The Medieval and Post-medieval Graveyard of St Peter-le-Bailey at Bonn Square, Oxford

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SUMMARY

Excavations at Bonn Square, Oxford, revealed a total of 296 burials within the graveyard of the Church of St Peter-le-Bailey, which stood on the site from the eleventh to the late nineteenth century. None of the early burials was coffined, although some were buried in stone-lined cist graves. Many of the later burials were interred in brick shaft graves. A total of fifty-three memorial stones was also revealed, and surviving inscriptions catalogued. The analysis of the skeletons provided a rare opportunity to study the health and disease of the population of one of the poorest parishes in Oxford during the medieval and post-medieval periods, as well as the effects of environment and pollution on it. The results of the analysis have demonstrated that a large proportion of both the early and later population suffered from the effects of hard labour, crowded living conditions, pollution, and generally poor hygiene.

Between January and October 2008 Oxford Archaeology carried out an excavation and watching brief at Bonn Square, Oxford (NGR SP 5118 0615). The site of the graveyard of St Peter-le-Bailey Church covers an area of about 0.04 hectares and is located at the junction of Queen Street and New Inn Hall Street, about 150 m west of the centre of Oxford (Fig. 1). The work was carried out on behalf of Oxford City Council and English Landscape Ltd, in advance of a landscape scheme with new paving and lighting (Planning Ref: 06/00487/FUL).

GEOLOGY AND TOPOGRAPHY

The site is located in the medieval town, on the southern spur of the Summertown-Radley gravel terrace (overlying Oxford clay), between the rivers Thames and Cherwell. The site slopes up from the current road surface at about 64.2 m OD on the south to 65.8 m OD on the north, due to the build-up of ground from a millennium of burials within the cemetery. The landscaping scheme involved the removal of the historic cemetery walls on the east and west sides, and the entrance walls and railings of the adjacent Baptist church, to create a more open and accessible space. The general profile of the graveyard was modified, but it remains higher at the north end, and the war memorial still stands in the centre.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Two phases of trenched evaluation and a phase of geophysical survey have taken place on the site as part of the pre-planning stage of the current works.[1] The evaluations recorded evidence for an upper horizon of burials and structural evidence of the eighteenth-century church of St Peter-le-Bailey.

[1] 'An archaeological evaluation at Bonn Square, Oxford' (JMHS, TS report, 2005); 'Bonn Square improvements, Oxford, an archaeological evaluation' (TVAS, TS report, 2003); 'Geophysical survey, Bonn Square, Oxford' (Fugro Engineering Services Ltd, TS report, 2005).

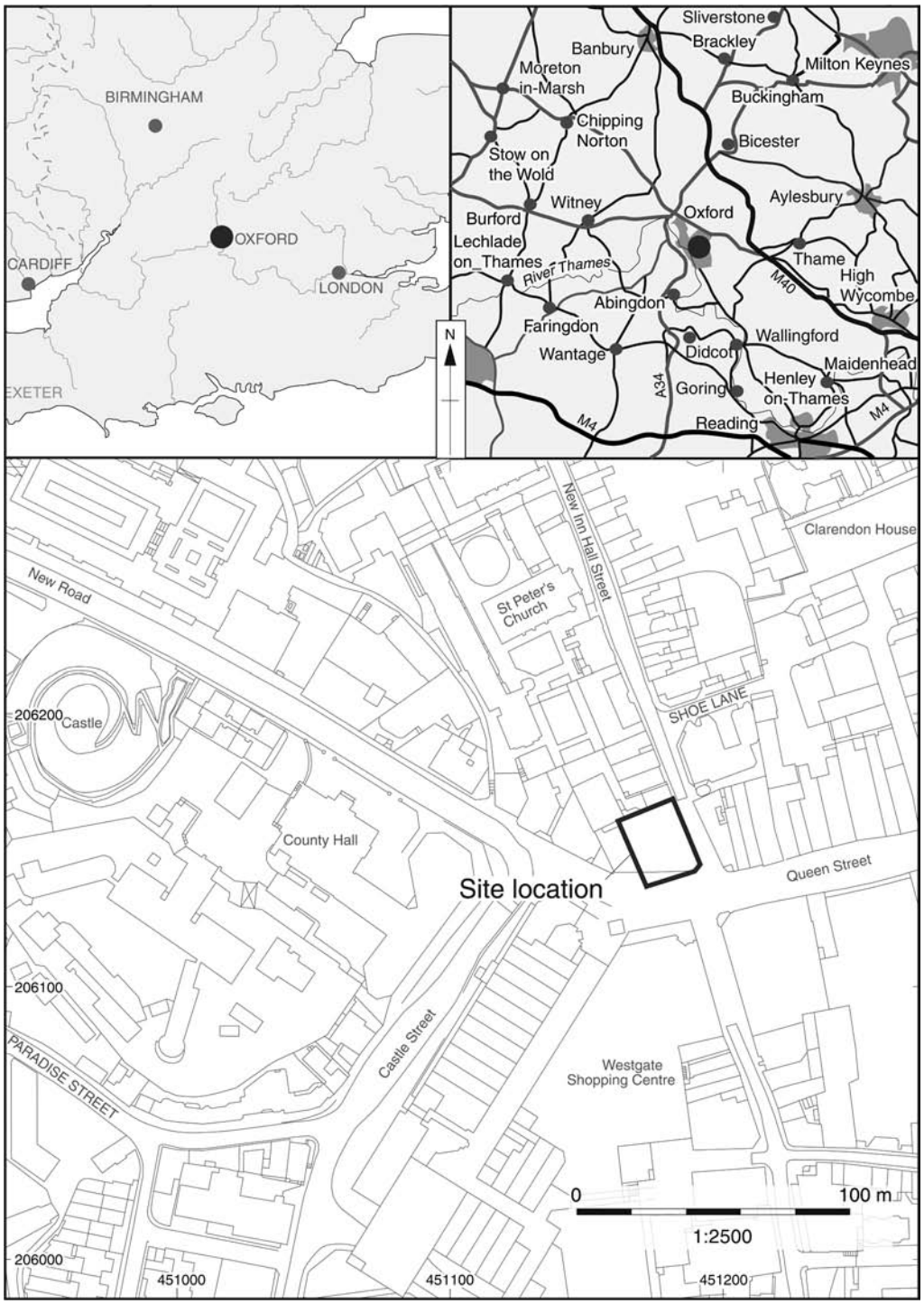

Fig. 1. Site location

Oxford was developed as a fortified *burh* in the late tenth century, and Queen Street (formerly Great Bailey) is likely to have formed part of the main east–west road through the centre of the town. A section across Queen Street, exposed in the building of the Westgate Centre in the 1960s, revealed a considerable number of road surfaces back to the earliest phases of urban activity.[2] In 1071 Robert d'Oilly constructed a castle at the western end of the Saxon town, the north-eastern extent of which lay 100 m to the west of the site. Whatever route it had previously taken, Queen Street was then diverted as Castle Street and curved southwards towards the West Gate.

The development site consists of the graveyard of the church of St Peter-le-Bailey. The church itself was situated at the south end and under the present road. Although it may have had Saxon origins, it was depicted on the bird's-eye views of Agas (1578) and Loggan (1675) with a nave, northern and southern aisles, and a central tower, characteristic of the twelfth century (Fig. 2). Following the collapse of the tower in 1726, a new church was constructed on the site in 1728 (Fig. 3). This was in turn demolished in 1874 to allow for road widening, and rebuilt in New Inn Hall Street (now the Chapel of St Peter's College). The graveyard, unused for new burials since 1855, had the Tirah Memorial erected in 1900 and became a public garden in the care of Oxford City Council.[3] The Baptist church was established on this site from the 1720s, following the loss of the previous meeting house. With the construction of the New Road in 1769, Queen Street was once more realigned to form a direct route out of Oxford, and part of the Baptists' site was lost to the road.[4]

St Peter-le-Bailey was a heavily built-up parish on the western side of the historic town centre and contained a number of the poorer properties that lay on the fringes of the commercial area. Its prosperity declined throughout the later medieval period, and by 1524 it was the poorest parish in Oxford, characterized by high concentrations of unskilled wage-labourers and artisans, and with an extremely low average tax assessment.[5]

Although from the sixteenth to eighteenth centuries the town's appearance was transformed by the construction of grand university buildings, the streets in the central area, including St Peter-le-Bailey parish, were badly paved, inadequately drained, and littered with rubbish. As in the earlier period, Oxford suffered heavily from consequent outbreaks of disease. In sixteen years of the sixteenth century, epidemics were recorded, most of them plague, and in 1643 overcrowded, insanitary conditions in the town, along with bad food, were thought to have contributed to an outbreak of *morbus compestris*, probably typhus. St Peter-le-Bailey was still regarded as poor, so much so that other parishes contributed to its relief. Poll-tax assessments of 1667 indicate that the small average household size in such parishes probably reflect the exemption of the children of the poor, the lack of live-in servants, and the early departure of young children to live as servants in other households.[6]

During the Civil War many hundreds of soldiers were billeted within the city. Disorder and pillaging were common, and the churchwardens of St Peter-le-Bailey paid several Royalist soldiers billeted there to leave the town.[7]

FIELDWORK METHODS AND RECORDING

General reduction was carried out by a mechanical excavator fitted with a toothless bucket, and under close archaeological supervision. Excavation ceased at the top of the first archaeological

2 T. G. Hassall, C. E. Halpin, and Maureen Mellor, 'Excavations in St Ebbe's, Oxford, 1967–1976: Part I: Late Saxon and medieval domestic occupation and tenements, and the medieval Greyfriars', *Oxoniensia*, 54 (1989), p. 128; Anne Dodd, ed., *Oxford before the University*, Thames Valley Landscapes Monograph, 17 (Oxford, 2003), pp. 26–9.

3 *VCH Oxon*, 4, p. 403.

4 Ibid., H. E. Salter, *Survey of Oxford*, 2, OHS, ns 5 (1966), p. 136.

5 *VCH Oxon*, 4, pp. 85–101.

6 Ibid., pp. 98–9.

7 Ibid., pp. 80–4.

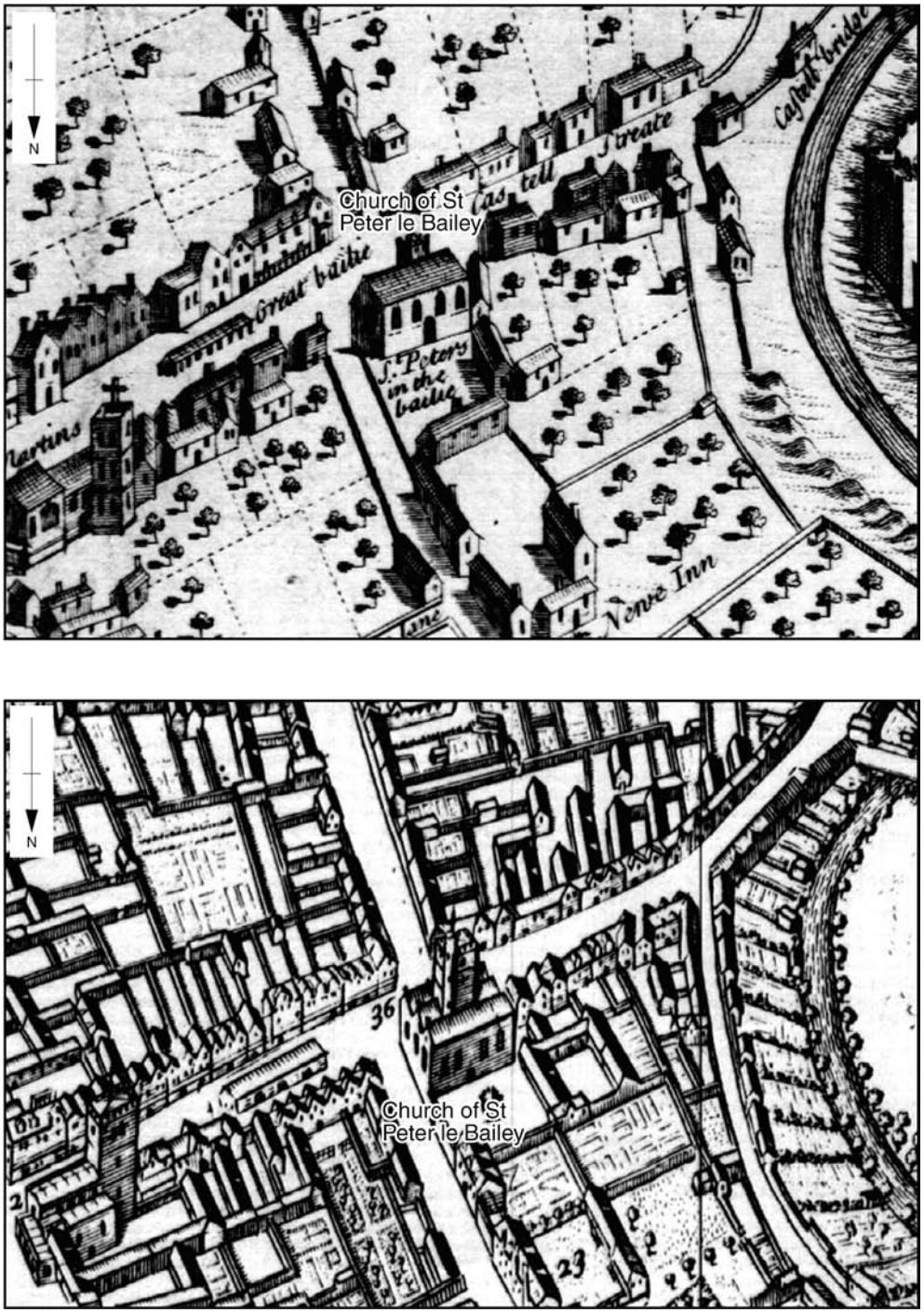

Fig. 2. The Church of St Peter-le-Bailey, as depicted in 1578 (see above detail from Whittlesey's 1728 engraving of Agas's 1578–88 plan) and 1675 (see below, detail from Loggan's 1675 plan)

Fig. 3. The eighteenth-century church of St Peter-le-Bailey, photographed in 1870.
(*By kind permission of Oxfordshire County Council.*)

horizon and was followed by the hand excavation of any archaeological remains. Excavation was generally limited to the impact level for the proposed redevelopment, except for specific areas, principally within light pits and service trenches (Fig. 4).

All burials pre-dating 1726 (the date of collapse of the medieval church tower – Phase 1) were digitally rectified and were subject to full osteological analysis. Any burials revealed during the works that post-dated 1726 (Phase 2) were rapidly plotted and subjected to rapid osteological analysis, in accordance with the agreed design brief. All non-skeletal archaeological features were planned and, where excavated, their sections drawn at scales of 1:20. Recording followed procedures laid down in the OAU Fieldwork Manual.[8] Finds were recovered by hand during the course of the excavation and bagged by context. Finds of special interest were given a unique small-find number.

DISCUSSION

General

Little was found relating to the earliest phases of the town and church building. The northern and western sides of the eighteenth-century church were revealed in the southern part of the site, which included the base of the church tower, and a small extension at the west end of the tower, confirming the evidence of engraved views of the old church. The principal remains of significance were the burials, which are the main subject of this report. Burials and their pathology are first discussed by phase, followed by an account of burial vaults and coffin furniture. The more detailed description of archaeological stratigraphy, the skeletons, memorial stones and finds follow thereafter.

