Excavation Report

Excavations at the Litten Medieval Cemetery Newbury West Berkshire

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Prepared by:	Sharon Clough
Position:	Osteologist
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Checked by:	Alan Hardy
Position:	Senior Project Manager
Date:	24th July 2006
Approved by:	Anne Dodd
Position:	Director of post-excavation
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Signed.....

Oxford Archaeology

Janus House
Osney Mead
Oxford OX2 0ES
t: (0044) 01865 263800
f: (0044) 01865 793496
e: info@oxfordarch.co.uk
w: www.oxfordarch.co.uk

EXCAVATIONS AT THE LITTEN MEDIEVAL CEMETERY, NEWBURY, BERKSHIRE

by Sharon Clough and AnnSofie Witkin

NGR: SU 8469 8665

ARCHAEOLOGICAL EXCAVATION REPORT

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SUMMARY

In July and August 2004, an archaeological excavation was carried out by Oxford Archaeology at the corner of Pound Street and Newtown Road, Newbury on behalf of the West Berkshire Highways Department. The excavation in advance of roadworks, revealed 59 inter-cutting graves and a quantity of charnel bones. These burials formed part of a much larger cemetery (locally known as the Litten), which served the medieval infirmary of St Bartholomew between the early 13th century and mid 16th century.

The skeletons that were recovered were found to be in a generally good condition, though many were incomplete, having been truncated by later graves and modern services. High levels of pathology were observed, not unsurprising in a hospital population. A case of congenital syphilis has been proven by radiocarbon dating to pre-date Columbus's discovery of the New World.

Three phases of burial were identified and evidence for burial practice through items such as coffin nails and soil staining was recovered.

1 INTRODUCTION

1.1 Project background

1.1.1 Excavations by Oxford Archaeology took place on the corner of Pound Street and Newtown Road, Newbury, Berkshire (Fig.1). The work took place on behalf of West Berkshire Highways Department in response to the discovery of human remains during road construction. Further work in the form of a watching brief took place to observe two service trenches.

1.2 Site Location, *(Fig. 2)*

1.2.1 Newbury lies within a triangle of Reading, Basingstoke and Swindon at the confluence of the rivers Lambourn and Kennet. The site is situated south of the river Kennet and south of the railway line at the far end of St Bartholomew street. The site lies within a triangle of land at the junction of Pound Street, Argyle Road and Newtown Road and covers an area of some 52 sq m (NGR: SU 8469 8665). To the south of the site is the 'Litten' Chapel and St Bartholomew's Almshouses.

1.3 Topography and geology

1.3.1 The development area is located on alluvial floodplain and gravel terraces, covered in places by deposits of alluvial soils and peat (BGS Sheet 267) at 78.6 m OD. Underlying geology comprises sands within the Reading Beds overlying London Clay.

2 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Historical background of hospital

2.1.1 The Litten is located to the north of a triangle of land that is associated with the medieval hospital of St Bartholomew. The word 'Litten' refers to a litten tree whose name is a corruption of the Old English name for a rowan tree. The rowan tree has been part of the English landscape for centuries and was particularly planted in churchyards to ward off evil spirits. Here the 'Litten' was the burial ground for the medieval hospital.

2.1.2 St Bartholomew's hospital, of which the Litten Chapel and burial ground is a part, is located at the far southern end of St Bartholomew's Street on the edge of the medieval town, on land probably granted by the founder. The great period for the foundation of hospitals was the late 12th and early 13th centuries (Rawcliffe 1995). St Bartholomew's hospital was founded prior to *circa* 1200, prior to its first documentary reference in 1215 as a hospital for the aged and sick. The need for relief for the sick poor was recognised and founding a hospital was seen as an opportunity to enhance public esteem and perhaps gain favour in the afterlife. Because of the central role of religion in medieval life it was natural that these charitable works were essentially religious institutions. The rule for this hospital may have been Augustinian, as the warden or custos of this house is referred to as the 'prior' in historical documents. It is also categorised as a hospital for a warden, brethren and sisters living under religious vows (Knowles and Hadcock 1953, 292). The earliest reference to the hospital is on 7th July 1215, when King John instructed the sheriff of Berkshire to "give all facilities to the hospital of St Bartholomew at Newbury, and to the brethren serving God there, to have two day's annual fair at Newbury on the day and on the morrow of St Bartholomew" (Ditchfield and Page 1907, 132-3).

2.1.3 The hospital was granted the right of burial in 1267, as hospitals were obliged to bury those who died in their care. This date is taken as the earliest definite date for the graves found during excavation. However as a burial licence could confirm a previous practice, it is quite possible for burials to have commenced early in the 13th century.

2.1.4 The last Prior of St Bartholomew's left in 1547, although the hospital was in decline before this date. In 1554 the hospital was dissolved and the borough of Newbury took up the management of the house and received the rents. It is likely that the cemetery went out of use no later than 1554, and possibly earlier. Eventually the hospital was converted into almshouses, which were demolished in 1698 and small tenements erected for four almsmen. The Litten Chapel was converted into a schoolhouse in the time of Edward VI.

The hospital in the historical context of Newbury

2.1.5 Newbury is first mentioned as a borough in 1189 and is considered to have been founded sometime after Domesday (1080) by a Norman lord, Arnulf de Hesdin. The town grew quickly and archaeological evidence suggests that the earliest phases of the medieval town were situated on the south side of the river, starting with St Bartholomew's Street in the 11th century (Hind 2005). Burgage plots lined Cheap St and Bartholomew's St, with Northbrook St a later extension, located between areas of common pasture. By 1204 the town had a market, fulling mill and corn mill (Astill 1978).

The town declined in the later 13th and 14th centuries, as did other towns in lowland England. Newbury picked up again in the 15th and 16th centuries and it became a centre of wool and cloth production.

Archaeological context of Newbury

Work by Wessex Archaeological Trust in Newbury (Vince *et al.* 1997) in advance of development in the 1970s has investigated the areas of Bartholomew Street and Cheap Street. Fieldwork has demonstrated the survival of a well-stratified sequence of deposits of medieval Newbury. There is some evidence of earlier settlement, with Saxon ditches and a hearth at 143-5 Bartholomew Street, interpreted as part of a field system surrounding the manor of *Ulvritone* (later 'Newbury' or new market town) (Vince *et al.* 1997). Excavations on Bartholomew Street confirm the historical evidence that it began in the early 11th century with a series of burgage plots. The site of St Bartholomew's hospital was at the southern limit of the medieval town (Astill 1978), and this appears to have remained so until the 18th century.

Archaeological context of St Bartholomew's hospital and cemetery

2.1.6 Very little archaeological work has been done in this southern area of Newbury with most of the excavations taking place on Bartholomew street or Cheap Street. Evidence for the cemetery is in *'The History of Berkshire'* published in 1769. It records that 'according to an old inhabitant of Newbury, when a may-pole was erected many years before, a quantity of human bones were found'. Skeletons were also found when Newtown Road was widened in 1882 (Garlick 1979, 94). The human remains were then reburied in the garden of the Litten. In 1926, a number of human bones, including skulls, were found in a pit in front of Litten House (Newbury Borough Library and Museum Committee Minutes 1926 - 'Bones discovery'). Further discoveries of human remains were made in 1929 and in 1935, though it is not specified where (Newbury Weekly News 1935). During building work in 1980 more human remains were found in around the Litten Chapel. One skeleton was uncovered to the south of the Chapel and another at the base of a lift shaft within the Litten House (built in 1849) (Cannon 1998, 46). The most recent work in the immediate area was an archaeological watching brief on the north side of Pound Street during digging of foundations for an extension to a building in the 1980s (Cannon 1998, 52), skeletons were recovered here and these may belong to the Litten cemetery.

3 ARCHAEOLOGICAL DESCRIPTION

3.1 The excavation area *(Figs 3 and 4)*

3.1.1 The excavation area took the form of a crescent-shaped trench. Two linear service trenches were also examined for human remains. The excavation revealed 59 inhumations in earth-cut graves. Some disarticulated human bone was recovered. Limited finds assemblages were also recovered.

3.2 Excavation methodology

3.2.1 The impacted area was stripped of overburden to the top of visible grave cuts by a mechanical excavator using a toothless ditching bucket. Two service trenches were also observed to a depth of 0.8 m. The features were then hand dug, taking due care and consideration given the nature of these particular archaeological deposits. Where an inhumation went beyond the boundary of the area of impact, skeletal remains were left *in situ*.

3.2.2 Each deposit was given a unique context number, and where skeletons were encountered these were digitally photographed and then later rectified, to create a plan of each grave. Colour-transparency and black and white negative photographs were taken of each deposit and feature. Sections and plans where appropriate were drawn. Environmental samples were taken from around the skeletons and later processed. Finds were recovered by hand and bagged by context, finds of special interest being given a unique small find number. All recording was done in accordance with established OA practices as detailed in the OA fieldwork manual (Wilkinson 1992).

3.3 Pre-cemetery

3.3.1 There are no features that pre-date the cemetery. The finds that pre-date the cemetery are residual and consist of sherds of Roman pottery. This supports the contention that the area was open fields before the cemetery was established.

3.4 The cemetery

3.4.1 The graves were all aligned west-east and sub-rectangular in shape with straight sides where they could be discerned. They varied in dimensions from 1 m long x 0.32 m wide (an infant burial) to 2 m long x 0.58 m wide. The grave depth below machined level varied from 0.05 m to 0.65 m, with the majority between 0.1 and 0.2 m. The graves exhibited a high level of intercutting, with some directly on top of earlier ones (for instance graves 41,45 and 67). Some graves were also truncated by modern services. All of the grave fills comprised re-deposited natural brickearth.

3.5 *Stratigraphic phasing*

3.5.1 The stratigraphic relationships between graves suggested at least three phases of burial (Table 1). The initial phase of the burials had several evenly spaced rows of graves. These were probably no longer visible as earth works when the second phase of burials occurred with a slight shift of alignment. A third and final phase occurred with another slight shift in orientation, resulting in much disturbance of earlier inhumations. The resultant charnel was often re-deposited in the backfill of the latest grave in the sequence.

3.5.2 Medieval cemeteries are difficult to phase, due to the lack of dating evidence within the graves. There were only eight graves with pottery in the backfill, which varied in date from the 1st-2nd century through to the 14th-16th centuries (see Cotter below). These sherds of pottery are seen as from a normal background scatter, and are typical of areas away from human activity, such as fields. Therefore the phasing scheme in Table 1 below must be viewed as tentative due to the small area of excavation and may not be representative of the whole cemetery. Skeleton 184 was radiocarbon dated and stratigraphically belongs to the first phase. The result (see Appendix 4: Radiocarbon Dating) places this burial between the mid 12th and mid 13th centuries. This coincides with the historical evidence that confirms the foundation of the hospital sometime before 1215, and the grant of the right of burial in 1267. This would place the burial of skeleton 184 and others from this phase at the beginning of the hospital.

Table 1: Phasing of the graves

Proposed phasing	Grave numbers
Phase 1	68, 200, 184, 220, 125, 157, 144, 59, 38, 75, 88, 119, 167
Phase 2	78, 181, 196, 72, 6, 62, 10, 47, 56
Phase 3	33, 27, 15, 42, 170, 90, 164
Unphased	18, 21, 47, 51, 65, 81, 84, 96, 99, 102, 105, 108, 112, 116, 128, 131, 134, 137, 140, 147, 150, 154, 176, 187, 190, 213, 215, 223, 226, 232

3.6 **Post-cemetery activity**

3.6.1 There was considerable activity after the cemetery went out of use. A shallow linear ditch/gully crossed the site (36), interpreted as a landscaping feature, which truncated several graves and contained charnel in the fill. A shallow linear ditch/gully bounded the west side of site (172). Approximately 0.25 m deep, it contained no charnel and may relate to a post-medieval boundary.

3.6.2 Overlying many of the inhumations, there was a graveyard soil (2), with modern features, such as a garden wall cut into it. Modern service trenches (such as 12) crossed the site, truncating many of the graves. The existence of the modern road and pavement had impacted on the graves, not necessarily by cutting them, but from the vibrations of heavy traffic which had caused many of the skeletons to fragment.

3.6.3 The two service trenches which were observed as part of a watching brief revealed earlier service pipes at a depth of 0.6 m. These cut through made ground, in which no human bone was observed. As the new services were to lie in the same trench as the old, no archaeology was uncovered. It is therefore not possible to determine from these trenches whether the cemetery extended further north or east.

4 THE BURIALS

4.1 Grave layout

4.1.1 Intercutting of graves in a medieval cemetery is common This could occur over a very short period of time, or many centuries. The logical way to lay out graves on a fresh piece of land is in straight rows. A preference against the immediate reuse of burial areas can be seen in the graves that are not disturbed by others. However, demands on space in the sanctified ground led to cutting through existing graves and incorporating bones into the backfill. A major shift in curation of graves has been found to occur when there was pressure on space within a cemetery (Daniell 1997). Later rows cutting into the earlier ones can create an appearance of random placement. Marking of the graves was not a universal habit, and the amount of inter-cutting can be an indicator of this.

4.1.2 There were many inter-cutting graves at the Litten (in this small portion of what is clearly a much larger cemetery), especially in the eastern part (Fig. 3). There are also a number of burials that were not disturbed by any others, and appear to be arranged in evenly spaced rows. This suggests that initially there was an organised layout. Due to demands on space or loss of grave markers, this order was subsequently lost leading to later burials cutting the earlier ones. Three burials lay directly on top of one another (67, 44 and 41), indicating a possible family group of an older child, a young adult female and a prime adult female. There could have been short-term grave markers, such as the mound itself, flowers, or a piece of wood (often in the shape of a cross) (Gilchrist 2005). Through the means of a grave marker, it would have been possible to bury family members in the same plot.

4.1.3 The osteological sex of each skeleton was plotted onto the site map (Fig. 5) in order to look for sexual patterning in burial organisation. In this instance there was no separation of the sexes, nor any grouping of the sub-adults. However, as the whole cemetery has not been excavated the assumption cannot be made that this small area is representative of the remainder of the cemetery.

4.2 Cemetery Population

4.2.1 The excavated area revealed 59 inhumations, each in a single grave. Of these, three were not subjected to full skeletal analysis. One was a skull that was not lifted, another comprised toe bones only seen in section and the third was a neonate whose bones did not survive lifting. Therefore 56 skeletons were analysed. Of the articulated skeletons there were 19 sub-adults and 37 adults, of which 12 were female, 19 male and 6 could not be sexed. The charnel bone that was recovered consisted of a large quantity of disarticulated material. A minimum number of 19 individuals were identified from the disarticulated bones, and these were added to the analysis where appropriate.

4.3 Burial practices

Body position

4.3.1 Body position could be determined in all 59 inhumations. They were laid in the supine position, with head to the west and feet to the east. Body position was very standardised, with the majority of burials in the medieval period supine (laid on the back). Other positions in this period appear to have been reserved for criminals or deviants of some kind (Clough 2001).

4.3.2 Where it could be determined (in 37 burials), there was some variation in the positioning of the arms. The positions observed were: by the side of the body, one arm flexed over the pelvis, both arms flexed over pelvis, or one or both arms much more tightly flexed and bent at the elbow across the chest, or in one case up near the top of the chest. This is shown in Table 2.

Table 2: Summary of the position of the arms (n=37)

Both arms extended by sides	18
Left arm flexed, hand on pelvis	5
Right arm flexed hand on pelvis	7
Both arms flexed hands on pelvis	3
Left arm bent at elbow 90 °	1
Right arm bent at elbow 90	1
Both arms bent 90 °	1
Tightly flexed at elbow, hands on upper chest	1

In 54 of the 56 intact burials the legs were fully extended and straight. Two individuals had the legs slightly flexed, one to the left and the other to the right. Skull position was predominantly facing forward, although some of the individuals had their skull on the side facing north (6 individuals) or south (2 individuals).

Coffins

4.3.3 It has been considered that in the medieval period a coffin was a status symbol (Litten 1991, 86). Those who could not afford one may have been transported to the grave side in a coffin, and then placed in the ground in only a shroud. However, an increasing amount of archaeological evidence from the early medieval period suggests that this was not necessarily the case. There were 13 graves that displayed evidence for a coffin, either in the form of iron nails, and/or staining of the soil (Table 3). Five of these (nos 67, 185, 221, 169, 114) were of sub-adults, buried close to one another in the north-west part of the site. This supports the current thinking (Gilchrist 2005, 112-7) that states that coffins cannot automatically be equated with social status, due to the high proportion of subadult coffins. It was not until after the Dissolution that coffin use became associated with status. It is interesting to note that the juvenile identified with congenital syphillis (184) was a coffined burial. Of the three burials (nos 41, 44, 67) interred one on top of another, two of them had coffins (nos 41, 67). It is possible that this was a family grouping. In most cases the coffined burials date to the earliest phases, being truncated or overlaid by later interments. This does not support the view of an increasing use of coffins over time, either due to changing attitudes to burial or to greater affordability of the coffins. Survival of a wooden coffin depends on the burial environment. Commonly they often only survive as stains in the ground, or metal nails, which held the coffin together. However, coffins could also be held together by wooden pins, so lack of nails does not necessarily indicate the absence of a coffin (Daniell 1997, 162).

Table 3: Summary of coffins (n=13)

Grave cut	Grave fill	Small find	Item	Soil stain
14	16	4	1 Nail	
26	28	3	1 Nail	
32	34	7, 5	1 Nail	
41	43	19	1 Nail	
67	69	-	7 Nails	Coffin stain, trapezoid
83	85	8, 9	1 Nail	
98	100	10-13	3 Nails	
114	115	13, 14	2 Nails	Dark stain, trapezoidal
165	162	-	1 Nail	
169	171	16	1 Nail	
175	177	17	1 Nail	
185	183	20	1 Nail	
221	219	21, 22	2 Nails	

Burial clothes

4.3.4 Possible evidence for clothing came from two graves (9 and 98) in the form of copper-alloy objects (SF 1 and SF 10), which may have been clasps holding an item together, or for decoration. Evidence for burial clothing in the medieval period is

scarce, except for bishops who were buried in readiness to meet Christ in their robes (Daniell 1997, 153). Clothed burial probably only applied to the highest ranks of society; for the vast majority of the population, a simple shroud sufficed. This was either sewn together, tied at the head and feet, or kept together by pins. Use of a shroud did not preclude the use of a coffin, as a shroud was merely used to clothe the body. It has been considered (Litten 1991, 86) that before the 15th century, peasants would not expect to be buried in a coffin and the nobles would not expect to be buried in only a shroud. This is thrown into some doubt by the evidence from this site for 13 coffins.

Grave goods

4.3.5 An Edward I silver penny was found in the backfill of grave 20, low down in the fill close to the skeleton (see below). It was therefore not a 'grave good' as such, but may have been either deposited in the grave as it was being backfilled after the individual had been interred, or it was residual in the backfill.

4.3.6 In the medieval period the vast majority of graves had no grave goods. This was the case across England as it was a Christian country and it was pagan burial practices that included burial of coins and vessels with the body. The general rule for grave goods is that the earlier the grave the higher the likelihood of grave goods (Daniell 1997, 164). As the individuals in the graves were most likely from the poorer strata of society and upon entering the hospital no longer had possessions, then it would be extremely unlikely and surprising if grave goods were found. The rule of the hospital of St John in Nottingham stated that should any of the poor within the hospital be found to own property (i.e. money) at their death, then his body 'shall be cast out from Christian burial, and shall be buried elsewhere, his property being thrown upon him by the brethren saying "thy money perish with thee" (Gilchrist 2005, 102).

5 HUMAN SKELETAL REMAINS

by Annsofie Witkin

5.1 Introduction

5.1.1 The human skeletal assemblage is historically dated to the medieval period, between the early 13th and the early 16th century. The assemblage comprised 56 articulated individuals, and a further 19 represented by the disarticulated remains. The bone was generally in a good state of preservation, but completeness was poor due to post-medieval truncation. The remains displayed a high prevalence of pathological lesions, which is typical of this type of assemblage.

