, seen by the author, have produced exactly the same pattern. The presence of wares such as 'M40' ware,

London ware and Ashampstead ware, couple with the lack of Brill wares, suggests that the town looked more to the south than to the north for trade during the medieval period.

The minimal occurrence of pottery within the churchyard is perhaps expected, given the land-use, but the few sherds found here are useful for dating.

9 OTHER FINDS by Tora Hylton and Geoff Egan

9.1 Introduction

The excavations at Wallingford produced a collection of specific finds spanning the late Saxon through to the post-medieval period. With the exception of a small group of ten finds recovered during the foregoing evaluation, the majority were located in grave earth deposits in Trenches 12 and 15; these presumably were redeposited during the extensive grave digging from the 11th century. The range of finds is small and dominated by nails, but of particular interest is the presence of two religious souvenirs, implying a religious community with a keenness for travel. Residual finds within grave earth deposits provide evidence for metal working (copper alloy) and costume fittings.

In total there are 60 individual or group recorded small finds, providing a total number of 66 individual objects in eight material types. Each object has been described and measured, and a descriptive catalogue is retained in archive. The majority of artefacts were recovered by hand, but the use of a metal detector at regular intervals during the excavation increased the recovery of metal objects.

The small finds may be quantified by material type (Table 13). A total of six iron and copper alloy objects (excluding nails and small fragments) were submitted for X-ray. This was undertaken by Kelly Abbot, Conservator with Wiltshire Conservation Service, Wilstshire County Council. This not only provided a permanent record, but it enabled identification and revealed technical details not previously visible. No stabilisation was necessary.

Table 13: Finds by material

material	total
Copper alloy	17
Iron objects	28
Lead	5
Bone	2
Shell	1
Glass	1
Slag	1
Ceramic	5
Total	60

9.2 Finds from the churchyard

Religious souvenirs

The excavations produced two pre-Conquest religious souvenirs, a lead cross from beneath the earliest cemetery levels and a scallop shell from Burial 56.

An early lead/tin devotional aid by Geoff Egan

Slightly convex, flattish cross with Christ crucified, 45x38mm, from [12294], a soil below cemetery and below the mortar mixer (10th/11th century; Fig 27.1 and front cover photo). Thickness <1mm. It may be slightly distorted from flat and some corrosion is evident. Christ is crudely delineated, with curiously prominent, angled eyebrows. He is (?)apparently wearing a tunic indicated by vertical lines over the torso and presumably the three horizontal lines on the arms. This should continue at the waist and below but two lines horizontally over three vertically here look more like shorthand for a loincloth with its usual retaining loop around the waist and the lower drape. The arms are roughly indicated, straight out to each side with the hands stretched out flat. There is no suggestion of the weight of the body. A (?)crown, hovering somewhat awkwardly a little above the head, is also simply rendered, by a single horizontal line with three or more transversely across it. Perhaps the most remarkable feature is a small disc of shell, 2mm diameter, attached to the middle of the wrist on the left side, representing one of the nails. The corresponding place on the wrist on the right has a faint, raised roundel, where a second applied disc, now lost, was presumably set (there is no discernible evidence for one at the feet, which are a little apart and splayed outwards - a position on which it would be difficult to locate a single nail convincingly). The entire perimeter is picked out with a series of almost pellet-like strokes. The back is plain (save for a small, off-centred area of uplifted corrosion – i.e. there was no provision for an integral pin to allow this trinket to be worn on clothing as a brooch).

The simple, crude linear style is familiar from many cheap pilgrim souvenirs, which catered for a popular market from the late 12th century onwards in England and a little earlier in some parts of the Continent (eg Spencer 1998). The crown and tunic (the seamless coat of the bible), if indeed that is what is shown, are Saxon-period traits in portrayals of the Crucifixion, as opposed to the later medieval crown of thorns and naked torso with loincloth (ibid 170). It seems improbable that two different images of Christ were deliberately amalgamated in carving the mould for this present one, though it is possible elements were combined from memory by chance - perhaps such a detailed reading is to see too much in what is after all a very rough image. The Wallingford find overall has more in common with the earlier conventions than the later ones, despite the ambiguity of the lower area of clothing. Some later medieval pilgrim badges depicting roods of early style from Bermondsey and Lucca (Italy) look somewhat similar, though more definitive, with other features as well as context making it clear these are souvenirs of later date, eg ibid, nos. 190d & 254f-h).

It is difficult to trace any more closely comparable items from the same period as the present find, right at the start of the tradition of lead/tin trinkets for devotional aids. Similar in several respects but with some significant differences is an incomplete, flat lead/tin badge or pendant on a similar scale, also showing Christ crucified but without clothing on the upper torso. This fragment was excavated at the Guildhall Yard site at the heart of the City of London, in a deposit datable to *c*1050-1140 (GYE92 site acc. no. 6387 - Egan forthcoming). The surviving part comprises the arms of a cross, each with a pair of attachment loops (in the manner of many later Continental Pilgrim badges) and some of the lower part of the vertical shaft. Christ is shown in a still rough but much more realistic (non-linear) style than on the Wallingford find. The reverse is covered with triangular areas alternately plain and with oblique hatching, suggesting that while this object was intended to be worn, at least occasionally it would have been handled with both sides being seen, rather than permanently sewn in place by the loops (these would have allowed it to be worn as a pendant).

Overall, the present find, for all its crudity, appears to stand right at the start of what became the English tradition of cheap, lead/tin religious trinkets. Its so-far-unparalleled embellishment with the nail discs, however, places it in a somewhat different category from these later, simply cast devotional aids, as the shell additions would have necessitated significant further provision of raw material and skill, as well as a special tool when they were cut out to be fixed in place. It is not possible to identify it with a specific rood, though it may perhaps have referred to a local one.

Scallop shell

The scallop shell (*Pecten Maximus*) has two holes drilled through the top to facilitate its attachment to an item of clothing/bag or its suspension as a pendant (Fig 27,2). It was located in Burial 56 (a phase 2 burial), at the side of the spine, inside the rib cage, suggesting that originally it had been suspended in pendant form on the person's midriff (see Figs 14 and 15). Such symbols were highly prized; they were obtained from the Shrine of St. James, after enduring one of the most famous and arduous of medieval pilgrimages, to Santiago de Compostela in north-west Spain. Records suggest that during the 11th and 12th centuries the bulk of the pilgrims to Santiago were penitents (Hobler 1957, 54-55). Examples of scallops deposited in graves are well known throughout Europe, Koster in his study (1983, 199-55) recorded well over 200, from Germany, Denmark, Netherlands and France. In Britain examples associated with burials include one from East Kirk of St Nicholas, Aberdeen (www.aberdeencity.gov.uk/localhistory/nc_loc/loc_archkirk_wk36.asp), which was sited close to the pelvis, indicating that it had probably been attached to a bag (scrip) and another example from May Island at the mouth of the Firth of Forth, had been placed in the mouth (Yeoman 1999, 8-9). Elsewhere they have been recovered as individual finds from excavation deposits dating to the 12th-13th centuries in Perth (Yeoman 1999, 8) and 13th/14th century in Norwich (Margeson 2002, fig 38, 4) and Winchester (Spencer 1990, fig 234, 2481).

Other finds

Costume fittings

A mount and two late Saxon hooked tags were recovered from grave earth deposits. It is not possible to determine if the fittings were attached to clothing when a body was interred, or if they were residual within the grave earth deposits, perhaps left by a mourner, rather than a dead body.

The mount was associated with Burial 28 (a Phase 6 burial) and it was positioned close to the left side of the skull. It is shield-shaped (14 x14mm) with two small opposing lobed projections on the curved sides; at the centre there is a copper alloy rivet, for attaching to items of leather or textile. The surface of the mount is decorated with a motif of three fleur-de-lys (Fig 28,3), a common motif in the medieval period. Plain shield-shaped mounts have been recorded on leather straps (Egan 1991, fig 126, 1087), while armorial mounts of similar form have been recorded on an ornate belt found on the body of a Castilian Infante who died in 1275 (ibid 1991, fig 140).

The hooked tags represent a distinctive late Saxon type-fossil, comprising a circular plate with two attachment holes and an integral hook projecting from the lower edge. One is incomplete and is decorated with a centrally placed stamped ring-and-dot (Fig 28,4), it displays similarities to excavated examples from 11th-century contexts in Norwich (Goodall 1984, fig 111, 32-33). The other is ornamented with an incised motif, which appears to display 'zoomorphic' characteristics (Fig 28,5). Hooked tags may have had any number of uses, as clothes fasteners, garter hooks or to secure burial shrouds (Hinton 1990, 548).

Nails
A total of 23 nails were recorded, of which thirteen are complete. The majority of nails were recovered as single finds from burials or disturbed layers. Two types are represented: structural nails and horseshoe nails. The former are represented by two types; nails with flat sub-circular heads (fourteen examples), which range in length from 43-72mm, and nails with T-shaped heads (three examples) which measure 28-38mm in length. Both types would have been used with wood; they would have been hammered in so that the head was flush with the surface of the timber.

Finally there is a single unused fiddle key nail for use with a horseshoe. Fiddle key nails have semi-circular heads with circular-sectioned shanks and they would have been used with a type of horseshoe often referred to as a 'Norman' shoe, which have a sinuous profile, oval counter sunk depressions and date to the 11th-12th centuries.

Commercial activity
Two dished pans for use with a balance were recovered from Trench 1 (context 127) from the plot adjacent to the cemetery (Figs 28,6 and 7). The pans are virtually complete but exceedingly fragile and fragmentary; they were recovered together, one placed inside the other. The pans have been manufactured from sheet metal and the x-ray reveals the remains of two perforations sited close to the outside edge, spaced to indicate that there would originally have been three perforations, to which threads or chains would have been attached for suspension. Balance pans of this size may have had any number of uses, either domestic or commercial.

Copper alloy smelting
Evidence for small-scale copper alloy working is represented by *c* 50 miniscule fragments of metal working debris in the form of melted nodules weighing 77.2g. All the fragments were recovered from grave earth deposits in Trench 15.

Catalogue of Illustrations (Figs 27 and 28)

1: Crucifix, lead. SF 13, Churchyard: Context 12294 (below late Saxon mortar mixer).

2: Religious souvenir, scallop shell (Pecten Maximus). SF 11, Churchyard, Context 12103 (with Burial 56 - Phase 2).

3: Mount, copper alloy. Shield-shaped mount decorated with three fleur-de-lys. Pierced by a centrally placed copper alloy rivet, two small opposing centrally placed lobed projections on the outside edge. Good patina. Dimensions: 14 x 14mm, SF 10, Churchyard, Context 1258 (with Burial 28 – Phase 6).

4: Hooked tag, copper alloy. Incomplete, lower half of hooked tag only. Central perforation with concentric ring motif. SF 30, Churchyard: Context 1512 (homogeneous grave-soil).

5: Hooked tag, Copper alloy. Circular plate with two attachment holes, integral hook projecting from the lower edge. Filing marks evident on the underside. Surface of plate decorated with an incised motif. Plate: 13 x 13mm, Hook: 8mm. SF 12, Churchyard, Context 12111 (layer, possible surface, within early graveyard). Fig 28.5

6 and 7: Balance pans, copper alloy. Two virtually complete, but fragile circular pans, one placed inside the other. Diameter: 130mm, Depth: *c*12-15mm, Thickness: *c*2mm SF 7, Trench 1: Context 127 (pit).

9.3 Post-medieval finds

Identifiable finds from deposits of post-medieval date include a circular brush and condiment spoon manufactured from bone, a copper alloy pin with a small solid domed head and a cold chisel similar to a 16th to 17th-century example from Winchester (Biddle 1990, fig 41, 43).

10 THE RADIOCARBON DATES by Andy Chapman

Samples from four burials that were early in the usage of the excavated part of the cemetery were submitted for radiocarbon dating (Table 14). Three of these burials, 170, 210 and 211, came from a group of 12 graves that belonged to the earliest phase of burial while another, 56, was part of a group of 20 graves belonging to the second phase of late Saxon graves.

The results are tightly clustered, indicating that these four burials were of near contemporary date, certainly to within a few decades, and suggesting that the first two phases of burial were indeed part of an ongoing and unbroken process of early interment, with this including the interment of second individuals into early graves, perhaps often only a matter of a few years after the first interment.

In this period there is a wiggle in radiocarbon calibration curve and, as a result, the date ranges at the 98% confidence level are broad, with the range of possible dates from the four samples spanning 900-1160 Cal AD.

At the 68% confidence level, the wiggle in the calibration curve creates double date ranges for three of the four samples. The earliest date, from burial 210, could be as early as 900-920 Cal AD, although this has a very low statistical probability, while at the other extreme the two latest dates, burials 56 and 170, could be as late as 1100-1120 Cal AD, at quite a high statistical probability.

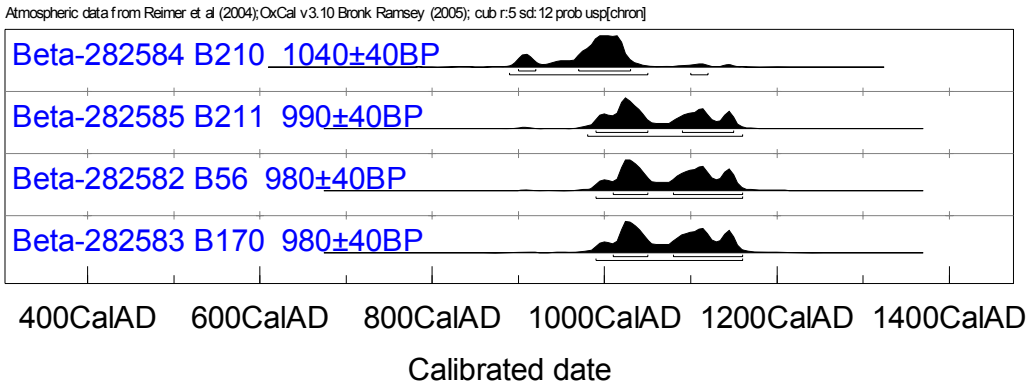
However, given the consistency of the four results, it can be suggested that the central dates should be adopted as the most probable indicator for this period of cemetery use. This would indicate a date for the four burials of *c*980-1040 Cal AD. Burial 210 has the highest probability of dating to the late 10th or early 11th century (980-1020 Cal AD at 68% confidence), while the other three burials are more likely to date to the early to mid 11th century (1010-1040 Cal AD at 68% confidence).

The radiocarbon dating has therefore confirmed the date for the commencement of burial deduced from the residual pottery and other finds, found associated with the early graves and the related soil horizons.

Table 14: The radiocarbon determinations

Laboratory & Sample No.	Context	Sample details	13C/12C N15/14	Conventional Radiocarbon Age BP	Cal AD intercept 68% confidence 95% confidence
Beta-282584 WAL 210	*Burial 210*	Human bone	-19.3 +10.1	1040+/-40	1010 **980-1020** 900-920 & 950-1040
Beta-282585 WAL 211	*Burial 211*	Human bone	-19.6 +11.0	990+/-40	1030 **1010-1040** 980-1160
Beta-282582 WAL 56	*Burial 56*	Human bone	-19.3 +11.8	980+/-40	1030 **1020-1040** & 1100-1120 990-1160
Beta-282583 WAL 170	*Burial 170*	Human bone	-19.1 +9.5	980+/-40	1030 **1020-1040** & 1100-1120 990-1160

Laboratory: Beta Analytic, Miami, Florida, USA
Calibration: INTCAL04 Radiocarbon Age Calibration



Plot from OxCal 3.10

11 DISCUSSION AND CONCLUSIONS

11.1 St Martin's, its location and origin

It is currently the case that recent research has not shed much light on the origin and location of St Martin's Church, the recent volume on the origins of Wallingford, looking chiefly to these excavations for a lead in relating this church to the *burh* before the Norman Conquest (Keats-Rohan and Roffe 2009).