Despite the investigations being limited to relatively small areas of deep foundations or services, a total of 296 burials was revealed during the works. While it appears that more people (171) were buried between the eighteenth and nineteenth centuries than between the eleventh and eighteenth centuries (126), the earlier burials were revealed only within areas of deeper excavation, and many burials may have been removed through later grave digging. It is also likely that the later assemblage included individuals from the earlier post-medieval period. The high density of skeletal remains meant that it was difficult to phase individual burials accurately. In general, any burials on a similar stratigraphic level to those with coffin handles (which were in regular use from the 1720s – see Boston below) were assigned a post-1726 date. It is likely that some of the later phase of burials without coffin handles were shallow, early post-medieval graves. Taking the number of burials encountered within the area excavated as an approximation for the whole churchyard, it is estimated that the churchyard, covering perhaps 600 to 700 sq m, may have been the site of about 4,500 eleventh- to eighteenth-century burials, and 1,500 eighteenth- to nineteenth-century burials.

The medieval cemetery clearly extended into the area that now forms the entrance to the Baptist church. Two skeletons (482, and one left *in situ* – see Fig. 4) were found beneath the existing flagstone courtyard, but no structural evidence of the medieval church of St Peter-le-Bailey was identified. Loggan's plan of 1675 shows a three-aisled building, with a central tower facing St Ebbe's (Fig. 2). The medieval church was likely to have been smaller, and lain within that footprint; medieval graves were disturbed by the eighteenth-century church foundations.

Nine of the medieval burials were placed within stone cists (Figs 5 and 6), a style of burial thought to date from the start of the eleventh century.[9] In general, such cists were formed from local material and only one or two courses high, so that a cover could be laid over the cist prior to backfilling the grave. The coating of the inside of such cists with mortar is also relatively

[8] D. Wilkinson, ed., 'OAU Fieldwork Manual', 1st edn (OAU TS report, 1992).

[9] John Blair, 'The Bronze Age barrows and the churchyard', *Bampton Research Paper* 5 (1999), pp. 34–7.

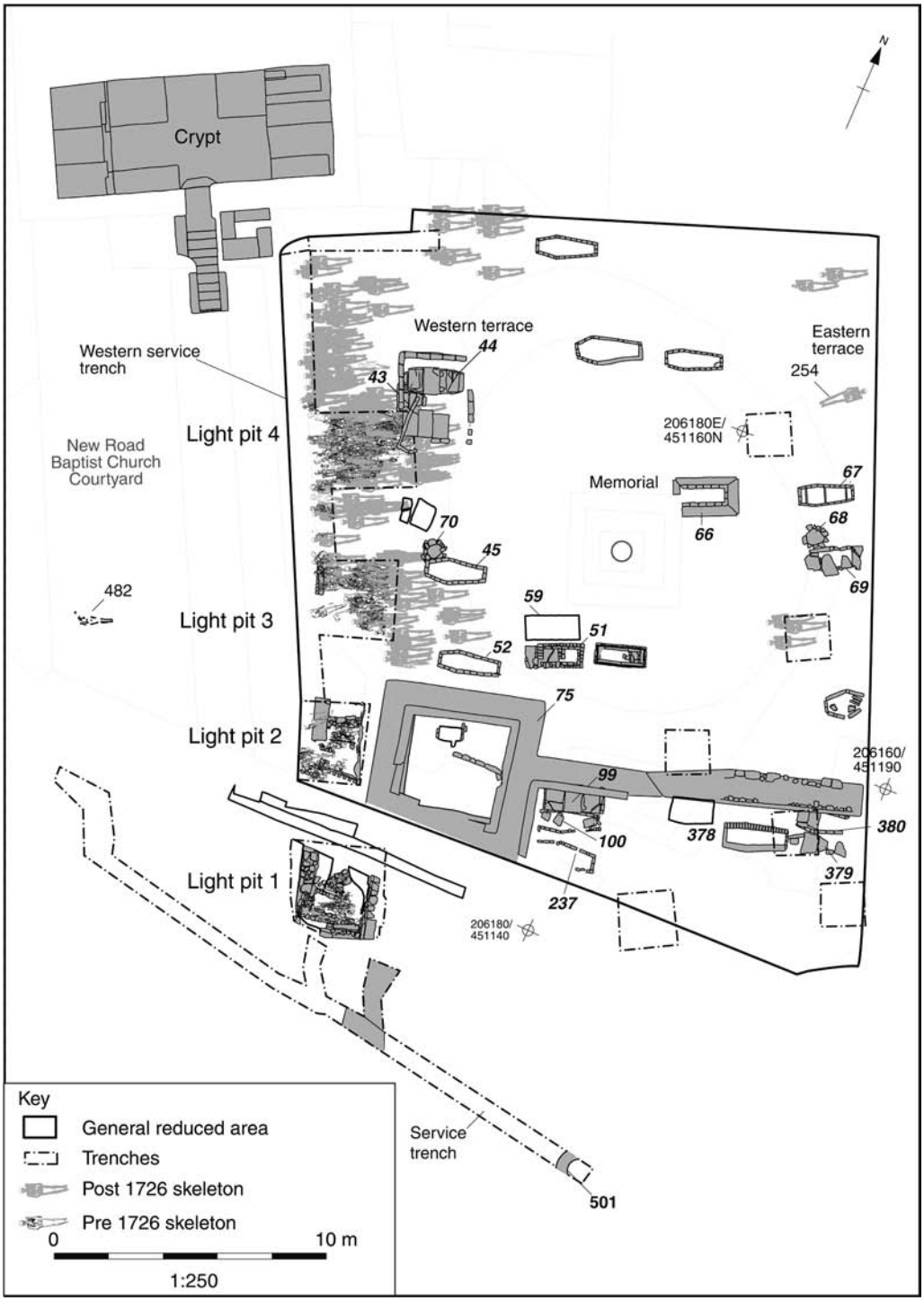

Fig. 4. Site plan

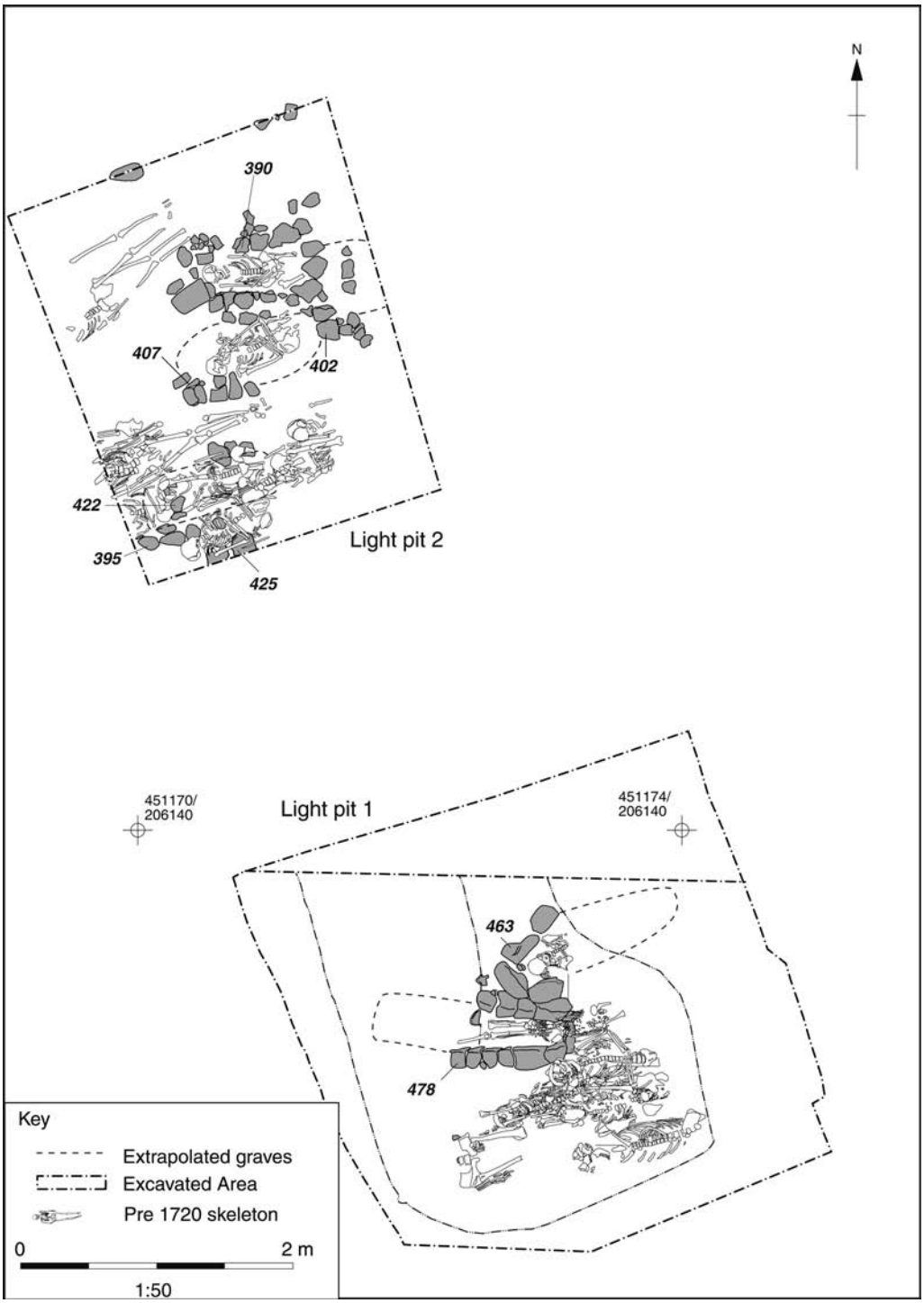

Fig. 5. Cist burials

common.[10] Cists are thought to have been used for higher status burials, although whether they were higher in status than wooden coffins is debatable.[11]

One stone lining (390) had a head niche (Fig. 4). Late eleventh- to twelfth-century stone cists with head-niche constructions have been recorded at Colchester,[12] and more locally at All Saints' and Christ Church, Oxford.[13] Head-niche graves may have signified a person of status,[14] although it is also possible that the niche, like stone 'ear muffs', was used to keep the head upright. This was because it was believed that on Judgement Day the resurrected would rise and face east towards the coming Christ.[15]

The graves were generally laid shoulder-to-shoulder and placed in straight rows, although there was some variation in this pattern, primarily due to the high density of burials within the graveyard. This suggests that grave markers were not used or were short-lived, resulting in the graves' precise locations being quickly lost. Temporary markers may have comprised a mound over the backfilled grave, a hearse cloth over the grave, or possibly flowers.[16] All but one of the graves were aligned approximately west–east, with the skeleton in a supine position, and flexed arms were recorded in some of the earlier burials. By contrast, skeleton 254 (see Fig. 4) in the east of the site was placed in an east–west position. Such orientation is sometimes an indication that the grave is that of a priest. From the early seventeenth century priests were sometimes buried with their heads to the east, so that on the Day of Judgement they might rise to face their flock. However, it is also possible that an east–west burial was a sign of suicide, punishment, or penance.[17]

A brick vault filled the area within the church tower, which may have covered a family burial. There was no obvious access into the vault, and it is possible that the space was used to re-bury charnel bones disturbed when the church was constructed (Fig. 7). A small extension was revealed on the west side of the church, thought to be part of a polygonal building used to house part of the heating system of the church.[18]

The Skeletal Remains – Some Caveats

Of the skeletons that could be assigned to an age category in both the earlier and the later assemblages, the majority fell into the older adult category, and few were assigned to the youngest subadult age categories (neonate and infant). When interpreting these trends there are several caveats to be considered. Estimating the biological age of an individual is problematic, not least because present standards have been derived using populations that are distanced in time and space from archaeological populations.[19] Recent comparisons of the age estimates of adult skeletons set against their documented ages have shown that present methods tend to overestimate the age of the young and underestimate the age of the old, and this must also be borne in mind in relation to the present results.[20] In these samples many of the skeletons were incomplete, which meant that a fairly substantial proportion of the assemblage could not be aged more specifically than 'adult'.

[10] Roberta Gilchrist and Barney Sloane, *Requiem: the Medieval Monastic Cemetery in Britain,* Museum of London Archaeological Service (London, 2005), p. 135.

[11] Christopher Daniell, *Death and Burial in Medieval England, 1066–1550* (London, 1997), p. 162.

[12] N. Crummy, P. Crummy, and C. Crossan, *Excavations of Roman and Later Cemeteries, Churches and Monastic Sites in Colchester, 1971–1988* (Colchester, 1993), pp. 215–17.

[13] Dodd, *Oxford before the University*, p. 237; C. Scull, 'Excavations in the Cloister of St. Frideswide's Priory, 1985', *Oxoniensia,* 53 (1988), pp. 21–73.

[14] Reg. Jackson and Geraldine Barber, *Excavations at St James's Priory Bristol* (Oxford, 2006), p. 96.

[15] Daniell, *Death and Burial*, p. 178.

[16] Ibid., p. 146.

[17] Gilchrist and Sloane, *Requiem*, p. 153.

[18] *VCH Oxon*, 4, p. 403.

[19] J. Bocquet-Appel and C. Masset, 'Farewell to paleodemography', *Journal of Human Evolution,* 11 (1982), pp. 321–3.

[20] Margaret Cox, 'Ageing adults from the skeleton,' in Margaret Cox and Simon Mays, *Human Osteology in Archaeology and Forensic Science* (London, 2000), p. 75.