5.2 Methodology

5.3 *Preservation and completeness*

5.3.1 There are a number of factors that affect the preservation and completeness of a skeleton. These are the pH value of the soil, the depth of the burial, the degree of compression *in situ,* and truncation. The quality of excavation and post-excavation treatment will also effect preservation (Brothwell 1981, 7-9).

5.3.2 Overall preservation of the skeleton was scored on a sliding scale ranging from destroyed to excellent, depending on the amount of erosion and flaking of the outer surface of the bone. Completeness of the skeleton was also scored on a sliding scale ranging from less than 25% complete to near complete. The state of preservation and completeness of the skeleton primarily affects the recognition of pathological lesions and metric data.

5.4 *Skeletal inventory*

5.4.1 The presence or absence of skeletal components of the individual were recorded in tabular form. The dental inventory was recorded following the Zsigmondy system. Dental notations were recorded using the universally accepted recording standards and terminology (after Brothwell 1981).

5.5 *Age at death*

5.5.1 Osteological assessment of age provides the biological age and not the chronological age of the individual. This is due to factors such as nutrition and lifestyle which have an impact on skeletal growth and subsequent degeneration. Subadults may be more precisely aged than adults since the growth and maturation sequence of children is fairly predictable and uniform. The development and eruption of both deciduous and permanent dentition is less affected by environmental influences than the skeleton, and is thus the most accurate tool for ageing subadults below 12 years (Roberts 1997,

111). The ageing of adults over the age of 25 relies on the degeneration of various sites on the skeleton.

5.5.2 In order to increase the accuracy of age assessment, a number of techniques were adopted. For the subadults, one or more of the following were used: the formation and resorption of deciduous dentition and the formation of the permanent dentition (Moorees *et al.* 1963a and b), length of long bones (Hoppa 1992, 275-88) and epiphyseal fusion (Ferembach *et al.* 1980, 517-49, Schwartz 1995, 196-99). Epiphyseal fusion was also used for adults up to 28 years.

5.5.3 Adults were aged by the degenerative changes to the auricular surface (Lovejoy *et al.* 1985, 15-28), the pubic symphyses (Todd 1920; 1921; Brooks and Suchey 1990, 227-38) and the sternal rib end (Iscan *et al* 1984, 1985, 853-63). Other parameters utilised were dental attrition (Miles 1962, 881-6; Brothwell 1981, 72) and cranial suture closure (Meindl and Lovejoy 1985, 29-45).

5.6 *Sex determination*

5.6.1 The sexually morphological differences between males and females emerge after the onset of puberty. Generally, sex can therefore only be determined with any degree of accuracy in skeletons aged over approximately 17 years. Cranium, pelvic and post-cranial metrical measurements are used for the determination of sex. The differences between the sexes are most pronounced in the pelvis, as the female pelvis is adapted to childbirth. Post-cranial measurements rely on the generalisation that males tend to be larger than females. The measurements of the diameters of certain joints can therefore be used to determine sex. The measurements taken for the assignment of sex were the diameters of the femoral, humeral and radial heads, as well as the length of the clavicles and the width of the glenoid fossa (Chamberlain 1994). Six cranial features and ten pelvic features were used for sexing. On the cranium, the features used were chosen from Standards (Ferembach *et al.* 1980; Buikstra and Ubelaker 1994). The features on the pelvis included the sciatic notch, the preauricular sulcus (Ferembach *et al.* 1980) as well as the pubic bone region (Phenice 1969, 297-301).

5.7 *Stature estimation*

5.7.1 Stature was calculated using the regression formulae devised by Trotter (1970) (for white males and females). Complete long bones were used for the calculation of stature, the bones of the lower limb being favoured over those of the arm.

5.8 *Pathology*

5.8.1 The remains were examined for abnormalities of shape and surface texture. When observed, pathological conditions were described fully and recorded following normal osteological standards (e.g. Ortner 2003, Aufderheide and Rodriguez-martin 1998). Where appropriate the results have been compared to other contemporary assemblages.

5.9 Results

Quantification

5.9.1 The articulated skeletal assemblage comprised 56 individuals. The minimum number of individuals represented by the disarticulated remains was 19. This was determined from a combination of adult right femoral midshafts, right distal femora and complete right femora, giving a total of 16. Three other individuals were represented from other age categories.

Preservation and completeness

5.9.2 Overall preservation of the bone was good, with minimal flaking and erosion of the cortical surface. The majority of the inhumation burials (76.8 %) were scored as being well-preserved. Only one individual was extremely poorly preserved and another individual was recorded as excellently preserved (Table 4).

Table 4: Skeletal preservation (n=56)

Preservation	Number of individuals
Destroyed	**1.8%** (1/56)
Poor	**19.6%** (11/56)
Fair	**16.1%** (9/56)
Good	**60.7%** (34/56)
Excellent	**1.8%** (1/56)

5.9.3 The completeness of the articulated skeletons was generally poor, with 35.7% of the individuals less than 25% complete. However, 44.7% of the inhumations were more than 50% complete, the majority being between 50% and 75% complete (Table 4). Completeness was affected by truncation, both by later burials and post-medieval activities, such as the excavation of service trenches. Construction and use of the pavement and road had compressed the soil, causing a high number of post-mortem breaks, particularly of the long bones.

Table 5: Skeletal completeness (n=56)

Completeness	Number of individuals
< 25%	**35.7%** (20/56)
26-50%	**19.6%** (11/56)
50%	**12.5%** (7/56)
51-75%	**14.3%** (8/56)
76-100%	**17.9%** (10/56)

5.9.4 In general, skeletal preservation and completeness are interlinked. A high degree of intercutting of burials and post-mortem breaks would usually signify poor preservation of the bone. However, despite the presence of these factors the preservation of the skeletons was good (Figure 6). The pH value of the soil is therefore a significant variable. The soil acidity on this site was close to neutral, which would primarily be due to the high organic content of the cemetery soil.

Figure 6: Comparison between levels of preservation and completeness

5.10 *Demography*

5.10.1 The articulated skeletons consisted of 37 (66.1%) adults and 19 (33.9%) children (Table 6). Of the adults, 12 (38.7%) were female, and 19 (61.3%) were male and 6 could not be aged or sexed. There were substantially more males than females within the population group. A mere 8.9% of the cemetery population (or 16.1% of the adults) lived to a greater age than 40 years. This figure is comparable to St Nicholas, Shambles, London, in which 8.3% of adults survived to an age greater than 45, or 11.3% of the aged adults (White 1988, 30).

Table 6: The age and sex of the articulated skeletal remains (n=56)

	?M/M	?F/F	?	Total
Neonate (0-1 m)			**1.8%** (1/56)	**1.8%** (1/56)
Infant (2-12 m)				
Young Child (1-5 yrs)			**10.7%** (6/56)	**10.7%** (6/56)
Older Child (6-12 yrs)			**7.1%** (4/56)	**7.1%** (4/56)
Adolescent (13-18 yrs)			**7.1%** (4/56)	**7.1%** (4/56)
SubAdult (0-18 yrs)			**7.1%** (4/56)	**7.1%** (4/56)
Young Adult (18-25 yrs)	**7.1%** (4/56)	**9%** (5/56)		**16.1%** (9/56)
Prime Adult (26-40 yrs)	**12.5%** (7/56)	**7.1%** (4/56)		**19.6%** (11/56)
Mature adult (40+)	**5.4%** (3/56)	**3.6%** (2/56)		**9%** (5/56)
Ageing Adult (50+)				
Adult (18+)	**9%** (5/56)	**1.8%** (1/56)	**10.7%** (6/56)	**21.5%** (12/56)
Total	**34%** (19/56)	**21.5%** (12/56)	**44.5%** (25/56)	**100%** (56/56)

5.10.2 The disarticulated assemblage consisted mainly of unsexed and unaged adult remains. A total of five adults (represented by maxillae and mandibulae) and six children could be aged (Table 7). When the demographic profile was compared to the articulated skeletons (Figure 7), the age of the disarticulated remains followed the

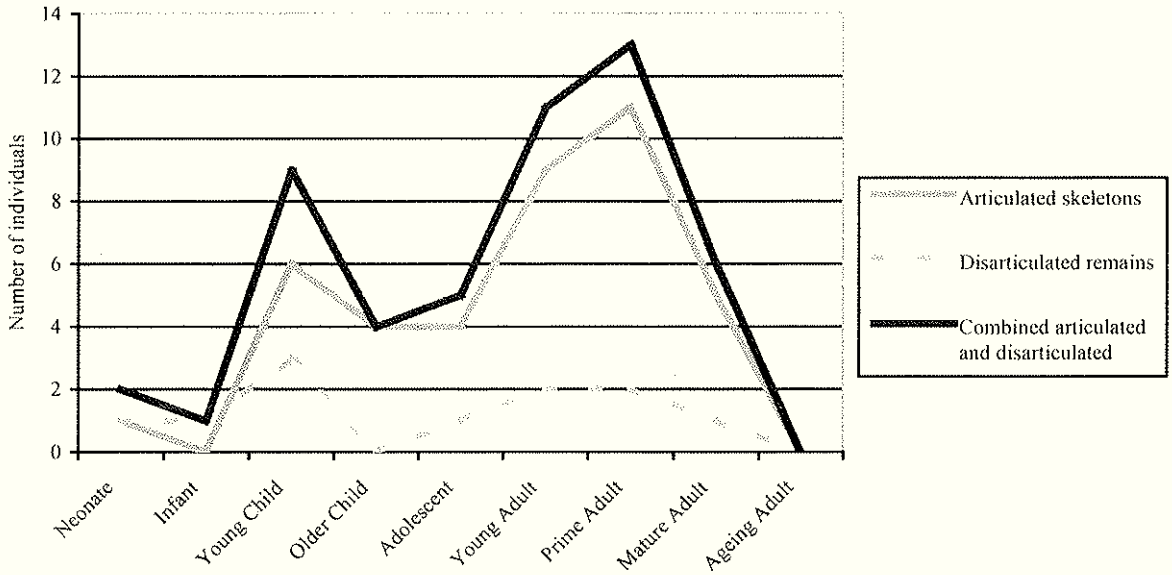
same trend as the articulated remains. The combined shows exactly the same trend as that of the articulated skeletal remains.

Table 7: The age and sex of the disarticulated skeletal remains

	?M/M	?F/F	?	Total
Neonate (0-1 m)			**9.1%** (1/11)	**9.1%** (1/11)
Infant (2-12 m)			**9.1%** (1/11)	**9.1%** (1/11)
Young Child (1-5 yrs)			**27.2%** (3/11)	**27.2%** (3/11)
Older Child (6-12 yrs)				
Adolescent (13-18 yrs)			**9.1%** (1/11)	**9.1%** (1/11)
Young Adult (18-25 yrs)	**9.1%** (1/11)	**9.1%** (1/11)		**18.2%** (2/11)
Prime Adult (26-40 yrs)	**9.1%** (1/11)	**9.1%** (1/11)		**18.2%** 2/11)
Mature Adult (40+)	**9.1%** (1/11)			**9.1%** (1/11)
Ageing Adult (50+)				
Total	**27.3%** (3/11)	**18.2%** 2/11)	**54.5%** (6/11)	**100%** 11/11)

5.10.3 Overall, there appeared to be two main mortality peaks (Table 7). The first appeared in age group 1-5 years, and the second between 26 and 40 years. Of the 30 aged and sexed adults (articulated and disarticulated combined), the highest proportion of the females, 37.5% (6/16), died as young adults, whereas the largest proportion of the males died as mature adults, 52.9% (9/17) (Table 6 and 7). Although this is a relatively small sample, this trend tentatively suggests that the higher mortality in young females was likely to relate to child bearing.

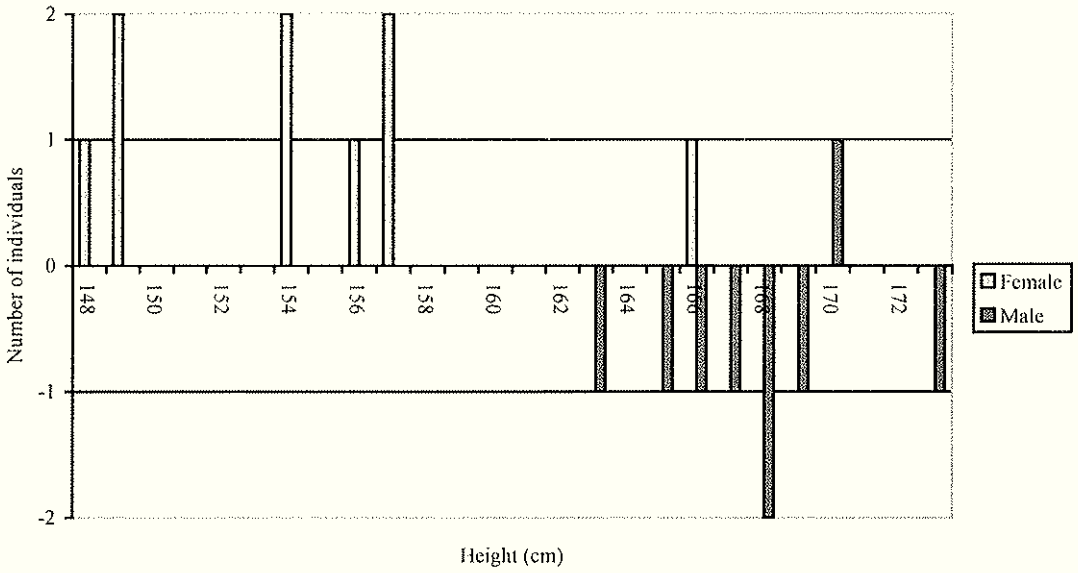
Figure 7: Comparative demography



5.11 *Stature*

5.11.1 Female stature ranged between 148 cm (4" 10') and 166 cm (5" 5') with an average of 155 cm (5" 1'). Male stature ranged between 163 cm (5" 4') and 173 cm (5" 8') with an average of 167 cm (5" 6') (Figure 8). There appears to be a marked difference in stature between the sexes, with females being much shorter than the males. It is more common to have an overlap of stature between the sexes. Due to the small sample size it is impossible to be certain that this represents any real sexually dimorphic difference.

Figure 8: Female and male stature



5.11.2 The mean male and female statures have been compared with contemporary assemblages in Table 8 (after White 1988, 31; Roberts and Cox 2003, 248). The Litten mean female stature was the shortest of the assemblages listed below and the mean male stature is also one of the shortest. This may be due to the small sample size, but it may also reflect poor childhood dietary status and health. An inadequate diet during childhood may lead to stunted growth. Considering that this was an infirmary population, these individuals may well have been of the poorer sector of the society and may therefore have had a poor childhood diet and higher disease load.

Table 8: Comparative stature in 11 medieval populations

Site	Male mean stature (cm)	Female mean stature (cm)	Male stature range (cm)	Female stature range (cm)
The Litten, Newbury	167	155	163-173	148-166
St Helen, York	169	157	-	-
Wharram Percy	168	-	-	-
Greyfriars, Chester	168	160	-	-
Austin Friars, Leicester	178	158	-	-
Bordesley Abbey	173	-	-	-
Rothwell Charnell House	165	158	-	-
Dominican Priory, Chelmsford	170	156	-	-
Guildford Friary, Surrey	175	158	-	-
South Acre, Norfolk	168	156	-	-
St Leonard's, Hythe, Kent	170	157	-	-

St Nicholas Shambles, London	172	157	159-187	150-174
Medieval Britain mean	171	159	-	-

5.12 **Dental pathology**

5.13 *Dental Calculus*

5.13.1 Dental calculus is formed by mineralised plaque which accumulates at the base of living plaque deposits on the teeth (Hillson 1996, 225). Calculus is a common pathological condition and is generally related to poor oral hygiene. The deposits are generally seen on the teeth nearest the saliva glands.The location of the deposits seen on the teeth of the Litten skeletons correlates with this pattern of deposition.

5.13.2 The prevalence of calculus was based on the total number of affected teeth expressed as a percentage of the total number of teeth observed. This included the dentition of both articulated and disarticulated remains. A total of 19 individuals (33.9%) had calculus deposits. These consisted of 17 adults (8 females and 9 males) and 2 subadults. A total of 32.4% (174/537) of all permanent teeth observed had calculus deposits (Table 9). There was a greater frequency of calculus on the mandibular dentition (36.09%) and the incisors were most frequently affected (59.4%). Only 5.26% (1/19) of the deciduous dentition had deposits of calculus (Table 9).

Table 9: Permanent dentition calculus distribution (articulated and disarticulated dentition)

Tooth	**% Calculus maxilla**	**% Calculus mandible**	**Total**
1	**13.04%** (3/23)	**66.67%** (22/33)	**44.64%** (25/56)
2	**36.36%** (8/22)	**52.78%** (19/36)	**46.55%** (27/58)
3	**30%** (12/40)	**41.67%** (15/36)	**35.53%** (27/76)
4	**33.33%** (12/36)	**35.56%** (16/45)	**35.57%** (28/81)
5	**32.26%** (10/31)	**27.90%** (12/43)	**29.73%** (22/74)
6	**35.48%** (11/31)	**23.08%** (9/39)	**28.57%** (20/70)
7	**20%** (6/30)	**25%** (9/36)	**22.73%** (15/66)
8	**13.64%** (3/22)	**28.59%** (7/34)	**17.86%** (10/56)
Total	**27.66%** (65/235)	**36.09%** (109/302)	**32.40%** (174/537)

5.13.3 The average prevalence of individuals with calculus reported from a number of medieval assemblages is 59% (Roberts and Cox 2003, 262). This is a significantly higher rate than that seen in the Newbury assemblage. The low prevalence of calculus may be seen as an indicator of good oral hygiene, although diet may also influence the presence of these deposits.

5.14 *Dental Caries*

5.14.1 Dental caries is a destruction of the enamel caused by the production of acid from bacteria present in dental plaque and is therefore considered to be an infectious disease (Hillson 1996, 269). The cavities are commonly found in areas where food is likely to be trapped, such as on the occlusal surface of premolars and molars, between the teeth and along the cemento-enamel junction (CEJ). Cavities present at the CEJ, often predisposed an individual to periodontal disease (Hillson 1996, 275). Caries rates amongst a population are strongly linked to the consumption of carbohydrates (Hillson 1996, 278). Where starch-rich plants form a small part of the diet, caries rates are low. Where sugars have been introduced into the diet, fissure and approximal caries, particularly in children, become dominant.

5.14.2 The caries prevalence of permanent dentition was calculated using the total number of affected teeth expressed as a percentage of the total number of teeth observed. This included the dentition of both articulated and disarticulated remains. A total of 17 individuals (30.35%) had carious lesions present. These comprised 15 adults (7 females and 8 males) and 2 subadults. Only 9.31% (50/537) of the permanent dentition was affected by caries (Table 10). Overall, the tooth displaying the highest number of caries was the first molar (20%). This is largely due to early eruption of this tooth (at the age of 6 years) and being exposed to plaque for the longest time. Of the 50 lesions observed, 66% (33/50) were recorded as small, and only 16% (8/50) as large.