The Reverend Field wrote (1905, 77), that if a combination of the early dedication and the position of St Martin's on the central cross-roads of Wallingford, a notably focal cross-roads location it shares with St Martin's in Oxford (the latter in existence by 1032), are both taken into account, St Martin's may arguably be regarded as the primitive church of Wallingford and its pre-Conquest *burh*. In the mid-late Saxon period, what was considered to be the oldest church in England was dedicated to St Martin (in Canterbury, and deriving from the Roman period, according to Bede, but see Blair, 2005).

Parsons (1992) following the work of Hoekstra (1988, concerning Utrecht), suggested that there may be a cruciform arrangement to late Saxon and possibly Norman urban planning in England. At Wallingford there may be some room for further research on this question.

At Utrecht this is what has been coined an 11th-century 'cross of churches' arranged around the central Cathedral, which was also dedicated to St Martin. The cross there was made up of four principal churches, their dedications being St John (north), St Peter (east), St Paul (south) and St Mary the Great (west) (Hoekstra 1988, 9).

Parsons looked for a similar arrangement at Northampton and at Leicester, both major late Saxon towns but ones in which development was continuous either side of the Norman Conquest. At Northampton he found a derivative cross of churches, but its layout would have to be entirely Norman, with the western church, (here St Peter's) being the only Saxon church, and the whole reliant upon a monastic hospital completing the cross. At Leicester he found the layout too complicated to unravel on the evidence available (Parsons 1992). A plan of pre-Conquest Oxford too might be said to show some similar plan-characteristics (see Booth *et al* 2007, 135-6).

It seems pertinent to test this theory in relation to a planned Saxon *burh*. Even allowing for a proportion of the churches of Wallingford being post-Conquest, and by association, an afterthought (by which it is meant a superimposition of a new continental ecclesiology), the churches which have evidence of a Saxon origin, or suspected to have a Saxon origin, do indeed suggest a cross in plan (Fig 4).

At the west lay St Peter in the West, to the east lay St Peter's (and maybe St Mary the Less), To the north was All Hallows or All Saints, while a foot to the cross (a calvary-form) might be formed by an arrangement of St Mary the More, St Leonard's and St Rumbold's (or Rumwald/Ruwald in an alternative spelling), any two of which might be removed from the argument with no effects other than to simplify the cross in plan. The extra-mural pre-Conquest St Lucian's, however, might be seen as a complicating factor. The central, in every way focal, position is held by St Martin's at both cross-roads and head of market place.

Whether such a deliberate layout is plausible or not certainly requires more work to gain ground and some further parallels, but Parsons and Hoekstra have highlighted an avenue of thought which might find a very particular and planned or regulated layout in this planned *burh* and resonance in studies elsewhere.

Blair's association of Frankish-inspired dedications to St Martin for pre-900 churches might further suggest that St Martin's at Wallingford began life as the principal church of the new *burh*, founded with a canting allusion to prevailing continental patterns (Blair 2005, 120). Its exact foundation date remains a matter for conjecture but may be only a short while before the excavated radiocarbon-dated burials. Also of note is the fact that both Rumbold and Leonard were popular Saxon Saints, dying *c* 650 and *c* 560, respectively, and Leonard was also a Frankish nobleman, perhaps echoing a Frankish influence behind the dedication of St Martin's. St Mary Magdalen (St Mary the Less) came to renewed prominence as a Saint under Charlemagne when, amidst new stories of some 1st-century wanderings taking her to France, her remains were said to have been transferred from Aix-en-Provence to Vezelay at the heart of the Carolingian world (Clarke 1968, 195-6). To complete the set, as it were, St Lucian was also martyred in the Frankish world, at Beauvais.

Whether St Martins was conceived as part of a wider pre-Conquest cross-plan of churches will generate further debate as will the extent to which Norman and medieval influence completed, actively confounded or simply lost interest in the idea. So too who might have been behind any Saxon emulation of Frankish models, whether the king or one of his *thegns,* or whether as a private chapel or a monastic dependency. However, St Martin's late Saxon origin and its prime focal location in late Saxon Wallingford are now beyond doubt.

11.2 Graveyard morphology

It is a considerable loss to this excavation that the exact whereabouts of the church foundations are unclear. The recorded discovery of the church foundations close to St Martin's Street in the early 18th century may have been accompanied by the wholesale robbing of its stone, in addition to the need for gravel. This inability to relate with certainty any of the graves to the church building might be considered a considerable bar to understanding the setting out and growth of the churchyard.

The discovery of a late Saxon mortar mixer towards the western end of the churchyard is significant, however. It is a of a type known from 9th-century examples at St Peter's Street, Northampton, where five were found (Williams 1979, 118-28; Williams, Shaw and Denham 1985, 21-26) and more recently two early 11th-century examples at Eynsham Abbey, Oxfordshire (Hardy, Dodd and Keevill 2003, 73-6 and 487-9). In all cases they are to be associated with focal or religious buildings nearby. Another has been plausibly attested at Monkwearmouth in Northumberland, but where it was not initially identified as such (Cramp 1969; Williams, Shaw and Denham 1985, 36-7). All the examples have been of similar size (2m-3m in diameter).

At all of these sites the mixers stood at a short distance from the buildings to which they contributed. Notably the one here at Wallingford it lay equidistant between early structural features to the north and the south, one a clunch-built wall, the other a substantial mortared flint foundation of unknown use. Such placement suggests an ergonomic approach to a building project. It is almost certainly related to the construction of the church and its boundary (and whatever the flint foundation was-if not closely linked to the church). It is also possible that it was initially supplying mortar for a primary lay-out of clunch-built tombs, most of which were mortared, although few remained without truncation. Its purpose dispensed with, the later grave-diggers showed it no regard.

Such mortar mixers have also been noted on the continent where commentators have largely related them to sites of considerable importance and where they are said (not without critics) to date between 900AD and 1000 AD. For these discussions see Williams, Shaw and Denham (1985, 36-7). Such a date here at Wallingford would

coincide well with the early burials.

While the location of the church may not be apparent, it is clear that this was never a very large churchyard relative to the numbers of parishioners who sought burial. Thus the press for space became considerable, with the result that graves were piled three, four and even five deep, with an additional attempt to dig deeply during the mid-life of the cemetery. This resulted in considerable fragmentation of many preceding bodies. The repeated burial within the same grave-earth left few later graves with clear cuts, except where materials, such as clean sand or mortar had been inadvertently introduced and which enabled a change in soil colour to demark a fill from its surroundings.

The simple overlay of the bodies, sometimes separated by only a few tens of millimetres, or the brutal intercutting of graves has facilitated separation of the graves into six basic phases. Each grave was carefully measured in relative to its excavation area and levels taken at head and knee (where both survived). Thus, although the site was dug in two campaigns either side of demolition of shops above, and although between areas there continued to exist massive, concrete foundation beam-topped baulks, the accuracy of location means that the graves can be overlaid one on another to elicit the sequence of burial in any one place.

This said, any so-called 'phase' of burial is a misnomer. There is no indication of any breaks in the sequence of burials, so no one phase can be separated by an historical event or by a deliberate importation of soils or other event on the site. It is merely for ease of presentation and so that the reader can separate the mass of bodies and body-parts into the stratigraphic layers by eye. The process of burial was apparently continuous. It seems to have begun at the eastern end, most likely near the church, and progressed westwards, however gradually. The same ground was then dug over continually as more graves were dug. This might have continued until the churchyard could barely take any more by the standards of the day. However, the churchyard authorities may have been saving the far western end of the churchyard for further burials since, when the churchyard came to an end before 1412, that area was still free from burials and even disarticulated charnel for some 4m from the western churchyard wall.

Since the area up to this western four-metre mark was always left clear of burials, it also remains possible that this area was planted up with trees or other undergrowth as is perhaps the suggestion from a possible planting pit recorded at one point 1.4m away from the wall. Once mature, such planting might have screened the church and churchyard from the prevailing winds. In any case as an area furthest from the church and the altar, it was never going to be a preferred place of burial. If the press for space became too great, undergrowth could always be cut down and the area brought into use for burial. Regardless of how this ground was actually used, burials never extended over it.

11.3 Dating

The excavation of a churchyard could not reasonably be expected to produce large amounts of pottery, since such a location would not be one in which domestic occupation or its refuse would be expected to be apparent, except perhaps for the dwelling of the rector or chaplain during the medieval period. So it has proved with St Martin's, including documentary evidence for the chaplain living in the churchyard in 1291. Although pottery has been present in 22 graves, in almost every case the small numbers of sherds were residual in the grave earth and are dated from the 11th century. One residual sherd dates from the 10th century. The stratification makes it clear they are mostly odd disturbed, redeposited sherds. It is no surprise that where

patches of the grave-earth survived undisturbed by graves (1206, 1511, 1512), it is pottery of this same date which has been forthcoming, albeit in small numbers (41 sherds). The grave-earth layer (1512) also produced the late Saxon hooked tag, while a single sherd of 11th-century pottery also derives from the same layer (12294) beneath the mortar mixer as produced the lead crucifix which is independently dated to the 10th/11th centuries on artistic and comparative grounds by Dr Egan (above).

In order to corroborate this commencement of burial, bone samples from three of the earliest burials (one female and two juveniles) closest to the supposed location of the church (170, 210 [the female of the three] and 211) were sent for radiocarbon dating. These most notably were the ones each buried on a bed of charcoal (see section 10, above). These provided a wholly consistent picture for the first and the start of the second phases of burials in the period *c*980-1040 AD.

It is therefore clear that the evidence points to burials in a clearly-defined churchyard beginning in the late 10th or early 11th century. That similarly dated material seems to date the establishment of the mortar mixer, it is suggested that the stone church of St Martin's was also built at the same time. It is possible that the remains of the former church, as likely as not characterised by intramural burials, would have contained the very first graves, followed soon after by the first churchyard burials.

In terms of artefactual dating, only two graves produced medieval pottery, numbers 3 and 22, both having redeposited sherds of the 13th century within their fills. Grave 3 is certainly among the final, shallowest surviving burials (Phase 6) while Grave 22 may not precede it by very long (Phase 5). These are among St Martin's last parishioners to be interred in the churchyard. Combining this with the documentation, the last burials can be no earlier than the 13th century but are probably of the 14th century.

The documentary trail for the end of the church and churchyard has been set out above in parallel to Wallingford's wider decline. The first church to be lost to spiralling economic woes was St Lucian's, united with St Leonard's by 1291. By the same year St Martin's was already untitheable, almost certainly due to dwindling numbers, its fate during the 14th century was shared by an ailing St Peter's, St Michael's and St Mary-the-Less nearby, the first of these having to receive special Papal privileges to keep afloat at the hands of pilgrims and visitors in 1368 while the other two were ruinous in 1374, the year St Mary's was merged with St Peter's. Perhaps the most telling reference, and the one which brings down the curtain on about three and a half centuries of burial at St Martins was that of 1412, referring to the church '*which collapsed long ago and is ruined, without a rector and almost entirely without parishioners'.* By 1438 the entire town, at the nadir of its fortunes, contained only 44 householders. By 1542, the eleven churches of the town had been reduced to three.

11.4 Burial practice

Overall the churchyard contains a majority of burials whose interment might draw little comment. They are all supine, laid with their hands at their sides or crossed on their pelvis. Most are in simple earth-cut graves, where no timber coffins are evident although a few odd nails might suggest the occasional use of a reused timber to provide a plank on which to lay the body, not uncommon in lay cemeteries such as Barton-on-Humber (Hadley 2001, 103-4). It also became (and remains) an accepted Carthusian monastic practice, also seen in a lay burial at Coventry Charterhouse (Soden 1995, 67). Unpinned winding sheets are assumed in most of the Wallingford burials, there being an absence of shroud pins so common in later medieval churchyards. With so many Wallingford burials being so fragmentary, there is considerable margin for the non-recognition of coffins due to insufficient survival.

The earliest graves are notable for displaying the distinctive burial practice of interment of a bed of charcoal or ashes. While the bed of ashes in life was intimately connected in late Saxon ritual with public penance and its imposition on Ash Wednesday, its use in a burial environment is unclear (Hamilton 2001, 92-3, 114-7; Lucy and Reynolds 2002, 238-40). It may possibly imply death during such a period of penance. Where recorded previously, it is a burial rite associated with the ninth, tenth and eleventh centuries, found at Winchester, Hereford, Lincoln, York and Repton (Hadley 2001, 99; Lucy and Reynolds 2002, 231). Moreover, increasingly it is seen as a primarily urban rite and one associated with churchyards or at least burials within them which were of higher status (Boddington 1996, 70; Booth *et al* 2007, 265). Here at Wallingford this would chime with the locations of the three noted, all being close to the purported location of the church, although their early date might equally qualify them for this favoured location. Their sex-attribution is more difficult to pin down, however, as of the three only skeleton 210 is confirmed as that of a woman. Those of 170 and 211 are of juveniles showing insufficient bone changes present to make sexing reliable. Their radiocarbon dates put them firmly as an associated group in the period 980-1040, and these bear comparison with those from other charcoal burials, similarly radiocarbon-dated, principally at St Aldate's, Oxford (Booth *et al* 2007, 266-7; Tyler 2001, 393-5 and 406-7).

Changes in burial practice

The second phase of burial at Wallingford is dominated by two distinctive and notable burial practices, comprising burial in clunch-built tombs or cists, first remarked upon by Skermer in his notes about the site of *c*1712-16, and the use of ear-muffs on one or both sides of the head in the grave.

With regard to the clunch, this was not quarried on the site, which was of gravel, but may have been brought from a site already exploited by the construction of the church. The origin is unknown but one possible stone origin was at Clapcote where there is later an existing quarry or '*Stanidelf*' (literally a delving or digging for stone) noted in documents of 1235 (Denholm-Young 1931, 135).

The material was hewn into uneven-sized but roughly rectangular blocks to create the sides and ends of a stone tomb or cist, just high enough to stand above the body. In most instances this tomb formed a simple rectangle, sometimes tapering slightly to the foot. In one case this was also thickened and widened to form a more solid block either side of the head (Burial 199; Figs 18 and 20).

These cists would have been covered with a slab or slabs, probably mortared. Only the child's grave (Burial 138) could be said to have such an *in situ* (single-slab) grave cover, as there was no obvious sign of the slab having been removed and res-set (Fig 28). However, in all the other cases, the numerous slabs which covered the surviving undamaged cists were of multiple parts and, although mortared, their laying was sufficiently inexpert to suggest they may represent re-use and re-covering of the cist (Burial 199 is a perfect example again). Some also contained disturbed bones left over from a primary, dispersed burial to confirm their re-use.

In one case, Burial 197, cover-slabs had been used on their own, without a supporting cist (Figs 18 and 19). In this case the grave was deliberately narrow, so that the slabs rested on the earthen sides, rather than pressing on the body beneath. While not common, this has been seen at coeval churchyards, such as Raunds Furnells, Northamptonshire, where the widespread use of numerous such stones, often creating a cairn-like structure around the body, and especially the head, was noted (Boddington 1996, 38-43).

It has been indicated that the use of cists arrived in Oxfordshire around the year 1000 (John Blair, pers comm). Their use in Oxfordshire has been recorded elsewhere, at Christchurch, Oxford (Boyle 2001), while such pre-Conquest cist graves have also been recorded at St Frideswide's Oxford (Scull 1988, 33 and fig 14). A previously-excavated example at Wallingford's St Michael's Church, may warrant re-visiting in terms of date, where the excavator has published a date in the 13th-14th centuries (Weare 1977, 210-11). Anywhere else a medieval cist would be acceptable as a relatively common occurrence, but set against a background of pre-Conquest occurrence at St Martin's, it now stands out as potentially anomalous.