Fig. 6. Skeleton 480, cist 478

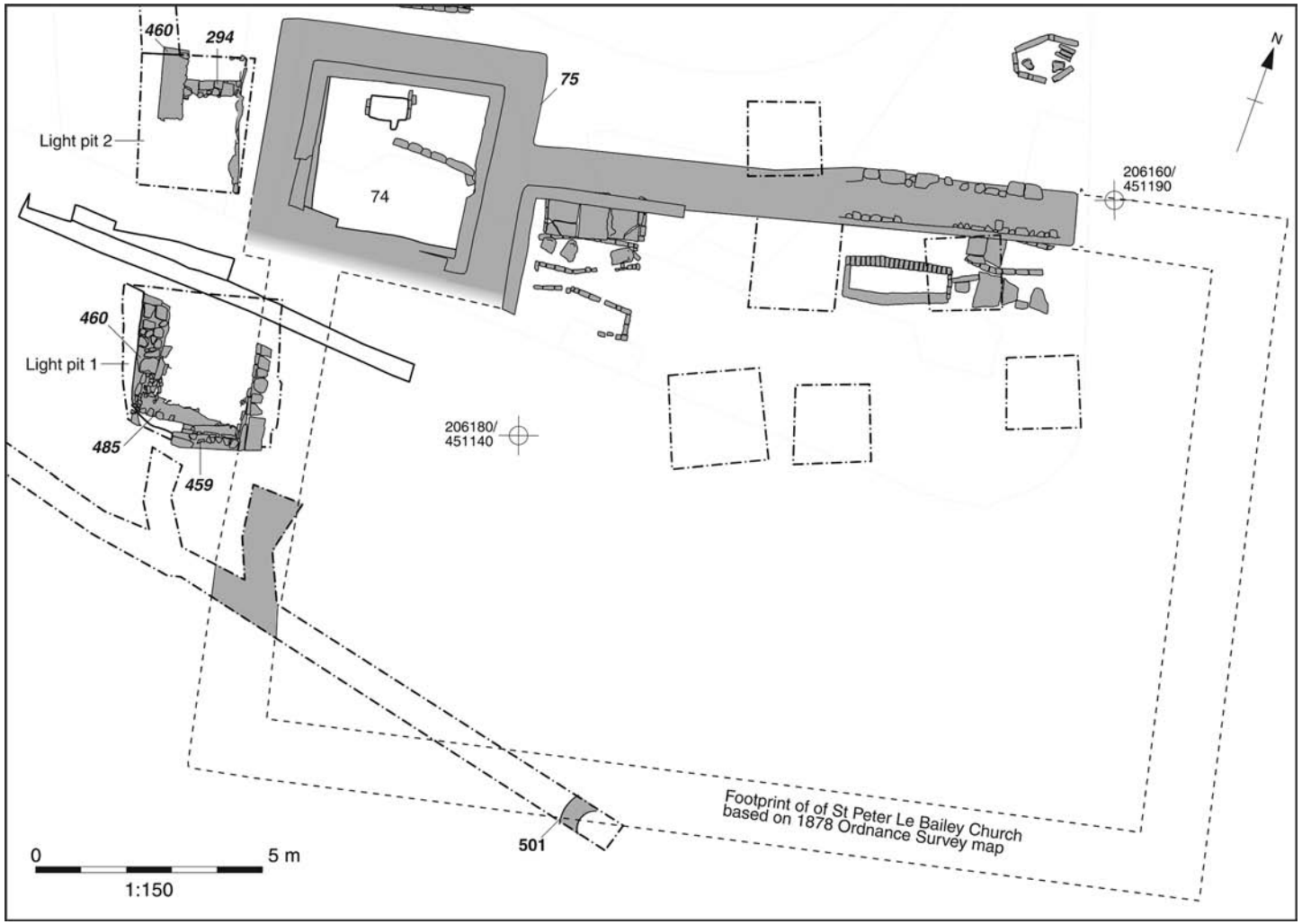

Fig. 7. Plan of eighteenth-century church

If it had been possible to estimate more precise ages for these individuals, the mortality profile might have appeared quite different.

Phase 1: Eleventh- to Eighteenth-century Skeletal Assemblage

The mortality profile. Despite the caveats discussed above, the mortality data that we do have suggests that while a large proportion of individuals was living beyond the age of 45, a fairly large proportion of individuals was dying during younger adulthood. A peak in mortality was seen in the young adult (18–25 year olds) category. While the very young (less than 2 years old) appear to have been generally under-represented, a peak in mortality was seen in the young child (2–5 year olds) category, and older child deaths were also well represented.

The under-representation of the very young could be explained in several ways. Firstly, it should be stated that it does not seem likely that the low proportion of very young is a true reflection of the mortality of the population, particularly if we take into account the historical data, which claims St Peter-le-Bailey parish to have been very poor. Poor diet and living conditions would, no doubt, have affected the weakest members of society most severely, notably the very young and the very old. In addition, the process of childbirth itself during this period must have accounted for numerous infant deaths. While midwives, generally poorly paid females, were used, their practices were questionable, and where the life of a mother and child was at risk, it was the mother who had to be saved.[21] Other explanations for the dearth of the very young must therefore be sought. It is possible that the lack of infant burials may be a result of unbaptized infants being denied a Christian burial.[22] Given that the entire cemetery was not excavated, it is possible that the very young were buried in a different part of the cemetery not in the excavation area. However, a few subadult remains *were* recovered, and it is possible that the negative bias may be explained by the poorer preservation of subadult remains or their less successful retrieval during excavation. The high number of inter-cutting graves may also have removed smaller infant and child burials. Since the charnel from Bonn Square was not osteologically analysed, the number of subadults represented within it is unknown.

A slight peak in mortality for the young adult category is the result of male deaths, as the number of females remained constant from the young to prime adult category. A peak in deaths in young adulthood is compatible with the mortality profiles of other populations dying as a result of a catastrophic event, such as war, massacre, or plague.[23] Although the historical evidence tells us that the Black Death had a significant impact on Oxford's population during the medieval period, the peak involves males only. Similar patterns can be seen in Oxford at All Saints' and in the external burials at Greyfriars and Blackfriars.[24] It is tempting to suggest that interpersonal violence might have played a part in this.

Pathology. The range of pathological conditions identified in the sample is similar to that recorded for other contemporary sites. A variety of spinal and non-spinal congenital and developmental abnormalities was observed, most of which occurred quite frequently, and with no effect on the well-being or survival of the individual. In addition, a few cases of probable neoplastic disease (tumours) were observed.

[21] Carole Rawcliffe, *Medicine and Society in Later Medieval England* (Stroud, 1995), pp. 194–200; Charlotte A. Roberts, and Margaret Cox, *Health and Disease in Britain from Prehistory to the Present Day* (Stroud, 2003), p. 253.

[22] Julian Munby, personal communication.

[23] B. J. Margerison and C.J. Knüsel, 'Paleodemographic comparison of a catastrophic and an attritional death assemblage', *American Journal of Physical Anthropology,* 119 (2002), p. 141.

[24] Dodd, *Oxford before the University*, pp. 224–6, Table 5.1; M. Harman, 'The human remains,' in George Lambrick, 'Further excavations on the second site of the Dominican priory, Oxford', *Oxoniensia*, 50 (1985), pp. 188–9; E. Edwards, and M. Harman, 'Human remains from Greyfriars (Site B)', in T. G. Hassall, C. E. Halpin, and Maureen Mellor, 'Excavations in St Ebbe's, Oxford, 1967–1976: Part 1: Late Saxon and medieval domestic occupation and tenements, and the medieval Greyfriars', *Oxoniensia*, 54 (1989), pp. 256–7.

The presence of joint disease in the form of osteoarthritis was not a surprising find, given that it is the most common pathological condition to be observed in skeletal populations.[25] Compared with other contemporary sites, and the period overall, the rate of osteoarthritis in the eleventh- to eighteenth-century assemblage was high. While it can have many causes – in that age, genetics, diet, and sex, amongst other factors, may all have played a part – it has been suggested that intense activity starting at a young age may influence osteoarthritis, particularly in the upper body.[26] Males were affected in the upper body only, except for the hip joint, a trend seen at other contemporary sites. This may well relate to the suggestion that osteoarthritis relates to intense activity from a young age in these individuals.

Osteoarthritis of the hip was relatively common in both males and females. While the hip joint, one of the major weight-bearing joints, is a common target for joint disease, it was perhaps more common at Bonn Square in both males and females than at other sites. The reason for this is not clear, but it has been suggested that it may relate to the physical activity of the population. Given its lower status, it seems unlikely that a diet high in calories, and consequent obesity, would have played a major role. The absence of joint disease associated with higher status diet – such as diffuse idiopathic skeletal hyperostosis (DISH – a form of degenerative arthritis) and gout – in addition to the overall high rate of osteoarthritis, suggests a population of lower socio-economic status.

Cribra orbitalia, a condition indicative of iron deficiency anaemia, is seen as a generic indicator of childhood stress. The prevalence at Bonn Square was low or average compared with other assemblages. A comparatively high prevalence of rickets, indicative of vitamin D deficiency, was observed. Cemeteries associated with lower status populations generally show higher rates of this disease. However, the Bonn Square rate was higher than that at St Helen's, Fishergate, in York, an assemblage comprising individuals of lower status.[27] Overall the Bonn Square rate was almost two and a half times that of the average for the period. This suggests that the people were lacking in dietary vitamin D and/or exposure to solar radiation, compared with their contemporaries, even those of low socio-economic status.

The level of infection, including syphilis, brucellosis (possible), and non-specific bone inflammation was comparable with other contemporary populations.[28] Infection was arguably a reflection of living conditions. High population density, proximity of animals, ineffective sewerage, lack of clean drinking water, and polluted air are among the numerous factors that would have been detrimental to health and would have provided the perfect breeding-ground for the numerous infectious diseases prevalent at the time.[29]

Osteochondritis dissecans, a fairly common osteological disorder, is a defect in the subchondral bone of a joint, usually caused by trauma.[30] Spondylolysis is the separation of a single vertebra into two parts and may be the result of a congenital anomaly of vertebral ossification, or a stress or

[25] Juliet Rogers and Tony Waldron, *A Field Guide to Joint Diseases in Archaeology* (Chichester, 1995), p. 32: URL: http://cat.inist.fr/?aModele=afficheN&cpsidt=17756457 (Accessed: 08/09/08).

[26] E. Weiss and R. Jurmain, 'Osteoarthritis revisited: a contemporary review of aetiology', *International Journal of Osteoarchaeology*, 17 (2007), p. 444.

[27] M. Holst, 'The human bone: the cemetery of St Helen's, Fishergate, York', in C. A. Spall and N. J. Toop, eds, '*Bluebridge Lane and Fishergate House, York. Report on excavations July 2000–2002*' (2005): www.archaeologicalplanningconsultancy.co.uk/mono/001/rep_bone_hum1a.html [Accessed: 08/09/08].

[28] Roberts and Cox, *Health and Disease*, p. 299.

[29] Ibid., p. 300.

[30] Arthur C. Aufderheide and Conrado Rodriguez-Martin, *The Cambridge Encyclopaedia of Human Paleopathology* (Cambridge, 1998), p. 81; Charlotte A. Roberts, and Keith Manchester, *The Archaeology of Disease*, 3rd edn (Stroud, 2005), p. 121.

fatigue fracture that fails to heal.[31] It is also possible that both causes (congenital and traumatic) are mutually compatible, with a congenital weakness of the bone predisposing it to a stress fracture.

The rates of osteochondritis dissecans, spondylolysis, and other fractures within the Bonn Square assemblage were high compared with other sites. Untypically, females had more fractures than males. The elements affected by fractures within the assemblage are also interesting. If the rib and vertebral fractures are counted as single cases, even in cases of multiple fractures these elements account for the highest number of fractures, each accounting for just under 30 per cent of the total number of fractures observed (24). Ribs are commonly cited as the most frequent site of fractures. The true prevalence rates show a different picture, however, with the skull as the most frequently affected part. As discussed above, as with any fracture, it is impossible to attribute it to a specific event, but studies have shown the head and face to be the most commonly targeted areas in violent assaults. It is tempting to relate these results to the knowledge we have of rioting and unrest in Oxford at this time, but despite the rate being comparatively high for the period, the overall number of fractures in the sample is still relatively small, and a much higher number would be needed for a meaningful analysis of whether interpersonal violence really had played a significant role. Despite its poor status in the later medieval period, the parish of St Peter-le-Bailey was relatively affluent in the 1340s and had one of the lowest murder rates in Oxford.[32] The majority of murders occurred in the poorer, sparsely settled suburbs and in the east, the area of greatest academic concentration.[33] The availability of weapons certainly played a part in the high murder rate of medieval England, with four out of eleven murders in Oxford being carried out by knife.[34] The murder rate in Oxford was higher than that in contemporary English towns and approximately six times higher than the murder rate of cities in twentieth-century America.[35]

During the thirteenth and fourteenth centuries, there were high levels of violence in Oxford between town and gown and between different 'nations' of scholars.[36] The great riot of St Scholastica's day in 1355 lasted for three days, and both sides were accused of robbing, wounding, and killing.[37] Interestingly William Offard, a burgess of Oxford, gave 5*s.* 4*d.* to the sixty-three burgesses attending the St Scholastica's day penitential for distribution in the parish of St Peter-le-Bailey, and 1*s.* for the chaplain who read the service.[38] There were probably deaths within the parish as a result of the riots. Coroners' inquests provide details for three violent deaths within the parish of 'St Peter-in-the-Bailey': in 1297 John Laurence was grievously beaten about the body and smote on the head with a staff by David of Northampton, although Laurence had initiated the altercation through pushing Northampton and causing 'strife'; in 1343 Henry of Ocle also died when 'smote with a staff on the head'; and Henry of Stodley died by his own hand in 1346, when he stabbed himself in the neck by falling on his knife when drunk.[39] A fourth inquest in the parish was a result of the death of Alice of Luton in 1345; Alice was found to have died of a tumour.[40]

Aside from the pathological conditions discussed above, the dentition has provided further information in support of the historical evidence of low socio-economic status. Caries, calculus, periodontal disease, and ante-mortem tooth loss rates were all higher than observed in other

31 Aufderheide and Rodriguez-Martin, *Encyclopaedia of Human Paleopathology*, p. 63; Roberts and Manchester, *Archaeology of Disease*, p. 106.

32 C. I. Hammer, 'Patterns of homicide in a medieval university town: fourteenth-century Oxford', *Past and Present*, 78 (1978), p. 22.

33 Ibid.

34 Ibid., p. 21.

35 Ibid., pp. 11–13.

36 *VCH Oxon*, 4, pp. 13–21.

37 Ibid.

38 A. Clark, ed., *Survey of the Antiquities of the City of Oxford, Composed in 1661–6 by Anthony Wood*, 2, *Churches and Religious Houses*, OHS (1890), p. 105.

39 H. E. Salter, ed., *Records of Mediaeval Oxford, Coroners' Inquests, the Walls of Oxford, etc.* (Oxford, 1912), pp. 3–39.

40 Ibid.

contemporary assemblages and higher than the averages cited for the period.[41] In addition, the rate of dental enamel hypoplasia (DEH), indicative of non-specific childhood stress, was also higher than at many other sites, and higher than the average for the period.

Phase 2: Eighteenth- to Nineteenth-century Skeletal Assemblage

The mortality profile. The mortality data for the eighteenth to nineteenth centuries suggests that, as in the eleventh to eighteenth centuries, although a large proportion of individuals lived beyond the age of 45, a relatively large proportion died during childhood; again few were dying in the first month after birth. Slight peaks in mortality were seen among the older children (6–12 years) and the prime adults (26–35 years). As in the eleventh to eighteenth centuries, there are several possible explanations for the under-representation of the very young. It does not seem likely that the low proportion is a true reflection of the mortality of the population, particularly if we take into account the historical evidence, which suggests that the parish was very poor during both periods. The London Bills of Mortality (1728–1840s) show that for the period up to 1800 over 30 per cent of all deaths were of those below 2 years old.[42] The experience of Londoners was probably similar to that of other rapidly expanding towns and cities such as Oxford, so other suggestions for the dearth of the very young must be sought.[43] As stated above, it is possible that they were buried outside the excavation area, but this seems unlikely, given the propensity for burying family members together in this period, supported by the presence of numerous grave memorial stones listing family members within family plots (see Clough below). It is possible that the lack of subadults may be explained in terms of poorer preservation of their remains, but given the general good condition of the skeletons, this also seems unlikely.