Table 10: Permanent dentition caries distribution (articulated and disarticulated dentition combined)

Tooth	% Carious maxilla	% Carious mandible	Total
1	**4.34%** (1/23)	**0%** (0/33)	**1.78%** (1/56)
2	**4.55%** (1/22)	**0%** (0/36)	**1.72%** (1/58)
3	**2.5%** (1/40)	**0%** (0/36)	**1.32%** (1/76)
4	**11.10%** (4/36)	**0%** (0/45)	**4.94%** (4/81)
5	**25.8%** (8/31)	**2.32%** (1/43)	**12.16%** (9/74)
6	**32.25%** (10/31)	**10.25%** (4/39)	**20%** (14/70)
7	**16.67%** (5/30)	**16.67%** (6/36)	**16.67%** (11/66)
8	**0%** (0/22)	**2.94%** (1/34)	**1.78%** (1/56)
Total	**12.76%** (30/235)	**6.62%** (20/302)	**9.31%** (50/537)

5.14.3 According to Roberts and Cox (2003, 259) the overall caries rates per individual in medieval Britain was 53%. This is considerably higher than the rate in the Newbury population (9.31%). This may be due to the high proportion of subadults and young adults, but, like the low calculus rate, this may also be related to other factors, such as diet.

5.15 *Ante-mortem tooth loss*

5.15.1 The aetiology of ante-mortem tooth loss is multifactoral in its origin (Lukacs 1989, 265). Accumulation of calculus may lead to periodontal disease, eventually leading to the loss of the tooth. The formation of a peri-apical abscess (caused by severe attrition or caries) may also cause premature exfoliation. Trauma is another cause of tooth loss.

5.15.2 The prevalence of ante-mortem tooth loss was calculated by using the total number of teeth lost ante-mortem (expressed as a percentage of the total number of *in situ* teeth, tooth roots and empty sockets present). Unerupted and partially erupted teeth, loose teeth and teeth believed to be congenitally absent were excluded. Nine (16.07%) articulated individuals (four females, four males and one adolescent) had ante-mortem tooth loss. A total of 6.06% (35/577) teeth had been lost ante-mortem and more teeth were lost from the maxillary dentition than from the mandibular dentition (Table 11). The most common tooth affected was the first molar which accounted for 19.10% (17/89) of all teeth within the assemblage (Table 11).

Table 11: Ante-mortem tooth loss permanent dentition (articulated and disarticulated jaws combined)

Tooth	% AMTL maxilla	% AMTL mandible	Total
1	**0%** (0/23)	**2.86%** (1/35)	**1.72%** (1/58)
2	**0%** (0/23)	**0%** (0/36)	**0%** (0/59)
3	**0%** (0/40)	**0%** (0/36)	**0%** (0/76))
4	**5.26%** (2/38)	**0%** (0/45)	**2.15%** (2/93)
5	**6.10%** (2/33)	**2.13%** (1/47)	**3.75%** (3/80)
6	**20%** (8/40)	**18.37%** (9/49)	**19.10%** (17/89)
7	**9.10%** (3/33)	**10.26%** (4/39)	**9.72%** (7/72)
8	**8.33%** (2/24)	**5.56%** (2/36)	**6.67%** (4/60)
Total	**7.10%** (18/254)	**5.26%** (17/323)	**6.06%** (35/577)

5.15.3 In the medieval assemblages listed in Roberts and Cox (2003, 262-63) the average number of individuals with ante-mortem tooth loss was 36%, with the number of teeth lost averaging 19%. Both these figures are higher than those reported from the Litten, Newbury (6.06%). This is again an indication of either good dental hygiene, youthful population and/or diet low in carbohydrate consumption.

5.16 *Dental enamel hypoplasia*

5.16.1 Hypoplastic lines, grooves or pits on the enamel surface are formed during periods of growth arrest in the development of the tooth crown. This growth arrest has been linked to periods of childhood diseases, weaning and malnutrition (Hillson 1996, 166-67). The prevalence of enamel hypoplasia was calculated in the same way as the prevalence of calculus.

5.16.2 Enamel hypoplasia was present in 22 (39.28%) articulated individuals. These consisted of 19 adults (9 females and 10 males) and 3 children. Of all teeth observed 49.53% (266/537) displayed enamel hypoplasia (Table 12). The mandibular dentition (51.32%) had a slightly higher prevalence than the maxillary dentition (47.23%). Overall, the canine (72.37%) displayed the most hypoplastic anomalies followed by the incisors (Table 12).

Table 12: Enamel hypoplasia permanent dentition (articulated and disarticulated dentition combined)

Tooth	% Hypoplasia maxilla	% Hypoplasia mandible	Total
1	**43.47%** (10/23)	**54.55%** (18/33)	**50%** (28/56)
2	**45.45%** (10/22)	**55.55%** (20/36)	**51.72%** (30/58)
3	**67.5%** (27/40)	**77.78%** (28/36)	**72.37%** (55/76)
4	**47.22%** (17/36)	**51.11%** (23/45)	**49.38%** (40/81)
5	**35.48%** (11/31)	**46.51%** (20/43)	**41.89%** (31/74)
6	**41.93%** (13/31)	**41.03%** (16/39)	**41.43%** (29/70)
7	**46.67%** (14/30)	**50%** (18/36)	**48.48%** (32/66)
8	**40.90%** (9/22)	**35.29%** (12/34)	**37.50%** (21/56)
Total	**47.23%** (111/235)	**51.32%** (155/302)	**49.53%** (266/537)

5.16.3 The average percentage of individuals with enamel hypoplasia in medieval Britain is estimated at 35% with the majority of assemblages ranging between 20% and 40%

(Roberts and Cox 2003, 264). The prevalence in the Litten population was slightly higher than the norm for this time period (49.53%). This supports other osteological indicators of a population who had experienced high levels of childhood malnutrition and/or disease, a finding in keeping with the socially disadvantaged nature of this population.

5.17 *Periodontal disease*

5.17.1 Periodontal disease is commonly caused by the accumulation of calculus between the teeth and the soft tissue causing inflammation of the soft tissue, gingivitis, which may lead to inflammation of the surrounding bone. This inflammation causes horizontal bone loss and subsequent exposure of the roots. The loss of the tooth would eventually follow (Roberts and Manchester 1995, 56). There are two types of periodontal disease. Horizontal bone loss involves the simultaneous loss in height of the alveolar margin surrounding several teeth, or often the whole dental arcade (Hillson 1996, 263). Vertical bone loss is localised around an individual tooth or a pair of teeth. This would create a narrow deep pocket (Hillson 1996, 264-65).

5.17.2 A total of 12 adults (37.5%) of the 32 articulated adult skeletons with some dentition preserved had vertical and/or horizontal reduction of the alveolar margin. These consisted of eight males and four females. A further two individuals from the disarticulated remains also had periodontal disease.

5.17.3 The prevalence of periodontal disease in medieval Britain is estimated at 37% (Roberts and Cox 2003, 261), very similar to the rate given for the Newbury population.

5.18 *Dental abscesses*

5.18.1 The route to the development of an abscess may have many starting points. Bacteria may enter the pulp cavity through dental caries, excessive attrition or trauma to the crown. An abscess can also occur when a periodontal pocket is formed. When bacteria accumulate in the pulp cavity an inflammation starts which can track to the apex of the root. As the pressure builds from the continuous accumulation of pus, a hole (sinus) forms on the surface of the jaw allowing the pus to be expelled (Roberts and Manchester 1995, 50). It is at this advanced stage that the abscess is osteologically visible. The prevalence of dental abscesses was calculated by dividing the total number of abscesses by the combined total of teeth lost ante-mortem, teeth lost post-mortem and permanent *in situ* dentition.

5.18.2 Eight (14.29%) articulated skeletons had dental abscesses. These consisted of six adults (two females and four males) and two subadults. There were 18 abscesses (2.59%) in the combined articulated and disarticulated dentition. Of these, 17 (2.5%) were associated with permanent dentition and 1 (5.26%) with deciduous dentition (Table 13).

Table 13: Summary of dental disease, including disarticulated dentition

	Ante-mortem tooth loss	Abscesses	Calculus	Caries	Hypoplasia	Periodontal disease*
Permanent teeth	**6.06%** (35/577)	**2.50%** (17/677)	**32.40%** (174/537)	**9.31%** (50/537)	**49.53%** (266/537)	**37.5%** (12/32)
Deciduous teeth	-	**5.26%** (1/19)	**5.26%** (1/19)	**5.26%** (1/19)	**0%** (0/19)	-
Total	**6.06%** (35/577)	**2.59%%** (18/696)	**31.47%** (177/556)	**9.17%** (51/556)	**47.84%** (266/556)	**37.5%** (12/32)

* Prevalence of periodontal disease was calculated using only the articulated adult individuals.

5.18.3 The mean prevalence of individuals with dental abscesses in the medieval period was estimated at 26% with a range of from 0.33% to 9.60% (Roberts and Cox 2003, 259-60). The overall prevalence per individual was much greater than the Newbury assemblage but the rate per tooth was comparable.

5.19 *Dental anomalies*

5.19.1 A variety of dental anomalies may be found within the human dental arcade. These include impacted teeth, congenitally absent teeth (agenesis), supernumerary teeth and the retention of deciduous teeth.

5.19.2 The only dental anomaly recorded in this assemblage was agenesis. However, without radiography it is impossible to distinguish between impacted teeth and agenesis. The figures below are therefore crude.

5.19.3 Five (8.93%) articulated individuals had teeth recorded as not present. These consisted of three adults (two females, one male) and two subadults. Within the whole of the assemblage, nine teeth were not present. Of these, eight were third molars and one a right maxillary lateral incisor.

5.20 Skeletal pathology

5.21 *Degenerative joint disease*

5.21.1 Joint surfaces are subjected to wear and tear throughout life. This gradual deterioration is therefore more common in older individuals. In the western world today, up to 85% of individuals are affected by joint diseases such as osteoarthritis (Roberts and Manchester 1995, 100). The changes that take place are new bone formation on the joint margins and the surface, and porosity. When the cartilage covering the joint surface has worn away, the resultant bone to bone contact causes the bone to be polished or eburnated. Eburnation is an important criterion for the diagnosis of osteoarthritis in skeletal remains. The aetiology of this disease is

multifactoral; but increasing age, genetic predisposition, lifestyle and environmental factors, such as climate, all play a part in its development.

5.21.2 A total of nine (24.32%) articulated adults of the Newbury assemblage displayed degenerative changes. These consisted of five males and four females. In most cases the severity of the lesions was either slight or moderate. Only two skeletons (62 and 164) had lesions consistent with osteoarthritis (5.4%).

5.21.3 The mean prevalence of extra-spinal degenerative joint disease in medieval Britain has been reported at 14% and osteoarthritic lesions range between 3.33% and 40.91% (Roberts and Cox 2003, 282-283). This large variation between populations is likely to reflect the type of assemblage. For example, the prevalence would be greater in an older population group that might comprise a monastic assemblage.

5.21.4 Spinal degenerative changes were observed on 23 adult individuals (62.16%) and one adolescent. Of all the sexed adults, 74.19% suffered from degenerative changes (Table 14), of which 12 (37.5%) were male and 11 (34.37%) were female. Although this is a small assemblage, there was a clear correlation of increased severity with advancing age. There was little difference between the sexes, although more young adult females than males showed spinal degenerative changes.

Table 14: Spinal degenerative joint disease, articulated sexed adults only

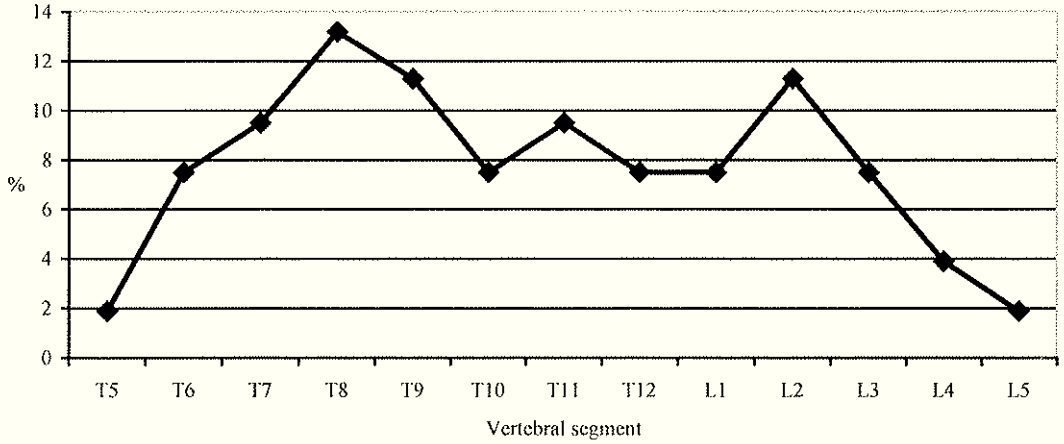
	Young Adult		Prime Adult		Mature Adult		Adult		Total
	F	M	F	M	F	M	F	M	
Slight	**100%** (5/5)	**25%** (1/4)	**25%** (1/4)	**85.7%** (6/7)	**0%** (0/2)	**33.3%** (1/3)	**0%** (0/1)	**0%** (0/5)	**29.03%** (9/31)
Moderate	**0%** (0/5)	0% (0/4)	**25%** (1/4)	**14.3%** (1/7)	**100 %** (2/2)	*0%* (0/3)	**0%** (0/1)	**0%** (0/5)	**12.90%** (4/31)
Considerable	**0%** (0/5)	0% (0/4)	**50%** (2/4)	**0%** (0/7)	**0%** (0/2)	**66.7%** (2/3)	**0%** (0/1)	**20%** (1/5)	**16.13%** (5/31)
Total	**100%** (5/5)	**25%** (1/4)	**100%** (4/4)	**100%** (7/7)	**100 %** (2/2)	**100%** (3/3)	**0%** (0/1)	**20%** (1/5)	**74.19%** (23/31)

5.21.5 Schmorl's nodes are indentations on the vertebral bodies which are most common in the lower thoracic and lumbar regions. These are caused by the herniation of the intervertebral disc through the end plates and are in effect pressure defects (Rogers and Waldron 1995, 27).

5.21.6 Thirteen (23.21%) articulated skeletons had Schmorl's nodes. These consisted of 12 adults and 1 adolescent. Of the adults, four (33.33%) were females and eight (40%) were males. Schmorl's nodes were located exclusively in the thoracic and lumbar region (Figure 9). The highest prevalence was present in the mid thoracic and mid

lumbar region. The location of the lesions is associated with the natural curvature of the spine and these vertebral bodies are consistent with the points of highest stress.

Figure 9: Distribution of Schmorl's nodes



5.22 *Trauma*

5.22.1 The categories of trauma represented within the Litten population were fractures, soft tissue trauma and osteochondritis dissecans.

5.22.2 Osteochondritis dissecans is caused by shearing of blood vessels to the joint, causing localised necrosis of the bone and has generally an underlying traumatic aetiology (Roberts and Manchester 1995, 87). The lesion involves the separation of the necrotic bone fragment from the joint surface. The fragment may remain loose in the joint causing secondary arthritis, become reabsorbed or heal back onto the defect and is usually associated with strenuous exercise, particularly in young men (Aufderheide and Rodriguez-Martin 1998, 82).

5.22.3 Two individuals (3.6%), one prime adult female (skeleton 33) and one mature adult male (skeleton 164) exhibited osteochondritis dissecans on the posterior articular surface for talus on the right calcaneus and the trochlea of the right humerus respectively.

5.22.4 Fractures are caused by an acute injury to the bone and/or an underlying disease or repetitive stress (Roberts and Manchester 1995, 68). Two (3.6%) mature adult individuals (skeletons 27 and 164) of the total articulated population, had 14 fractures. All fractures were healed and longstanding. Both individuals were male (10.5% of all males). The majority were rib fractures (10/14) and the individuals each had five. Skeleton 164 also had a fractured left blade of the scapula. The rib

fractures were associated with the same traumatic event. Indeed, one of the ribs had three separate fractures. This individual also had an intra-articular fracture on the proximal joint surface of the right first proximal pedal phalanx.

5.22.5 Skeleton 27 had a fractured styloid process of the right ulna. A transverse fracture was also present on the distal right fibula shaft. This fracture may well have caused the infectious lesion present on the distal end of the right tibia shaft.

5.22.6 Soft tissue trauma recognised in palaeopathology involves the formation of new bone at a site of a muscle tear, usually at a ligament or muscle insertion point. Two soft tissue traumatic lesions were observed in this assemblage. The first comprised a bony spur on the right femoral shaft of an adult male (skeleton 213). The location of the lesion corresponds with the insertion point of *Vastus medialis*. The other individual was a young adult male (skeleton 75). The oblong depressed lesion was situated on the left humerus at the insertion point of the muscle *Teres major*.

5.23 *Infectious disease*

5.23.1 Infectious diseases within this population consisted of both non-specific and specific types. Of the former, periostitis and paranasal sinusitis were present. Tuberculosis and syphilis were also present.

5.23.2 Sinusitis is mucosal congestion resulting from viral infection, commonly seen in maxillary and frontal sinuses. Maxillary sinusitis may be caused by a multitude of reasons such as allergies, smoke, upper respiratory tract infections and dental abscesses (Roberts and Manchester 1995, 131). Ten (40%) of the 25 individuals with one or more sinus cavities present had lesions consistent with maxillary sinusitis. Of these, seven (two females and five males) were adults and three were children. The lesions were active at the time of death in seven individuals. The recording of sinusitis is rather problematic as it relies on the sinus cavity being available for examination. When the skull is intact this is not possible and individuals with such lesions present may therefore be missed. Nevertheless, a crude prevalence of 0.22% to 71.93% has been reported amongst medieval British populations (Roberts and Cox 2003, 233). The rate of 40% in the Litten assemblage is lower than St Helen-on-the-Walls, York, (71.93%) an urban site. This may reflect higher air pollution levels from density of smoke in their respective environments.

5.23.3 Periostitis is an inflammation of the periosteum, the uppermost surface of bone. This inflammation may occur in response to localised soft tissue infection, osteomyelitis or osteitis or from a systemic disease. Periostitis may also be a consequence of trauma, haemorrhage or chronic skin ulcers (Aufderheide and Rodríguez-Martín 1998, 179). Periostitis was present on 17 (30.35%) of the Litten skeletons. These comprised eight males, five females, two unsexed adults and two children. Nine (four males, three females and one unsexed adult) had active lesions. The Litten assemblage had a higher prevalence of periostitis when compared to contemporary British assemblages (1.15% to 44.12% respectively) (Roberts and Cox 2003, 235).

The high prevalence of 44.12% is also from a hospital burial ground, St Mary Spital, London.

5.23.4 The only specific infection present was tuberculosis. Skeleton 90 (a young adult male) and skeleton 229 (a mature adult female), had lytic lesions on multiple vertebral bodies, characteristic of tuberculosis (3.57%). One further individual (skeleton 84, a mature adult female) had active periostitis on the visceral surface of three left ribs. Periosteal new bone formation on ribs is generally accepted as being caused by a pulmonary infection. It is highly likely that these lesions are caused by tuberculosis (Aufderheide and Rodríguez-Martín 1998, 137). This therefore suggests that three individuals (5.35%) had tuberculosis.

5.23.5 The comparative prevalence of tuberculosis (excludes rib lesions) for this time period ranges between 0.34% and 3.57% (Roberts and Cox 2003, 231). The prevalence from the Litten, Newbury (5.35%) was therefore rather high, probably the consequence of this being a hospital population.

5.23.6 One skeleton (184) showed developmental abnormalities consistent with congenital syphilis. This was a child aged between 1 and 1.5 years. The lesions affected the developing crowns of the first permanent molars. The cusp abnormalities consisted of irregular lobulations (or mulberry molars). The child contracted the disease from its mother (who suffered from primary, venereal, syphilis) whilst in utero. Commonly such infants would die shortly after birth and skeleton 184 is therefore a rarity in the osteological record.