Of equal note are the numerous occurrences of burials in the early growth of the churchyard, of burials in which stones have been utilised as 'ear-muffs' to support or steady the head, not always upright, within the grave. Sometimes these comprise a single stone, on most occasions one on either side, occasionally more than two. Usually in this churchyard these were simply carefully placed flint nodules. This is a very common late Saxon burial rite seen the length of England, notably locally at St Frideswide's Oxford (Scull 1988, 33 and fig 14). While nine examples of this rite alone were noted at St Martin's (Graves 56, 86, 89, 90, 91, 131, 156, 201 and 202), Grave 56 warrants further mention in dating terms since this was the (male) incumbent who wore a pierced scallop shell around his neck (Figs 14, 15 and 27.2). This symbol is normally indicative of pilgrimage or intended pilgrimage to Santiago de Compostella in north-west Spain, it is pertinent to note that the Compostella shrine was built in 899, destroyed by the Moors in 997 and rebuilt in 1078 (Judy Dewey pers comm). Thus the period of pilgrimage for this individual would seem most likely to be the period 899-997AD.

Burial 78, also a male, warrants some individual note as exhibiting a strange combination of burial rites (Figs 16 and 17). Firstly, the practice of providing 'ear-muffs' has here been taken to an extreme. Instead of providing flint nodules (like most examples here) or perhaps pieces of clunch, someone (presumably the sexton) has placed disturbed skulls carefully on either side of the head. Dispersed bones of a primary Saxon or medieval burial have been noted, carefully replaced to one side around or on top of a secondary burial, such as at Pontefract (Hadley 2001, 66) or Coventry where they were replaced skull-and-crossbones style (Soden 1995, 76). However, both of those replacements constitute care and consideration for the earlier remains.

Here at St Martin's, by contrast, the very re-use of the disarticulated skulls suggests that the previous remains have definitely taken on a useful if slightly macabre secondary role and the supposed eternal rest of their previous owners is given short shrift. Given Saxon and medieval views on the sanctity of the body with respect to the final resurrection of the dead, it might suggest that the sexton shared little of the clergy's avowed understanding. In fact how such re-use of charnel might be viewed in the eyes of the officiating priest or any attending mourners is impossible to gauge.

Secondly, Burial 78 was weighted down by a single large, flat stone placed across his chest. While such apparent cover-stones are seen elsewhere in the cemetery, their use was apparently without pattern and did not appear deliberate, except where to cover graves, usually in a combination of a few. Here the single stone is very clearly placed deliberately on the chest of the incumbent. While at Raunds Furnells, Northamptonshire, combinations of stones were placed over and around bodies, particularly the head and shoulders, these may have been related to the apparent preservation of the visage of the individual in the grave, which otherwise would be in contact with earth (Boddington 1996, 40-41). No such sensititvity towards the face can be suggested at St Martin's where the stone seems designed to keep the

individual in his grave. When another burial (77), possibly related given the close correlation of their laying-out, was later introduced, the stone was carefully avoided and left in position.

The relationship of the two prevailing rites merits some attention if only to note that a relationship is actually discernible. Both rites occur within the same spread of early burials, the late-Saxon use of the churchyard.

Although most use of the clunch-built cists actually probably comprises their re-use, filled with secondary interments, one stratigraphic relationship survives between Burial 156, utilising 'ear-muffs' or pillow-stones, and Burial 164, probably the first incumbent of its clunch-built cist (see Fig 13 for locations). In this instance the 'ear-muff' burial clearly post-dates the cist by virtue of the stratification. There is no occasion in which an ear-muff burial is placed in a clunch-built cist; both appear different traditions. The suggestion is that the 'ear muffs' do seem to consistently post-date the construction and first use of the clunch-built cists and that the construction and first use of the cists most probably belong to the earliest laying out of the graveyard. Almost all, however, had been re-used, a process which damaged them. It is likely, therefore, that the capacity for re-use which is a characteristic of the cists, ensured that, although degrading rapidly, they continued to be a part of the known burial environment after the predeliction for using ear-muffs had passed.

Once the disparate burial traditions of the pre-Conquest period were past, the medieval burials at St Martin's are unremarkable, given over to an earth-cut uniformity which leaves the churchyard almost indistinguishable from a dozen other medieval lay churchyards. For the majority of burials it is only the pathology and congenital abnormalities which mark them out from the ordinary.

Sex distribution

Ceridwen Boston (above) has remarked that the gender profile is not quite that which might be expected of a Saxo-Norman or medieval population, there being a small number of infants and a relative dearth of young women whose death-rates usually increase with the onset of the age of child-bearing. Without comparative sites in the town it may be speculative, but the picture in Wallingford may be one of very localised differences since this small town was before its economy nose-dived, served by eleven churches. Each parish may have been so small that it represented a population profile of just a handful of streets and lanes. Thus a concentration in one small area of trades served by men, or conversely by women, could unbalance a burial profile which would not be explicable in an excavation unless a similar, counter-balance was seen in the excavated assemblage from another parish cemetery.

It is pertinent to note that the palaeopathologists and excavators examining skeletal material from the mid-late Saxon Minster Church at Wing, Buckinghamshire also highlighted this same unexpected profile of age/sex characteristics of relatively few infants and young women in the sample of 77 burials. Here the site was (in contrast to St Martin's) both rural and minster-based (Holmes and Chapman 2008, 83). Since only a small portion of that churchyard was dug, it remains a possibility that the burial space there was split into zones. The possibility of a similar restriction at St Martin's has been hidden (and lost) in the destruction of an unknown amount of burials between 1712 and the 1960s. It also remains a distinct possibility that more infants have simply been lost to subsequent grave-digging because they almost always represent shallow, insubstantial burials at any phase in the use of the cemetery.

If the restrictions of the parish-system within the town were sufficiently relaxed, another possible reason for the dearth of young women in the assemblage is that

within the town was the church of St Leonard. Other than being a favoured dedication for leper-churches (which as an intra-mural church, Wallingford's is probably not), Leonard was the Patron Saint of women in labour (Clarke 1968, 286). The families of women dying in or soon after childbirth might reasonably seek the intercession of their dedicated saint by burial in such a churchyard. Clearly such a possibility could not have resulted in universal diversion of burials of new mothers and infants to St Leonard's, since just such a burial at St Martin's constituted Graves 111 and 113 and probably represents a mother and infant buried together (see below).

It remains the strongest possibility that, with an unknown proportion of the churchyard already lost in the 18th and 20th centuries, an area formerly given over to burials of a particular type has been lost entirely or denuded to such an extent that its demographic profile has been diluted.

It is, however, certain that amongst the burials at St Martin's there is no basic gender separation anywhere in the churchyard as excavated, entirely in keeping with expectations of a lay churchyard. Male and female burials are to be found distributed all over, with no grouping or clustering. Similarly the deployment of the distinctive burial rites (above) did no discriminate between sexes.

The burial of infants

Boston and Anderson have remarked upon the apparent dearth of babies and neonates which were amongst the articulated assemblage (above). This, however, does not represent the whole picture. While it is accepted that in an urban cemetery there is much disarticulation of burials, here at Wallingford a programme of bulk soil removal and sieving was instituted in case where a neonate or a dispersed neonate burial was suspected. This produced the positive identification of eight such burials or dispersed burials which can be seen to have two distinct clusters, one in the east (161, 187, 192 and 195) and one in the west close to the major mortared flint foundation (15, 52, 72, 88) (Fig 25). Their dates are uncertain since they are not readily associated with clear-cut stratification and none possessed grave cuts; indeed most are incomplete.

Their clustering may be seen to reflect *sub-stigillatio*, the process of burial close to a church building, thereby blessing dead infants with rain-water sanctified by dripping off the eaves of the church roof. Seen in a number of places, both urban and rural, notably published from Norwich (Ayers 1985, 57-8), it may here be a guide to the location of the church close to the east end of the excavated area (and thus close to the historic and present street frontage). Meanwhile the western cluster lends weight to the idea that the large mortared flint foundation raft seen in Trench 14 belonged to a dependent ecclesiastical building, perhaps a mortuary chapel, or maybe even the rectory attested within the churchyard in the 13th century.

A ninth, but poorly-preserved neonate (113) was noted on the midriff of Burial 111 and is thus probably the burial of mother and new-born foetus, the pregnancy either not having gone quite full term before the mother died or contributory to the death of the mother soon after birth. In the lower levels of society in which a lactating relative or friend could not be found to act as a surrogate, or a wet nurse paid, a motherless baby stood no chance of survival and its death would follow the mother within days.

Local variation in burial rites

The burial rites and practices observed have been noted elsewhere to varying degrees and this begs questions concerning how widespread (and why) were particular burial rites. However, while they probably represent some quasi-religious (ie not Biblically-inspired) or cultural (whether superstitious or church-led) views, they

do seem to have been regionally or locally varied during, particularly, the 10th-11th centuries. Thus while St Martin's has both stone cists and ear-muff burials in roughly equal numbers and proportions, another cemetery at Raunds Furnells, Northamptonshire, had only the ear-muffs, despite a local stone-building tradition. Raunds on the other hand contained numerous 'cairns' of stone slabs around (particularly) the head, while St Martin's had a single example of a slab placed on the chest. Both churchyards had a narrow slab-covered grave with no stone sides.

In Oxford, although contemporary excavated numbers are few by comparison, local parallels have been found for charcoal burials, cists and ear muffs in pre-Conquest burials, the basic sequence of burials benefitting also from radiocarbon dating.

In total contrast, however is the contemporary mid-late Saxon and medieval churchyard which lies geographically between the two, at Wing, Buckinghamshire (Holmes and Chapman 2008). At this high-status Minster church, excavation of 77 lay graves uncovered not one example of charcoal burial, either stone cist or ear-muffs, or grave-covers of any description. There is perhaps some mileage in beginning to ask questions concerning the regimes which were applied (or even permitted under sufferance) in parochial (lay) and minster (lay) churchyards, and whether choice of one or the other as a resting place might have been influenced by the strictness or laxity of the authorities' adherence to declining/emerging monastic codes or the fickleness of local superstition and cultural factors amongst the laity or parish priests.

Clearly there is much more data to be collected from a variety of former churchyards before these questions can be fully addressed. With a wealth of such abandoned churchyards yet to be addressed archaeologically, Wallingford still has a major contribution to make.

The boundaries of the churchyard to both the north and the west were clearly observed and recorded in the excavation. The southern boundary was not observed but that is probably due to its destruction. Certainly the most southerly burial deposit located was some disarticulated material which just protruded into the deepest northern deposits in Trench 14, where the remainder of the archaeology was of a domestic sequence and type seen in the adjacent Trench 1. The eastern boundary of the churchyard was probably at least partly taken up with the church itself, since the documented discovery of bones and the church foundations in 1712 relate to the digging of cellars, almost certainly those which still characterise much of the St Martin's Street frontage. Trenching shows that these cellars were deepened and extended westwards in concrete in the 20th century (Trench 13).

South of the burials, and possibly demarking part of the southern side (if not boundary) of the churchyard, lay a rectilinear raft of flint set in a thick deposit of mortar (Trench 14). Other than to note that it underlay all post-medieval layers, its identification is tentative but it may be the foundation of a building. Other than the church, for which all evidence is probably lost, documentary evidence states that the vicar of St Martin's lived in a separate house in the churchyard in 1291. In the absence of other evidence it seems plausible that this raft represents its last vestiges.

Directly to the south of the churchyard lay a long sequence of domestic rubbish deposits in Trench 1, which almost certainly constitute part of the adjacent property. The two contrast markedly. While within the churchyard lies almost three metres thickness of layered and intercut burials, here lay a similar thickness of deposits built up of soil layers and inter-cutting pits. The earliest deposit from which good dating material could be retrieved (at depth) is of 13th century date [107], a pit cut from just

above the natural sand. A similarity between levels at this date and the near-contemporary burials in the churchyard, suggests that the churchyard surface and those of this adjacent plot rose at a similar rate, one due to burials, the other due to (perhaps) horticulture and (certainly) refuse disposal into the 16th century. At that date the name of Bell Dunghill, possibly located here, however briefly, may have been appropriate.

The dead of St Martin's

As has been seen the articulated burials were almost equally split between males and females, with only a slight bias towards males. Their distribution showed no discrimination across the area. A high proportion of children but a comparative lack of newborns and very young children is notable, but its significance is not clear since so many disarticulated remains were also present. Within the limitations of the site, the mortality profile of the site differs in this respect from the national pre-modern mortality curve, which is more even.

The population was of average height for the period nationally, but with the males buried at St Martin's being slightly shorter than their Oxford-based neighbours, possibly because there the population included more higher-status and monastic burials, all felt to have been generally better-fed. Both degenerative pathologies and inherited conditions affecting bone were noted, as were noteworthy rate of trauma, some of it violent, rather than accidental.

Generally they led healthy early lives in comparison with other urban assemblages, although incidences of Tuberculosis and iron deficiencies in diet suggest that living conditions at the heart of medieval Wallingford were far from ideal.

11.5 Future research

It was said in a recent volume that '*recent and current work is....improving our knowledge of Wallingford*' (amongst other Oxfordshire towns) (Booth *et al* 2007, 412). Since the excavations at the former St Martin's were included in that volume (Ibid 267-8) they may be said to have been included in that statement.

Since this report constitutes some of the detail behind that statement for Wallingford, it must be asked in what way the excavations at the Waitrose site have contributed to understanding of late-Saxon and medieval cemeteries in Oxfordshire, despite the obvious limitations created by the high levels of residuality in urban churchyards (as were expected) and the knowledge that an unknown portion of the original cemetery, together with the remains of its church, were lost to gravel extraction in the 18th century. The absence of a church remains regrettable for study of both pre-and post-Conquest architecture and structural enquiry.

Firstly, since it was adjacent to the central cross-roads in the town centre, the principal, focal church site in late Saxon Wallingford, St Martin's may be said to represent the best that its founders could offer in the town in terms of visible piety, worship and eventually sepulture. As such it would have attracted burials from anyone who wished their family to enjoy notable status for their piety in a period before the monastic orders moved in. One may surmise therefore that some early burials might have enjoyed higher than average status, although it is not certain whether families seeking such burials would have been content with interment in a churchyard, preferring perhaps a higher-profile intra-mural burial place for their family.

Secondly, the date of the foundation of St Martin's has been more firmly fixed (even without church remains), by the scientific dating of the early burials probably closest to the church buildings. This has been combined with a variety of contemporary

finds, some ecclesiastical/funereal but all from the early churchyard and from beneath a distinctive late Saxon mortar mixer, which pin the foundation of St Martin's down to the late tenth or very early eleventh century. Residual 9th- to 11th-century pottery from grave fills attests contemporary pre-Conquest domestic occupation close by, albeit not intensive. However, an absence of late-Saxon domestic features means that no evidence was present in the churchyard area for pre-church domestic occupation. The churchyard seems to have been the first-use of the plot.

Thirdly, received wisdom concerning the dating of late Saxon burial rites has been confirmed by the excavation. The use of charcoal beds for burials, employment of stones as head-supports (so-called 'ear-muffs'), stone cists, all supposed to have been in use or introduced in Oxfordshire c1000 have been confirmed at this date. In addition the practice of infant burial close to the eaves-drip of the church seems plausible here, although the absence of structural remains makes this tentative.