The relatively large number of younger and older children, compared with the relative dearth of adolescents and young adults, is interesting. It suggests that even having survived past the vulnerable neonate and infant periods, life was tough for children during this period. This supports the historical evidence, which suggests that even young children from the poorest parishes, such as St Peter-le-Bailey, were forced into working as servants.[44]

The peak in mortality for the prime adult category is the result of a higher rate of female deaths, with fewer in the age categories on either side. It is unclear why there should be this increase. While epidemic disease might affect the 'stronger' young and prime adults of society, it is unlikely that women rather than men would be affected. Given the information we have on rioting in the town, a higher rate of male deaths amongst young and prime adults would seem more likely. A higher mortality among younger adult women is often seen as an indication of frequent deaths during childbirth. Certainly haemorrhage during childbirth was a high risk during this and earlier periods.[45] The peak in mortality among 25- to 35-year olds, however, is perhaps later than would normally be expected if related to childbirth.

Migration of people in and out of Oxford is another possible factor. Goldberg has argued for the late medieval period that often the high ratio of women to men in cities was the result of women migrating to the city in search of employment created by economic expansion and labour shortages following the Black Death.[46] Such migration gave women more independence and allowed them to delay marriage, and thus delayed the age of childbirth.[47] Such an influx of

41 Roberts and Cox, '*Health and Disease*,' pp. 321–7.
42 Ibid., p. 303.
43 Ibid., p. 287.
44 *VCH Oxon*, 4, pp. 98–9.
45 Roberts and Cox, *Health and Disease*, p. 303.
46 P. J. P. Goldberg, 'Female labour, service and marriage in the late mediaeval urban north', *Northern History*, 12 (1986), pp. 18–38.
47 A. L. Grauer, 'Patterns of life and death: the palaeodemography of medieval York', in Helen Bush and Marek Zvelebil, *Health in Past Societies: Biocultural Interpretations of Human Skeletal Remains in Archaeological Contexts*, BAR IS, 567 (1991), pp. 72–3.

Fig. 8. Brick shaft graves 378–80 within the eighteenth-century church, looking north-west

women, combined with the delayed age of childbirth, could well have accounted for a peak in female mortality in the 25 to 35-year-old category. The same may well be true of the eighteenth and nineteeth centuries. Indeed, Miles and others have stated that most people did not marry until they were over the age of 25,[48] and thus any mortality peak among women caused by childbirth would be within this later age category. Using seventeenth- and eighteenth-century London data, Galloway has suggested that mid-adulthood peaks in mortality reflected migration into cities and the exposure of new individuals to the pathogenic urban environment.[49] If most women were migrants, exposed to new pathogens as well as the risks of childbirth, this would certainly account for a peak in mortality.[50] Whether migration, delayed maternity, or vulnerability to pathogens played a part in the peak in female mortality at Bonn Square in the later period is unclear. As yet no documentary evidence of sex-specific migration in or out of eighteenth- and nineteenth-century Oxford has been found.

Pathology. The range of pathological conditions that was identified is similar to that recorded for other contemporary sites. However, rates were often much lower than in the eleventh to eighteenth centuries and lower than at other sites, which is most likely a result of the low-resolution methodology employed.

Osteoarthritis showed a considerable decline from the medieval period. This does not tie in with the overall picture for the post-medieval period, which saw a rise in joint disease, starting in the late medieval period. Given that osteoarthritis is so common in both modern and pre-modern populations, it is unlikely that the inhabitants of St Peter-le-Bailey escaped it. It seems more likely that the methodology used accounts for its apparently lower rate.[51] The fact that no spinal osteoarthritis was recorded at all for the sample further supports this, given that the spine is often frequently affected.[52] It is interesting to note that although Schmorl's nodes (a common pathological indicator) were also less frequently observed in the post-medieval sample than the medieval, they still showed a higher rate than at St Peter's, Barton-upon-Humber.[53] Adolescents were also affected during this period, possibly a reflection of the involvement of younger individuals in physical labour.

Diffuse idiopathic skeletal hyperostosis (DISH) is a systemic disorder in which additional bone is deposited around a number of joints and sites of insertion for ligaments and tendons, largely due to the ossification of surrounding ligaments.[54] Typically DISH begins with ankylosis of the mid-thoracic spine, due to ossification of the anterior longitudinal ligament and paraspinal tissues. This typically appears as dripping candle wax, along the right side of the vertebrae.[55] Its specific cause is unknown, but it appears to be associated with obesity and Type 2 diabetes.[56] The condition is most frequently observed in middle- and upper-class populations and those from monastic sites, probably because their diets predisposed them to it.[57]

48 Adrian Miles, William White, and Danae Tankard, *Burial at the Site of the Parish Church of St Benet Sherehog before and after the Great Fire,* MoLAS Monograph 39 (London, 2008), p. 83.

49 P. R. Galloway, 'Annual variation in death by age, death by cause, prices, and weather in London, 1670–1830', *Population Studies*, 39 (1985), pp. 487–505.

50 Ibid.

51 Rogers and Waldron, *Field Guide.*

52 C. V. Boston and A. Boyle, 'Burial practice and material culture', in A. Boyle, C. Boston, and A. Witkin, 'The archaeological experience at St Luke's Church, Old Street, Islington,' (OA TS report, 2005); Roberts and Cox, '*Health and Disease*,' p. 352.

53 Tony Waldron, '*St. Peter's, Barton-upon-Humber, Lincolnshire. A Parish Church and its Community. 2: The Human Remains* (Oxford, 2007), p. 94.

54 Rogers and Waldron, *Field Guide*, p. 48.

55 Roberts and Manchester, *Archaeology of Disease*, pp. 159–60.

56 Rogers and Waldron, *Field Guide*, p. 48.

57 Roberts and Cox, *Health and Disease*, p. 311.

The prevalence of DISH at Bonn Square was low compared with other sites, and lower than the average rate calculated for the period. Given the distinctive nature of the spinal manifestations used to diagnose this condition, it is unlikely that cases of DISH would have been overlooked, despite the methodology employed. It is likely that the prevalence of this disease was genuinely low. The disease is associated with a rich diet, and the poverty and low social status of the population supports this conclusion.

The rate of cribra orbitalia was lower than Christ Church, Spitalfields, and Newcastle Infirmary, but similar to other contemporary sites. The higher rate of cribra orbitalia at Christ Church, Spitalfields, may lie in fashionable infant-feeding practices among this middle class crypt assemblage. This included feeding infants flour and water (pap, or panada), greatly lacking in the required nutrients for growth.[58]

The rate of rickets within the Bonn Square sample was only slightly below the average for the period. Only two sites within the sample for the period had lower rates.[59] This disease impacted considerably upon the poor and those subject to the fashionable infant-feeding practices.[60] Possible cases of scurvy were noted within the assemblage and, if confirmed, are further evidence of the low socio-economic status of the population.

Specific and non-specific infection was present in the form of possible tuberculosis, periostitis, and maxillary sinusitis. In particular, a high prevalence of sinusitis was noted compared with other sites. The occurrence of periostitis was found to be lower than expected, and this is probably because this bony lesion is often very subtle and likely to have been overlooked as a result of the low-resolution methodology employed.

With evidence for rioting continuing into the eighteenth century,[61] the fracture rate in the later assemblage could be expected to be high, particularly among males. The overall crude fracture rates confirmed this. In contrast to the earlier assemblage, men were more frequently affected than women, perhaps because they were more frequently involved in interpersonal violence. The elements affected may lend support to the theory. The cranium was the most frequently fractured element within the assemblage, and showed a higher prevalence than the average rate for the period. Of the five cases of cranial fracture, three were nasal fractures. The head, and particularly the face, are most commonly targeted in violent assaults.[62]

Of the dental conditions, the rate of caries was lower than at several other sites, and lower than average for the period. This is not what might be expected of a low-status community, severely lacking in oral hygiene, but it may be explained by the infrequent consumption of refined sugars, which play a large part in the formation of caries. Samples from other sites, mostly crypts, were from middle-class people, probably with a high proportion of refined sugars in their diet, and are probably not representative of the poorer classes. The higher than average calculus rate at Bonn Square seems to concur with poor dental hygiene, and a higher than average ante-mortem tooth loss rate may also tie in with this, given that it may occur as a result of periodontal disease secondary to calculus formation. The rate of observed dental enamel hypoplasia (DEH) was lower than at other sites and lower than average. The rapid nature of the analysis, however, may have led to less obvious DEH being overlooked. The rate calculated certainly indicates that this factor was significant. As an indicator of non-specific childhood stress, one would have expected the rate to be high, particularly given the relatively high childhood mortality rate.

To summarize, the range of pathological conditions observed in both the eleventh- to eighteenth-century and the eighteenth- to nineteenth-century assemblages was typical for these

58 Ibid., p. 307.
59 Ibid., p. 310.
60 Ibid., p. 308.
61 *VCH Oxon,* 4, p. 77.
62 M. Brickley and M. Smith, 'Culturally determined patterns of violence: biological anthropological investigations at a historic urban cemetery', *American Anthropologist*, 108 (2006), p. 164.

periods. However, the levels of pathology indicate that in both periods the population was of lower socio-economic status, as suggested by documentary evidence. In terms of the mortality profiles, the earlier period showed a slight peak in young adult males, and it is tempting to suggest that this may relate to interpersonal violence, which is known to have been rife. The rate and pattern of trauma also seems to reflect this. A peak in prime adult female deaths in the later period is more difficult to explain, but sex-specific migration in or out of Oxford, delayed maternity, and/or vulnerability to pathogens may all have played a part.

SHAFT GRAVES AND MEMORIAL STONES by SHARON CLOUGH

In the eighteenth and nineteenth centuries concern over disturbance of the remains of family members (either through grave robbing or by later burials) and the increasing use of death ritual for social display led to the construction of subterranean, brick-built family vaults and shaft graves for the interment of multiple burials. A vault traditionally has a vaulted roof, the entrance to the interior commonly being through a doorway in one of the side walls, often with a set of steps leading down to it. A brick shaft grave is essentially a rectangular or single-break grave cut, lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. The top of the grave was covered by horizontal ledgers, often roughly dressed sandstone or limestone slabs, which could be removed for subsequent interments (see Fig. 8). Vault and brick shaft graves were originally surmounted by above-ground memorials. In St Peter's churchyard the majority of these memorials were recumbent ledgers inscribed with the names, age, date of death, and other biographical information. At Bonn Square shaft graves 51, 59, and 66 had several courses of above-ground brickwork, indicating that an upright memorial had originally existed, such as a chest tomb. A total of fifty-three memorial stones was also recovered; many were not *in situ*, but stones were in place over several of the brick shaft graves, and individuals could be identified from the inscriptions.

A full catalogue of the memorial stones and their inscriptions is available in the archive, or online.[63]

MEMORIAL STONES

The majority of the post-medieval memorial stones from the site were not in their original location; most were incorporated into a wall at the north side of the site or against the western edge. Others were laid flat below the modern topsoil and in some cases reused as levelling surface for a path. The exceptions were:

Memorial 28 – the Pratt and Cudd family
Memorial 41 – the May family
Memorial 46 – also possibly commemorating more of the Pratt family
Memorial 47 – the Low and Bunting family
Memorial 48 – the Elliot family
Memorial 50 – the Hopkins family (which overlay undisturbed brick shaft graves). Unfortunately none of the inscripted memorial stones can be confidently linked to the recovered skeletal remains.

Headstone and Ledger Typology

The shape and outline of memorial stones have been categorized by Harold Mytum, and the memorials from Bonn Square have been thus assigned.[64] There were forty headstones and thirteen ledger stones; of these six were made of limestone, six of slate, and the remainder (forty-one) were of sandstone.

[63] See http//searches.oxfordshirefhs.org.uk/oxboxq/menu.htm.
[64] Harold Mytum, *Recording and Analysing Graveyards*, Practical Handbooks in Archaeology, 15, CBA (York, 2000).

A headstone is the most common form of memorial found in Britain. In the late seventeenth and early eighteenth centuries monuments usually had either a simple flat top or a 'bedstead' type, which mirrored the tops of contemporary chairs and bedsteads.[65] From the dated inscriptions on the memorials they range from the mid-seventeenth to the mid-nineteenth centuries, spanning both phases of the church. Headstones generally increased in size during the late eighteenth and nineteenth centuries, arguably reflecting the social importance of monument visibility.

Symbols and Decoration

Few of the memorials had decoration beyond the lettering. Memorial 13 had a winged cherub, a popular symbol for the soul passing to heaven, with bows of vine or ivy. Memorial 27 had a garland or bow of a floral design and no. 47 had a flower in each corner of the text panel. Flowers denote the frailty of life, and were common flourishes to the perimeter of a memorial. Memorial 20, on removal from the earth, which preserved the lower half, was found to have been painted white, with the incised lettering painted black. From the remaining inscription it commemorates a child, or possibly two. White was commonly used for child coffins and unmarried women, as found at the Christ Church, Spitalfields, vault.[66]

Lettering

Styles of lettering changed over time and with changing fashions. The most common type was Roman, and there were thirteen inscriptions in this style. One had Gothic-style lettering as the first inscription and Roman for all subsequent ones. Roman italic style was found on six inscriptions, while two had elaborate copperplate. A single inscription was in relief, Roman style, all the rest were incised.

Inscriptions

A total of twenty-five memorials had some inscription remaining. However, due to the level of erosion, many of these were partial and in some cases only a few letters survived. The content was mainly demographic – name, age at death, date of death, and relationship to others commemorated on the same stone. The occasional further detail related to status or occupation, with praise or religious reference. The number of people commemorated on the inscriptions are listed in Table 1, and further details can be found in the catalogue online.[67]

TABLE 1. MEMORIAL TYPES

Headstone type	**Quantity**
4100	1
4300	1
4500	13
4600	2
4700	3
4708	1
Bedstead type	9
Broken	10
Ledger type	
0100	9
0105	1
5107	1
Single-break	2

[65] Ibid., pp. 7–10.
[66] Margaret Cox, *Life and Death in Spitalfields, 1700–1850*, CBA (York, 1996).
[67] See *http\www.thehumanjourney.net* or *http://searches.oxfordshirefhs.org.uk/oxbosq/menu.htm.*