5.23.7 This individual (Skeleton 184) was selected for radiocarbon dating due to the diagnosis of syphilis and its location in the first phase of the site. Until recently syphilis was believed to have originated in America and was brought over to Europe after 1493 (Roberts and Manchester 1995, 155). However, the increasing body of osteological evidence of syphilis pre-dating 1493 throws doubt on this assertion (Roberts and Cox 2003, 272). A date of 859 ±23 BP (OXA15839, see Appendix 4) was obtained from a sample of the human bone (femur) from the skeleton 184. This result has a 95% probability of dating between 1150 and 1260 cal AD, or much less likely 1050-1080 AD and a 68.2% chance of 1165-1215 AD. This places this individual firmly in the 11th-13th centuries, which comfortably pre-dates Columbus' return from the New World.

5.24 *Metabolic disease*

5.24.1 The metabolic diseases observed within this population group consisted of iron deficiency anaemia and vitamin D deficiency.

5.24.2 The aetiology of iron deficiency anaemia maybe multifactoral in origin and includes an iron deficient diet, parasitic infestation, chronic and acute blood loss (Roberts and Manchester 1995, 166-67, Stuart-MacAdam 1991, 101-33).

5.24.3 Eight individuals (14.3%) displayed cribra orbitalia lesions on the eye orbits. These consisted of five adults (three females and two males) and three subadults. Most of the lesions were healed but active lesions were present in two subadults. Porotic hyperostosis (thickening of the cranial vault) was observed on six individuals (10.7%). All lesions were present on adults, and all but one was female. All lesions were healed. The crude prevalence of cribra orbitalia in medieval assemblages varies tremendously between 0.91% and 51.35% (Roberts and Cox 2003, 234). Hospital sites have a higher reported prevalence of 25.61% compared to a general 9.33% (Roberts and Cox 2003, 234). Although the prevalence from the Litten was not as high as other medieval hospital assemblages, it is nevertheless higher than non-hospital assemblages of this period.

5.24.4 Deficiency in vitamin D is mainly caused by a lack of sunlight. Vitamin D is essential for the mineralisation process of bone (Roberts and Manchester 1995, 173). A lack of vitamin D produces soft bones, which causes the weight-bearing bones of children to bow. The condition is commonly known as rickets. One adult male skeleton (15), had lesions consistent with rickets (1.8%). This low figure is comparable to other medieval assemblages, which have a crude prevalence of 0.19% to 3.63% (Roberts and Cox 2003, 247-248).

5.25 *Endocrine disease*

5.25.1 Endocrine disease involves the over- or under-production of a hormone. Imbalance in the pituary hormones that regulate skeletal growth, and hormones produced by the thyroid gland that regulate skeletal maturation may be identified in the osteological record.

5.25.2 A young adult female (skeleton 18), displayed pathological lesions which may be consistent with an endocrine disorder. All the long bones, including the bones of the hands and feet were very elongated and thin. The cortex was of normal thickness. Her stature was not abnormally tall by modern standards, but at 166 cm she was nearly 10 cm taller than the second tallest female of the assemblage (see Figure 8). The significance of her greater stature must however be viewed with caution as the Litten sample was very small. Nevertheless, the comparative morphological differences seen in this individual strongly suggest a pathological origin. It is however not possible to specify which condition could have caused the lesions though a very tentative diagnosis would be mild hyperthyroidism.

5.26 *Congenital malformations*

5.26.1 Developmental abnormalities were observed on four individuals (21, 90, 96, 196) (8.9%). The majority of the lesions were very minor and would not have caused any discomfort or impaired the individual in any way. The minor lesions present are summarised in Table 15.

Table 15: Congenital malformations

Skeleton number	Age	Sex	Side	Element	Lesion
21	Young adult	Female	Right and Left	5th Metatarsals	Non-union of the tubercles
90	Young adult	Male	Right -	1st and 2nd rib Sternum	Fusion of the rib bodies Multiple segmentation
96	Older child	-	Left	C2 and C3	Fusion of the articular processes lamina and spinal process
196	Adolescent	-	-	L6 and sacrum	Spina bifida occulta

Discussion of the human remains

5.26.2 The Litten assemblage indicates that few (8.9%) lived to an age greater than 40 years and subadults accounted for 33%, or 19 individuals. This is probably reflective of the type of population group rather than medieval life expectancy in general. Dental health appeared to be better than the British averages for the time period as the number of individuals with caries, calculus, ante-mortem tooth loss and dental abscesses was much lower than the national average. These conditions are aetiologically interlinked and could be reflective of the general diet of the individuals, or (more probably) the young age of the population. The staple diet of peasants outside the hospital was cereal based (bread, porridge and ale), supplemented with seasonal available foodstuff, such as nuts and berries. Meat would have come primarily from domestic animals although this may have been supplemented with wild fowl caught on common land (Roberts and Cox 2003, 242). Overall, their diet was low in refined carbohydrates but high in roughage. Both would have contributed to a generally good oral health. The diet in hospitals is not well known, although evidence from St Mary of Bethlehem, London, suggests gardens and orchards associated with the infirmary may have provided fresh fruit and vegetables. Faunal remains from this site suggest that beef was prominent until the 14th century after which it was replaced by mutton and pork (Price and Ponsford 1998, 223). What is not known is how much this contributed to the dental health of the inmates.

5.26.3 Health in childhood and adolescence contributes to a higher potential stature. Compared to other assemblages from the medieval period, the Litten mean female stature was the shortest and the mean male stature was one of the shortest. This reduced stature indicates inadequate nutrition and poor health in the growing years. Deficiency in iron may reflect a high intestinal parasite load and/or inadequate dietary intake. The richest source of iron is red meat - a luxury probably beyond the means of many of the hospital inmates. High rates of dental enamel hypoplasia (DEH) also reflect periods of poor nutrition and/or disease in childhood, perhaps before entering the hospital. Together with low stature these lesions suggest that the individuals from Newbury were primarily drawn from the poorer sections of society.

5.26.4 Urbanisation brought problems of water supply and sewage and other waste disposal and close living conditions increased the risk of exposure to infection and disease. The prevalence of periostitis and tuberculosis in the Litten cemetery is characteristic of a hospital population, and much higher than other civilian medieval populations studied.

5.26.5 The single incidence of congenital syphilis may be highly significant in the debate on the origin of syphilis.

6 OTHER FINDS

6.1 Artefactual

Pottery by John Cotter

6.1.1 The assemblage comprises a total of 16 sherds of pottery. A few scraps of ceramic building material were also spot-dated, but they are not included in the quantification.

6.1.2 The assemblage comprises 3 sherds of Roman pottery and 13 sherds of medieval pottery. The Roman pottery consists of two sherds of 1st-2nd century Savernake ware from Wiltshire, and a single sherd of grog-tempered ware (1st century), which cannot be sourced, but is possibly local. The medieval pottery includes a few sherds of 11th century to early 13th century Newbury-type coarsewares with chalk, quartz and flint tempering. Among these are bowl rim and a cooking pot rim. A few glazed jug sherds appear to be in Earlswood-type ware (Surrey) and date to the 12th-14th century, and one is possibly in Kingston-type ware (Surrey) of 13th-14th century date. A collared/hooked jar rim in an unglazed orange fine sandy fabric cannot be securely sourced but may be a relatively local late medieval product, possibly as late as the 15th century or early 16th century.

All the pottery sherds are small and mostly comprised featureless body sherds. Some of the sherds were also quite worn. Their poor condition and widely ranging dates are suggestive of casual loss, rather than deliberate rubbish disposal. They would seem to indicate only peripheral and superficial human activity rather than settlement on or near the site.

Coin by Martin Allen

6.1.3 A single Edward I silver penny of the London mint, class 3c was recovered from the site (context 22, Small find 6), minted between June and August 1280. There is no evidence of clipping or significant wear (as far as that can be determined through the outer layer of corrosion products), suggesting that it was probably deposited at the site in the late 13th century or early 14th century.

Metalwork by Leigh Allen and Sharon Clough

6.1.4 Two small fragments of copper alloy were recovered. Small find 10 from context 98 is an elongated diamond shaped fragment of thin copper alloy sheet that has been roughly folded in half. Small find 1 from context 11 is a curved fragment of strip, roughly rectangular in shape. It is in very poor condition, and little of the original surface survives. Neither of the fragments are identifiable.

In total, 32 iron nails were recovered. Ten graves contained at least one iron nail near the base of the grave. Although it is unclear whether they all indicate the presence of a coffin, nails in at least three burials (67, 92 and 114) were associated

with dark staining of the backfill indicating the presence of a trapezoid coffin. It is probable that the rest were indeed the fixing nails of simple wooded coffins. The nails were corroded and many had been broken during excavation. However, it was possible to ascertain that they were hand-made, with square pins and round, flat flanges.

6.2 Ecofactual

Environmental sampling by Simon Dobinson

6.2.1 A total of 61 samples were taken from the graves in the areas approximating to the skull, hands and feet for recovery of small bones. Some samples were also taken from the chest and stomach areas for recovery of mineralised plant remains or calcified cysts. The human bones, recovered from the samples, were added to the other remains from the grave and analysed as part of the osteological report. A total of six samples were processed from contexts proximate to the stomach area. These samples were void of any mineralised plant remains.

7 DISCUSSION OF THE CEMETERY

7.1 *Location of cemetery and hospital*

7.1.1 As the cemetery was in use for over 300 years, it could be extensive. The true extent of the cemetery is not known, though previous discoveries of human remains (noted above) in the vicinity suggests that the cemetery may have covered an area of approximately 6500 m². The present excavation covered an area of approximately 52 m² (*c.*1%, of the whole cemetery). It is notable that there are no burials in the area directly to the north of the electric cable (12) and in the eastern part of the excavated area (Fig. 3). This may be due to modern interventions disturbing the burials, although it is also possible that this was the periphery of the cemetery, so the burials were less dense, and the area perhaps bounded by a wall or fence. However, as there are some burials in the most northerly part of the site, this suggests that burials do continue to the north (under Pound Street). There are burials in the south east part of the site so they must continue east (into Argyle Road) also. It is likely that they continue west (into Newtown Road) and south.

7.1.2 It is not known when Pound Street was first created; it is shown on Rocque's map of 1761 (Rocque 1761) and it is tempting to suggest that, as burials from the Litten cemetery have been found under its present line and on its north side (Cannon 1998, 52) that it is later than the end of the cemetery. There is evidence for a possible boundary to the west, as during excavation in 1988 by Newbury Museum on the corner of Pound Street and Argyle Road a series of linear features were observed

running north-south. Newtown Road was re-aligned and widened in the 19th century during enclosure and so may not reflect the true extent of the burials. Burials may extend to the south of the chapel, as one skeleton was discovered in that area according to Cannon (1998, 46).

7.2 *Preservation of bodies and dating*

7.2.1 Though the skeletons were in a fragmentary condition, the condition of the bone was such that 50 out of 56 skeletons could be sexed, and 44 were given age at death. Accurately dating the burials was not possible. The little artefactual evidence from the graves was mainly residual, and no grave goods were recovered. Burials of the medieval period cannot be dated on depth of grave, nor burial practice, though trends have been seen; they can only be put in a stratigraphical sequence. This, plus the slight variation in grave orientation, seems to suggest at least three phases of burial in the area investigated. From the radiocarbon date obtained from skeleton 184, who is from the first phase, it is possible to determine with a 95% probability that burial began between 1150 and 1260 (see appendix for details). This complements the documentary evidence which first refers to the hospital in 1215 and to the burial rights in 1267, placing the first phase of burial with the establishment of the hospital.

7.2.2 All the burials were aligned roughly west east. The west-east orientation (head at the west end, feet at the other) was normal by the Middle Ages. The explanations for this orientation are: Christ appearing on judgement day in the east; the cross of Calvary faced west (so those looking at Christ faced east), the west is the region of shadows and darkness, and the east of goodness and light (Daniell 1997, 148). Medieval graves come in a variety of shapes and sizes, most commonly about 1.8 m long and 0.4 m wide and between 0.4 and 0.7 m deep. They were therefore fairly shallow cuttings. Grave depth does not necessarily relate to social status, as demonstrated by the subadult graves. The notion of '6ft under' is a later medieval phenomenon, relating to concerns about body snatchers (Richardson 1988, 80).

7.3 *Population*

7.3.1 The population is similar to other hospital cemeteries in that there were more men than women. The investigated part of the cemetery was unlike other contemporary hospital cemeteries in that it contained a high proportion of subadults, and no adults over the age of 50. However when discussing cemeteries that have not been fully excavated it must be borne in mind that it may have a zoned layout and the small section that has been examined may not reflect the true nature of the overall cemetery population.

7.4 *Diet*

7.4.1 The teeth from this population reflect their diet and lifestyle. Unlike other medieval populations these skeletons show evidence of either a 'good' diet (in terms of staple foods) or good dental hygiene. It is possible that as a hospital population the diet of

the inmates was perhaps better or at least regular compared to their contemporaries in the population at large. The soft diet of an invalid may also be a contributory factor for the low levels of dental pathology, although the relative youthfulness of the population under analysis may be influencing the impression, as caries and other dental pathologies increase with age.

7.4.2 The incidence of cribra orbitalia (iron deficiency anaemia) of 8 individuals may also be an indicator of a long term dietry deficiency low in red meat (or green leafy vegetables) or alternatively an intestinal infection.

7.4.3 The low stature of this population may also be a reflection of poor diet and frequent illness in childhood, but it is worth noting that only 10% of height is environmentally dependent and 90% is inherited (Brothwell 1972).

7.5 *Disease*

7.5.1 The slightly high level of infectious disease seen amongst the population is indicative of this being a hospital cemetery. Medieval hospitals were established for those with long term illness, as seen from the documentary evidence. It is therefore unsurprising to find two cases of tuberculosis and periostitis, lower leg inflammation, on 17 individuals. The case of congenital syphilis indicates that the hospital also admitted chronically ill children and/or their mothers.

7.5.2 The high level of enamel hypoplasia (grooves on the teeth), suggests that severe and long-term childhood illness was frequent amongst this population, resulting in arrested growth.

7.6 *Lifestyle*

7.6.1 The evidence of sinusitis in 40% of the population reflects the type of environment that they were living in. The rate was higher than for rural cemeteries, suggesting an urban setting, but lower than (say) York, a densely occupied city. This evidence concurs with the history of Newbury as a developing town, which had some industry by the 16th century.

7.6.2 The one incidence of rickets in an adult male suggests that he did not have much exposure to sunlight as a child or many dairy products in the diet. The practice of swaddling bands for infants has also been suggested as a cause of rickets in pre-industrial populations. A sick or invalid child may also be kept indoors reducing the amount of available vitamin D exposure.

7.7 *Trauma*

The most common type of fracture in the medieval period was to the ribs. These fractures are seen more in males than females (Roberts and Cox 2003, 237) and it is impossible to determine whether they came from accident or interpersonal violence. The two individuals with fractures at Newbury were male and displayed 5 rib

fractures each. At 3% of the assemblage this is an average amount for a medieval cemetery population.

7.7.1 The pathologies discussed are generally long-term illnesses, which is to be expected for a medieval hospital. These institutions generally only served the poor as the rich could afford to be nursed in the comfort of their own home. They catered for people with particular, not necessarily medical needs, such as pilgrims, the blind, cripples, elderly priests or impoverished widows and children. Some institutions categorically refused to admit anyone with a serious illness, lest they upset the peaceful round of prayer and ritual necessary for spiritual as well as physical regeneration (Rawcliffe 1995, 205).

8 COMPARATIVE INFIRMARY SITES

8.1.1 The hospital and cemetery of St Bartholomew, Newbury is among several that have been excavated in England of this date. St Bartholomew's Hospital, Bristol (Price and Ponsford 1998) existed from around 1232-4 to 1532 and was sited on the banks of the River Frome near the principal northern entrance to the town. Hospitals were usually sited near entrances to towns, a visible presence to those coming and going from the town and, in a practical sense, a means of keeping sick people out of towns. It was originally a hospital for the sick and poor, later becoming a home for retired mariners. The site was excavated in 1976-8 and revealed the infirmary buildings and the cemetery. A total of 30 articulated burials were recovered along with a quantity of disarticulated remains. The individuals recovered reflected the hospital population and consisted of relatively old men and women, with few children and young adults present. This is unlike the cemetery at Newbury as there were more young adults and children and relatively few old adults. This may reflect the age groups admitted to the hospital. The difference may be because of sample size (56 at Newbury, 30 at Bristol) and/or that only a selected area of the cemetery was excavated.

8.1.2 Another medieval hospital cemetery that has been investigated is the hospital of St Leonard, Newark, Nottinghamshire founded between 1123 and 1148 for the poor and infirm (Bishop 1983). The hospital was located on the Fosse Way on the north side of the town at the end of Northgate, Newark. The burials lay on the south side of the church with the Fosse Way marking the eastern limit of the cemetery. There was much intercutting of burials and a total of 82 individuals were recovered during excavation of part of the cemetery. There was a high proportion of males (88%) to females (14%) with the majority of burials in the 25-45 age range, and no juvenile remains. That there were more males than females recovered at both St Leonard's and St Bartholomew's, may reflect a later practice of only having male inmates. Among the articulated skeletons there is one neonate and no infants recovered from Newbury, but there are 18 sub adults. This is in stark contrast to St Leonard's where no juvenile remains were recovered. This may be because both sites have not been fully excavated. It is possible that at St Bartholomew's the area excavated was predominantly for subadults and at St. Leonard's the area for subadults had not been excavated. However, it may also be that those under 18 years were not admitted to

the hospital at St Leonard's. This may also reflect a differing admission policy, or, as with St Bartholomew's, Bristol, zoning of the cemetery. It is only by the excavation of a full medieval cemetery that issues of burial zoning can be fully addressed.

9 APPENDIX 1

9.1 The grave catalogue

Inhumation 6	
W-E	1.24 x 0.38 x 0.08 m
Truncated below knee by modern feature.	
Sub-rectangular grave. Body supine; skull straight; left arm by side, right arm flexed slightly over pelvis; legs parallel, knees together.	
No finds	

Inhumation 10	
W-E	1.15 x 0.4 x 0.1 m
Truncated by landscaping 36 and service trench 12 at either end of grave.	
Sub-rectangular grave. Body supine. Head truncated; right arm across pelvis, left arm straight; legs straight.	
Cu alloy clasp on right pelvis where articulates with sacrum.	

Inhumation 15	
W-E	1.92 x 0.37 x 0.1 m
Truncates inhumations 18 and 21 and 187	
Sub-rectangular grave. Body supine. Head slightly on right side. Arms straight by sides; legs straight.	
No finds.	

Inhumation 18	
W-E	1.45 x 0.34 x 0.1 m
Truncates inhumation 21	
Sub-rectangular grave. Body supine. Arms flexed with hands over pelvis; slightly flexed at the knees to the left.	
No finds.	

Inhumation 21	
W-E	1.61 x 0.34 x 0.15 m
Truncated by inhumation 18	
Sub-rectangular grave. Body supine. Arms extended at side of body; legs extended and parallel.	
Silver coin, found between the lower legs, but part of the backfill of grave, not placed.	

Inhumation 27	
W-E	1.7 x 0.4 x 0.1 m
Truncated by landscaping 36, removing skull.	
Sub-rectangular grave. Supine body Right arm flexed with hand on left pelvis, left arm extended hand bent back; legs extended and parallel.	
Coffin nail in backfill.	

Inhumation 33	
W-E	1.55 x 0.4 x 0.1 m
Truncated by Inhumation 26	
Sub-rectangular grave. Supine body. Head on side facing south. Left arm flexed, hand resting on right pelvis, left arm straight; legs slightly flexed to south on right side.	
Fe L-shaped object, possible nail, found on ribs. Fe nail found in backfill.	

Inhumation 38	
W-E	0.8 x 0.42 x 0.13 m
Truncated by lamppost base and inhumations 47 and 128	
Sub-rectangular grave. Supine body. Left arm straight, right arm flexed hand over left pelvis. Legs truncated.	
No finds.	