A possible former pilgrim to Santiago de Compostella has been identified amongst the early graves and dated by radiocarbon calibration at a pre-Conquest date, potentially before 997 when the shrine in north-west Spain was destroyed by the Moors. Whether he died and was buried during his outward or return journey, or whether the scallop-shell souvenir relates to a pilgrimage he had made earlier in life is unknowable.

Later on while burials, albeit less spectacular, continued unabated through the post-Conquest period, the evidence of the adjacent trench to the south suggests that this domestic plot was occupied into the 13th to 14th centuries. However, the absence of ceramic type fossils for the 15th into the 16th centuries (but not all contemporary pottery) suggest that the inhabitants of this domestic property may have felt the full force of Wallingford's economic woes every bit as much as the next-door church which served the rapidly declining parish.

After 400 years, the end of St Martin's church in the later 14th century, being ruinous and completely abandoned by 1412, is part of a very clear pattern documented parish by parish across the town. Whether its archaeology is typical of that boom-bust Wallingford economy is currently unknown. With so many 'lost' Wallingford churches and their churchyards hidden beneath the townscape, it is surely only a matter of time before another becomes the subject of archaeological evaluation and possible fuller excavation on a similar scale. Some of them may well have been in existence for a shorter time even than St Martin's, with a consequent higher potential for a briefer, more detailed snapshot of a population in time. It is to be hoped that St Martin's has provided a benchmark in Wallingford against which one or more of these others might be compared in the future.

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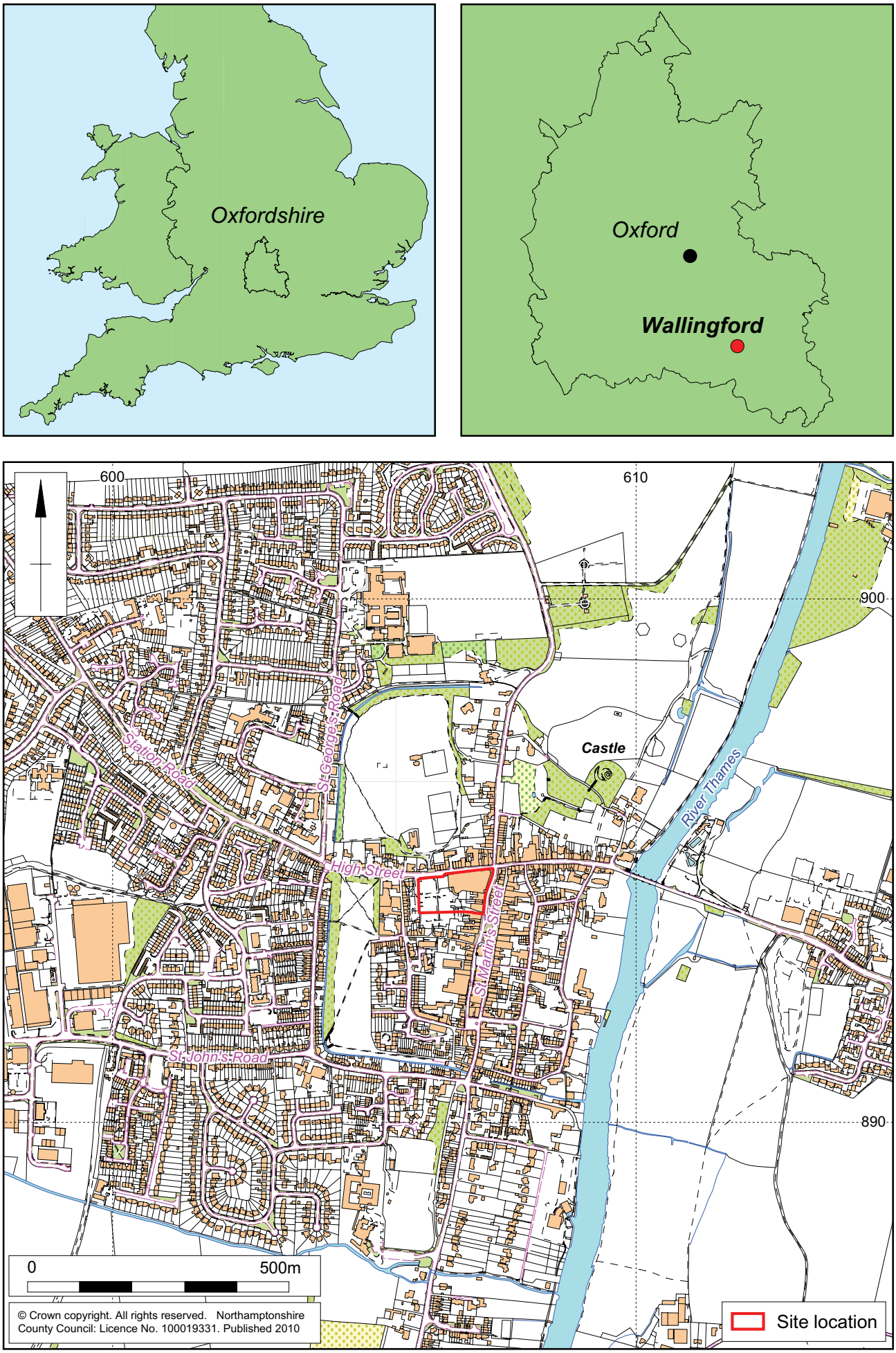
APPENDIX 1 GLOSSARY OF PALAEOPATHOLOGY TERMS

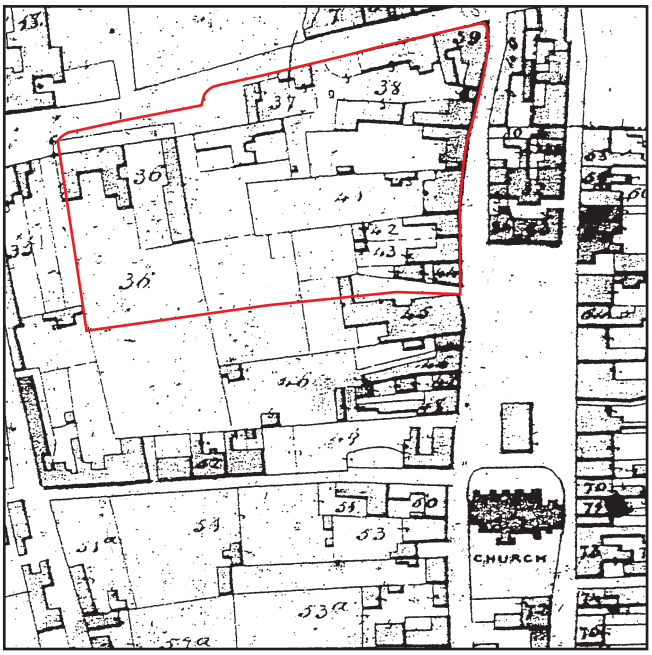
Terms	Explanation
Active	bony changes still occurring at the time of death, indicating that the individual was still suffering from the disease at the time of death
Acute	of short duration, opposite to chronic
alveolar bone	bone of the jaws surrounding the tooth sockets
Anterior	situated or facing towards the front of the body
anterior dentition	the incisors, canines, and premolars
Articulated	skeleton still in anatomical order (had not been disturbed in the grave)
attrition of the teeth	wearing down of the biting surfaces of the teeth, usually as a result of a coarse diet, but sometimes when using the teeth for functions other than eating. Attrition increases with age, as tooth wear is progressive.
auricular surface	ilial joint surface articulating with the sacrum of the pelvic girdle; degenerative changes to this surface form the basis of an ageing method
Buccal	pertaining to the cheek (in teeth the surface facing the cheek)
Calculus	Tartar
Caries	holes in the tooth crown
cervical vertebrae	vertebrae of the neck; there are normally 7.
Charnel	disarticulated or loose bone that results from the disturbance of a burial; this bone is often reburied in the fill of a later grave.
chronic	of long duration, opposite of acute
Coccyx	the 'tail bone'
cortical bone	the dense bone found between the perisoteum and the marrow cavity, largely in long bones
cortical defects	shallow hollows of bone loss at the point of insertion of muscles or ligaments into the bone; cortical defects are thought to be the result of damage to muscle fibres or ligaments, and the bone into which they insert.
Cranium	Skull
crude prevalence rate (CPR)	the percentage of the total number of individuals (or skeletons) of the assemblage affected. In this assemblage, 187
Disarticulated	bones discovered in a disturbed state, no longer lying in anatomical order. This often occurs due to later grave digging or construction disturbing the grave.
Eburnation	increased density of bone following inflammation (on joint surfaces). In skeletons, eburnation appears dense and shiny
Enthysphytes	bony spurs or projections at the point of insertion of muscles or ligaments into the bone; enthysophytes are thought to be the result of tearing of muscle fibres or ligaments, and subsequent ossification
Epiphysis	the rounded end of a long bone; in sub-adults the epiphysis is separated from the long bone shaft or diaphysis by a cartilaginous growth plate; growth of the long bone takes place in this plate; at adulthood this cartilage changes to bone and the epiphysis fuses to the diaphysis and no further growth occurs.
Fracture	broken bone
Inferior	below (often to describe relative positions in the body)
Lesion	an injury, wound or structural change in an organ in response to disease
Lingual	pertaining to the tongue (in teeth the surface facing the tongue)

Localised	affecting only a discrete part of the body (eg a localised infection will only involve a small limited part of the body)
lumbar vertebrae	vertebrae of the lower back. There are normally 5.
Morphology	shape
occlusal surface	the biting surface of teeth
Ossification	the process whereby bone develops (involving the laying down of inorganic bone chemicals)
Osteophytes	bony outgrowths that are often found associated with joint disease; these changes are the body's response to enlarge the joint surface thereby spreading the load more widely.
Palaeopathology	study of diseases in past populations
Palmar	the palm surface of the hand
Pathological	causing or arising from disease
Periostium	the fibrous membrane covering the surface of bone; inflammation of this membrane is known as periostitis.
Plantar	the surface of the sole of the foot
Posterior	situated or facing towards the back of the body
posterior dentition	the molars
Remodelling	in bone, the process of changing structure of the bone in response to a stimulus (eg losing a tooth; healing)
Resorption	in bone, when chemical components of the bone are removed from a site
Sacrum	the base of the spine which joins the spinal column to the hips
Subadult	Age category including foeti, infants, children and adolescence. Osteologically, any individual where the long bones epiphyses are unfused (i.e. is still growing)
Superior	above (often to describe relative positions in the body)
Sutures	corrugated joints between the plates or bones of the skull; these joints fuse during adulthood.
Symphysis pubis	the bony bridge at the front of the pelvic girdle; the left and right symphyses pubis are joined by fibrous cartilage; degenerative changes to these joint surfaces form the basis of an ageing method.
Systemic	affecting the whole body, rather than a localised area (eg a systemic infection is often blood-borne and affects multiple organs and areas of the body)
tempero-mandibular joint	the joint where the lower jaw is attached to the skull
thoracic vertebrae	vertebrae of the chest region; vertebrae here attach to the ribs
Trabecular bone	spongy bone, found lining the marrow cavity of long bones, and composing most of the bone of the hips, breast bone and spinal column. There are normally 12.
true prevalence rate (TPR)	the percentage of the total number of skeletal elements present in the assemblage that were affected. Where many skeletons are incomplete this may vary considerably from the crude prevalence rate. As it reflects the bones that were actually available for examination by the osteologist, it is considerably more meaningful than the crude prevalence rate.