TABLE 2. THOSE COMMEMORATED ON THE MEMORIALS

Name	Date of death	Age	Other remarks
(Elizabeth) Holloway	?	?	d. of Joseph (&) Catherine
(Margarette Nourse)	29 July 1749	75	
John Nourse	16 Sept. 1762	96	
Sarah (Wooton)	?	Infancy	
Eliz (abeth) Wooton	?	Infancy	
Richard Pratt	14 Apr. 1822	40	s. of Wm and Lucy
Ann Cudd	June 1843	46	s. of Richard Pratt
Ann J B Cudd	31 Dec. 1847	16	d. of Ann Cudd
Walter Pratt	30 Nov. 1851	69	
Richd Pratt Cudd	4 Jan. 1834	Infancy	s. of Josh and Ann Cudd
Sarah (Taylor)	28 March 1794	40	1st wife of …
John May	10 April 1816		
Ann May	Feb. ? 1816	63	
Pratt family: William, Lucy, Samuel, Sampson, William, Elizabeth, Joseph, Jane, Lucy	Possible dates are William 18 Jan. 1821, Lucy 10 April 1818, and their children in 1788, 1790, 1794, 1806, 1812, 1815, and 1819	William 78, Lucy 66	?
Richard Low	13 Nov. 1767	27	
Richard Low	23 Mar. 1768	18 months	s. of Richard and Mary Low
James Bunting	9 Apr. (1826)	33	
James Edward Bunting	29 May 1833	9	s. of James Bunting
Mary Elliot	Nov. 1744		wife of Thomas
Thomas Elliot	14 Dec. 1760	73	
Sarah Elliot	20 June 1763	38	
Henry Elliot	8 May 1771	55	husband of Sarah
?William Ledwell	15 Nov. 1716	30	s. of Thomas and Mary Ledwell
Thomas Ledwell	?	?	s. of Thomas
Mary Ledwell	22 July 1717	34	
M(r Thom)as Ledwell	(13 Apr. 1727)	?	
Anna Hopkins	14 Sept. 1810	53	wife of Richard
Hesther Hopkins	3 Dec. 1813	13	d. of Anna and Richard
Richard Hopkins	21 July 1822	76	
Richard Hopkins	11 Dec. 1829	45	s. of Richard and Anna
5 infant children of R Hopkins (possibly Thomas, Mary, Hannah, Anna, and ?)	(possibly 23 Sept. 1783; 22 Apr.1788; 18 Dec. 1794; 12 May 1801 ?	Infancy (Hannah 3 yrs 6 mths, Anna 5)	
William Bunting	28 Jan. 1814	48	
Elizabeth Bunting	5 Apr. 1812	(59)	wife of William
J(ame)s B(unting)	?	?	?s. of William and Elizabeth
Jo(h)n B(unting)	?	?	?s. of William and Elizabeth
Christopher Hatton	24 June 1666		married to Margaret for 51 years
Ann Wade	17 May 18(26)	62	
Maria Wade	Sept. 1837	37	d. of Ann
William Wade	22 Jan. 1838	49	s. of Ann
Caleb Colton	10 Sept. 1733	70	Post Master of Oxford

Using the parish register for St Peter-le-Bailey, research was undertaken to find these individuals and their relatives (see Table 2). Although the register ran from 1585, it is doubtful if all burials were recorded, as it did not become compulsory to record births, marriages, and deaths until 1837. The register confirmed the information about the majority of these people, filling in some of the missing details. Furthermore, occasionally it recorded the names of the women making the *affidavit* for burial. This legally confirmed that the burial was in woollen clothing, a stipulation that had become law after the Burial in Woollen Acts, 1666–80, and which remained in force until 1814, but was generally ignored after 1770.[68]

Interestingly the originating parish is declared against some names – for example, 'Lucy Pratt of St Giles, Oxford'. Usually people were buried in the parish in which they lived. As there are several different parishes mentioned in the register, all within the immediate area surrounding St Peter-le-Bailey, it is possible there was a preference, or necessity, to be buried there. The register also records that some of the named people were buried in the church: six shaft graves were found within the footprint of the eighteenth-century church, but unfortunately no biographical details survive with these burials.

COFFIN FURNITURE by CERIDWEN BOSTON

In the St Peter-le-Bailey assemblage burials were dated as either pre-1726 or post-1726. This was based principally on the presence of coffin fittings indicating that a coffin post-dated the collapse of the medieval church tower. Later seventeenth-century coffins, decorated with metal studs and occasionally decorative fittings, do exist but are less common than their eighteenth- and nineteenth-century counterparts. Nevertheless, it was broadly from the 1720s to 1730s that stamped, decorative metal plates were mass-produced and became ubiquitous in coffins of both the poorer and more affluent strata of society. In a poor parish such as St Peter-le-Bailey it is probable that most coffin fittings post-date this time.

Deep pre-1720s burials recovered from the Light Pit excavations were fairly characteristic of the period, being either shroud burials or being interred within simple wooden coffins that lacked any decoration. The stone-lined graves were consistent with medieval burials found elsewhere in Britain.[69]

Only one burial, which contained a drape ring, suggested burial in everyday clothing. Nightdress-like shrouds were an eighteenth-century introduction, and in the absence of clothes fastenings, such as buttons, toggles, buckles, or pins, it is assumed that most earlier burials at St Peter-le-Bailey were unclothed within their shrouds. In this poor parish the practice may reflect the need to conserve the clothing of the deceased – an expensive commodity at this time – for the living. Naked burial may also invoke religious symbolism of spiritually standing 'naked before God' on the Day of Judgement. Certainly medieval manuscript illustrations suggest that most of the dead were unclothed within their shrouds.

The later post-medieval period may well be viewed as the heyday of the funeral, with very large sums being spent on ostentatious funerals and mourning paraphernalia, not least the coffin. Poorer people went to great lengths to have as good a 'send off' as could be afforded, often placing themselves in considerable financial distress as a result. Contributing to a funeral fund or paying a stipend to a 'friendly society' was a very popular means of ensuring that one avoided the dreaded and shameful fate of 'dying on the parish'.[70] This dread was based not only on the social ignominy of being accorded a pauper burial, but also on the very real dread of being anatomized. The antipathy

68 Stephen Friar, *The Sutton Companion to Churches* (Stroud, 2003), p. 69.
69 Gilchrist and Sloane, *Requiem*, p. 134.
70 Trevor May, *The Victorian Undertaker* (Aylesbury, 2003), p. 11.

to the notion of being dissected was based on religious and social perceptions, which held that dissection damaged the spiritual state of the individual. In 1832 the Anatomy Act allowed medical professionals the right to claim not only the corpses of executed felons, but also of those dying on the parish, without family, or in the workhouse or hospital. Although successful in stamping out the despised body-snatching trade, the Act served only to deepen the fear and shame among the poor of dying on the parish.[71] At least some of the uncoffined post-medieval burials in St Peter-le-Bailey churchyard may well be pauper burials and represent the very poorest or most friendless of Oxford society at that time; some may have been executed felons. However, no evidence for anatomization (such as craniotomies or sternotomies) was identified in the osteological analysis. It is possible that all anatomized felons were buried at Oxford Castle. Amongst the sixty-two executed or diseased felons buried within the motte ditch, three individuals showed evidence of dissection, and further evidence of anatomization was present amongst the charnel assemblage.[72]

The majority of later post-medieval burials were coffined, all but two being wooden. Two triple wood-lead-wood coffins were present within the brick shaft grave of the Pratt-Cudd family. The artisan class of the interments and the coffins' location within a brick shaft grave are consistent with a modestly affluent family, superior to the more modest earth-cut burials placed within simple wooden coffins.

A large proportion of the coffins retained evidence of simple metal coffin fittings, most commonly grips and upholstery studs, and less commonly breastplates and grip plates. The majority of coffin fittings were composed of iron, the cheapest metal available. Unfortunately, due to iron's propensity to corrosion, some of the thin breastplates and grip plates may have been completely destroyed. Similarly no lid motifs or escutcheons were identified, although their absence may also reflect the lower status of many of the burials, being fittings found principally on elaborate triple lead-lined coffins.

Corrosion of many fittings also accounted for the dearth of decorative detail that could be discerned. Nevertheless, three new styles of grip (OXBOSQ 1–3) and two grip plates (OXBOSQ 1 and 2) were identified and will be added to OA's coffin-fitting catalogue (see below Figs 18 and 19).

Conclusion

The coffins and coffin fittings recorded from St Peter-le-Bailey were broadly consistent with more widely found burial practices identified elsewhere in the medieval and post-medieval assemblages in Britain. Medieval coffins were largely simple shroud burials, with some evidence of coffins or stone linings in the minority of graves.

The wooden coffins and simple iron coffin fittings of the bulk of the St Peter's post-medieval coffin assemblage were characteristic of coffins manufactured for the poor. A few more affluent individuals may be identified from more elaborate triple coffins, and where brass or tin-dipped fittings replaced the ubiquitous iron. These were much simpler, however, than middle- and upper-class crypt assemblages of this period. This picture is confirmed by historical analysis, which indicated that most individuals commemorated on memorial stones were of the artisan or skilled workman class.

[71] J. Rugg, 'From reason to regulation: 1760–1850', in Peter C. Jutt and Clare Gittings, *Death in England: an Illustrated History* (Manchester, 1999), p. 222.

[72] Daniel Poore, Andrew Norton, and Anne Dodd, 'Excavations at Oxford Castle: Oxford's western quarter from the mid-Saxon period to the late eighteenth century', above, p. 15, and Andrew Norton, Julian Munby, and Daniel Poore, *The Oxford Castle Excavations: a Study of Western Oxford from the mid-Saxon Period to the Nineteenth Century* (OA, forthcoming monograph).

ARCHAEOLOGICAL RESULTS

General

The deposits encountered comprised well-worked humic graveyard soils, within which grave cuts were not clear, and any artefactual remains were not stratigraphically secure. Based on the presence of iron coffin handles (which were in common usage from the 1720s), and the stratigraphic relationships between burials and early eighteenth-century walls of the rebuilt church, the cemetery could be divided into two main phases: Phase 1, pre-1726, and Phase 2, post-1726. Approximately 2 m of mixed silty graveyard soil overlay the natural deposits. The lowest part of the soil was compact and contained a higher percentage of gravel, but no obvious differences in stratigraphic layers were evident. The soil contained redeposited Saxon, medieval, and post-medieval pottery, reflecting both the lifespan of the cemetery and Saxon occupation before it.

Phase 1: Pre-1726

Natural gravel was revealed only within Light Pits 1 and 2, where it was overlain by a reddish-brown silty clay loess (supra-natural), the top of which lay at 62.2 m OD. The deposits were cut by numerous west–east aligned grave cuts, of which at least eight were lined with unworked ragstone, limestone, or flint blocks (390, 395, 402, 407, 422, 425, 463, and 478 – Fig. 5). All of the stone linings had been disturbed by later graves or by the foundations of the eighteenth-century church, but in general the graves were over 1 m long and about 0.7 m wide. The stone blocks measured about 0.3 m by 0.2 m by 0.1 m and were laid in one or two courses. The stone linings were either not bonded or bonded with a sandy mortar. Stone lining 463 was also rendered with a sandy mortar on its internal faces, and stone lining 390 was constructed with a niche for the head.

Phase 2: Post-1726

The burials within the overlying soils had no obvious grave cuts (due to the density of burials and homogeneity of the soil), but were assigned a post-1726 date or pre-1726 primarily based on the presence or absence of iron coffin handles.

Eighteenth-century Church

The tower and northern and western walls of the eighteenth-century church of St Peter-le-Bailey were exposed within the general reduction to the southern part of the site, in addition to the excavation of Light Pits 1 and 2, and within a service trench in the main carriageway (Fig. 7). The church walls were constructed from limestone blocks, some of which appeared to have been reused from the medieval church. The surviving walls of the church measured over 2 m high and 1.5 m wide, the stones averaging 0.4 m by 0.3 m by 0.2 m, bonded with a sandy mortar. The outline is shown on the 1878 OS plan, and measures about 20 m by 15 m (Fig. 7). The base of the tower at the western end measured about 6.5 m square, with an internal dimension of 3.5 m square (75). The void within the tower had been capped by a vaulted brick roof of the eighteenth or nineteenth century (74), the bricks of which measured 240 mm by 110 mm by 70 mm. This may represent a family burial vault, although the lack of an access point may indicate that it housed charnel remains, possibly resulting from the construction of the church. The vault was not further investigated.

A compacted lime mortar surface, forming a pathway between the church and graveyard, was identified immediately to the north of the northern church wall in the 2005 evaluation.[73]

Foundations of a porch abutting the western end of the tower and church wall were revealed within Lightpits 1 and 2 (Fig. 7). The walls (294 and 459) were constructed from grey ragstone and limestone blocks with a sandy mortar. Measuring over 0.9 m high and between 0.4 m and 0.56 m wide, the walls may have formed part of a structure to the north of the polygonal extension shown on the 1870 photograph (Fig. 3) and an internal wall footing (459). The photograph shows the northern and southern extents of the extension located to the south of Lightpits 1 and 2. The lower courses of the walls were of a slightly cruder build, and it is possible that the structure was rebuilt or repaired. Wall 459 had an unclear relationship with a linear rubble dump (485) that contained thirteenth- or fourteenth-century pottery. It is possible that the rubble represented a crude medieval wall (an earlier porch?) or, alternatively, material from the demolition of the later porch.

Boundary Wall

Along the western limits of the site a north–south aligned boundary wall (460) was revealed (Fig. 7), constructed from ragstone and limestone blocks, measuring about 0.3 m by 0.2 m by 0.1 m and bonded with a yellow sandy mortar. The wall was 0.5 m wide and 0.6 m high and was abutted by a threshold at its southern end (466). The threshold comprised a single course of limestone blocks, 0.08 m thick. Although wall 294 appeared to abut wall 460, it is more likely that it formed a nineteenth-century boundary wall between Bonn Square and the neighbouring

[73] 'An Archaeological Evaluation at Bonn Square, Oxford' (JMHS TS report, 2005).

plot, constructed once the eighteenth-century church had been demolished. An eighteenth-century boundary wall, which incorporated the south-western wall of the church porch, is shown on the 1870 photo (Fig. 3), but for the most part the boundary wall extends beyond the limits of the current Bonn Square boundary. Approximately 9 m to the east of the western church wall a well (501) was revealed, which lay beneath the assumed line of the southern wall of the church and may have pre-dated the building; it is not shown on the 1870 photograph. It was constructed from roughly hewn limestone blocks, measuring 0.4 m by 0.27 m by 0.2 m; there was no obvious bond. The well had an internal diameter of 0.8 m and was 5.25 m deep and capped with wooden planks. The church walls were overlain by modern topsoil, and beneath Queen Street they were abutted by a reddish silty sand, most likely service trench backfill or make-up for the modern road surface.

Nineteenth-Century Shaft Graves

A total of nineteen brick shaft graves was exposed within the general reduction and the reduction of the eastern side of the site. The graves were all at a depth where any human remains were not impacted by the development. The graves were single-break shaped (shouldered) or rectangular and were constructed from a single skin of red unfrogged bricks, measuring 0.22 m to 0.24 m long by 0.1 m by 0.07 m. Six of the graves (99, 100, 237, and 378–80) were located within the eighteenth-century church. The bricks were laid in a stretcher bond in a matrix of a sandy yellow mortar. Iron reinforcing rods were used to stop the sides collapsing inwards, and the internal faces of most graves had been whitewashed. The graves measured up to 2.46 m long, between 0.85 m and 1.05 m wide, and over 1.5 m deep. Sandstone ledger stones capped the brickwork. Brick bases of table-top tombs were evident above shaft graves (51, 59, and 66). Two shaft graves (43 and 44) formed part of the Pratt/Cudd family plot, one of which (43) was for a juvenile and measured 0.96 m long and 0.52 m wide. Shaft grave 67 was constructed in two phases, and a smaller structure lay at the base.

Two circular stone structures (68 and 70) were recorded on the northern sides of shaft graves 69 and 45. The structures were placed at the western (head) ends and constructed from a single skin of sandstone blocks, three courses high and measuring 0.9 m in diameter, with an internal diameter of 0.6 m. The structures may have been to contain flowers, or possibly memorial stones.