Inhumation 42	
W-E	1.68 x 0.48 x 0.08m
Truncated by road building.	
Regular sub-apsidal grave. Body supine. Right arm bent at elbow across chest, left arm flexed hand over pelvis; Legs straight as far as truncation.	
No finds.	

Inhumation 46	
W-E	1.65 x 0.32 x 0.15m
Truncated by inhumation 42.	
Regular sub-apsidal grave. Body supine. Skull forward. Arms straight by sides; legs extended, parallel.	
No finds.	

Inhumation 47	
W-E	Dimensions unknown
Truncated by lamppost - skull seen only in section	
Sub-rectangular grave. Supine. Lower legs extended, feet straight.	
No finds.	

Inhumation 51	
W-E	0.3 x 0.37 x 0.06m
Truncated by service trench	
Sub-rectangular grave. Supine. Feet only, lying extended.	
No finds.	

Inhumation 56	
W-E	0.2 x 0.2 x 0.05m
Truncated by service 12 and inhumation 65	
Sub-rectangular grave. Supine extended body. Legs only, straight and parallel.	
No finds.	

Inhumation 59	
W-E	0.2m deep
Truncated by limit of excavation	
Sub-rectangular grave. Supine body. Extended left arm, bent slightly at elbow.	
No finds.	

Inhumation 62	
W-E	1.51 x 0.45 x 0.0m
Truncated by inhumations 56 and 65 and service 12	
Sub-rectangular grave. Supine body. Arms extended; legs extended.	
No finds.	

Inhumation 65	
W-E	0.6 x 0.24 x 0.15m
Truncated by inhumation 90	
Sub-rectangular grave. Supine body. Skull forward, rest truncated.	
No finds.	

Inhumation 68	
W-E	1.6 x 0.38 x 0.22m
Truncated by inhumation 46	
Sub-apsidal grave. Supine body. Skull facing forwards. Arms flexed at elbow crossing over pelvis. Legs extended, feet together.	
Coffin stain. Coffin nails.	

Inhumation 72	
W-E	1.24 x 0.45 x 0.11m
Truncated by service cable	
Sub-rectangular grave. Supine body. Skull facing forwards. Right arm flexed at elbow hand over pelvis, left arm extended. Legs extended.	
No finds.	

Inhumation 75	
W-E	0.1m deep
Truncated by inhumation 62 and lamppost base.	
Sub-rectangular grave. Supine body. Arms extended.	
No finds.	

Inhumation 78	
W-E	1.65 x 0.2 x 0.14m
Truncated by inhumation 90.	
Sub-rectangular grave. Supine body. Right arm bent at elbow hand on pelvis. Right leg extended.	
No finds.	

Inhumation 81	
W-E	0.57 x 0.27 x 0.05m
Truncated by inhumation 90	
Sub-rectangular grave. Supine? Very fragmented left ribs and cranial fragments only.	
No finds.	

Inhumation 84	
W-E	1.6 x 0.45 x 0.2m
Truncated by inhumation 112 and modern feature	
Sub-rectangular grave. Supine body. Skull removed by modern feature. Arms flexed at elbow hands on pelvis. Legs extended.	
2 Fe nails.	

Inhumation 88	
W-E	0.85 x 0.35 x 0.05m
Truncated by inhumation 96 and limit of excavation	
Sub-rectangular grave. Supine body. Legs extended.	
No finds.	

Inhumation 90	
W-E	1.83 x 0.35 x 0.15m
Truncated by inhumations 51 and 72.	
Sub-rectangular grave. Supine body. Right arm extended with hand under pelvis. Legs extended knees together.	
No finds.	

Inhumation 96	
W-E	1.15 x 0.35 x 0.3m
Truncated by inhumation 84 and limit of excavation	
Sub-rectangular grave. Supine body. Arms and legs extended? Inhumation very fragmentary.	
No finds.	

Inhumation 99	
W-E	1.1 x 0.32 x 0.2m
Truncated by limit of excavation.	
Sub-rectangular grave. Supine body. Legs extended. CuA Clip found by right tibia.	
Copper Alloy clip, 3 Fe nails.	

Inhumation 102	
W-E	1.1 x 0.35 x 0.35m
Truncated by inhumations 88 and 95	
Sub-rectangular grave. Supine body. Arms and legs extended.	
No finds.	

Inhumation 105	
W-E	0.5 x 0.35 x 0.3m
Truncated by inhumation 102 and limit of excavation	
Sub-rectangular grave. Supine body. Skull facing forward. Right arm extended.	
No finds.	

Inhumation 108	
W-E	1.2 x 0.5 x 0.25m
Truncated by inhumations 105 and 102	
Sub-rectangular grave. Supine body. Head on side facing north. Right arm flexed at elbow. Leg extended.	
No finds.	

Inhumation 112	
W-E	0.8 x 0.28 x 0.15m
Truncated by inhumations 99 and 88.	
Sub-rectangular grave. Supine body. Legs extended.	
No finds.	

Inhumation 116	
W-E	1 x 0.32 x 0.35m
Truncated by inhumation 46	
Sub-rectangular grave. Supine body? Only skull remaining.	
Coffin nails x5 - visible stain trapezoid shape.	

Inhumation 119	
W-E	1.28 x 0.44m
Truncated by inhumation 150 and modern features.	
Sub-rectangular grave. Supine body. Skull facing forward. Left arm flexed slightly, hand on pelvis. Right arm extended, hand under pelvis. Legs extended.	
No finds.	

Inhumation 125	
W-E	Dimensions unknown
Truncated by inhumations 128 and 47	
Sub-rectangular grave. Feet only.	
No finds.	

Inhumation 128	
W-E	Dimensions unknown
Visible in section only	
Sub-rectangular grave. Toes only.	
No finds.	

Inhumation 131	
W-E	1.1 x 0.6 x 0.6m
Truncated by inhumation 108	
Sub-rectangular grave. Supine body. Legs extended.	
No finds.	

Inhumation 134	
W-E	0.2m deep
Truncated by inhumation 131	
Sub-rectangular grave. Very truncated, only lower left leg remains.	
No finds.	

Inhumation 137	
W-E	0.12m deep
Truncated by inhumation 47	
Sub-rectangular grave. Supine body. Left arm extended, hand by side.	
No finds.	

Inhumation 140	
W-E	1.1 x 0.45 x 0.35m deep
Truncated by inhumation 131	
Sub-rectangular grave. Supine body. Legs extended. Left hand on pelvis.	
No finds.	

Inhumation 144	
W-E	0.1m deep
Truncated by inhumation 140 and 131	
Sub-rectangular grave. Supine body. Left foot only.	
No finds.	

Inhumation 147	
W-E	0.56 x 0.22 x 0.06m
Inhumation did not survive lifting.	
Sub-rectangular grave. Supine body? Positioning not determinable.	
No finds.	

Inhumation 150	
W-E	1.86 x 0.38m
Truncated by concrete slab 152	
Sub-rectangular grave. Supine body. Legs extended, feet together.	
No finds.	

Inhumation 154	
W-E	0.2 x 0.2 x 0.1m
Truncated by inhumation 140	
Sub-rectangular grave. Supine body? Feet only.	
No finds.	

Inhumation 157	
W-E	0.5 x 0.25 x 0.05m
Truncated by inhumation 154	
Sub-rectangular grave. Supine body? Bones very fragmentary.	
No finds.	

Inhumation 164	
W-E	1.8 x 0.48 x 0.35m
Truncated by inhumation 33	
Sub-rectangular grave. Supine body. Right arm slightly flexed over left arm, which is flexed across body. Legs extended, feet together.	
No finds.	

Inhumation 170	
W-E	1.2 x 0.35m
Sub-rectangular grave. Supine body. Skull facing forward? Arms extended by sides. Legs extended.	
1 Fe nail.	

Inhumation 176	
W-E	2 x 0.58m
Truncated by inhumation 196	
Sub-rectangular grave. Supine body. Skull facing north. Arms tightly flexed, bent up at elbows over chest. Right foot under left, legs extended.	
1 Fe nail.	

Inhumation 181	
W-E	0.35 x .02m
Truncated by inhumation 164	
Sub-rectangular grave. Supine body. Lower legs and feet only, extended position.	
No finds.	

Inhumation 184	
W-E	1 x 0.3 x 0.2 m
Truncated by inhumation 33	
Sub-rectangular grave. Supine body. Head turned slightly north. Arms extended by side. Legs extended.	
3 coffins nails.	

Inhumation 187	
W-E	0.9 x 0.5 x 0.2 m
Truncated by inhumation 18	
Sub-rectangular grave. Supine body. Skull on left side facing north. Arms extended by sides; legs extended.	
No finds.	

Inhumation 190	
W-E	0.8 x 0.28 m
Truncated by inhumation 51	
Sub-rectangular grave. Supine body. Arms extended? Legs extended.	
No finds.	

Inhumation 196	
W-E	1.92 x 0.42 x 0.2 m
Truncated by inhumation 176	
Sub-rectangular grave. Supine body. Head tilted slightly north. Arms and legs extended.	
No finds.	

Inhumation 200	
W-E	1.8 x 0.48 x 0.21 m
Truncated by inhumation 187	
Sub-rectangular grave. Supine body. Arms extended, by sides. Legs extended, parallel.	
No finds.	

Inhumation 213	
W-E	? x 0.55 x 0.18m
Truncated by wall 212 and services.	
Sub-rectangular grave. Supine body? Very small amount of skeleton recovered due to massive truncation. Body position undeterminable.	
No finds.	

Inhumation 215	
W-E	? x 0.7 x 0.16 m
Truncated by wall 212 and services	
Sub-rectangular grave. Supine body. Very small amount of skeleton recovered due to massive truncation. Body position undeterminable.	
No finds.	

Inhumation 220	
W-E	0.95 x 0.37 x 0.08 m
Truncated by	
Sub-rectangular grave. Supine body. Arms extended. Legs extended.	
2 Fe nails.	

Inhumation 223	
W-E	0.38 x 0.64 x 0.1 m
Truncated by wall 212	
Sub-rectangular grave. Supine body. Lower arms only, extended.	
No finds.	

Inhumation 226	
W-E	1.3 x 0.37 x 0.18 m
Truncated by modern service trench.	
Sub-rectangular grave. Supine body. Head facing north. Left arm flexed at elbow 90 degrees, hand on right side. Right arm extended, hand on right pelvis. Legs extended.	
No finds.	

Inhumation 229	
W-E	0.97 x 0.62 x 0.3 m
Sub-rectangular grave. Supine body. Left arm flexed, hand on pelvis. Right arm extended.	
No finds.	

Inhumation 232	
W-E	0.15 x 0.3 x 0.18 m
Truncated by limit of excavation	
Sub-rectangular grave. Supine body. Skull only exposed.	
No finds.	

10 APPENDIX 2

10.1 The Skeletal catalogue

Catalogue of articulated burials

Skeleton number: 6

Completeness: 4

Preservation: 4

Age: 20-25 years

Sex: Female

Stature: 156 cm

Dental inventory:

	H	H	H													
8	7	6	5	/	3	-	-	-	-	-	-	-	-	-	-	-
8	7	6	5	4	3	/	1	1	2	3	4	5	6	7	8	
		H			H		H	H	H	H			H			
	Ca	Ca					Ca	Ca					Ca	Ca		

Non metric traits present:

Cranial: Bilateral lambdoid ossicles, parietal foramen, 2 left zygomatico-facial foramen, left posterior condylar canal.

Postcranial: Bilateral femoral allen's fossae, third trochanters and exostosis in the trochanteric fossae, Sternal foramen.

Dental pathology: Enamel hypoplasia, slight calculus deposits.

Pathology: Slight spinal degenerative changes, Schmorl's nodes, healed slight porotic hyperostosis, Type 3 healed cribra orbitalia. Active maxillary sinusitis.

Skeleton number: 10

Completeness: 3

Preservation: 4

Age: 34-49 years

Sex: Male

Non metric traits present: Postcranial: Right femoral plaque formation.

Pathology: Slight spinal degenerative joint disease, slight periostitis on left iliac blade, considerable active periostitis visceral surface of a right rib.

Skeleton number: 15

Completeness: 5

Preservation: 4

Age: 18-20 years

Sex: M

Stature: 166 cm

Dental inventory:

										Ca						
H	H				H		H	H	H	H	H	H		H	H	
8	7	X	5	4	3	/	1	1	2	3	4	5	X	7	8	

8	7	6	5	4	3	2	1	/	2	3	4	5	6	7	8
		H	H	H	H	H	H		H	H	H	H		H	
					Ca	Ca	Ca								

Non metric traits present: Postcranial: Bilateral femoral hypotrochanteric fossae,.

Dental pathology: Vertical and horizontal periodontal disease, slight calculus, enamel hypoplasia.

Pathology: Mixed active and healed periostitis on right tibia. Healed porotic hyperostosis, Type 2 healed cribra orbitalia. Slight rickets (tibiae).

Skeleton number: 18

Completeness: 4

Preservation: 4

Age: 20-29 years

Sex: Female

Stature: 166 cm

Non metric traits present: Postcranial: Bilateral lateral tibial squatting facets

Pathology: Slight spinal degenerative changes, possible mild hyperthyroidism

Skeleton number: 21

Completeness: 5

Preservation: 4

Age: 17-25 years

Sex: Female

Stature: 157 cm

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
	C				H	H	H	H	H	H			C	C	
						Ca	Ca	Ca							

Non metric traits present: Postcranial: Bilateral femoral hypotrochanteric fossae, bilateral lateral tibial squatting facets, bilateral double anterior calcaneal facets.

Dental pathology: Slight calculus, enamel hypoplasia, slight periodontal disease, small caries.

Pathology: Slight spinal degenerative changes, Schmorl's nodes, healed periostitis on both tibia.

Skeleton number: 27

Completeness: 5

Preservation: 4

Age: Over 45 years

Sex: Male

Stature: 170 cm

Non metric traits present: Postcranial: Bilateral double anterior calcaneal facets.

Pathology: Moderate to considerable spinal degenerative changes, Schmorl's nodes, active periostitis with possibly underlying traumatic lesion, fractured distal right fibula, fractured right ulnar styloid process, 4 left rib fractures and 1 right rib fracture. Slight degenerative joint changes both triquetrals and pisiforms, 1st MIP joint, left patella, left humeral head and right distal radius.

Skeleton number: 33

Completeness: 5

Preservation: 4

Age: 25-35 years

Sex: Female

Stature: 148 cm

Dental inventory:

		A	A								C		C		
H	H		C		H	H	H		H	H	H		H	H	H
8	7	6	5	4	3	2	1	/	2	3	4	/	6	7	8
8	7	6	5	4	3	2	1	1	/	3	4	5	6	X	8
H	H		H	H	H	H				H	H	H	C		H
	A	A				Ca	Ca	Ca							
	C														

Non metric traits present: Cranial: 2 left and 3 right zygomatico-facial foramina, left foramen of huschke, left posterior condylar canal.

Postcranial: Left femoral poirier's facet

Dental pathology: Considerable periodontal disease, medium and large caries, abscesses, slight calculus, considerable enamel hypoplasia, slight overcrowding.

Pathology: Moderate spinal degenerative joint disease, moderate degenerative joint disease on the mandibular fossae and both acetabulums. Healed moderate porotic hyerostosis, active maxillary sinusitis, active periostitis on mandible, secondary to dental abscess, osteochondritis dissecans on right calcaneus.

Skeleton number: 38

Completeness: 3

Preservation: 4

Age: 30-40 years

Sex: Male

Dental inventory:

									Ca	Ca			C		
									H	H			H		
-	-	-	-	-	-	-	-	-	2	3	/	/	6	-	-
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
H	H	H	H	H	H	H	H	H	H	H	H	H		H	H
Ca	Ca			Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca
															C

Dental pathology: Slight periodontal disease, considerable enamel hypoplasia, considerable calculus, caries

Pathology: Slight spinal degenerative joint disease, Schmorl's nodes, slight degenerative changes on right clavicle.

Skeleton number: 42

Completeness: 2

Preservation: 2

Age: 35-40 years

Sex: Female

Dental inventory:

		Ca													Ca
		H			H						H				H

/	/	6	/	/	3	/	/	/	/	3	/	/	/	/	8
/	7	/	5	4	3	2	/	1	/	3	4	5	/	/	X
	H		H		H	H									
	Ca				Ca										
	C														

Non metric traits present: Cranial: Lambdoid ossicle, left posterior condylar canal.

Dental pathology: Considerable periodontal disease, enamel hypoplasia, calculus, small caries.

Pathology: Slight to considerable spinal degenerative joint disease, moderate degenerative joint disease on clavicles, slight on right hip joint. Ostoearthritis of both elbow joints.

Skeleton number: 46

Completeness: 4

Preservation: 2

Age: 18-24 years

Sex: Female

Dental inventory:

											C		C		
	H	H	H	H							H	H	H	H	
8	7	6	5	4	3	-	-	-	2	3	4	5	6	7	8
8	7	X	5	4	-	-	-	-	-	3	4	5	6	7	8
	H	A	H	H							H	H	H	H	
	C		C												

Non metric traits present: Cranial: Left lambdoid ossicle, 2 left and 1 right zygomatico-facial foramina.
Postcranial: Bilateral femoral hypotrochanteric fossae.

Dental pathology: Enamel hypoplasia, abscess, small caries.

Pathology: Slight spinal degenerative joint disease, healed moderate porotic hyperostosis.

Skeleton number: 47 + 122

Completeness: 1

Preservation: 4

Age: 20-25 years

Sex: Male

Dental inventory:

											Ca	Ca		C	
-	-	-	-	-	-	-	-	/	/	3	4	5	X	7	/
8	7	X	X	4	3	2	1	1	2	3	4	5	X	-	-
	C			H	H	H	H	H	H	H					
					Ca	Ca	Ca			Ca					

Non metric traits present: Cranial: Bilateral lambdoid ossicles, bilateral parietal foramina.

Dental pathology: Enamel hypoplasia, moderate to considerable periodontal disease, small caries, slight calculus

Pathology: Healed maxillary sinusitis.

Skeleton number: 51

Completeness: 1

Preservation: 3

Age: Over 18 years

Sex: Unknown

Non metric traits present: Postcranial: Bilateral lateral tibial squatting facets, bilateral double anterior calcaneal facets.

Pathology: Healed periostitis on right tibia.

Skeleton number: 56

Completeness: 1

Preservation: 4

Age: Over 18 years

Sex: Male

Non metric traits present: Postcranial: Left lateral tibial squatting facet, left double anterior calcaneal facet.

Pathology: Healed periostitis on left tibia and fibula.

Skeleton number: 59

Completeness: 2

Preservation: 3

Age: 28-38 years

Sex: Male

Dental inventory:

Ca	Ca	Ca	Ca				Ca	Ca	Ca	Ca				Ca	
H	H	H	H			H		H		H	H			H	H
8	7	6	5	/	/	2	1	1	2	3	4	/	/	7	8
8	7	6	5	4	3	2	/	/	/	/	4	5	6	7	8
				H	H						H		H	H	H
	Ca		Ca	Ca	CA	Ca					Ca		Ca	Ca	Ca

Dental pathology: Moderate periodontal disease, enamel hypoplasia, slight calculus.

Pathology: Slight spinal degenerative joint disease, healed maxillary sinusitis.

Skeleton number: 62

Completeness: 3

Preservation: 3

Age: Over 18 years

Sex: Male

Non metric traits present: Right femoral hypotrochanteric fossa.

Pathology: Osteoarthritis on cervicals, moderate spinal degenerative joint disease, healed periostitis on left rib.

Skeleton number: 65

Completeness: 1

Preservation: 2

Age: 13-25 months

Dental inventory:

-	-	-	-	-	-	-	-	-	-
E	/	/	/	/	-	-	-	/	/

Skeleton number: 68

Completeness: 3

Preservation: 4

Age: 7-8.5 years

Dental inventory:

			c		c			-	-	-	-	-			
			e	d				-	-	-	d	e			
					H					H	H				
-	-	6	U	/	U	/	/	I	/0	U	U	/	6	U	
	U	6	U	U	U	2	/	I	2	U	U	U	6	U	
		H		H	H					H			H		

Dental pathology: Enamel hypoplasia.