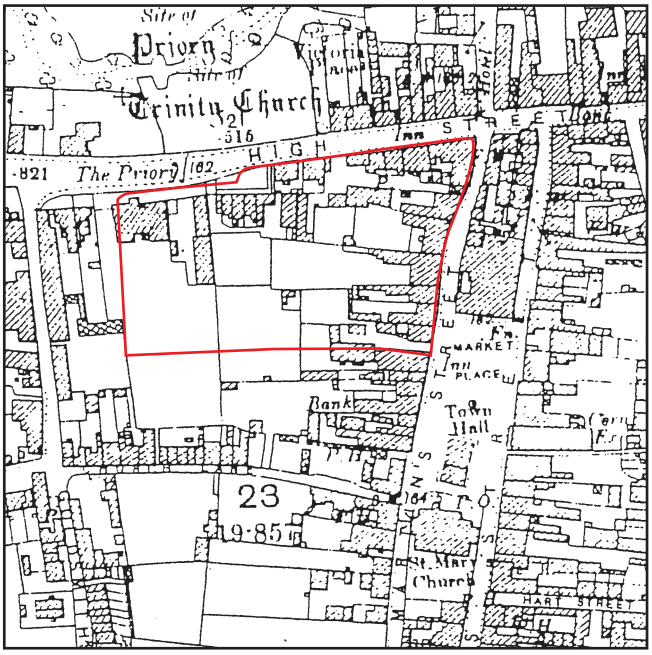
Scale 1:10,000

Site location Fig 1

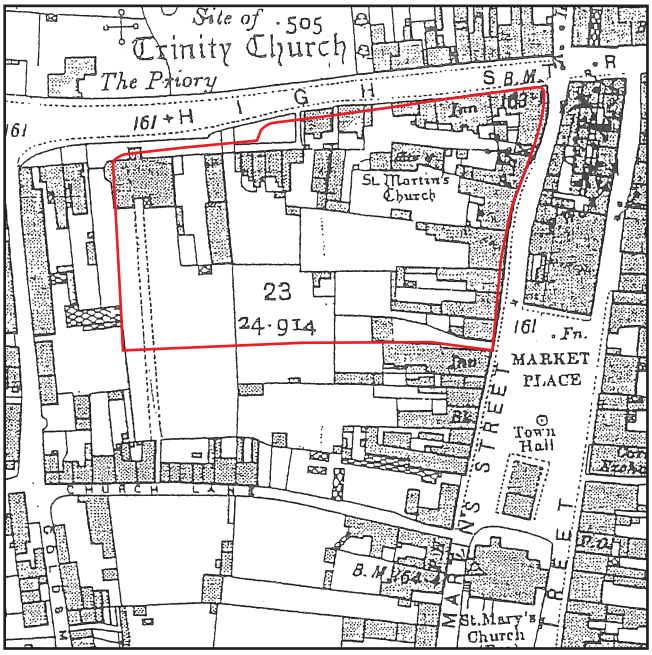


1850 2a

1877 2b



1899 2c



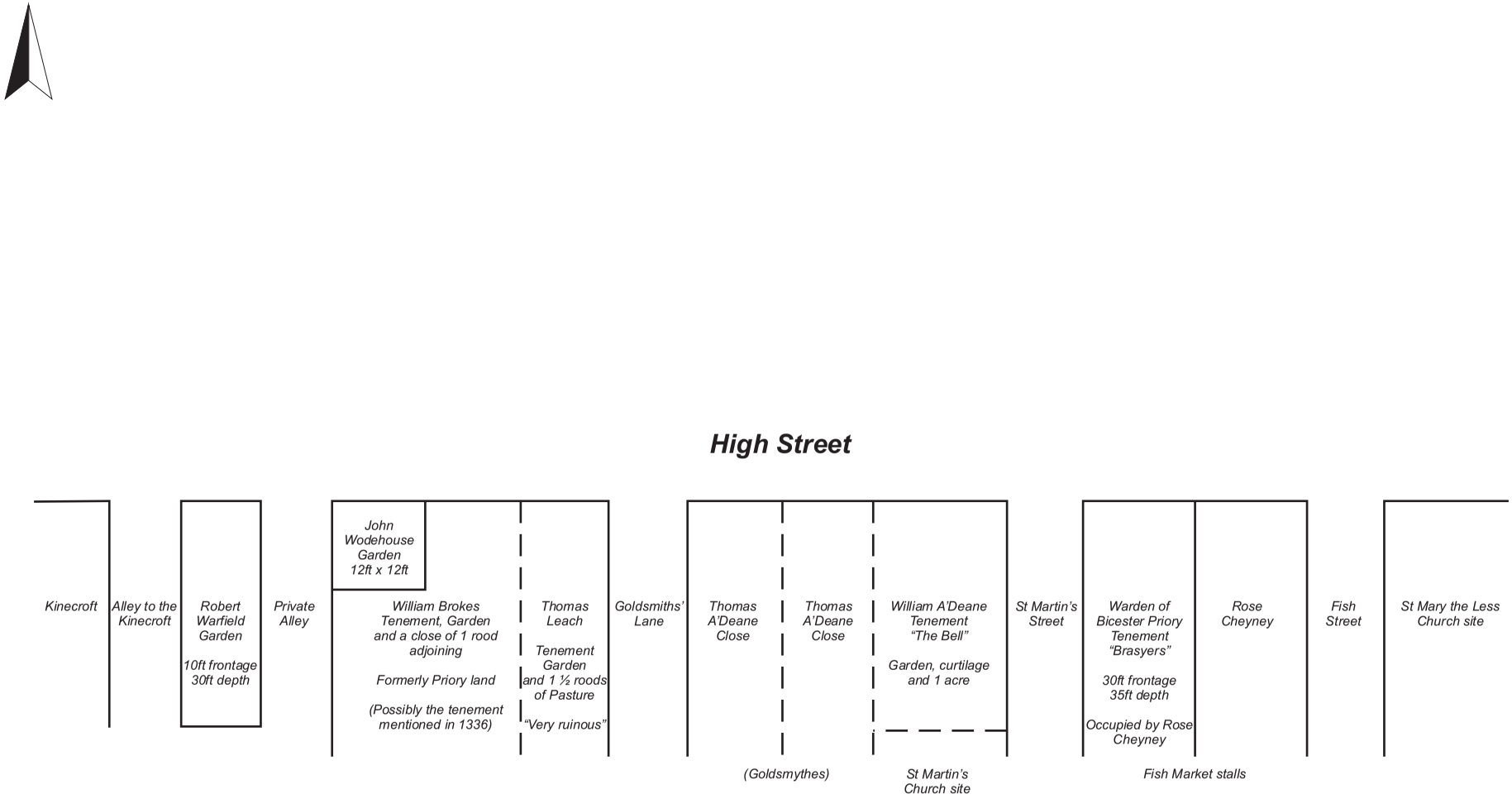
1912 2d

Site outline

The site and its surroundings 1850-1912 Fig 2 a-d

Scale 1:5000 The churches of Wallingford (after Booth *et al* 2007 and Airs *et al* 1975) Fig 3

Not to scale



The site relative to the 1550 survey Fig 4

607

High Street

Tr 9

cellar

Tr 10

Tr 8

Tr 7

Tr 12

Tr 11

Tr 6

Tr 15

churchyard boundary wall

Burials

St Martin's Street

Tr 5

Tr 14

Tr 13

Tr 1

Pits

flint and mortar base

Post medieval pits
Medieval pits
Extent of burials
Mortar mixer
Walls
Concrete
Wells
Edge of excavation

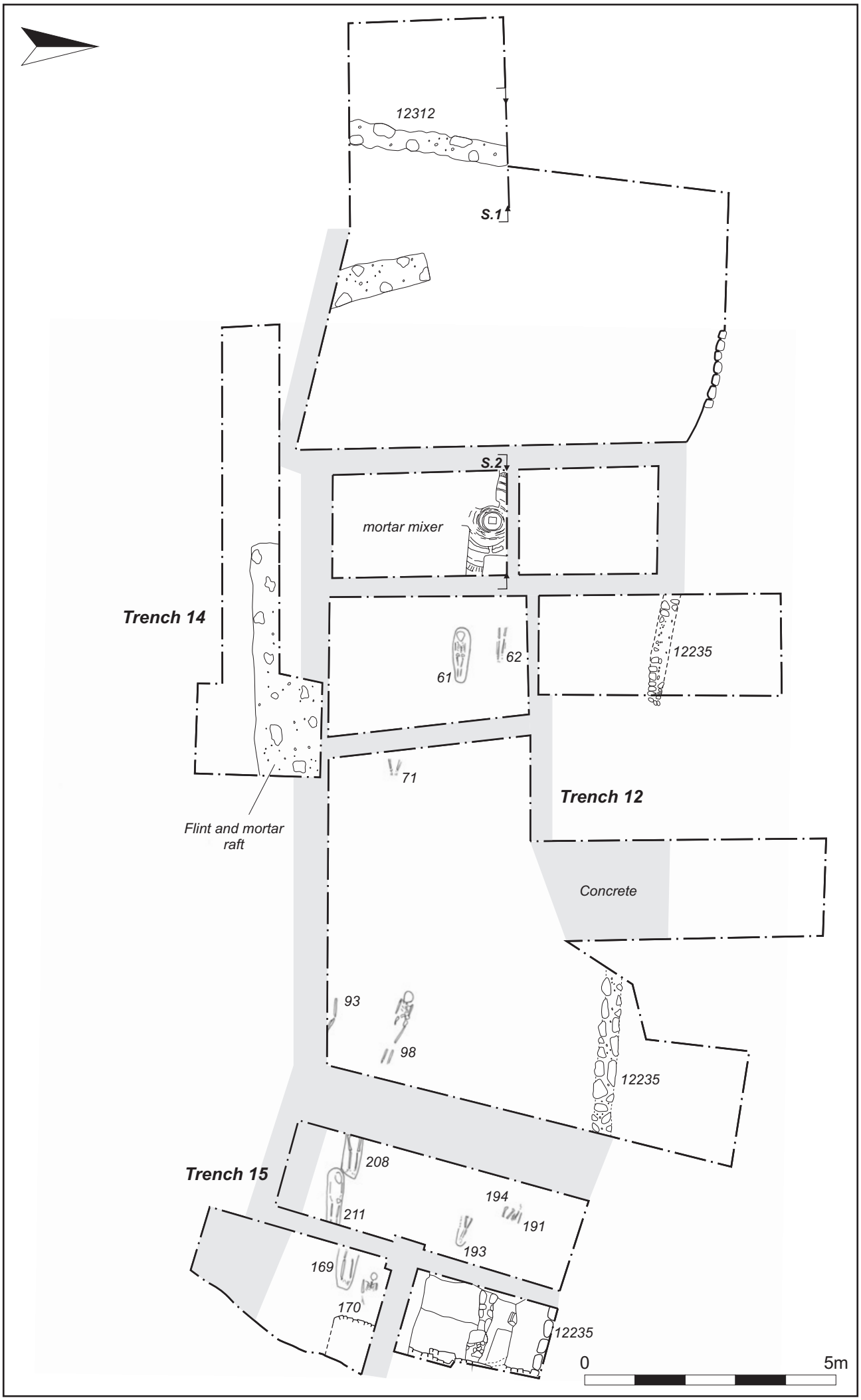
0 10m

Scale 1:250 (A3)

The excavations of 2003-2004 Fig 5

Scale 1:100

Plan of evaluation trench 1, with view of excavation Fig 6



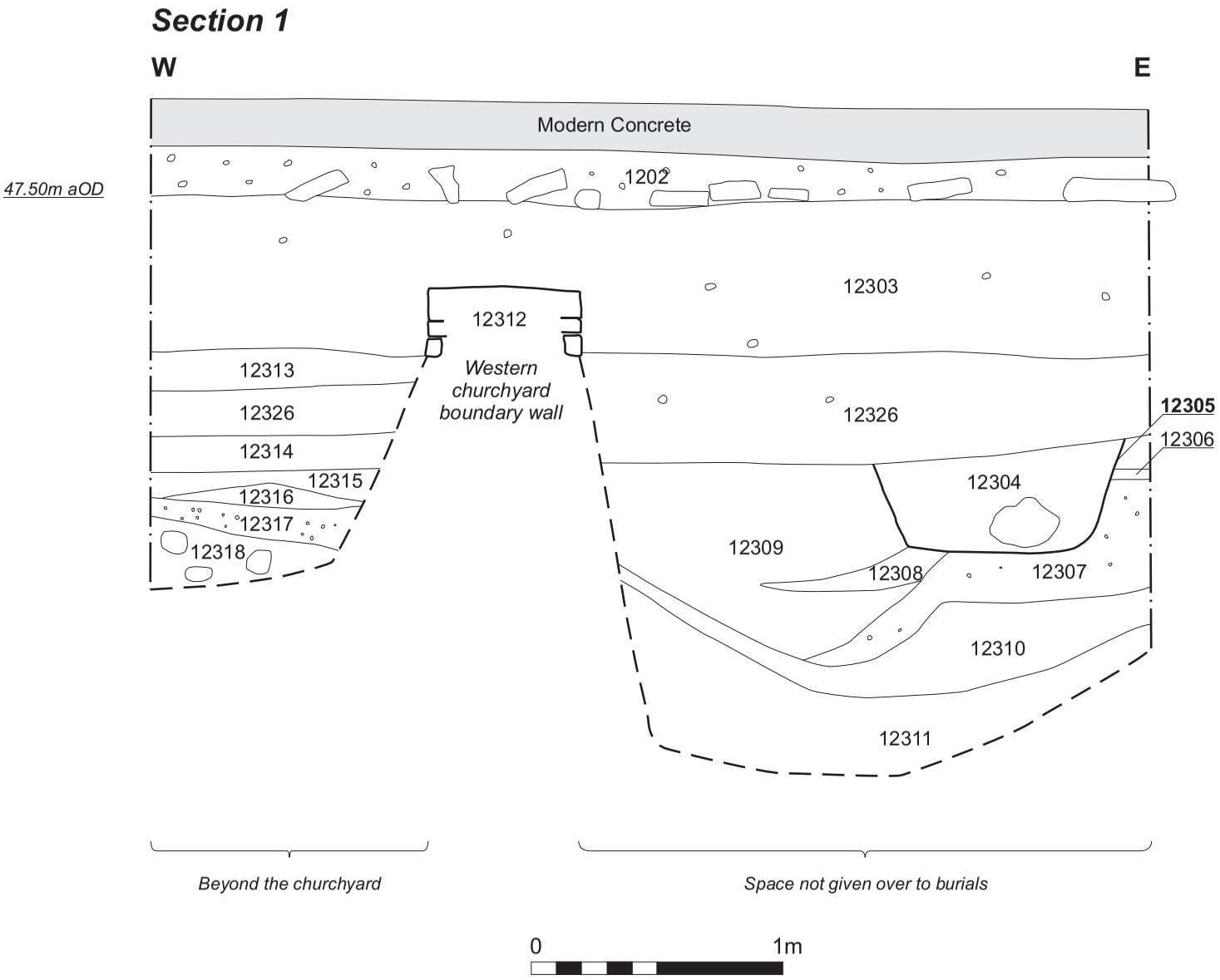
Scale 1:100 St Martin's churchyard: the beginnings Fig 7