APPENDIX 1: SUMMARY REPORT ON THE HUMAN SKELETONS
by HELEN WEBB and LOUISE LOE

A total of 282 skeletons was osteologically examined. Of these, 111 were dated to the eleventh to eighteenth centuries and 171 to the eighteenth to nineteenth centuries. A further fourteen eleventh- to eighteenth-century individuals were not analysed, the bones either remaining *in situ* or reinterment having taken place prior to recording. This sizeable assemblage presented a unique opportunity to explore the health and physical attributes of a medieval to late post-medieval population from one of Oxford's central parishes. The report that follows summarizes the main findings of the osteological examination. The full report will be published online.[74]

Osteological Methodology

Age, sex, and stature of all of the skeletons were estimated by employing standard anthropological techniques.[75] For the purposes of analysis, individuals were placed into one of ten age categories (1–5 subadult, 6–10 adult) (Table 3).

TABLE 3. AGE CATEGORIES EMPLOYED

Category	**Age range**
Neonate	late foetus – 1 month
Infant	1 month – 2 years
Young child	2 – 5 years
Older child	6 – 12 years
Adolescent	13 – 17 years
Young adult	18 – 25 years
Prime adult	26 – 35 years
Mature adult	36 – 45 years
Older adult	>45 years
Adult (non-specific)	>18 years

74 See http/www.thehumanjourney.net.

75 Megan Brickley and J. McKinley, 'Guidelines to the standards for recording human remains', IFA Paper 7 (London, 2004).

Completeness of each skeleton was recorded as a percentage (<25 per cent, 25–50 per cent, 50–75 per cent or >75 per cent). Only in the eleventh- to eighteenth-century assemblage were bone condition and fragmentation formally recorded. Condition was scored with reference to the criteria devised by McKinley.[76]

The later assemblage was fully examined for non-metric traits – that is, minor anomalies of skeletal anatomy that might be genetically or environmentally induced.[77] All pathology, including dental pathology, was fully recorded, and differential diagnoses explored, with reference to standard texts.[78] Due to limited opportunity to study the eighteenth- to nineteenth-century remains, this group was *not* formally examined for non-metric traits or pathology, but conditions noted incidentally in the course of their osteological examination were recorded.

Further details on the methodologies employed for anthropological and palaeopathological examination can be found in the full report (online). The following results are divided by period.

Phase 1: Eleventh- to Eighteenth-Century Skeletal Assemblage

Condition and completeness. A fairly high percentage of skeletons (32.4 per cent) in this assemblage were less than 25 per cent complete. Only 12.6 per cent were over 75 per cent complete (Table 4). The surface preservation of most skeletons, however, was generally good or excellent, with the majority of skeletons assigned to condition grades 1 and 2 – slight to moderate, patchy surface erosion (Table 5).[79] Most skeletons (63.1 per cent) were moderately fragmented (Table 6), with the skull, ribs, and vertebrae often the most highly fragmented elements.

TABLE 4. COMPLETENESS OF THE MEDIEVAL SKELETONS

Completeness	No. of skeletons (N=111)	%
< 25%	36	32.4
25–50 %	32	28.8
50–75 %	29	26.1
>75 %	14	12.6

TABLE 5. CONDITION SCORES (AFTER MCKINLEY, 2004)

Grade	No. of skeletons (N=111)	%
0 (no erosion)	0	0
1	30	27
2	57	51.4
3	22	19.8
4	2	1.8
5	0	0
5+ (extensive erosion)	0	0

TABLE 6. FRAGMENTATION OF THE SKELETONS

Completeness	No. of skeletons (N=111)	%
High	19	17.1
Moderate	70	63.1
Low	22	19.8

[76] J. McKinley, 'Compiling a skeletal inventory: disarticulated and co-mingled remains', in Brickley and McKinley, 'Guidelines', pp. 14–17.

[77] Simon Mays, *The Archaeology of Human Bones* (London, 1997).

[78] E.g., Aufderheide and Rodríguez-Martin, *Cambridge Encyclopedia*; Donald J. Ortner and Walter G. J. Putschar, *Identification of Pathological Conditions in Human Skeletal Remains* (Washington, DC, 1985).

[79] McKinley, 'Compiling a skeletal inventory'.

Assemblage composition. The distribution of the age at death and the sex of skeletons in a burial population is central to understanding many aspects of health and disease, longevity and fertility.[80] In this assemblage males and females were fairly equally represented, but the proportion of subadults was fairly low (18 per cent, 20/111) (Fig. 9).

The assemblage comprised ninety-one adults and twenty subadults. Of the adults, forty were male and forty-three were female. Sex could not estimated for eight of the adults, owing to missing elements or ambiguous morphological traits. Sex could be estimated for two subadults within the adolescent age category (13–17 years); one was possibly female, the other male.

Seventeen skeletons could not be aged more precisely than adult. Of the ninety-four individuals that could be more precisely aged, most (35) were assigned to the older adult category (>45 years). There was a very low proportion of newborns and infants, with only one newborn (0.9 per cent) and two infants (1.8 per cent). Peaks in mortality were evident in the young child category (2–5 years) and for males in the young adult category (18–25 years).

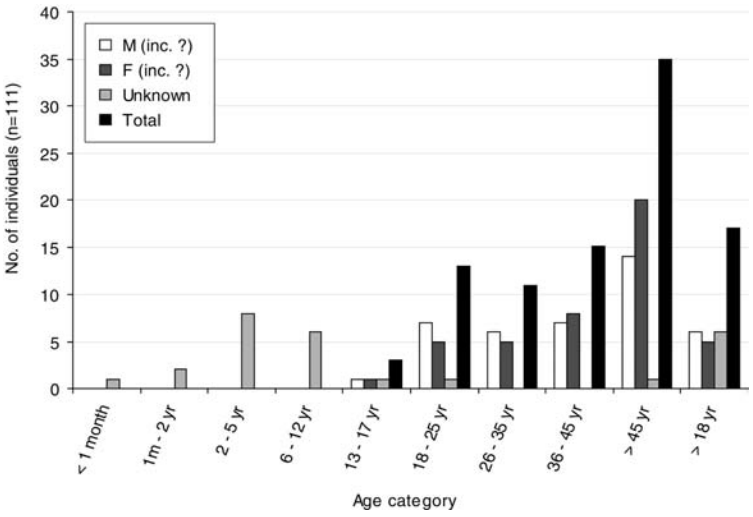

Fig. 9. Phase 1 assemblage: mortality profile

Physical attributes of the population. Stature is determined by both inherited and environmental factors. Severe or prolonged physical and emotional stressors (for example, malnutrition, infection, or chronic illness) during childhood and adolescence may prevent an individual achieving their maximum genetic potential stature.[81] Thus stature may be used as a rough yardstick to indicate the overall health of individuals and of populations, provided the genetic component of populations do not change (as would happen, for example, with an influx of peoples of different average stature). Stature ranged from 150.1 cm to 179.2 cm for the entire sample, between 156.5 and 179.2 cm (mean of 169.8 cm or 5 ft 7 in.) for males and between 150.1 and 169.6 cm (mean of 160.1 cm or 5 ft 3 in.) for females. These statures are consistent with the average statures calculated for the later medieval period by Roberts and Cox, with males just over 1 cm shorter than the average, and females just over 1 cm taller than the average.[82]

Non-metric traits were also recorded. These minor anomalies of skeletal anatomy are interesting because they may be used to indicate familial relationships between individuals.[83] Certain traits, however, may be environmentally influenced – for example, the presence of two joint facets on the calcaneus (one of the foot bones) instead of one. Variations in joint surfaces tend to be a reflection of mechanical factors operating on the bones.[84] The range of

[80] A. Chamberlain, 'Problems and prospects in palaeodemography', in Cox and Mays, eds, *Human Osteology,* pp. 101–15.

[81] S. E. King, and S. J. Ulijaszek, 'Invisible insults during growth and development: contemporary theories and past populations', in Robert D. Hoppa and Charles M. Fitzgerald, eds, *Human Growth in the Past: Studies from Bones and Teeth* (Cambridge, 1999), pp. 161–82.

[82] Roberts and Cox, '*Health and Disease*', p. 248.

[83] Simon Mays, 'The human remains,' in Simon Mays, C. Harding, and C. Heighway, *Wharram: a Study of Settlement on the Yorkshire Wolds, 11: The Churchyard*, York University Archaeological Publications 13 (2007), pp. 123–5.

[84] Mays, *Archaeology of Human Bones*, p. 110.

non-metric traits observed in this assemblage was in keeping with that from other populations. Of the cranial traits, the open posterior condylar canal was most frequently observed, but lambdoid ossicles (small islands of bone developed within the territories of the lambdoid suture of the skull) were also common. Of the post-cranial traits, the double facet on the atlas was most common, followed by the double anterior facet on the calcaneus. These post-cranial traits of the joint facets, as explained above, probably relate to physical activity rather than genetic influence.

Pathology. A range of pathological conditions was observed, including those relating to trauma, nutritional disorders, infection, and joint disease, as well as dental disease. Rates of dental caries, calculus ('tartar'), periodontal disease, and ante-mortem tooth loss were higher than observed in other contemporary assemblages. Calculus was by far the most prevalent condition, observed on 78.2 per cent of teeth, or 81.8 per cent of dentitions. This is significantly higher than the national average of 59.2 per cent in the later medieval period, and suggests that oral hygiene was poorer among the local community compared with their contemporaries.[85]

Joint disease was by far the most common skeletal pathology, and this was mainly present in the form of osteoarthritis, a disease that results in the destruction of cartilage (Fig. 10). Of the 111 individuals, 47.3 per cent, all adult, were affected. While a high prevalence of osteoarthritis is not unusual, this is a higher rate than observed at other contemporary sites, and much higher than the national average for the later medieval period (16.8 per cent of individuals).[86] Since osteoarthritis is more common with advancing age, it was not surprising that it was most common among the older adults (>45 years). Females were affected slightly more frequently than males, a pattern often noted in other assemblages.[87] Females tended to have greater lower limb involvement, compared with males, who showed greater upper-limb involvement. This pattern is a common finding; differences in the anatomy of joints and body-mass index probably play an important part in this.[88] Intense activity starting at a young age may also influence the development of osteoarthritis, particularly in the upper limbs,[89] and Spondylosis deformans and Schmorl's nodes, two other common joint conditions that involve the spine, were also observed in the assemblage.

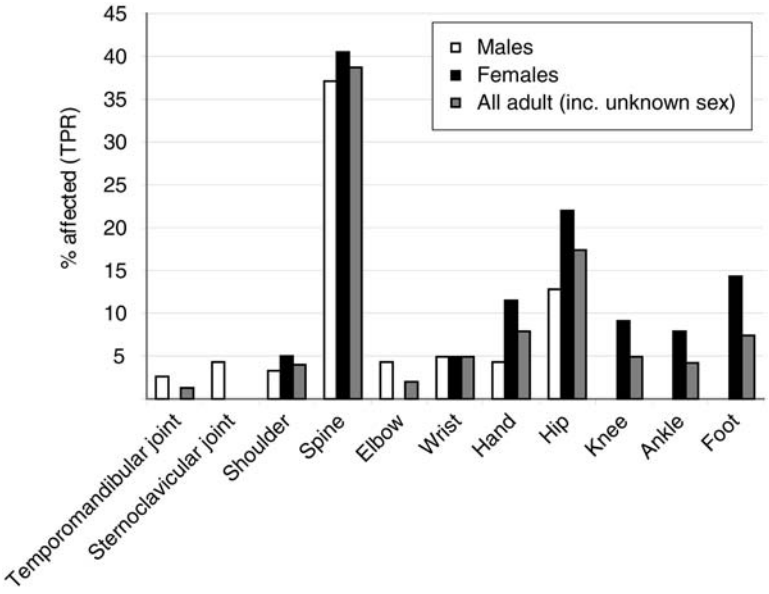

Fig. 10. Phase 1 assemblage: true prevalence of osteoarthritis

[85] Roberts and Cox, '*Health and Disease*', p. 262.

[86] Rogers and Waldron, *Field Guide*, p. 32; Holst, 'The human bone: the cemetery of St Helen's'; Louise Loe, 'Analysis of the human bone from sites 1 and 2', in Reg. Jackson, *Excavations at St James's Priory, Bristol* (Oxford, 2006), p. 112; Roberts and Cox, '*Health and Disease*', pp. 282–3.

[87] Waldron, '*St. Peter's, Barton-upon-Humber*', p. 56.

[88] E. Weiss and R. Jurmain, 'Osteoarthritis revisited: a contemporary review of aetiology', *International Journal of Osteoarchaeology*, 17 (2007), pp. 437–50.

[89] Ibid., p. 444.

Spondylosis deformans is identified on dry bone as increased porosity and osteophytes on the vertebral bodies. The condition is mainly caused by degeneration of the intervertebral disc and is associated with increasing age. Spondylosis is uncommon on young individuals and is probably the result of trauma. Schmorl's nodes are caused by intervertebral disc herniation into the vertebral body. They appear on dry bone as depressions, either on the superior or inferior surface of the body. Although associated with degenerative disease, Schmorl's nodes have been linked to activity and trauma, especially in adolescence, or metabolic disorders.[90]

Several metabolic conditions were identified within the assemblage. Iron deficiency anaemia, identified by increased porosity on the orbits (cribra orbitalia), was observed in 11.7 per cent of skeletons, or 23.1 per cent of orbits. These rates are roughly average for the period. A further two skeletons displayed other skeletal changes (to the cranial vault – porotic hyperostosis, and to the femur – cribra femoralis) resulting from iron deficiency anaemia. The most common causes of this disease, the physical symptoms of which may include shortness of breath and fatigue, are believed to be an inadequate dietary intake of iron, and/or severe intestinal parasite infestation.[91] Therefore cribra orbitalia, as well as the other skeletal changes, may be used as a generic indicator of physical stress in childhood. Two skeletons (1.8 per cent of the assemblage), both prime adult females, showed evidence of vitamin D deficiency. This rate is high compared with other contemporary sites, and the average for the period (0.7 per cent), suggesting that the people of St Peter-le-Bailey were lacking in dietary vitamin D and/or exposure to solar radiation, compared with many of their contemporaries.[92] The skeletal manifestations were bowed long bones (indicative of childhood rickets), observed in both individuals, and, in one individual, spinal deformity/vertebral fractures, indicative of osteomalacia – vitamin D deficiency during adulthood.

Further information on the nutritional status of the population may be derived from analysis for dental enamel hypoplasia. Enamel hypoplasia is identified on teeth as sharp lines, furrows, grooves, or pits of depressed enamel.[93] It is the result of disruption to the formation of enamel during growth and therefore represents health stress encountered during the growing years. Other factors besides malnutrition may cause this condition, including infection and childhood illnesses, such as measles.[94] In total, 60.9 per cent of adult dentitions had enamel hypoplasia, a very high rate compared with the national average of 35.4 per cent.[95]

Infection is arguably a reflection of living conditions, with high population density, proximity of animals, ineffective sewerage, and lack of clean drinking water among the factors that would have been detrimental to avoiding the numerous infectious diseases prevalent at the time.[96]

In the present assemblage there was evidence for venereal syphilis and, possibly, brucellosis. Venereal syphilis involved a prime adult male, who displayed bone inflammation (periostitis and osteitis) on numerous skeletal elements. In addition, he displayed numerous destructive lesions (caries sicca) on the outer surface of the cranium. Resorption of the bone around the nasal margins was also observed. Syphilis manifests in the bone only during the tertiary stages, by which time the effects on the health of the individual are severe.[97] The possible case of brucellosis, a disease transmitted to humans by close contact with animals, was observed on the remains of a mature adult male. The skeletal changes involved the spine and included massive osteophytes (new bone growth on the margins of the vertebrae), rounded lytic lesions in the vertebral bodies, probably having contained large abscesses, and prolific reactive new bone formation (Fig. 11).