Pathology: Bilateral healed periostitis on tibiae.

Skeleton number: 72

Completeness: 5

Preservation: 4

Age: 22-29 years

Sex: Female

Stature: 154 cm

Dental inventory:

	Ca	Ca	Ca	Ca	Ca				Ca	Ca	Ca	Ca			
					H		H	H	H	H	H				
8	7	6	5	4	3	/	1	I	2	3	4	5	/	7	8
NP	7	6	5	4	3	2	1	/	/	/	/	5	6	7	8
	Ca	Ca	Ca	Ca	H	Ca	Ca								Ca
					Ca										C

Non metric traits present: Cranial: Bilateral parietal foramina, 1 left and 2 right zygomatico-facial foramina, bilateral double condylar facets.

Postcranial: Right acromial articular facet, right pelvic accessory facet, bilateral femoral hypotrochanteric fossae.

Dental pathology: Slight to heavy calculus, small caries, enamel hypoplasia.

Pathology: Slight spinal degenerative joint disease, Schmorl's nodes, healed slight porotic hyperostosis, active periostitis on both radii and femora.

Skeleton number: 75

Completeness: 3

Preservation: 4

Age: 20-27 years

Sex: Female

Dental inventory:

									Ca							
									H							
-	-	-	-	-	-	-	-	I	-	-	-	-	-	-	-	

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Dental pathology: Enamel hypoplasia, slight calculus.

Pathology: Slight spinal degenerative joint disease, healed periostitis on right temporal bone, soft tissue trauma on left humerus.

Skeleton number: 78

Completeness: 4

Preservation: 4

Age: 25-30 years

Sex: Male

Stature: 168 cm

Non metric traits present: Postcranial: Right femoral allen's fossa, poirier's facet and exostosis in the trochanteric fossa.

Pathology: Slight spinal degenerative joint disease, Schmorl's nodes.

Skeleton number: 81

Completeness: 1

Preservation: 4

Age: Over 18 years

Sex: Unknown

Skeleton number: 84

Completeness: 5

Preservation: 4

Age: 40-50 years

Sex: Female

Stature: 157 cm

Dental inventory:

														C	
									Ca	Ca	Ca	Ca	Ca	Ca	
-	-	-	-	-	-	-	-	-	2	3	4	5	6	7	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Non metric traits present: Cranial: Left condylar facet double.

Postcranial: Bilateral transverse foramen bipartite on C6, bilateral femoral hypotrocanteric fossae and exostosis in the trochanteric fossae.

Dental pathology: Moderate periodontal disease, small caries, slight calculus.

Pathology: Slight to moderate spinal degenerative joint disease, considerable degenerative joint disease on right clavicle, healed periostitis on sacrum, both tibiae and fibulae, active periostitis on the visceral surface of 3 left ribs.

Skeleton number: 88

Completeness: 2

Preservation: 2

Age: Younger than 12 years

Skeleton number: 90
Completeness: 5
Preservation: 2
Age: 19-22 years
Sex: Male?
Stature: 168 cm
Dental inventory:

	C										C		A	A	
	A			H	H					H	H	H	C	C	
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
8	X	6	5	4	3	2	1	1	2	3	4	5	6	7	8
		H			H	H	H	H	H	H	H	H	H	C	H
		A				Ca									
		C													

Non metric traits present: Cranial: Right parietal foramen, 2 left and 1 right zygomatico-facial foramen, right anterior condylar canal.
Postcranial: Bilateral femoral third trochanters.
Dental pathology: Vertical periodontal disease, small to large caries, enamel hypoplasia, abscesses, moderate calculus.
Pathology: Slight spinal degenerative joint disease, Schmorl's nodes, Congenitally fused 1st and 2nd right ribs, congenitally segmented sternum, active maxillary sinusitis, spinal tuberculosis.

Skeleton number: 96
Completeness: 2
Preservation: 3
Age: 7.5-8.5 years
Dental inventory:

					c	/	/	-	-	-	-	-			
			-	-	-	-	-	-	-	-	-	-			
	U	6	U	U	U	PE	PE	-	-	-	-	U	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Pathology: Active type 2 cribra orbitalia, active maxillary sinusitis. Congenitally fused inferior and superior articular surfaces of C2 and C3. left lamina and spinal process.

Skeleton number: 99
Completeness: 2
Preservation: 3
Age: Over 18 years
Sex: Male?

Stature: 163 cm

Non metric traits present: Postcranial: Bilateral lateral tibial squatting facets, bilateral double anterior calcaneal facets.

Skeleton number: 102

Completeness: 2

Preservation: 2

Age: 9-11 years

Dental inventory:

			e									e				
												C				
												Ca				
		Ca				Ca				Ca	Ca					
-	-	6	-	4	3	2	1	1	2	3	4	5	-	-	-	
-	-	6	U	4	3	2	1	1	2	3	4	U	6	E	-	
		Ca					Ca	Ca	Ca	Ca	Ca		Ca			

Dental pathology: Small caries, slight calculus.

Pathology: Frontal bone, endocranial hyperostosis.

Skeleton number: 105

Completeness: 1

Preservation: 4

Age: 30-40 years

Sex: Male

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	
	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
	Ca	Ca	Ca	Ca		Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca		
	C															

Non metric traits present: Cranial: Left epipteric bone, bilateral mastoid foramina extrasutural.

Postcranial: Right acromial articular facet.

Dental pathology: Considerable periodontal disease, medium caries, slight calculus, enamel hypoplasia.

Pathology: Slight spinal degenerative joint disease.

Skeleton number: 108

Completeness: 2

Preservation: 3

Age: 33-43 years

Sex: Male

Dental inventory:

					H						H				C	
	Ca	Ca	Ca	Ca	Ca			Ca	Ca	Ca	Ca		Ca	Ca		
NP	7	6	5	4	3	/	1	1	2	3	4	/	6	7	NP	
8	7	6	5	4	/	2	1	/	/	/	4	5	6	7	8	
Ca			Ca	Ca		Ca	Ca				Ca	Ca	Ca	Ca	Ca	

Non metric traits present: Cranial: Bilateral lambdoid ossicles, left frontal foramen, left anterior condylar canal, inca bone.

Postcranial: Left posterior bridge on atlas.

Dental pathology: Slight periodontal disease, enamel hypoplasia, large caries, slight to medium calculus.

Pathology: Slight spinal degenerative joint disease. Mixed active and healed periostitis on the endocranial surface.

Skeleton number: 112

Completeness: 1

Preservation: 4

Age: 11-16 years

Skeleton number: 116

Completeness: 1

Preservation: 1

Age: Younger than 5 years

Skeleton number: 119

Completeness: 3

Preservation: 2

Age: 14-16 years

Dental inventory:

					H					H					
U	7	6	5	4	3	-	-	-	-	3	4	/	6	-	8
NP	7	6	5	4	3	2	-	-	-	-	4	5	6	7	NP
	H	H			H						H				
		Ca													

Dental pathology: Slight calculus, enamel hypoplasia

Skeleton number: 125

Completeness: 1

Preservation: 3

Age: Over 18 years

Sex: Unknown

Non metric traits present: Postcranial: Left tibial lateral squatting facet, bilateral double anterior calcaneal facets.

Pathology: Bilateral active periostitis on distal shafts of fibulae.

Skeleton number: 131

Completeness: 1

Preservation: 2

Age: Over 18 years

Sex: Unknown

Stature: 157 cm

Skeleton number: 134

Completeness: 1

Preservation: 4

Age: Younger than 12 years

Skeleton number: 137

Completeness: 1

Preservation: 4

Age: Over 18 years

Sex: Female

Skeleton number: 140

Completeness: 2

Preservation: 3

Age: 9-12 years

Pathology: Active periostitis on right tibia shaft.

Skeleton number: 144

Completeness: 1

Preservation: 4

Age: Over 18 years

Sex: Unknown

Skeleton number: 150

Completeness: 1

Preservation: 4

Age: 15-17 years

Dental inventory:

								C	C				C		
				H	H			H	H	H	H	H	H		
U	7	X	5	4	3	NP	/	1	2	3	4	5	6	-	-
/	/	6	5	/	3	2	1	1	/	-	-	-	-	-	-
					H	H	H	H							
		C			Ca	Ca	Ca	Ca							

Non metric traits present: Cranial: Palatine torus, bilateral parietal foramina.

Postcranial: Bilateral tibial lateral squatting facets.

Dental pathology: Vertical periodontal disease, small to large caries, slight calculus, hypodontia

Pathology: Active maxillary sinusitis.

Skeleton number: 154
Completeness: 1
Preservation: 4
Age: Over 18 years
Sex: Unknown

Skeleton number: 157
Completeness: 1
Preservation: 4
Age: 3-6 years

Skeleton number: 164
Completeness: 5
Preservation: 4
Age: 40-45 years
Sex: Male
Stature: 173 cm
Dental inventory:

											A	A				
/	X	X	X	X	3	2	1	/	/	3	/	/	X	X	X	
X	7	6	5	4	3	2	1	1	2	/	4	5	X	7	8	
	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca	Ca						Ca	
	H	H												H		

Non metric traits present: Cranial: Bilateral highest nuchal lines, left parietal foramen, 1 left and 2 right zygomatico-facial foramina, left supraorbital foramen, left posterior condylar canal, left double anterior condylar canal, bilateral mastoid foramina extrasutural.
Postcranial: Left humeral septal aperture, left supra-scapular foramen, bilateral femoral plaque, bilateral exostosis in the trochanteric fossae,
Dental pathology: Slight to moderate periodontal disease, dental abscess, slight calculus, enamel hypoplasia.
Pathology: Osteoarthritis on cervicals, moderate to considerable spinal degenerative joint disease, Schmorl's nodes. Slight degenerative joint disease PIP left 3rd pedal digit and right PIP on 2nd pedal digit, medial end of left clavicle, both knees, both hips, MCP joint on right 3rd digit, moderate degenerative changes on the left elbow. Osteoarthritis on right MTP joint and left wrist. Osteochondritis on right humerus, active periostitis on S2-4. Fractured right proximal phalanx of 1st pedal digit, 3 fractured right ribs, 1 fractured right rib, fractured blade of scapula. Active maxillary sinusitis.

Skeleton number: 170
Completeness: 4
Preservation: 4
Age: 1.5-3 years
Dental inventory:

e	d		b		a	b	c	d	e
e	d			a	a		c	d	e

Pathology: Active maxillary sinusitis.

Skeleton number: 176
Completeness: 5
Preservation: 4
Age: 25-30 years
Sex: Male
Stature: 167 cm
Dental inventory:

		C													
Ca	Ca	A	Ca	Ca	Ca				Ca	Ca	Ca	Ca	Ca		
	H	H		H	H			H	H	H		H	H	H	
8	7	6	5	4	3	/	/	1	2	3	4	5	6	7	8
8	7	6	5	4	3	/	1	/	/	3	4	5	6	7	8
			H		H		H			H		H			
Ca	Ca	Ca	Ca	Ca	Ca		Ca			Ca	Ca	Ca	Ca		

Non metric traits present: Cranial: Bilateral lambdoid ossicles, left parietal notch bone, bilateral parietal foramina, left frontal foramen, metopism.
Posteranial: Bilateral atlas posterior bridges, bilateral double anterior calcaneal facets.
Dental pathology: Moderate periodontal disease, small and large caries, enamel hypoplasia, abscess, slight calculus.
Pathology: Slight spinal degerative joint disease, Schmorl's nodes, slight degnerative joint disease on right ankle, healed and active periostitis on both tibiae and fibulae, active maxillary sinusitis.

Skeleton number: 181
Completeness: 1
Preservation: 4
Age: Over 18 years
Sex: Male?
Stature: 165 cm
Non metric traits present: Bilateral double anterior calcaneal facets.
Pathology: Healed periostitis on both tibiae.

Skeleton number: 184
Completeness: 2
Preservation: 3
Age: 1-1.5 years
Dental inventory:

									E
e	-	-	b	a	/	/	/	d	e
e	d	/	/	/	/	/	/	d	e

Dental pathology: Irregular lobulations on developing permanent 1st molars. Consistent of mulberry molars which is indicative of congenital syphilis.

Pathology: Active type 2 cribra orbitalia.

Skeleton number: 187

Completeness: 4

Preservation: 4

Age: 1-2 years

Dental inventory:

E	d	/	b	a	a	/	/	d	-
E	d	PE	b	a	/	b	/	d	E
							A		

Dental pathology: Abscess

Pathology: Healed type 2 cribra orbitalia.

Skeleton number: 190

Completeness: 2

Preservation: 4

Age: 1.5-2.5 years

Dental inventory:

-	-	-	-	-	/	/	/	d	e
e	d	B	/	/	/	/	c	-	-

Skeleton number: 196

Completeness: 5

Preservation: 5

Age: 15-16 years

Dental inventory:

												A			
H		C	H	H	H	H			H	H	H	C	H		H
8	7	6	5	4	3	2	-	1	2	3	4	5	6	7	PE
8	7	6	5	4	3	2	1	1	2	/	4	5	6	7	8
H	H		H	H	H	H	H	H	H		H		H		H

Non metric traits present: Cranial: Left accessory lesser palatine foramen, palatine torus, left auditory torus.

Postcranial: Left femoral third trochanter.

Dental pathology: Small and large caries, abscess, enamel hypoplasia.

Pathology: Slight spinal degnerative changes on cervicals, Schmorl's nodes, otitis media, spina bifida occulta.

Skeleton number: 200

Completeness: 3

Preservation: 2

Age: 32-42 years

Sex: Female

Stature: 149 cm

Dental inventory:

H		Ca													
8	7	6	5	4	3	2	1	1	2	3	4	5	6	-	-
8	7	6	5	4	3	2	/	1	2	3	/	5	6	7	8
Ca	Ca	Ca	Ca	Ca	Ca	Ca		Ca	Ca	Ca		Ca		Ca	Ca

Non metric traits present: Cranial: 1 right zygomatico-facial foramen, double right anterior condylar canal. Postcranial: Right double atlas facet form, bilateral femoral hypotrochanteric fossae, bilateral exostosis in the trochanteric fossa.

Pathology: Moderate spinal degenerative joint disease, slight degenerative joint disease on right TMJ, healed type 4 cribra orbitalia, healed maxillary sinusitis.

Skeleton number: 213

Completeness: 1

Preservation: 4

Age: Over 18 years

Sex: Male?

Pathology: Right femoral shaft, soft tissue trauma at insertion of vastus medialis.

Skeleton number: 215

Completeness: 1

Preservation: 4

Age: 18-25 years

Sex: Male

Skeleton number: 220

Completeness: 2

Preservation: 2

Age: 6-8 weeks

Dental inventory:

-	-	-	-	-	-	-	-	-	-
-	/	/	/	/	/	/	/	/	-

Skeleton number: 223

Completeness: 1

Preservation: 4

Age: Younger than 5 years

Skeleton number: 226

Completeness: 4

Preservation: 2

Age: 36-46 years

Sex: Male

Stature: 169 cm

Dental inventory:

					C	A	H									
X	X	X	X	X	3	X	1	-	-	-	-	-	-	-	-
8	7	6	5	4	3	2	/	/	/	/	4	5	X	7	8
H	H	H	H	H	H	H					H	H		H	H
Ca	Ca	Ca	Ca	Ca							Ca	Ca			

Non metric traits present: Cranial: Right accessory lesser palatine foramen, bilateral lambdoid ossicles, 2 left and 3 right zygomatico-facial foramina.

Postcranial: Left acromial articular facet, bilateral atlas posterior bridges, bilateral femoral hypotrochanteric fossae, left exostosis in the trochanteric fossa.

Dental pathology: Slight to moderate periodontal disease, large caries, slight calculus, enamel hypoplasia.

Pathology: Slight spinal degenerative joint disease, Moderate degenerative joint disease at lateral end of left clavicle, active maxillary sinusitis, healed type 1 cribra orbitalia.

Skeleton number: 229

Completeness: 4

Preservation: 4

Age: 30-35 years

Sex: Female

Stature: 154 cm

Dental inventory:

	H													H	
Ca	Ca													Ca	Ca
8	7	X	5	4	3	2	1	-	-	3	4	5	6	7	8
NP	7	6	-	4	3	2	1	1	2	3	-	-	-	7	8
	Ca	Ca		Ca	Ca	Ca	Ca	Ca	Ca	Ca				Ca	Ca
	C	C												H	H
	H														

Non metric traits present: Cranial: 1 right zygomatico-facial foramen, left frontal foramen, left supra-orbital foramen, left double anterior condylar canal.

Postcranial: Right femoral exostosis in the trochanteric fossa.

Dental pathology: Small caries, enamel hypoplasia, slight calculus, right 3rd molar not present.

Pathology: Slight spinal degenerative changes, Schmorl's nodes. Healed type 2 and 4 cribra orbitalia, healed porotic hyperostosis, spinal tuberculosis.

Catalogue of disarticulated remains

Context number: 13

Skeletal element: Mandible

Preservation: 4

Age: 18-21 years

Sex: Male

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	R	6	5	4	3	/	/	/	/	/	4	5	-	-	-
C		H	H	H	H						H	H			
				Ca	Ca										

Dental pathology: Two small caries, slight calculus, enamel hypoplasia, vertical bone loss at third molar.

Pathology: Active periostits posterior to the third molar.

Context number: 23

Skeletal element: Mandible

Preservation: 4

Age: 17-25 years

Sex: Female

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NP	/	6	5	4	/	/	/	B	/	/	/	-	-	-	-
		H	H	H											
		Ca	Ca	Ca											

Dental pathology: Slight calculus, enamel hypoplasia

Context number: 23

Skeletal element: Mandible

Preservation: 4

Age: 4.5-5.5 years

Dental inventory:

	-	-	-	-	-	-	-	-	-	-
E	e	d	/	/	/	/	/	c	d	e

Context number: 174

Skeletal element: 4

Preservation:

Age: 3.5-4.5 years

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-
c	/	-	-	-	-	-	-	-	-	-

Context number: 163

Skeletal elements: Frontal bone fragment, anterior mandible and right femur shaft

Preservation: 3

Age: 8-18 months

Dental inventory:

-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	/	/	/	c E	/	/	

Context number: 163

Skeletal element: Cranium. left scapula, clavicle, humerus, ulna, radius fragment, 2nd metacarpal, right scapula, finger bones, left carpal bones, ulna, both hips and femurs, C2, C3, L5 S1 and S3.

Preservation: 4

Age: 40-50 years

Sex: Male

Dental inventory:

	C Ca	Ca	C Ca	Ca						H Ca	C Ca	C Ca			A
-	7	6	5	4	/	/	/	/	/	3	4	5	/	/	/
-	-	X	5 Ca H	4 Ca	3 Ca	2 Ca	1 Ca	1 Ca	2 Ca	3 Ca	4 Ca	5 Ca	X	7 C	8 C

Non metric traits present: Cranial: Right lambdoid ossicle, 1 right zygomatico-facial foramen, bilateral supraorbital foramina, bilateral mastoid foramina extrasutural.

Postcranial: Bilateral femoral exostosis in the trochanteric fossae.

Dental pathology: Moderate periodontal disease, medium calculus, small caries, enamel hypoplasia, abscess.

Pathology: Osteoarthritis in the cervicals, moderate spinal degenerative joint disease, slight degenerative joint disease on both elbows, fingers (side unknown). Osteoarthritis on left wrist, both hips, both knees. Active maxillary sinusitis, healed slight porotic hyperostosis, healed type 1 cribra orbitalia.