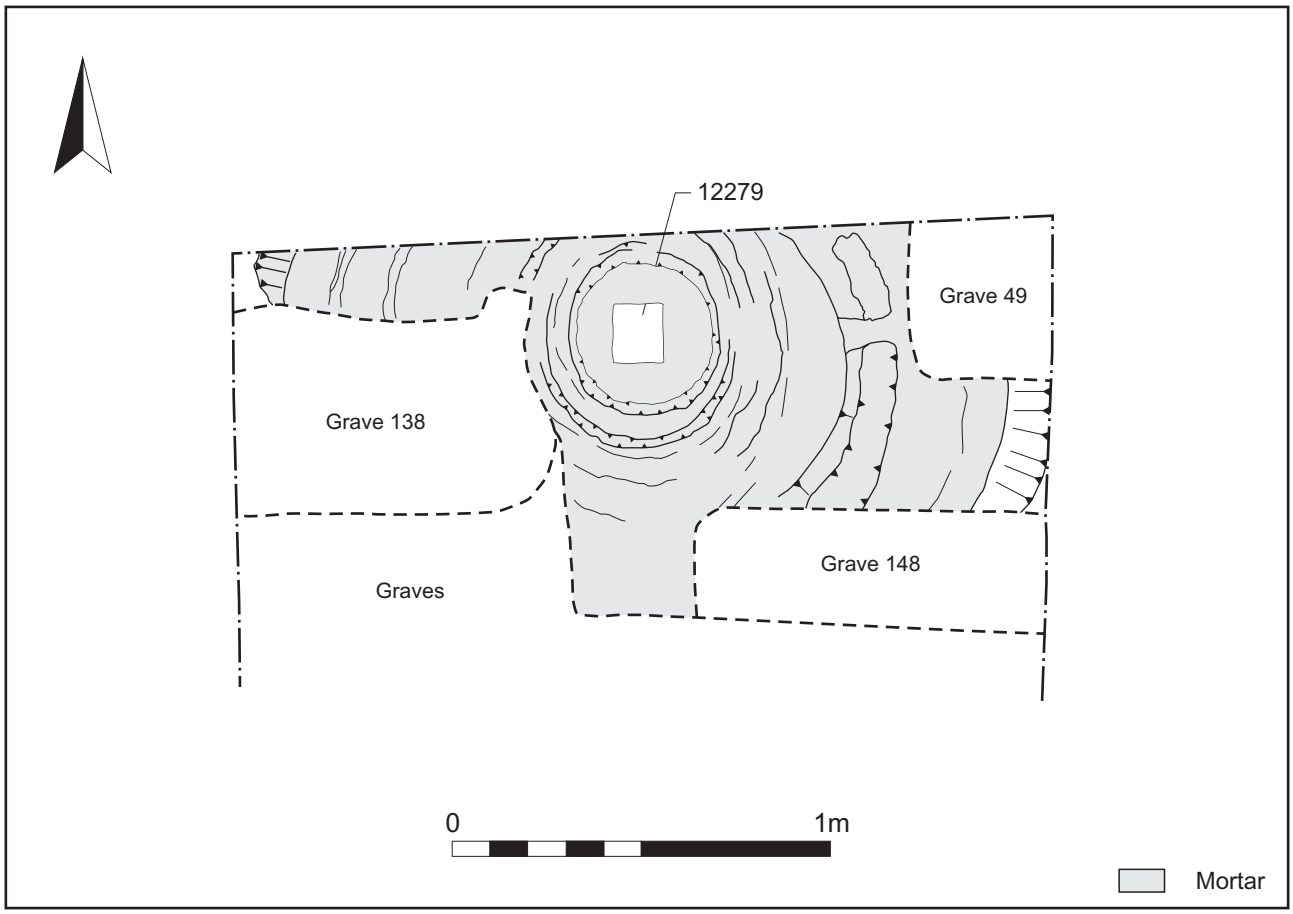
Charcoal burial, 211 Fig 8

Scale 1:25

Section across the western churchyard wall and deposits to either side

Fig 9





Scale 1:20

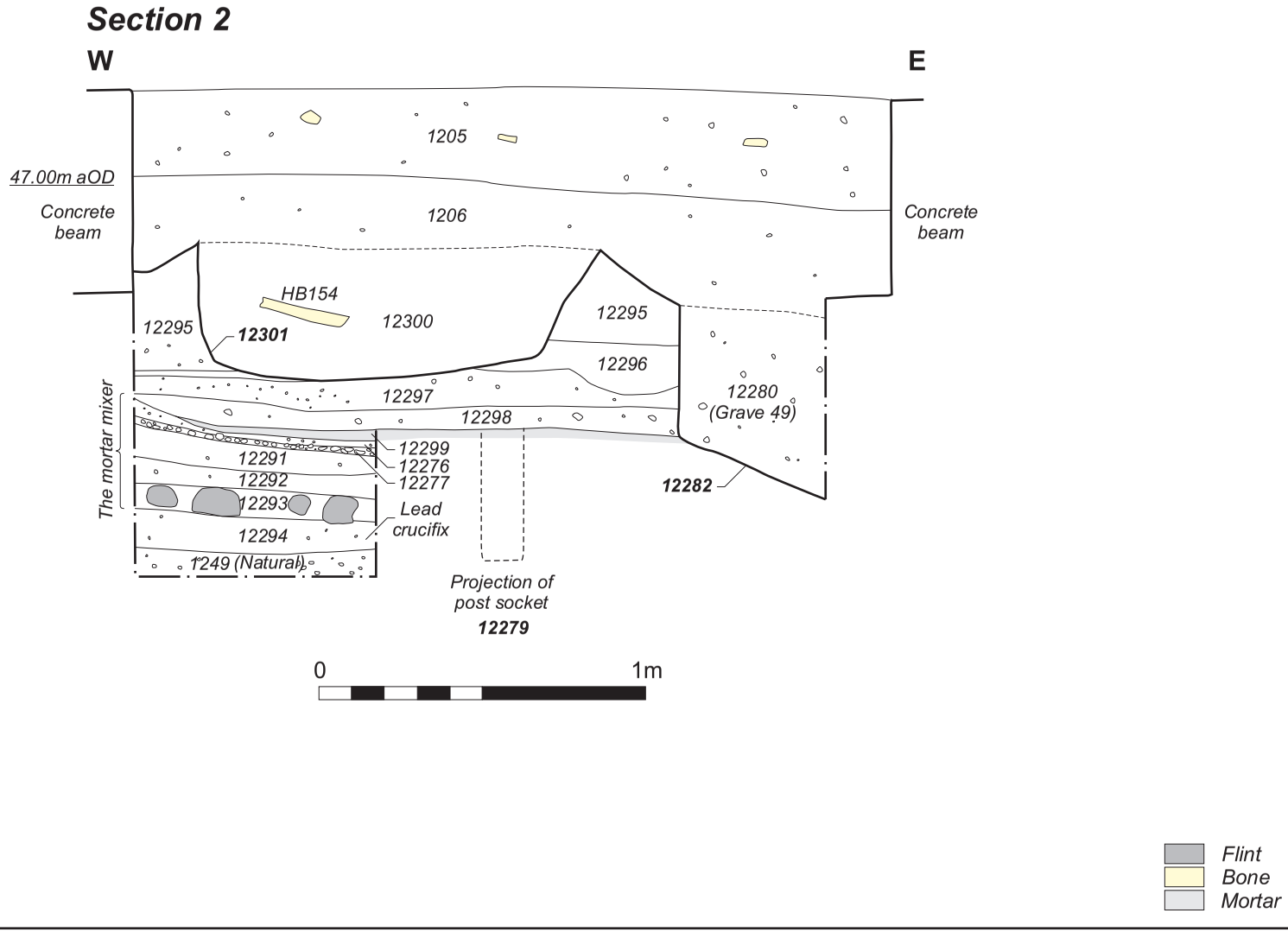
Plan of Late Saxon mortar mixer Fig 10

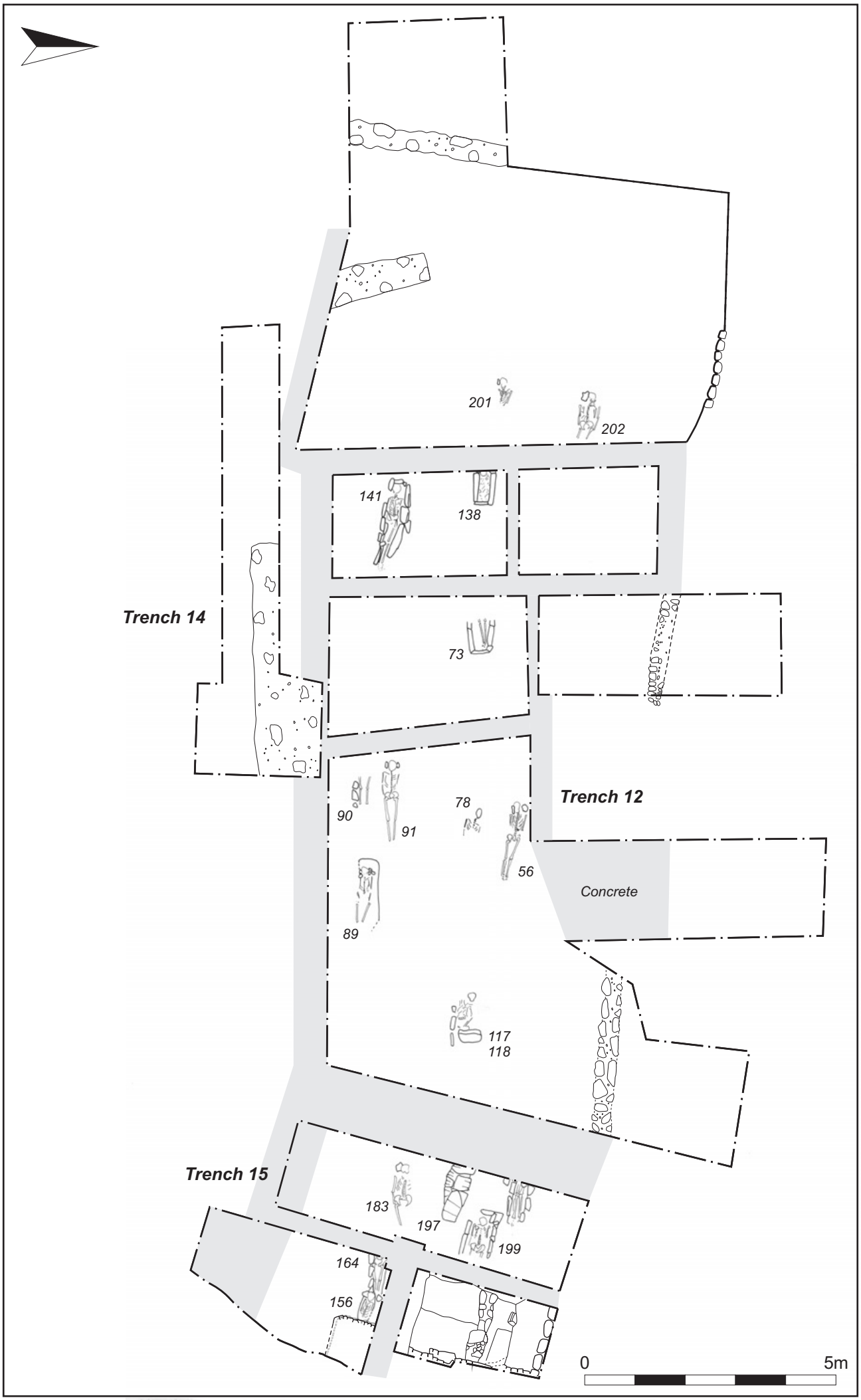
Late Saxon mortar mixer Fig 11

Scale 1:20

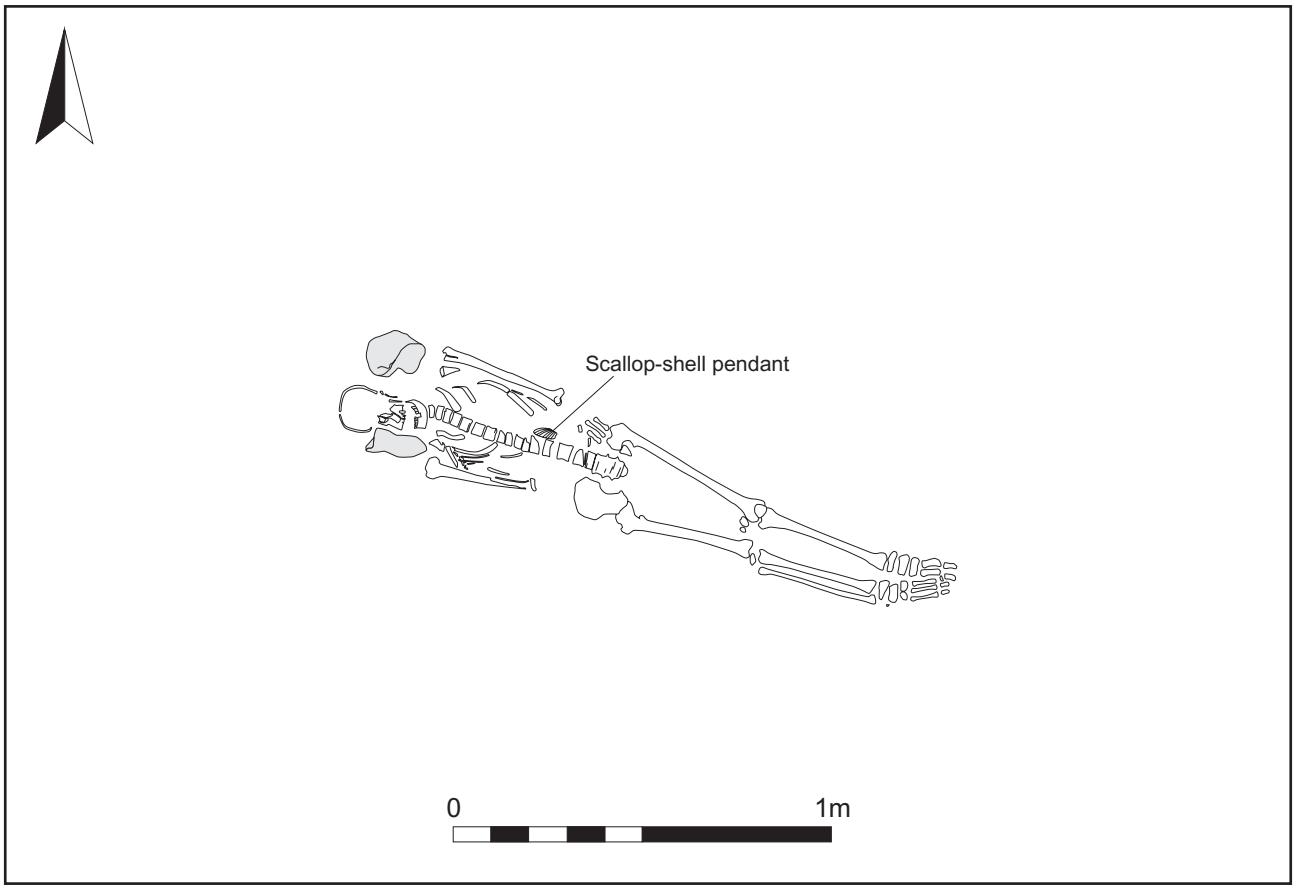
Section through Late Saxon mortar mixer and layers below

Fig 12



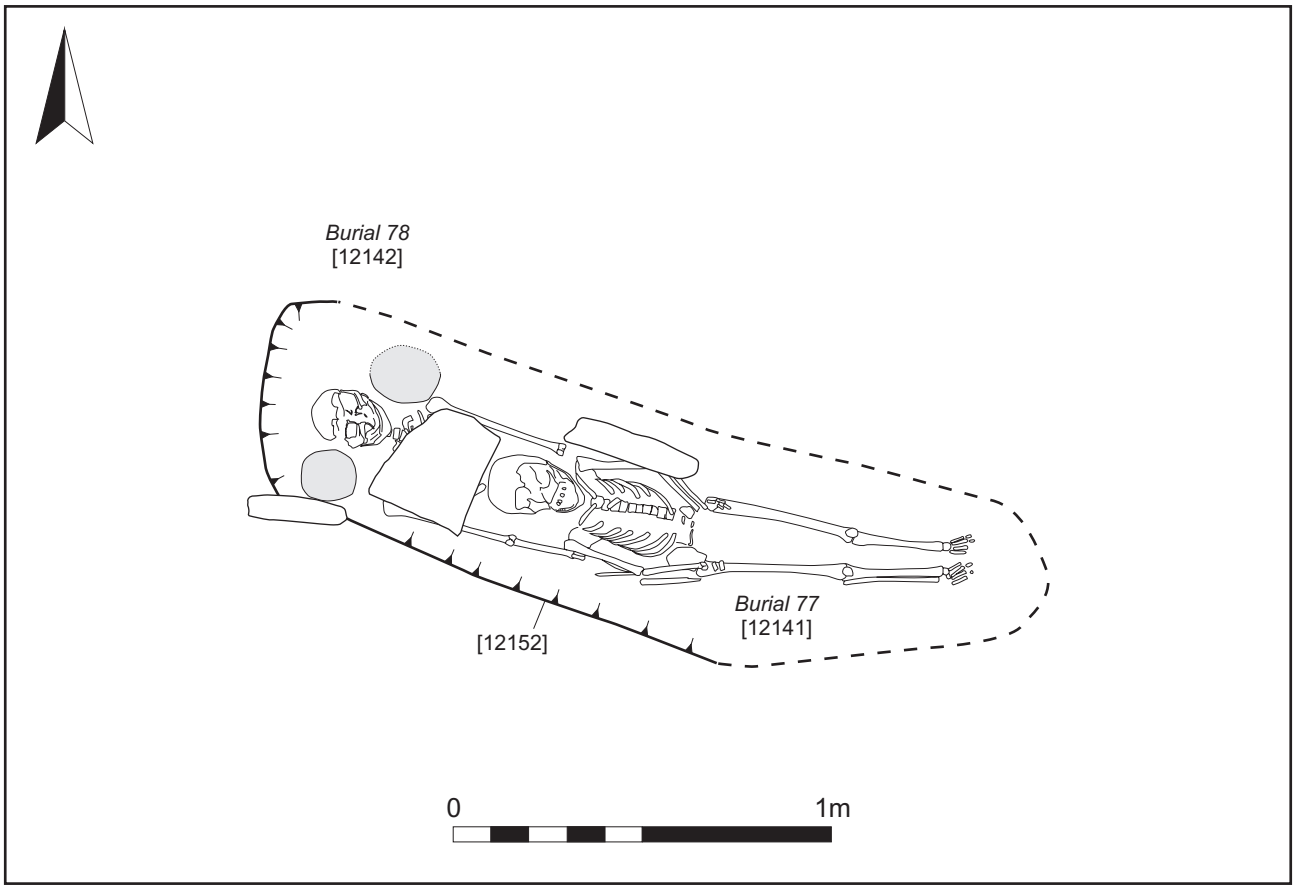


Scale 1:100 St Martin's churchyard: early growth Fig 13



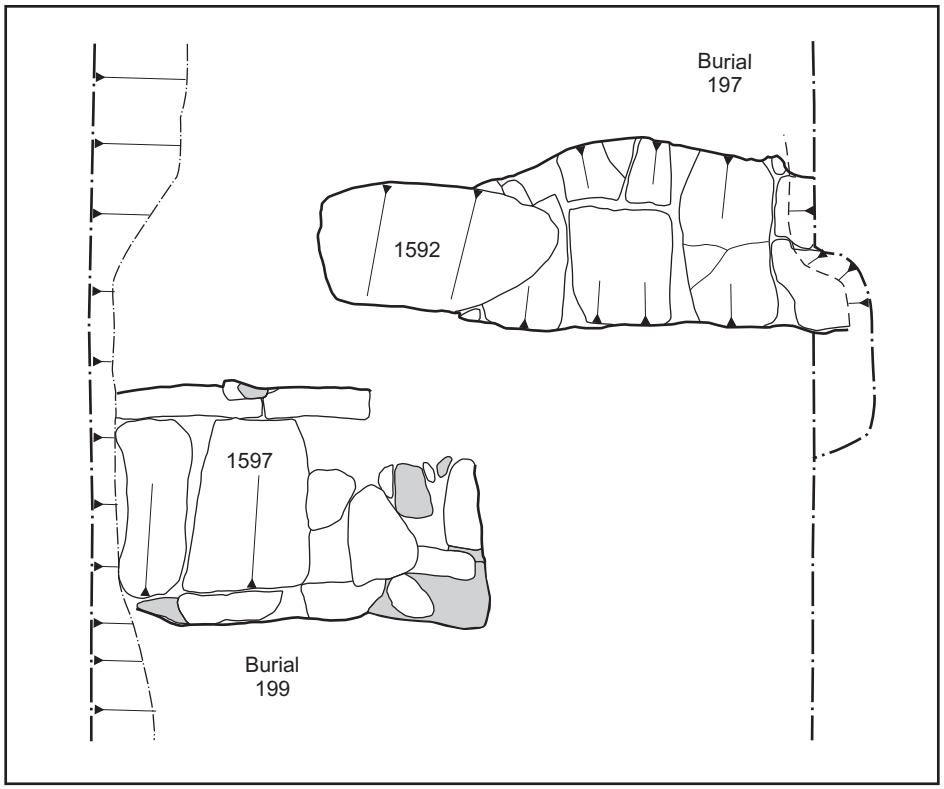
Burial 56 with stone “ear-muffs” and scallop-shell pendant Fig 14