In addition to these specific infections, there was also evidence of non-specific infection in the form of periostitis and sinusitis. Periostitis, inflammation of the periosteum, the outer membrane that covers bone, is seen in association with mild trauma and many diseases of metabolic, neoplastic, and infective nature. The condition was observed on 0.3 per cent of all post cranial bones and involved ten individuals (9 per cent of the assemblage), a rate comparable with other contemporary sites. The bones most frequently affected were the tibia and fibula (see Fig. 12), as seen in many skeletal populations.[98] The tibia (shin bone) is covered only by skin, and localized inflammation in this area is often secondary to trauma or leg ulcers. Sinusitis, a chronic and irritating inflammation of the paranasal sinuses, is associated with polluted environments. Rates of the condition were fairly low compared with other contemporary populations.

90 R. D. Jurmain, *Stories from the Skeleton. Behavioural Reconstruction in Human Osteology: Interpreting Remains of the Past,* 1 (Amsterdam, 1999), pp. 166–9.

91 Roberts and Manchester, *Archaeology of Disease*, p. 228; P. Hengen, 'Cribra orbitalia: pathogenesis and probable etiology', *Homo*, 22 (1971), pp. 57–76; S. Kent, 'The influence of sedentism and aggregation on porotic hyperostosis and anaemia: a case study,' *Man,* 21 (1987), pp. 605–36; P. Stuart-Macadam, 'Anaemia in Roman Britain: Poundbury Camp', in Bush and Zvelebil, *Health in Past Societies*, p. 101.

92 Roberts and Cox, '*Health and Disease*', p. 248.

93 S. Hillson, 'Teeth', *Cambridge Manuals in Archaeology* (1986), p. 129.

94 Roberts and Manchester, *Archaeology of Disease*, p. 76.

95 Roberts and Cox, *Health and Disease*, p. 264.

96 Ibid., p. 229.

97 Ibid., p. 272.

98 Roberts and Manchester, *Archaeology of Disease*, p. 172.

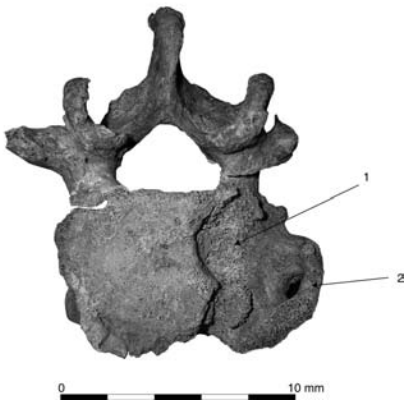

Fig. 11. Phase 1 assemblage: Skeleton 489 (mature adult male), fourth lumbar vertebra with a lytic lesion (arrow 1) in the superior body surface, new bone formation and a sinus (arrow 2)

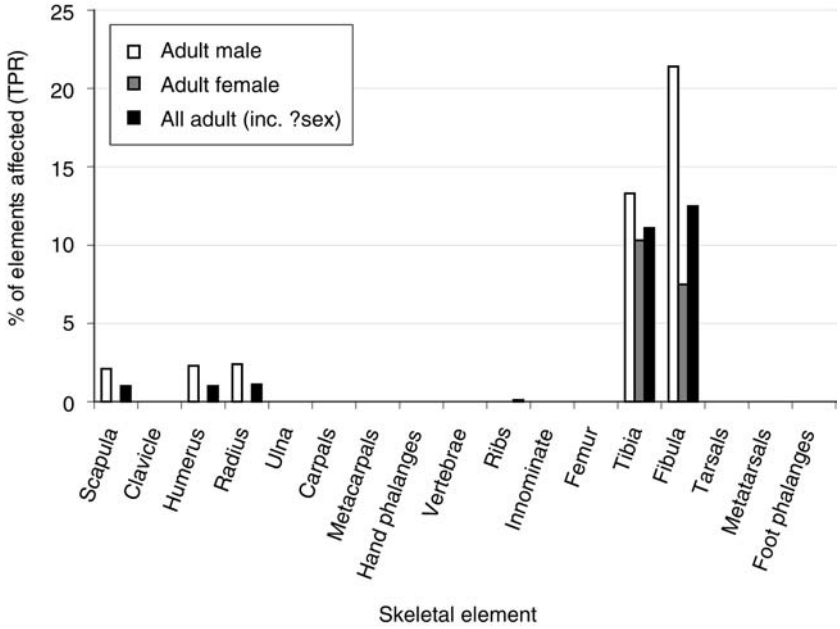

Fig. 12. Phase 1 assemblage: true prevalence of periostitis

Most trauma in the assemblage was represented by healed fractures, involving 18 per cent of individuals. This rate is high compared with other contemporary sites.[99] Untypically females were more frequently affected than males.[100] If the individual components of the 'spine' and 'ribs' are counted as single elements, these were the most commonly fractured elements in cases of multiple fractures, even when counted as single cases. Ribs are frequently cited as the most common site of fracture. The true prevalence rates (per element), however, showed the cranium to be the most frequently fractured element, followed by the ulna (Fig. 13). Of the cranial fractures (two cases),

[99] Mays, 'The human remains', pp. 143–50; Holst, 'The human bone'; T. Anderson and C. Boston, 'The skeletal assemblage', in I. Soden, ed., 'Excavations at St Martin's Church, Wallingford' (Northamptonshire Archaeology TS report, 2007); Jean D. Dawes and J. R. Magilton, *The Cemetery of St Helen-on-the-Walls, Aldwark, York*, York Archaeological Trust (1980).

[100] Holst, 'The human bone'; Waldron, *St. Peter's, Barton-upon-Humber*, p. 86.

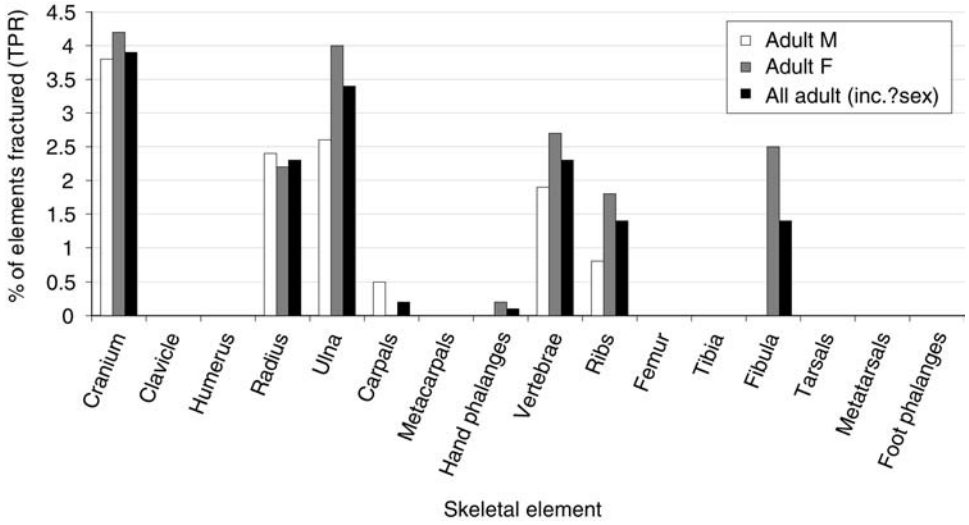

Fig. 13. Phase 1 assemblage: true prevalence of fractures

one was a small depressed fracture, while the other was more severe, having been caused by a blunt instrument. It is impossible to determine whether these fractures were the result of interpersonal violence or accidental trauma, but recent clinical data from the United States and Europe show that the head is often targeted in violent assaults which, as the documentary sources suggest, was not uncommon in Oxford at this time.

Several minor congenital or developmental abnormalities were also observed. These included minor anomalies of the spine – for example, an extra vertebral segment, and supernumerary ribs. It is unlikely that any of the abnormalities observed would have had a detrimental effect on the individuals during life. Evidence for neoplasms (tumours) was observed in three individuals. In two these were small, 'button' osteomas on the outer surface of the skull. These are common in both modern and archaeological populations. The third individual displayed a rounded, solitary lytic lesion in a vertebral body, possibly neoplastic in origin.

Phase 2: Eighteenth- to Nineteenth-century Skeletal Assemblage

Condition and completeness. Over half of the skeletons within this assemblage were less than 50 per cent complete (Table 7). Surface preservations and fragmentation were not formally recorded, but in general, the preservation was very good or excellent, and fragmentation was fairly low to moderate.

TABLE 7. COMPLETENESS OF THE PHASE 2 SKELETONS

Completeness	No. of skeletons (N=171)	%
< 25%	51	29.8
25–50 %	56	32.7
50–75 %	32	18.7
>75 %	32	18.7

Assemblage composition. The assemblage comprised 129 adults and 42 subadults. Of the adults, sixty-four were male, and fifth-six were female. Sex could not be estimated for nine of the adults, owing to missing elements or ambiguous morphological traits. Sex could be estimated for three subadults within the adolescent age category (13–17 years); one was a probable female, one a probable male, and the other a definite male.

Forty skeletons could not be aged more precisely than adult. Of the 131 individuals that could be more precisely aged, most (56) were assigned to the older adult category (>45 years) (Fig. 14). Subadult and older adult mortality appears to have been high, while adolescent and younger adult mortality was comparatively low. Peaks in mortality were noted in the older child (6–12 years) and prime adult (26–35 years) categories. The peak in the prime adult category was the result of a peak in female deaths.

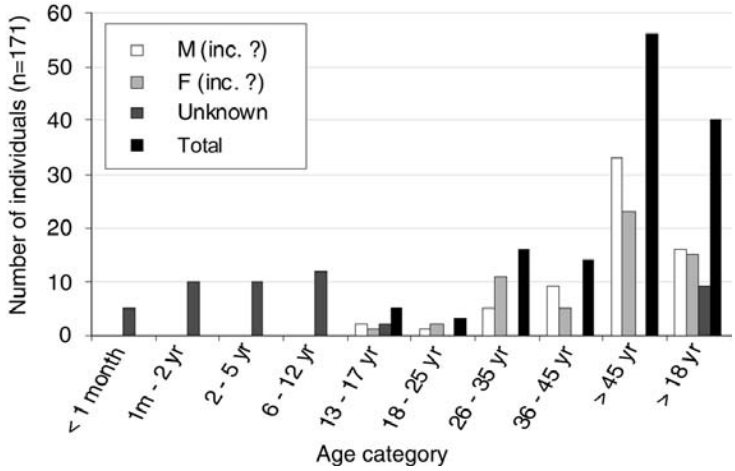

Fig. 14. Phase 2 assemblage: mortality profile

Physical attributes of the population. Stature ranged from 143 cm to 186 cm, 161 cm to 186 cm (mean of 172 cm or 5 ft 8 in.) for males, and 143 cm to 171 cm (mean of 158 cm or 5 ft 2 in.) for females. The males were of average height for the period, while the females were 2 cm shorter than the average.[101] This pattern is also reflected in Table 8, which compares these rates with several other post-medieval assemblages.

TABLE 8. COMPARATIVE DATA ON STATURE ESTIMATION IN OTHER POST-MEDIEVAL URBAN POPULATIONS IN ENGLAND

	Male (mean)	**Male (range)**	**Female (mean)**	**Female (range)**
Bonn Square (eighteenth–nineteenth century)	1.72 m	1.61 m–1.86 m	1.58 m	1.43 m–1.71m
St Luke's, Islington (unnamed) [102]	1.70 m	1.49 m–1.94 m	1.58 m	1.39 m–1.74 m
St Luke's, Islington (named) [102]	1.70 m	1.55 m–1.93 m	1.58 m	1.49 m–1.72 m
Newcastle Infirmary[102]	1.71 m	1.60 m–1.83 m	1.60 m	1.50 m–1.76m
St Bartholomew's, Penn[102]	1.75 m	1.45 m–1.85 m	1.60 m	1.42 m–1.83 m
St Nicholas, Sevenoaks[102]	1.73 m	1.62 m–1.83 m	1.61 m	1.49 m–1.72 m
St George's, Bloomsbury[102]	1.72 m	1.52 m–1.85 m	1.60 m	1.49 m–1.72 m
Christ Church, Spitalfields[102]	–	1.68 m–1.70 m	–	1.54 m–1.59 m
Cross Bones, Southwark[102]	1.69 m	1.53 m–1.80 m	1.58 m	1.42 m–1.72 m
Kingston-upon-Thames, London[102]	1.69m	1.54 m–1.90 m	1.60 m	1.40 m–1.75 m
Average for the post-medieval period[103]	1.71 m	–	1.60 m	–

Non-metric traits were not formally recorded, although many were observed. The range of traits observed was in keeping with that from other populations.

Pathology. Despite not being formally analysed for pathology, the range of conditions identified was similar to that recorded for other contemporary sites. Caries, calculus, abscesses, periodontal disease, and ante-mortem tooth loss were all observed. The rates for some of these conditions were lower than at many other contemporary sites, which does not fit with the expectation of poor dental hygiene in a lower status community. This may reflect the low-resolution methodology employed, but for caries, it should also be considered that the diet was low in refined sugars, a major factor in the formation of caries. However, the incidence of calculus and ante-mortem tooth loss

101 Roberts and Cox, *Health and Disease*, p. 308.
102 Boyle, Boston, and Witkin, 'St Luke's Church, Old Street, Islington', p. 204.
103 Roberts and Cox, *Health and Disease,* p. 308

rates (affecting 40.3 per cent of dentitions), was higher than the national average for the post-medieval period, which seems to concur with poor dental hygiene.[104]

Joint disease, specifically osteoarthritis, showed a massive decline from the earlier period assemblage. This does not tie in with the overall picture for the period, when an increase in the disease is seen.[105] Females were more frequently affected than males, a trend often commented upon for both archaeological and modern populations.[106] The knee was most frequently affected. As one of the major weight-bearing joints, it is prone to the disease and is frequently cited as one of the more commonly affected joints.[107] It has, however, also been linked with obesity, trauma, and activities involving the same, repetitive movement over an extended period of time.[108] Although changes to the spinal joints, indicative of joint disease, were observed, no true spinal osteoarthritis was seen, although this is unlikely to be a true reflection of spinal osteoarthritis in the community during this period. Schmorl's nodes were also less frequently observed in this assemblage than in the earlier one, although they still showed a higher rate than at St Peter's, Barton-upon-Humber.[109] Other joint diseases observed included a probable case of gout in an older adult male, a disease linked to obesity, excessive alcohol intake, high blood pressure, and kidney problems, and a case of DISH in another older adult male, possibly associated with obesity and Type 2 diabetes.[110] While both of these diseases are associated with a rich diet, their prevalence in the assemblage is low, and thus may be consistent with a low-status population. Another older adult male had extensive ankylosis (fusion) of the bones of the ankles and feet, possibly a case of rheumatoid arthritis (Fig. 15).