Context number: 219
Skeletal element: Cranium
Preservation: 3
Age: 24-30 years
Sex: Female
Dental inventory:

		C										C	C		
		Ca									Ca	Ca	Ca		
		H	H	H	H						H	H	H		
-	-	6	5	4	3	/	/	/	/	/	4	5	6	7	8
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Dental pathology: Enamel hypoplasia, small caries, slight calculus
Pathology: Active periostitis on the endocranial surface of the frontal bone, healed porotic hyperostosis.

Context number: 227
Skeletal element: Mandible
Preservation: 2
Age: Adult
Sex: Unknown
Dental inventory:

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	X	R	/	/	/	/	X	/	/	4	X	X	-	-
						A				A					

Dental pathology: Dental abscess

Context number: 232
Skeletal element: Cranium and C1
Preservation: 4
Age: 30-40 years
Sex: Male
Dental inventory:

	H														
NP	7	6	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Dental pathology: Enamel hypoplasia.

Pathology: Healed slight porotic hyperostosis.

Context number	Skeletal element	Side	Age	Sex	Non metric trait	Pathology
1	2 acromion fragments	Right	Adult	Unknown		
1	Humeral shaft	Right	Adult	Unknown		
1	Parietal fragment	-	Adult	Unknown		
1	Frontal bone with orbital rim	Right	Adult	Male		
1	Tibia, anterior border	-	Adult	Unknown		
1	Femur, proximal, midshaft and distal fragments	Right	Adult	Unknown		
1	7 unidentified fragments	-	Unknown	Unknown		
7	Temporal bone with petrous portion	Right	Subadult	Unknown		
7	6 long bone fragments	-	Subadult	Unknown		
13	Distal tibia	Left	Adult	Unknown		Active periostitis
13	Calcaneus	Left	Adult	Unknown	Double anterior facet	
13	2nd metatarsal	Left	Subadult	Unknown		
13	Metatarsal shaft	Left	Subadult	Unknown		
13	1st Metacarpal	Left	Adult	Unknown		
13	Femur, midshaft	-	Adult	Unknown		
13	Femur, distal	-	Adult	Unknown		
13	Femur, midshaft	Left	Subadult	Unknown		
13	Rib	Right	Adult?	Unknown		
13	Humerus, proximal shaft	Right	Adult?	Unknown		
13	Scapula, lateral border	Left	Adult	Unknown		
13	Fibula, distal shaft	Left	Adult	Unknown		
13	Clavicle, shaft	Right	Adult	Unknown		
13	Radius, midshaft	-	Adult	Unknown		
13	Femoral condyle	-	Adult	Unknown		
13	Femur, linea aspera fragment	-	Adult	Unknown		
13	Iliac blade fragments	-	Unknown	Unknown		
13	Rib fragment	Left	Adult	Unknown		
22	12 frontal bone fragments	-	Subadult	Unknown		
22	Orbital fragment	Left	Subadult	Unknown		
22	Maxilla fragment	Left	Subadult	Unknown		
22	Rib fragment	Right	Adult?	Unknown		
23	4 frontal bone fragments	-	Adult	Female		Type 2 healed cribra orbitalia
23	Lateral end of clavicle	Left	Adult	Unknown		
23	Thoracic spinal process	-	Adult	Unknown		

24	Proximal femur shaft	Right	Adult	Unknown		
24	Proximal femur shaft	Left	Adult	Unknown		
24	Proximal femur shaft	Right	Subadult	Unknown		
24	Femur, midshaft	-	Adult	Unknown		
24	Distal femur shaft	Left	Adult	Unknown		
24	Distal femur shaft	Left	Adult	Unknown		
24	Tibia midshaft	-	Subadult	Unknown		
24	Tibia midshaft	Right	Adult	Unknown		
24	Proximal ulna	Right	Adult	Unknown		
24	Distal humerus shaft	Right	Adult	Unknown		
24	Distal humerus shaft	Right	Adult	Unknown		
25	Lateral half of clavicle	Left	Adult	Unknown		
25	4 rib bodies	-	Adult	Unknown		
25	Tibia midshaft	-	Adult	Unknown		
30	Humerus	Right	Adult	Female?		
30	Sternal half of clavicle	Right	Adult	Unknown		
30	Scapula	Right	Adult	Female		Slight degenerative joint disease, glenoid fossa
30	Thoracic vertebral fragments	-	Adult	Unknown		
30	Rib	Left	Adult	Unknown		
35	Scapula blade	Left	Adult	Unknown		
37	Mental protuberance of mandible	-	Adult	Female?		
43	Fibula shaft fragment	-	Adult	Unknown		
43	Proximal manual phalanx	-	Adult	Unknown		
43	4 rib body fragments	-	Adult	Unknown		
54	Tibia	Right	Adult	Unknown		
54	Fibula shaft	-	Adult	Unknown		
54	Radius	Left	Adult	Female		
54	1st sacral element	-	Adult	Unknown		
54	5th metacarpal	Left	Adult	Unknown		
54	5th metacarpal	Right	Adult	Unknown		
54	Proximal manual phalanx	-	Adult	Unknown		
54	3 rib body fragments	-	Adult	Unknown		
54	Parietal	Left	Adult	Unknown		
54	Temporal	Left	Adult	Male		
54	Femur shaft fragment	-	Adult	Unknown		
54	2nd maxillary molar	Left	50-58 years	Unknown		
54	Maxillary canine	Left	Adult	Unknown		
54	Maxillary second premolar	Left	Adult	Unknown		
54	Maxillary first premolar	Left	Adult	Unknown		
54	5th lumbar vertebral	-	Adult	Unknown		Slight spinal degenerative

	element					changes
57	Distal third of femur shaft	Right	Adult	Unknown		
57	Distal third of fibula shaft	Right	Adult	Unknown		
57	2 rib body fragments	-	Adult	Unknown		
64	1st sacral element	-	Adult	Male		Slight spinal degenerative changes
73	Parietals, temporals and frontal bone	-	Younger than 27 years	Male??		Healed type 2 cribra orbitalia
73	Parietal	Right	Subadult	Unknown		
73	Tibia	Left	Adult	Unknown		
73	Proximal femur shaft	Right	Adult	Unknown		
73	Femur head	Right	Adult	Male		
73	Femur shaft	Left	Adult	Unknown		
73	Femoral condyle	Right	Adult	Unknown		
73	Femoral midshaft	-	Subadult	Unknown		
73	Proximal ulna shaft	Left	Adult	Unknown		
73	Ulna shaft	Left	Subadult?	Unknown		
73	Femur shaft fragment	Left	Adult	Unknown		
73	Ischium	Left	Adult	Male		
73	Auricular surface	Left	Adult	Unknown		
73	Iliac crest fragment	-	Adult	Unknown		
73	Talus	Right	Adult	Unknown		
73	2nd metatarsal	Left	Adult	Unknown		
73	Calcaneus fragment	-	Adult	Unknown		
73	Radius shaft	-	Adult	Unknown		
73	Clavicle shaft	-	Adult	Unknown		
73	Lateral cuneiform	Right	Adult	Unknown		
73	Medial cuneiform	Right	Adult	Unknown		
73	Manual phalanx shaft	-	subadult?	Unknown		
73	Metatarsal head	-	Adult	Unknown		
73	Iliac and acetabulum	Left	Younger than 6 years	Unknown		
73	Petrous and squamous portion	Right	Younger than 6 years	Unknown		
73	Femur shaft and proximal end	Right	Neonate	Unknown		
73	Intermediate manual phalanx	-	Younger than 6 years	Unknown		
73	Rib body	-	Neonate	Unknown		
73	Rib body	-	Adult	Unknown		
73	Distal tibia	-	Adult	Unknown		
73	Mandibular lateral incisor	Right	Adult	Unknown		Heavy calculus deposits
79	Thoracic vertebral body	-	Adult	Unknown		Sight spinal degenerative joint disease

79	1st metacarpal	Right	Adult	Unknown		
79	Intermediate manual phalanx	-	Adult	Unknown		
79	Cranial vault fragment	-	Younger than 6 years	Unknown		
85	Rib	Right	Adult	Unknown		
85	Proximal ulna	Right	Adult	Unknown		
85	Parietal	Left	Subadult	Unknown		
91	Humerus	Left	Subadult	Unknown		
91	3 vault fragments	-	Adult	Unknown		
91	Ischium and acetabulum	Right	Adult	Unknown		
91	Thoracic lamina, spinous process and transverse process	Right	Adult	Unknown		
91	Thoracic lamina	Right	Adult	Unknown		
91	Lesser trochanter, femur	Right	Adult	Unknown		
91	Femur shaft	Right	Younger than 6 years	Unknown		
91	Cranial vault fragment	-	Subadult	Unknown		
91	Rib body	-	Subadult	Unknown		
91	1st rib body	-	Adult	Unknown		
91	Rib body	-	Adult	Unknown		
97	Proximal femur shaft	Right	Adult	Unknown		
97	Lateral end of clavicle	Left	Subadult	Unknown		
100	Midshaft femur	-	Subadult	Unknown		
100	2nd rib body	Left	Subadult	Unknown		
100	Cranial vault framgent	-	Subadult?	Unknown		
109	Midshaft femur	-	Adult?	Unknown		
109	Cranial vault fragment	-	Subadult	Unknown		
110	Proximal femur shaft	Left	Adult	Unknown		
110	Proximal ulna shaft	Right	Adult	Unknown		
110	3 radius shaft fragments	-	Adult	Unknown		
110	Scapula blade and spine fragment	Right	Adult	Unknown		
110	5 cranial vault fragments	-	Adult	Unknown		
110	Distal ulna shaft	Left	Adult	Unknown		
110	Ischium and acetabulum	Left	Adult	Male		
110	Clavicle	Right	Adult	Unknown		
110	Femur shaft	Left	Younger than 6 years	Unknown		
110	Distal humerus shaft	Left	Adult	Unknown		
110	3 parietal fragments	-	Adult	Unknown		Healed slight porotic hyperostosis

110	Iliac blade fragment	-	Adult	Unknown		
110	Femoral shaft and distal end	Left	Adult	Male		Slight degenerative joint disease
110	Humeral shaft and distal end	Left	Adult	Unknown		
110	Midshaft femur	Right	Adult	Unknown		
110	Radius	Left	Adult	Unknown		
110	Ulnar head and proximal shaft	Left	Adult	Unknown		
110	Scapula, glenoid fossa, acromiona and lateral border	Left	Adult	Male		
110	Cranial vault fragment	-	Adult	Unknown		
110	Tibia shaft fragment	Left	Adult	Unknown		
110	Midshaft tibia	-	Adult	Unknown		Prolific mixed active and healed periostitis
113	Temporal squamous fragment	-	Unknown	Unknown		
120	Midshaft humerus	Right	Adult	Unknown		
120	Maxillar lateral incisor	Right	Adult	Unknown		
120	Maxillary canine	Right	Adult	Unknown		Enamel hypoplasia
120	Maxillary 1st premolar	Right	Adult	Unknown		Enamel hypoplasia
120	Parietal fragment	-	Younger than 6 years	Unknown		
120	Body of mandible	Left	7 months-1.3 years	Unknown		
121	Cervical vertebra	-	Adult	Unknown		
132	Rib body fragment	-	Adult	Unknown		
141	Fibula shaft and distal end	Right	Adult	Unknown		
141	Ulna shaft and distal end	Left	Adult	Unknown		
141	Ulna shaft and distal end	Left	Adult	Unknown		
141	Tibia distal end and shaft	Left	Adult	Unknown		
141	Tibia distal end and shaft	Right	Adult	Unknown		
141	Tibia shaft and distal end	Left	Adult	Unknown		
141	Tibia shaft and proximal end	Left	Adult	Unknown		
141	Midshaft femur	-	Adult	Unknown		
141	Proximal shaft femur	-	Adult	Unknown		
141	Auricular surface fragment	Left	Adult	Unknown		
141	2 iliac blade fragment	-	Adult	Unknown		

141	S1 and S2	-	Adult	Unknown		Slight spinal degenerative joint disease
141	T11	-	Adult	Unknown		Moderate spinal degenerative joint disease
141	Acetabulum	Right	Adult	Unknown		Considerable degenerative joint disease
141	Proximal femur	Right	Adult	Male		Considerable degenerative joint disease
141	T12 superior and inferior articular processes	-	Adult	Unknown		
141	Femur shaft	-	Younger than 6 years	Unknown		
141	Tibia shaft and distal end	Right	Adult	Unknown		
141	Femur shaft and distal end	Left	Adult	Male		
141	Femur shaft and distal end	Right	Adult	Male		
141	Calcaneus	Right	Adult	Unknown		
141	Calcaneus	Left	Adult	Unknown		
141	Talus	Right	Adult	Unknown		
141	Fibula distal shaft	Left	Adult	Unknown		
141	Fibula distal shaft	Right	Adult	Unknown		
141	5th metacarpal	Right	Adult	Unknown		
141	4th metacarpal	Left	Adult	Unknown		
141	Metatarsal shaft	-	Adult	Unknown		
141	Clavicle shaft	-	Adult	Unknown		
141	Femur distal half of shaft	Right	Adult	Unknown		
141	Femur distal half of shaft	Left	Adult	Unknown		
141	Femur proximal shaft	Right	Adult	Unknown		
145	Calcaneus	Right	Adult	Unknown		
145	Parietal fragment	-	Subadult	Unknown		
151	Intermediate manual phalanx	-	Adult	Unknown		
168	Lateral end of clavicle	Right	Adult	Unknown		
168	Zygomatic bone	Right	Adult	Unknown		
168	Tibia shaft fragment	-	Adult	Unknown		
168	C1	-	Adult	Unknown		
168	Cervical body	-	Adult	Unknown		
174	Parietals	Right and left	Adult	Unknown		
174	Proximal ulna	Right	Adult	Unknown		
174	Rib body fragment	-	Adult	Unknown		
174	Distal humerus	Left	Adult	Unknown		

174	Femur shaft	Left	Adult	Unknown		
174	Femur shaft	Left	Adult	Unknown		
174	Rib body fragment	-	Subadult	Unknown		
178	Proximal humerus	Right	12-18 years	Unknown		
178	Radius	Right	12-18 years	Unknown		
178	Ulna distal end of shaft	Right	12-18 years	Unknown		
178	Scapula	Right	12-18 years	Unknown		
178	Lateral end of clavicle	Right	Unknown	Unknown		
178	Rib body fragment	-	Unknown	Unknown		
179	Occipital fragment	-	Adult	Unknown		
179	Temporal bones	Right and left	Adult	Female?		
179	Femur distal shaft	Right	Adult	Unknown		
198	Occipital fragment	-	Adult	Unknown		
198	Rib head and neck	Right	Adult	Unknown		
198	Proximal end of femur	Right	Younger than 6 years	Unknown		
198	Orbit and roof	Right	Younger than 6 years	Unknown		Active type 2 cribra orbitalia
198	2 cranial vault fragments	-	Younger than 6 years	Unknown		
198	2 rib heads and body fragments	Left	Younger than 6 years	Unknown		
198	2 rib body fragments	-	Adult	Unknown		
198	Tibia shaft fragment	Left	Neonate	Unknown		
202	Frontal bone	Left	Adult	Unknown		Slight healed porotic hyperostosis
202	Fibula shaft	-	Adult	Unknown		
202	Femoral condyles	Left	Adult	Unknown		
202	Midshaft tibia	-	Adult	Unknown		
202	Midshaft tibia	-	Adult	Unknown		
202	1st metacarpal	Right	Adult	Unknown		
203	4th metacarpal	Right	Adult	Unknown		
203	Proximal manual phalanx	-	18-20 years	Unknown		
203	Midshaft tibia	-	Adult	Unknown		
203	4 proximal tibia fragments	-	Adult	Unknown		
203	3 rib body fragments	-	Adult	Unknown		
203	Occipital	-	Adult	Unknown		
203	Iliac blade and acetabulum fragment	Left	Adult	Unknown		
203	Distal third of femur shaft	Right	Adult	Unknown		
203	Distal half of femur shaft	Right	Adult	Unknown		
203	2nd metacarpal	Left	Adult	Unknown		

204	Distal humerus	Left	Adult	Unknown		
204	Distal humerus	Right	Adult	Unknown		
204	Ischial tuberosity	Left	18-23 years	Unknown		
204	Femur shaft	Right	Adult	Unknown		
204	Midshaft femur	-	Adult	Unknown		
204	Midshaft tibia	-	Adult	Unknown		
204	Distal tibia	Right	Adult	Unknown	Lateral squatting facet	
204	Midshaft tibia	-	Younger than 12 years	Unknown		
204	2nd rib	Left	Younger than 12 years	Unknown		
205	Midshaft tibia	Right	Adult	Unknown		Healed periostitis
205	Fibula shaft fragment	-	Adult	Unknown		
206	Proximal half of tibia	Right	Adult	Unknown		
206	Distal 3rd of tibia	Right	Adult	Unknown		
206	Distal femur shaft fragment	Right	Adult	Unknown		
206	Scapula spine fragment	Right	Adult	Unknown		
206	Distal tibia	Right	Adult	Unknown		
227	Humerus shaft	Right	Adult	Unknown		
227	Frontal and orbit	Right	Adult	Female??	Frontal foramen	Healed type 1 cribra orbitalia
227	Cranial vault fragment	-	Younger than 12 years	Unknown		
230	Lateral end of clavicle	Right	Adult	Unknown		
230	Radius shaft	Left	Unknown	Unknown		
230	Ulna shaft	Right	Adult	Unknown		
230	Frontal fragment	-	Subadult	Unknown		
230	Acromion	Right	Adult	Unknown		
230	Occipital	-	Adult	Female?		
230	Parietal	Left	Adult	Unknown		
230	Temporal	Left	Adult	Unknown		
230	C5	-	Adult	Unknown		
230	Femur	Right	Younger than 6 years	Unknown		
230	Parietal fragments	-	Younger than 6 years	Unknown		
233	3 sacrum fragments	-	Adult	Unknown		
233	Proximal quarter of radius	Right	Adult	Female		
233	Parietal fragments	Right	Younger than 6 years	Unknown		
233	Ilium	Right	Younger than 6 years	Unknown		
233	1st rib	Right	Younger than 6 years	Unknown		
233	Fibula shaft fragment	-	Adult	Unknown		

11 APPENDIX 3

11.1 Finds catalogue

Table 16: Summary quantification of pottery

Context	Spot-date	Sherds	Weight	Comments
11	1-2C	2	13	Savernake ware - grey fabric with dissolved chalk, mod flint, coarse rounded quartz, smoothed ext. 1x very worn Roman grog-tempered sherd
13	11-E13C	1	17	Newbury A/B related? Hammerhead-rim bowl, chalk, coarse round quartz, flint. Sooted ext. Fairly worn
15	11-14C?	1	1	Scrap grey-brown sandyware cook pot? (sooted ext). Prob med but not impossibly Roman. Environ sample [4]
16	14-E16C?	2	18	Orange sandy jar with Roman or French-style collared/hooked rim - poss Brill/Boarstall or local late med? 1x Poss Kingston-type ware - jug sherd from nr handle junction, splashes clear greenish glaze.
19	14-E16C?	2	31	Joins 16. Collared jar rim, orange sandy, fresh
22	11-12C?	1	5	Newbury A/B? Coarse flint, chalk (dissolved), sandy plus coarser quartz. Oxid ext. Possible wedge-shaped stamped dec ext?
39	1-2C	1	10	Savernake ware - bodysherd
73	11-12C?	2	10	Newbury A/B? Coarse flint, chalk (dissolved), sandy plus coarser quartz. Cook pot rim, plain upright thickened, brownish ext, reduced int. Large diameter
100	11-12C?	1	5	Newbury A/B bodysherd
174	12-13C	1	2	Earlswood-type ware? Scrap of jug/pitcher, coarse orange sandy with white slip under copper-green glaze
177	13-14C	2	34	Finer Earlswood-type? Or possibly Brill/Boarstall-type? Oval/rod jug handle with knife-slashing or piercing. Fine sandy light orange-brown with patchy greenish-brown glaze ext. Also separate small bodysherd
28	Rom or Med?	1	6	CBM possible roof tile scrap. Unglazed but similar to tile in 37.
37	13-16C	1	16	CBM medieval roof tile edge. Oxidised with clear glaze on upper surface
TOTAL		**16**	**146**	

Table 17: Summary quantification of Small finds

Context	Small Find number	Material	Dimensions mm	Type	Quantity
11	1	Cu alloy	8x6x2	Clasp?	1
16	4	Fe	28x14x15	Hand forged nail	1
28	3	Fe	29x11x9	Hand forged nail	1
34	5	Fe	23x12x3	Hand forged nail	1
34	7	Fe	23x11x8	Hand forged nail	1
42	19	Fe	18x8x7	Hand forged nail	1
69	-	Fe	35x17x4	Hand forged nail	7
85	8	Fe	18x15x12	Hand forged nail	1

85	9	Fe	60x18x10	Hand forged nail	1
100	10	Cu alloy	25x12x2	Clip	1
100	11	Fe	20x17x11	Hand forged nail	1
100	12	Fe	16x12x4	Hand forged nail	1
100	13	Fe	20x19x4	Hand forged nail	1
115	14	Fe	38x18x4	Hand forged nail	3
115	15	Fe	22x23x8	Hand forged nail	4
163	-	Fe	37.5x15.5x11	Hand forged nail	1
171	16	Fe	58x20x12	Hand forged nail	1
177	17	Fe	18x17x11	Hand forged nail	1
183	18	Fe	44x20x17	Hand forged nail	1
183	19	Fe	18x8x7	Hand forged nail	1
183	20	Fe	39x17x6	Hand forged nail	1
203	Finds ref.	Fe	70x8x8	Hook	1
219	21	Fe	32x6.5x7.5	Hand forged nail	1
219	22	Fe	32x6.5x7.5	Hand forged nail	1

12 APPENDIX 4

12.1 Radiocarbon date

Lab No.	Context	Radiocarbon age BP	$\delta^{13}C$ (%)	Material	Context type	Calibrated date range 95%* confidence
OXA15839	SK 184	859 ±23	-18.3	Human bone	Grave	1150-1260 AD (90.9%) 1050-1080 AD (4.5%)

*68.2% 1165-1215 cal AD

Calibrated using Oxcal computer programme (v 3.10) of C. Bronk Ramsey *et al.* (2004), INTCAL04 dataset.