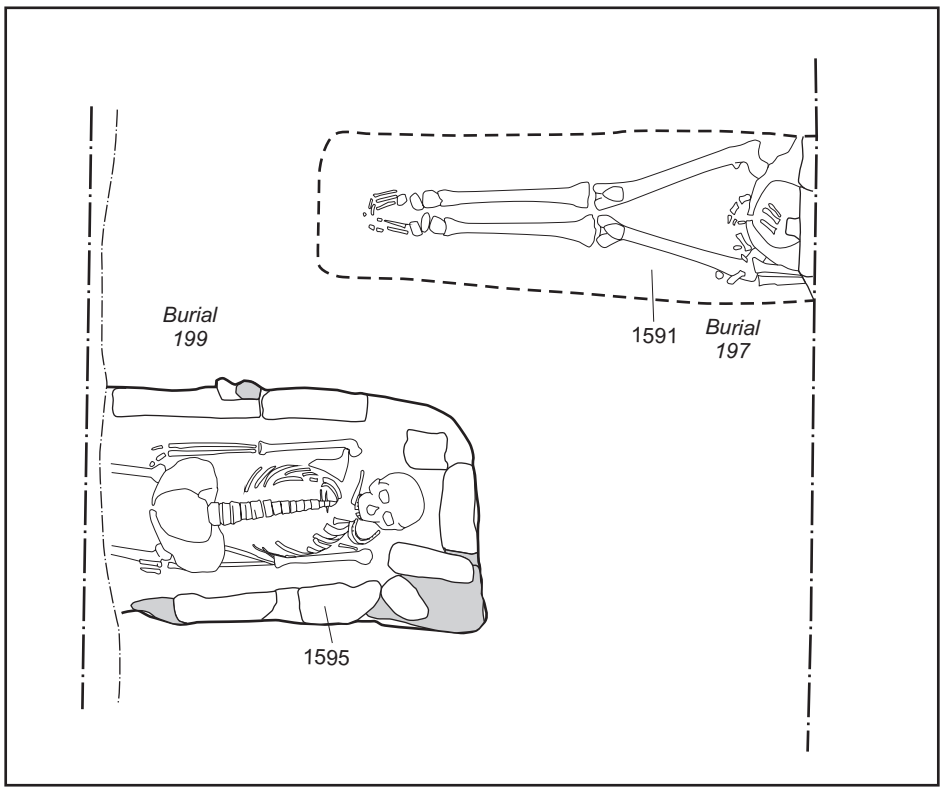
Burial 56: detail showing scallop-shell pendant Fig 15



Burials (77 and 78) with skulls as “ear-muffs” and stone slab on chest Fig 16

Burial 78 showing the skulls as “ear-muffs” Fig 17





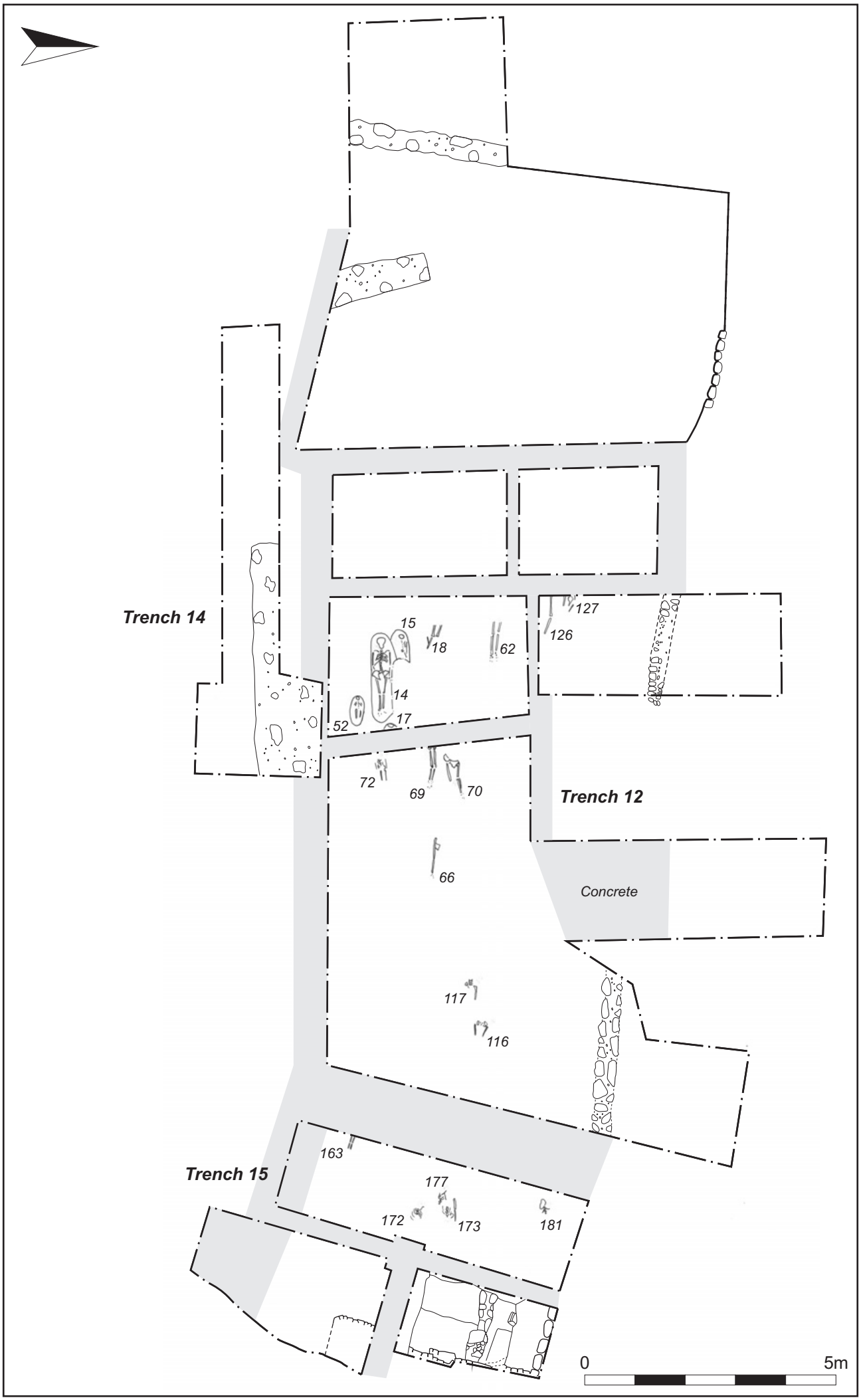
0 1m

Mortar

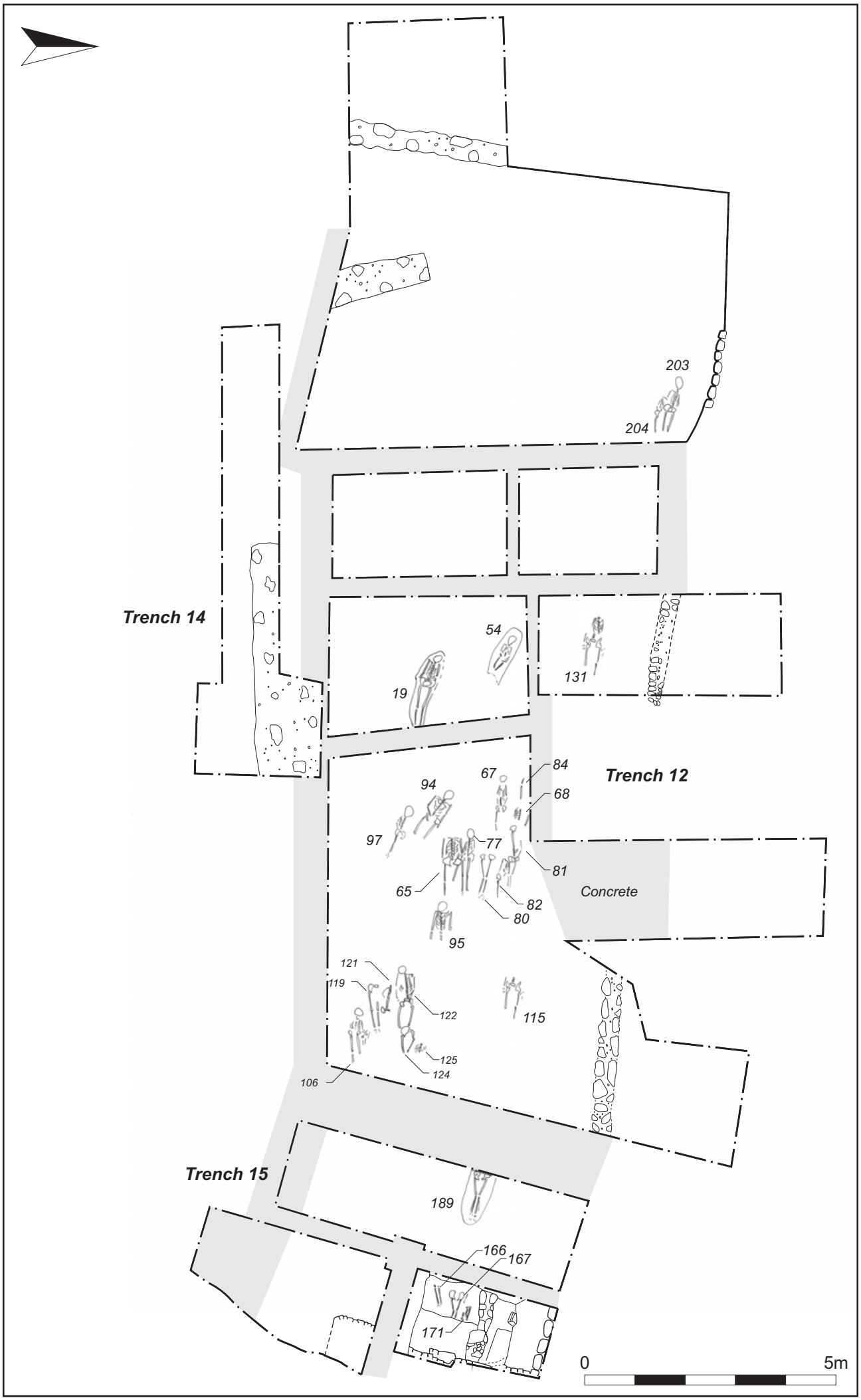
Comparative burial rites of Burials 197 and 199 Fig 18