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14 SUMMARY OF SITE DETAILS

Site name: The Litten, Newbury
Site code: NEWR04
Grid reference: SU 8469 8665
Type of fieldwork: Excavation
Date and duration of project: July and August 2004
Area of site: 52 sq m
Summary of results:

In July and August 2004, an archaeological excavation was carried out by Oxford Archaeology at the corner of Pound Street and Newtown Road, Newbury, on behalf of the West Berkshire Highways Department. The excavation, in advance of road works, revealed 59 intercutting graves. These burials formed part of a much larger cemetery (locally known as the Litten) which served as the burial ground of the medieval infirmary of St Bartholomew between the 1267 and 1554 AD.

56 skeletons were analysed to assess bone preservation and completeness, age and sex and pathology. Whilst there was considerable fragmentation the overall bone preservation was found to be good. Many skeletons were incomplete, having been truncated by later graves and by modern services. High levels of skeletal and dental pathology were present, not unsurprising in a hospital population. One case of possible pre-Columbian congenital syphilis was present.

Further work at the end of August and beginning of September involved a watching brief on two service trenches extending north and east of the excavation area. These two linear excavations cut through previous service trenches and the limit of impact was 0.8 m. No archaeology or human bone was observed.

Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with West Berkshire Heritage Services in due course, under the following accession number: NEWBYM: 2004.48.

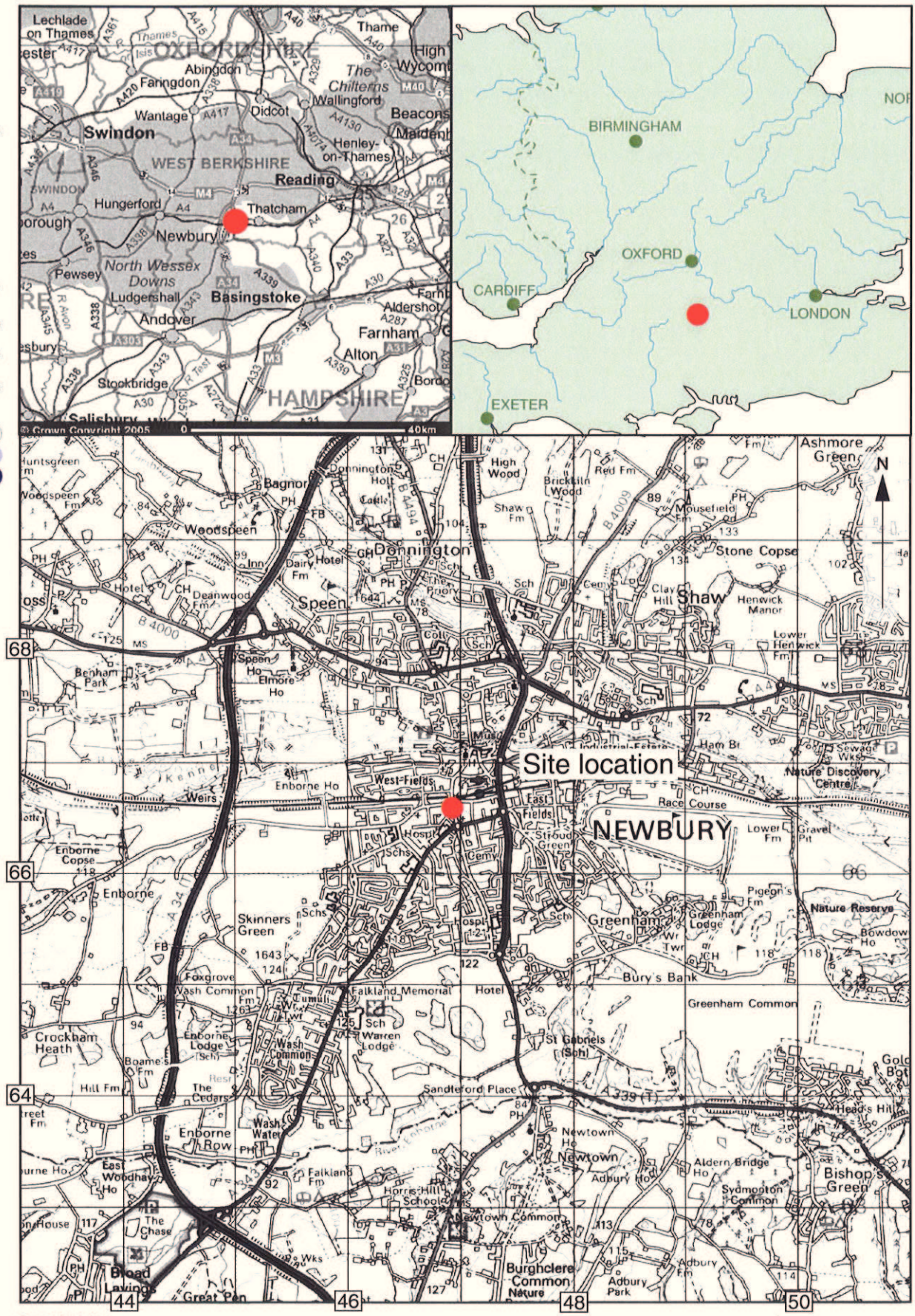

Figure 1: Site location

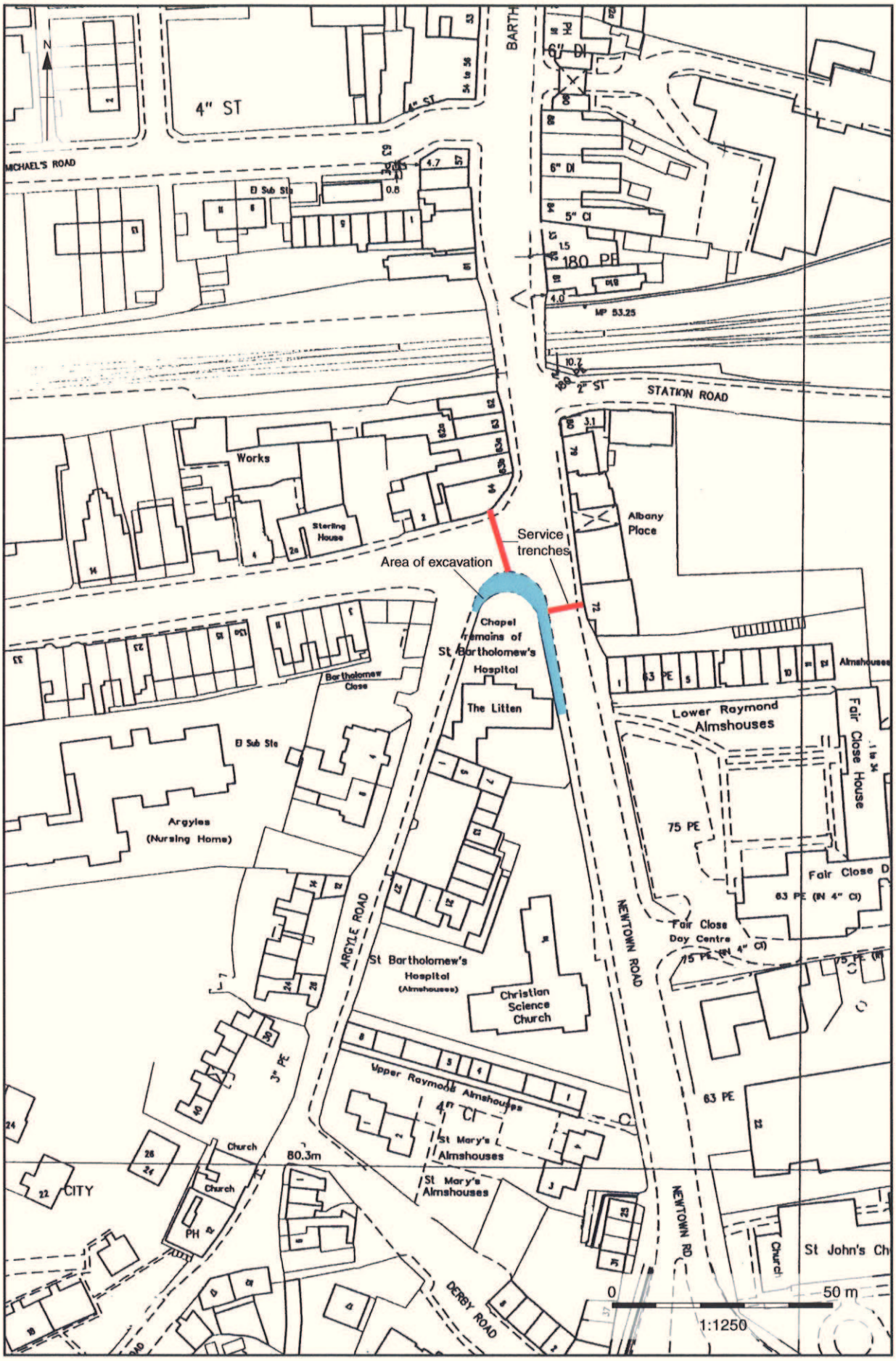

Figure 2: Site location on Pound Street and Newtown, Newbury

Figure 3: Plan of the excavated burials

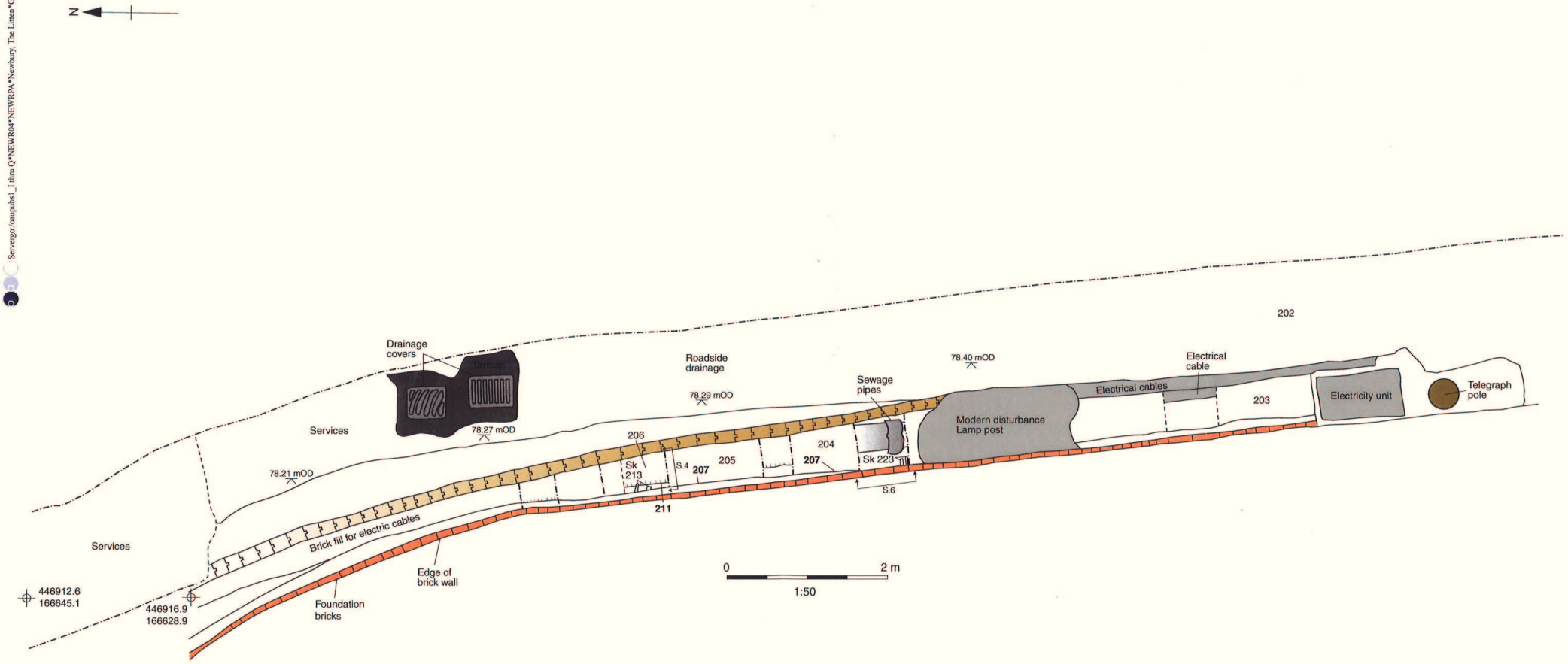

Figure 4: Plan of the watching brief of the eastern pavement of Newtown Road

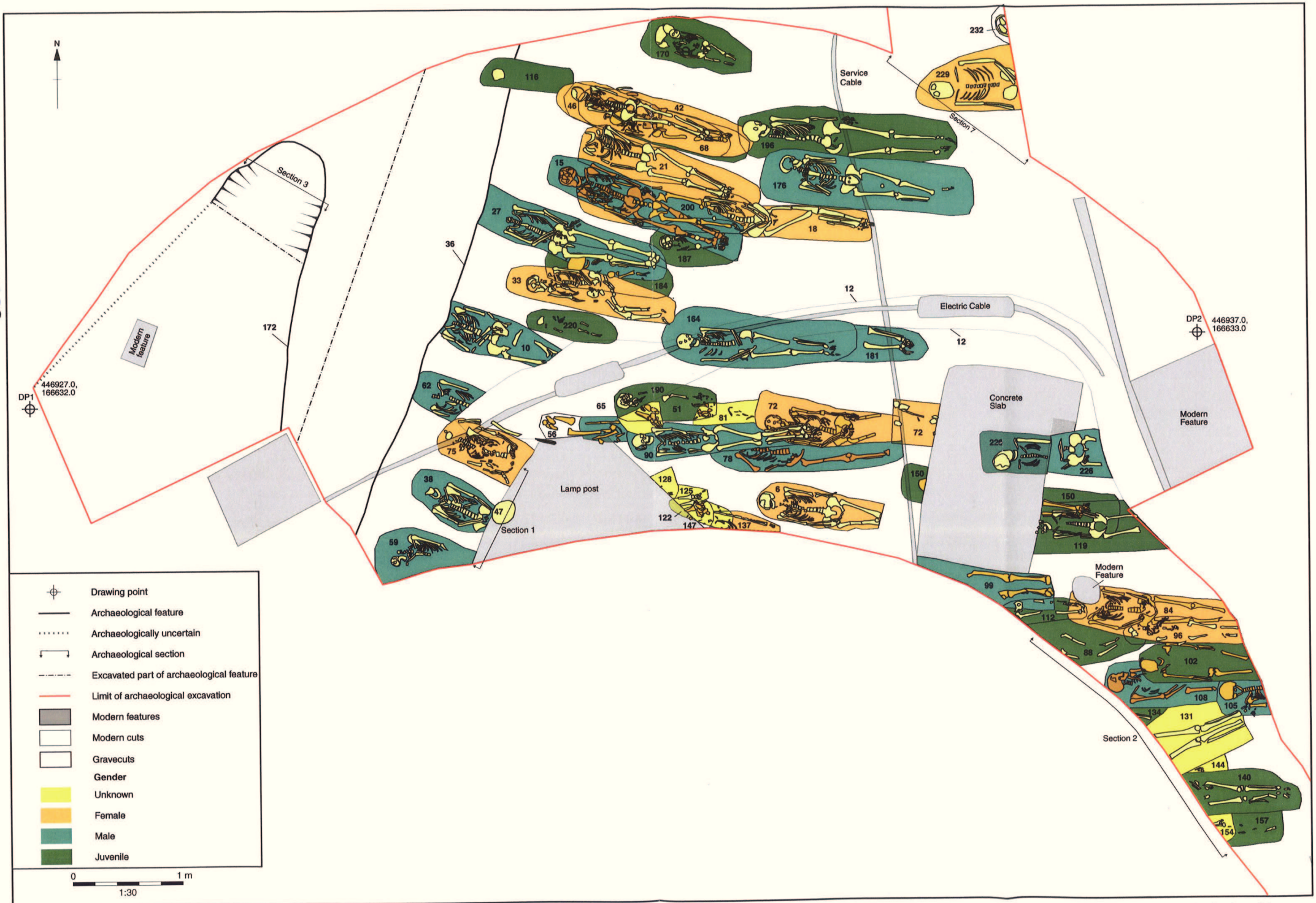

Figure 5: Sex distribution of the graves.

Plate 1: Skeletons 15, 18 and 27

Plate 2: Skeletons 15 and 27

Plate 3: Child burial (68) in wooden coffin

Plate 4: Working shot of south-eastern area of the site

Oxford Archaeology

Janus House
Osney Mead
Oxford OX2 0ES

t: (0044) 01865 263800
f: (0044) 01865 793496
e: info@oxfordarch.co.uk
w:www.oxfordarch.co.uk

Oxford Archaeology North

Storey Institute
Meeting House Lane
Lancaster LA1 1TF

t: (0044) 01524 541000
f: (0044) 01524 848606
e: lancinfo@oxfordarch.co.uk
w:www.oxfordarch.co.uk

REGISTERED IFA ORGANISATION

Director: David Jennings, BA MIFA FSA

Oxford Archaeological Unit is a
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Registered Office:
Oxford Archaeological Unit
Janus House, Osney Mead, Oxford OX2 0ES