Burials 197 (foreground) and 199 (background, right), looking south Fig 19

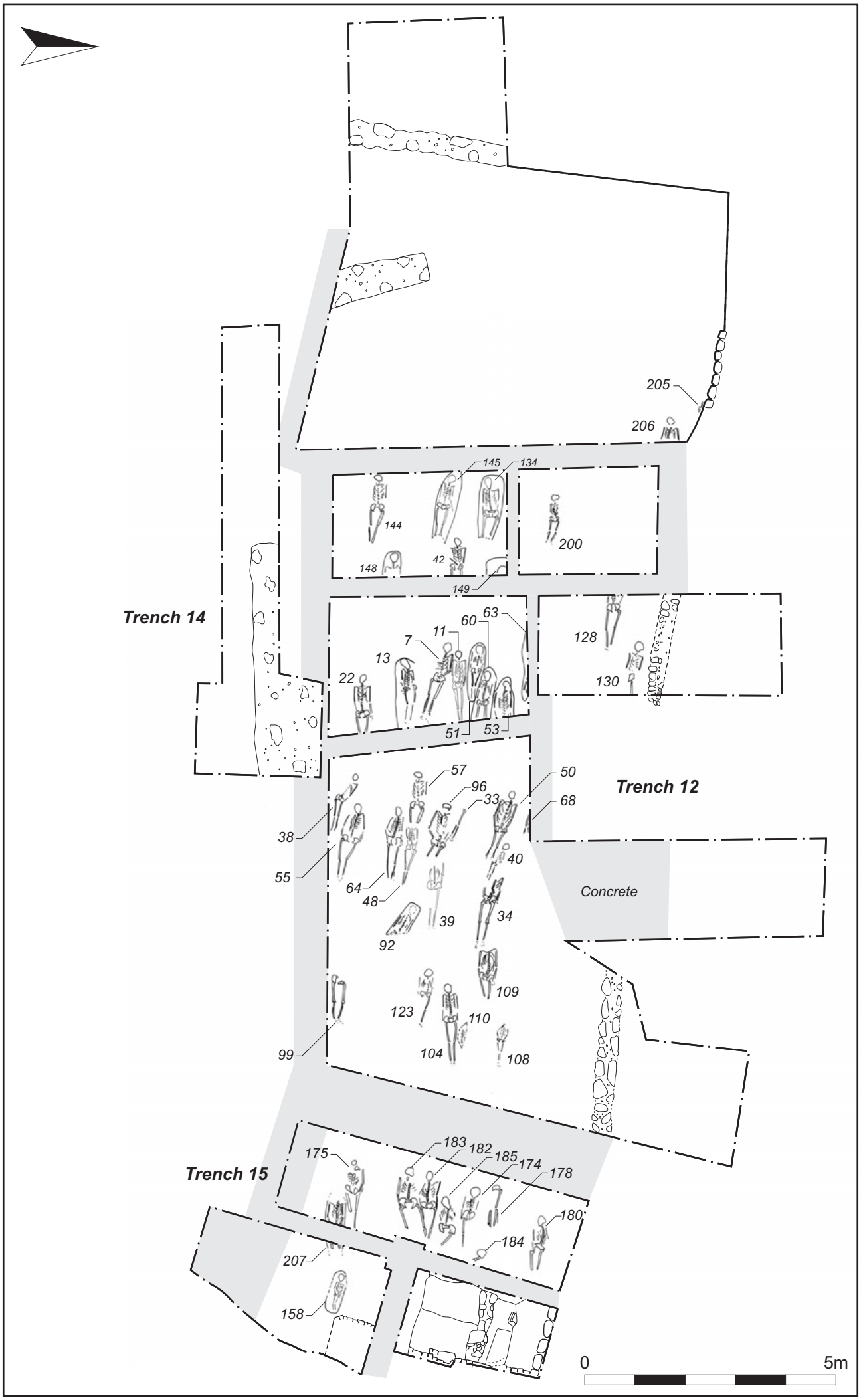
Burial 199, cover stones removed Fig 20



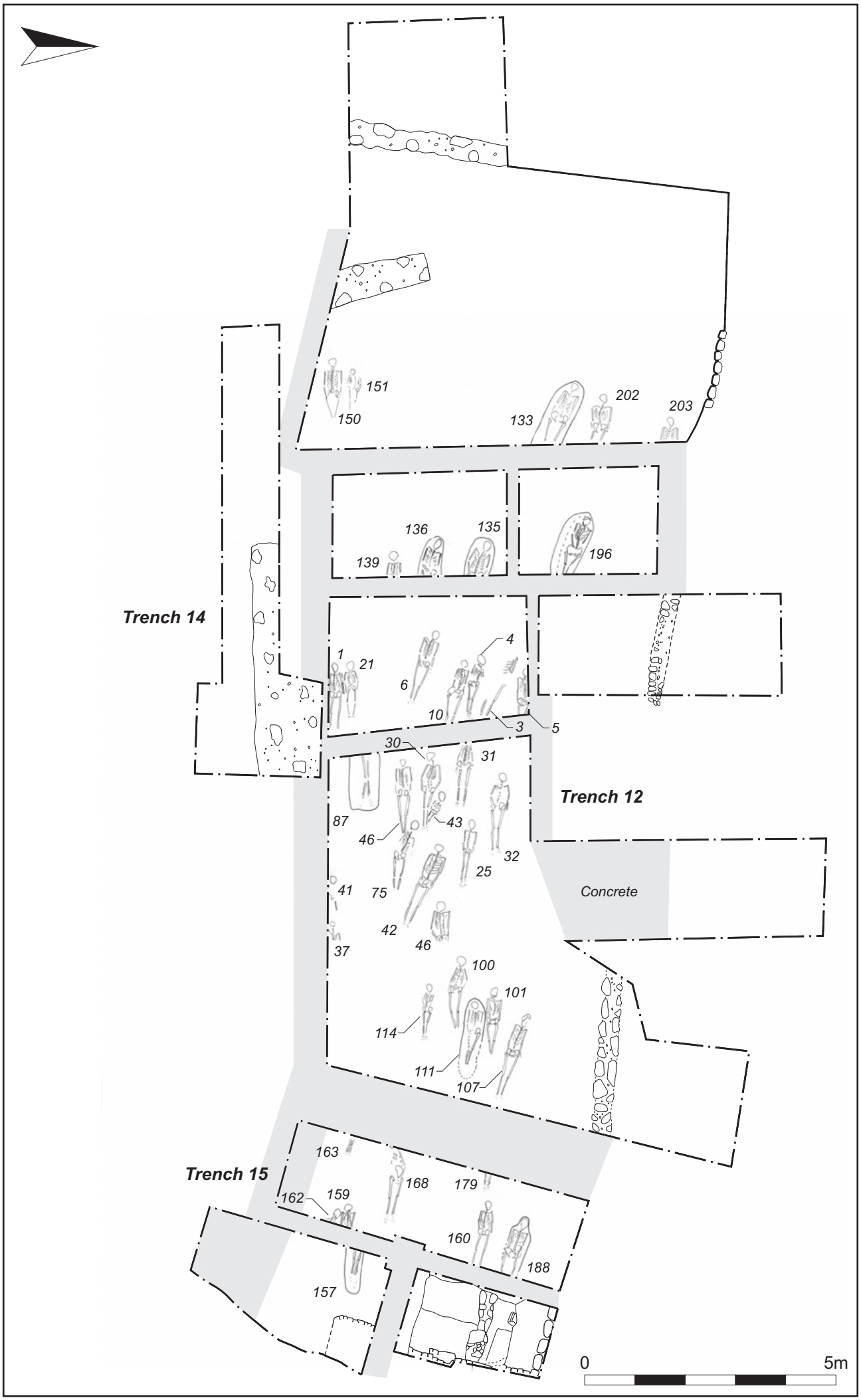
Scale 1:100 St Martin's Churchyard: Phase 3, mid 11th - 12 century Fig 21



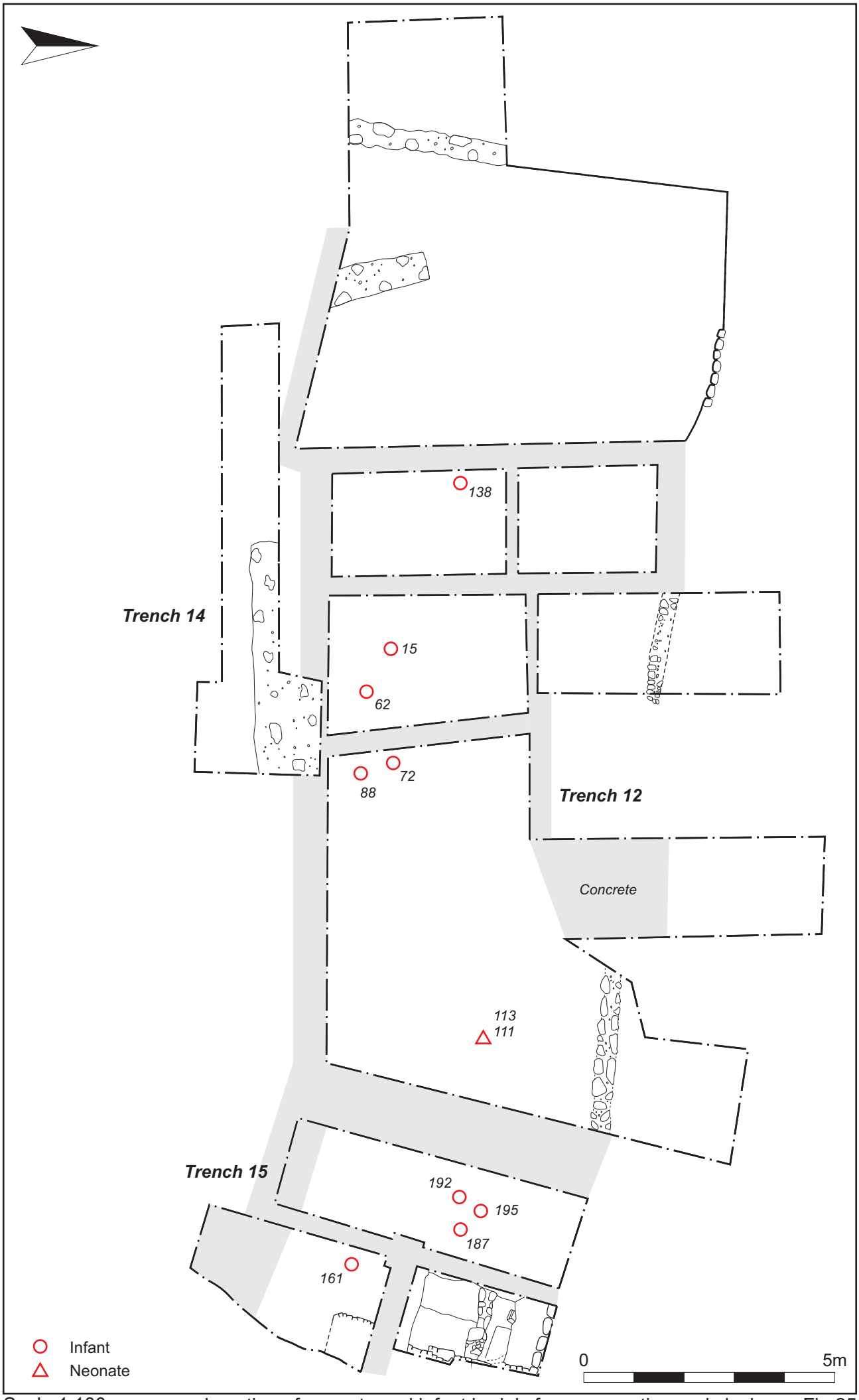
Scale 1:100 St Martin's Churchyard: Phase 4, 12th century Fig 22



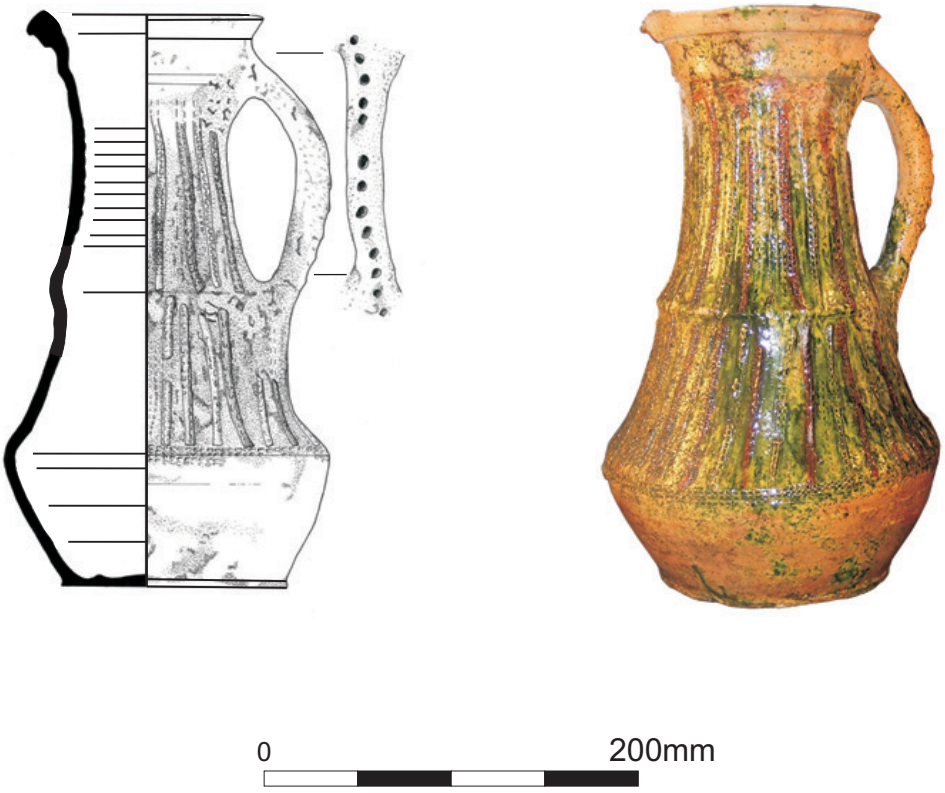
Scale 1:100 St Martin's Churchyard: Phase 5, Medieval 13th century Fig 23



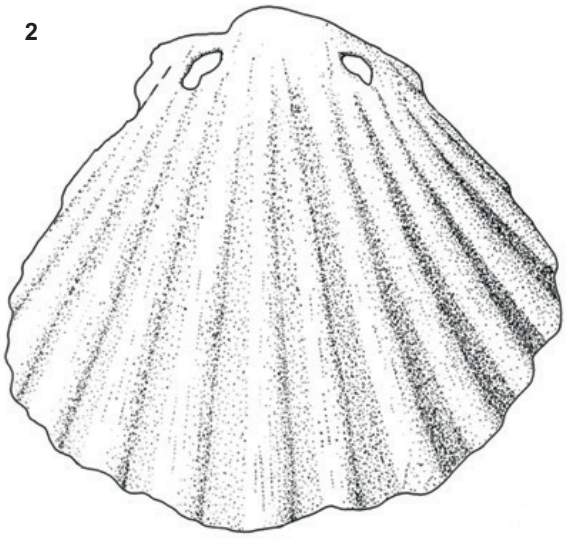
Scale 1:100 St Martin's Churchyard: Phase 6, Medieval 14th century Fig 24



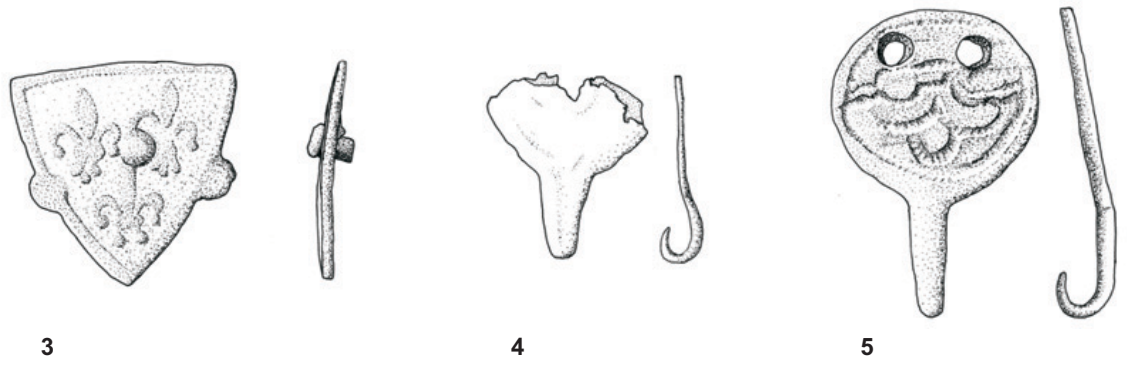
Scale 1:100 Location of neonate and infant burials from excavation and sieving Fig 25



Brill/ Boarstall jug from evaluation Trench 1 Fig 26

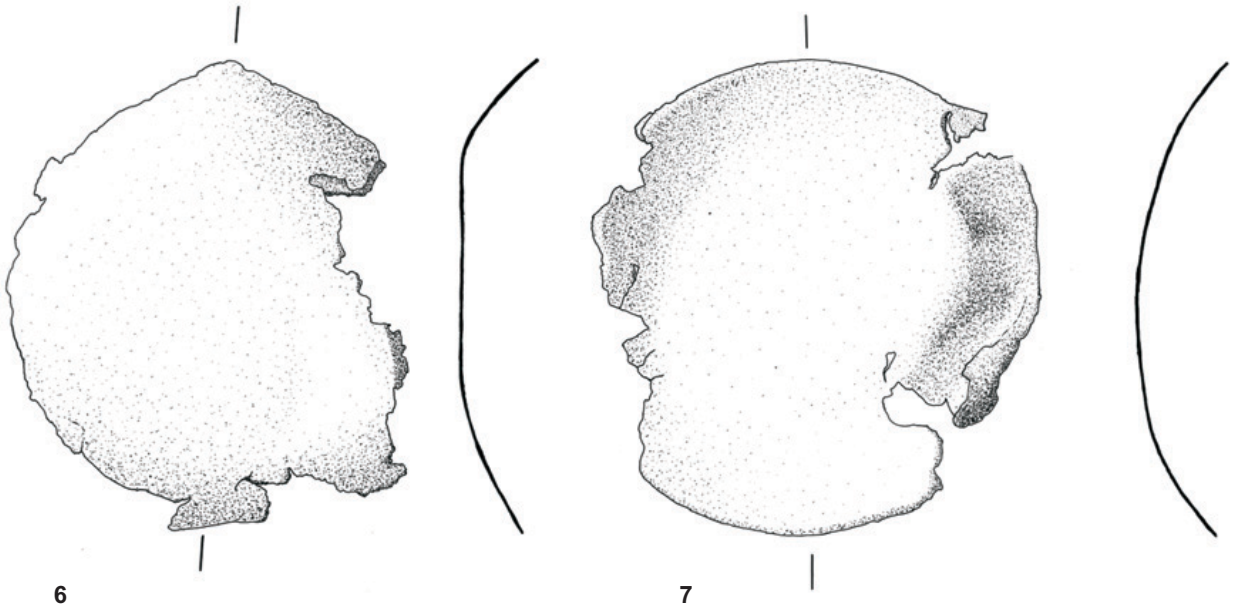


Religious souvenirs: 1) Lead crucifix and 2) Scallop-shell pendent Fig 27



3 4 5

0 20mm



6 7

0 100mm

Other finds: costume mount, 3); hooked tags, 4) and 5) and balance pans, 6) and 7) Fig 28

a)

b)

Burial 138: The only undisturbed stone cyst a) before excavation, b) the lid removed Fig 29

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