Fig. 15. Phase 2 assemblage: the feet of skeleton 110 (mature adult male), with possible rheumatoid arthritis

Evidence for metabolic conditions was also observed. Five individuals (2.9 per cent of the assemblage) displayed cribra orbitalia, indicative of iron deficiency anaemia. This prevalence is in keeping with some post-medieval assemblages, but lower than others.[111] A higher rate was observed at Christ Church, Spitalfields, but this may be explained by fashionable infant-feeding practices possibly used among this middle-class crypt assemblage. This included feeding infants on flour and water (pap, or panada), greatly lacking in the required nutrients for the growing infant.[112]

104 Ibid., p. 327.
105 Ibid., p. 353.
106 Waldron, '*St. Peter's, Barton-upon-Humber*', p. 56; Rogers and Waldron' *Field Guide*, p. 32.
107 Ibid.
108 Tony Waldron, 'Changes in the distribution of osteoarthritis over historical time', *International Journal of Osteoarchaeology,* 5 (1995), p. 388.
109 Waldron, '*St. Peter's, Barton-upon-Humber*', p. 94.
110 Roberts and Manchester, *Archaeology of Disease*, p. 162; Rogers and Waldron, *Field Guide,* p. 48.
111 Roberts and Cox, *Health and Disease*, p. 307.
112 Ibid.

Vitamin D deficiency, signalled by the occurrence of rickets, was also observed in 2.9 per cent of the Phase 2 assemblage, only slightly lower than the national average for the post-medieval period.[113] Nationally there was a general increase in rickets from the medieval to the post-medieval period, principally affecting the poor. The increase in air pollution at this time, from increased burning of coal, would undoubtedly also have had an impact on solar irradiation, thereby increasing the risk of children contracting rickets. Possible cases of scurvy (vitamin C deficiency) were also identified within the assemblage, affecting two subadults.

Living conditions within the parish would most likely have continued to be crowded and unhygienic during this period. A possible case of tuberculosis was observed in an adolescent. Tuberculosis is a disease principally, but by no means exclusively, of poverty and urbanization. A high prevalence of maxillary sinusitis (affecting 1.8 per cent of the assemblage) was also observed, a further possible indicator of increasing urbanization and pollution. The rate of periostitis (affecting 5.3 per cent of the assemblage) was lower than at other sites, but this may be a consequence of the low-resolution examination employed, given that the bony changes associated with periostitis are often subtle. However, the pattern of elements involved was in keeping with expectations, with the tibia and fibula most commonly affected. While a number of skeletons had more than one leg bone affected, one skeleton, an older adult male, had more diffuse periostitis, affecting all of the leg bones and those of the forearms, indicating that some kind of systemic infection was the cause.

As with the earlier assemblage, the majority of trauma was represented by healed fractures. A total of 17 individuals (9.9 per cent), all adult, had a fracture involving one or more bones. Males were more frequently affected than females, as is often observed.[114] As earlier, the skull was the most frequently fractured element. Five skulls, all adult male, were fractured (a true prevalence of 5 per cent, 5/101 skulls). Three of the five cases of skull fracture were nasal fractures, an area often fractured as the result of punches and kicks.[115] One of the cranial vault fractures was incompletely healed, indicating that it had occurred fairly shortly before death. Ribs were the most commonly fractured post-cranial element. For all major limb bone elements and crania, rates of fracture were found to be higher than the averages given for the post-medieval period (Table 9).[116]

TABLE 9. RATES OF FRACTURES PER SKELETAL ELEMENT

Element fractured	**% (Number of elements affected / number observed)**
Cranium	5.0% (5/101)
Ribs	3.2% (4/125 individuals with ribs)
Vertebrae	1.4% (2/138 spines)
Humerus	1.1% (2/184)
Radius	0.7% (1/145)
Ulna	0.7% (1/148)
Femur	1.2% (2/163)
Fibula	0.9% (1/114)

A number of minor congenital or developmental abnormalities was also observed, but as with the earlier assemblage, these would have been of little, if any, consequence to the individuals during life. Neoplastic disease was seen in one individual only, in the form of a button osteoma on the skull. An adult male skeleton displayed possible evidence for acromegaly, an endocrine (hormonal) disease. He had a disproportionately large mandible, compared with the rest of the skull (Fig. 16).

Two trepanations – the surgical removal of an area of skull – were observed (Fig. 17), although these were from the disarticulated skeletal remains. Both had been carried out by a surgical drill. At least one of these appeared to have been carried out as a treatment following severe trauma caused by injury with a blunt instrument to the side of the head. The motive for the other trepanation could not be determined. Neither trepanation showed macroscopic evidence for healing, indicating that the individuals died soon after the trepanations were carried out.

It is also worth noting that an upper denture, made from a combination of ivory (probably hippopotamus or walrus) and real human teeth, was recovered from the disarticulated material.

113 Ibid., p. 310.

114 M. Brickley and M. Smith, 'Culturally determined patterns of violence: biological anthropological investigations at a historic urban cemetery', *American Anthropoologist,* 108 (2006), p. 169.

115 A. Galloway, ed., *Broken Bones: Anthropological Analysis of Blunt Force Trauma* (Illinois, 1999), p. 75.

116 Roberts and Cox, *Health and Disease*, p. 302.

Fig. 16. Phase 2 assemblage: Skeleton 125 (adult male), enlarged mandible, possible acromegaly

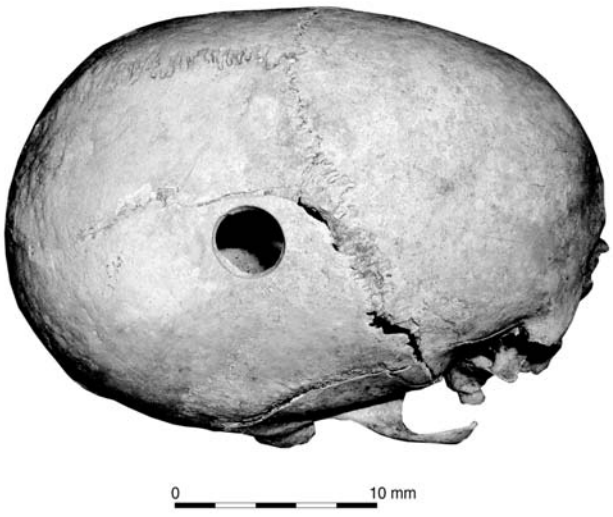

Fig. 17. Phase 2 assemblage: trepanned skulls (disarticulated crania)

APPENDIX 2: COFFIN FURNITURE by CERIDWEN BOSTON

Coffin fittings became ubiquitous from the second to third decades of the eighteenth century, and the Bonn Square burials were assigned a pre-1726 and post-1726 date principally on the presence of coffin fittings.[117] A pre-1726 date was assigned to 125 burials, and a post-1726 date to 171 burials. A total of twenty-six burials was uncoffined and unaccompanied.

PHASE 1: PRE-1720 BURIALS

Wooden Coffins

In the medieval and early post-medieval periods most people were buried uncoffined, although archaeologists have discovered some simple, unadorned wooden coffins albeit less frequently than in later post-medieval burial assemblages.[118] In the majority of common medieval funerals the corpse was conveyed from infirmary or home to the church, and from the church to the graveside within a parish (communal) coffin, from which it was removed prior to interment. The coffin was then reused in subsequent funerals.[119] In the absence of coffins, grave cuts were often narrow and cigar-shaped, rather than sub-rectangular or shouldered. Medieval manuscript illustrations depicting shrouded corpses within or being lowered into the grave also suggest that uncoffined burial was more the norm than the exception in this period.

None of the pre-1720 burials of St Peter-le-Bailey (n = 125) contained surviving coffin wood, common in later burials on the site. The presence of coffins was suggested, however, by iron fixing nails found within the backfill of fourteen early graves (12.6 per cent), most of which were directly associated with the skeleton in the base of the grave. Coffin evidence was somewhat tenuous in seven graves, where only one nail was recovered. In these cases the single nails may have been residual, but equally the dearth of nails may be explained in terms of alternative methods of securing the planks comprising the coffin. Coffins may have been largely or completely held together by carpentry joints or wooden pegs, with nails used only occasionally, for example, to nail down the lid. The number of nails per coffin in the remaining Phase 1 burials varied between two and eleven (coffin 286), a mean of three nails per coffin. In burial 274, three corroded iron bracket fragments appear to have been alternative fixing devices.

Soil stains were too ephemeral and nails too few to indicate the shape of the coffins. It is assumed that like most medieval and early post-medieval coffins (pre-1760s), these were either rectangular or trapezoid in shape.[120] The single-break or shouldered coffin was introduced only later, towards the end of the seventeenth century.[121]

Stone-lined Graves

Five burials within stone-lined graves (graves 390, 395, 407, 463, and 478) were revealed in the base of Light Pits 1 and 2. All five burials were uncoffined, and grave 463 contained two individuals: subadult 467a and older female 467b. Interestingly three of the remaining four stone-lined burials also contained the remains of adult females. By contrast, four of the five stone-lined graves in the nearby monastic cemetery of St Frideswide's, now the cathedral, contained the uncoffined remains of adult males.[122] This difference may be temporal (the St Frideswide's burials dating to the late Saxon period), or merely a factor of the predominantly male monastic population associated with the priory.

Shroud Pins

By contrast with eighteenth- and nineteenth-century burials, evidence for copper-alloy shroud pins in medieval burials is relatively rare.[123] In their review of medieval monastic burials, Gilchrist and Sloane found that shroud pins dated from no earlier than the twelfth century.

The St Peter-le-Bailey burial assemblage is unusual in the number of pins discovered and in more indirect evidence of green staining on the human remains, caused by direct contact with copper-alloy objects, most commonly pins. Seven burials contained at least one copper-alloy pin (233, 267, 271, 274, 286, 288, and 464), while green staining was observed on ten skeletons (263, 271, 277, 286, 287, 288, 289, 297, 300, and 307). The most common location of this green discolouration was the skull (n = 6), followed by the torso (n = 4), arms (n = 2),

117 Julian Litten, *The English Way of Death: the Common Funeral since 1450* (London, 1991), p. 90; Gilchrist and Sloane, *Requiem*, p. 97.
118 Gilchrist and Sloane, *Requiem*, pp. 111–17.
119 Ibid., p. 111.
120 Litten, *English Way of Death*, p. 112.
121 Ibid., pp. 96–7.
122 Angela Boyle, 'Excavations in Christ Church Cathedral graveyard, Oxford', *Oxoniensia,* 66 (2001), pp. 337–69.
123 Gilchrist and Sloane, *Requiem*, p. 110.

legs (n = 1) and the foot (n = 1). Medieval women usually stitched the shroud to enclose the corpse. Gilchrist and Sloane interpret pins in burials as accidental losses rather than deliberate inclusions, left over from temporary pinning of the shroud during stitching.[124] Alternatively some pins may have been used to secure a headdress and not a shroud, and may account for the verdigris staining seen on the skulls from St Peter-le-Bailey. With the exception of possible female burial 247, which contained a copper-alloy drape pin, dating from the fourteenth century onwards, the burials at St Peter-le-Bailey lacked any fastenings to suggest that the dead had been clothed when they were buried.

PHASE 2: POST-1720S COFFINS AND COFFIN FITTINGS

From the late seventeenth century onwards burial within a coffin became common, so that by the end of the eighteenth century only those in extreme poverty were buried without one. In this period coffin shapes changed from the rectangular or trapezoid to the single-break or shouldered shape that persists in coffin construction today.[125] Coffin lids became flat, replacing the gabled lids that had been popular in the early seventeenth century. From the 1670s onwards it became customary to cover the coffin with upholstery of baize or velvet. Coffin decoration became increasingly elaborate in the late seventeenth and early eighteenth centuries, and by the 1720s it had became customary to decorate the side and lid panels of coffins with complex patterns of metal upholstery studs and decorative metal plates (grip plates, lid motifs, escutcheons, and *departum* plates).

By the early eighteenth century the funeral furnishing trade was a well-established business, providing coffins for all classes of people at various costs, depending upon the status and wealth of the deceased.[126] The financial investment in funerary panoply grew over the next century, reaching its zenith in the 1840s. Even among the poor, the importance of providing a decent burial was keenly felt.[127] Greater simplicity in funerary practices reasserted itself after the 1840s, when elaborate mourning displays began to be regarded as vulgarly ostentatious and in poor taste.[128] Thus burials in St Peter's churchyard date from the heyday of the Georgian or Victorian funeral and to the period that followed, when greater simplicity in funerary practice became the norm.

The Coffins

In the churchyard of St Peter-le-Bailey remains of wooden coffins and coffin fittings were recorded in 140 post-1726 burials (73.3 per cent; n = 191). Fifty-one uncoffined burials were assigned to the later post-medieval period on the basis of the level from which they were recovered. It is possible that some of the uncoffined burials were earlier (pre-1726) burials, and have erroneously been assigned to the post-medieval period. Non-recording of coffins may also be a consequence of the fieldwork methodology, through which many burials were incompletely revealed. A very significant factor was the extent of truncation of many burials by later ones, which in many cases completely obliterated possible evidence for coffins.

St Peter-le-Bailey is historically known to have been one of the poorest parishes in Oxford, and it is probable that at least some of the post-1726 burials recorded as uncoffined were pauper burials of those too destitute to afford a coffin. Interestingly twenty-two of the burials where location is known (46.8 per cent, n = 47) were located in the northern churchyard, to the north of the light pits. In both the medieval and post-medieval periods there existed a hierarchy in the location of burial within the church and churchyard, with plots closest to the church being the most prized. Plots towards the periphery were assigned to social undesirables, including suicides, unbaptized infants, unchurched mothers, strangers, and criminals.[129] The northern churchyard, traditionally believed to be the 'devil's quarter', was also least favoured for burial. Unsurprisingly many of the uncoffined burials in St Peter's churchyard were located furthest from the church and in the northern part of the churchyard and were of the poor and the outcasts of Oxford society. Two such social pariahs were the highwaymen Hussey and Peck, who were hanged at Oxford Castle on 25 July 1654. Anthony Wood recorded that both men were buried at St Peter-le-Bailey Church, although neither was identified within the recovered skeletal assemblage.[130]

Coffin Construction

Evidence for post-medieval coffins was based on remnants of decayed wood, iron fixing nails, and/or metal coffin fittings. Wood was too poorly preserved to observe carpentry techniques, but it was possible to observe the single-break shape of many of the coffins. The widespread prevalence of iron fixing nails, in ninety-six coffins, does

124 Ibid.
125 Litten, *English Way of Death,* p. 99.
126 Ibid.
127 May, *Victorian Undertaker*, p. 3.
128 Litten, *English Way of Death*, p. 171.
129 Friar, *Companion to Churches*, p. 71.
130 Mark Davies, *Stories of Oxford Castle: from Dungeon to Dunghill*, Oxford Towpath Series (Oxford, 2005), p. 130.

suggest that the planks of the coffin were held together primarily by nails rather than wooden pegs or joints as seen elsewhere – for example, in the mortice-and-tenon joints of Baptist coffins from Broad Street, Kings Lynn, Norfolk.[131]

All but two coffins appeared to have been constructed of wood – probably elm, the most widely used type of wood, on account of its water-retentive properties.[132] The exceptions were two triple coffins within brick shaft grave 44, one child-sized coffin (44a) probably the coffin of Rich Pratt, who died in 1822, aged 10. The two coffins were constructed of an inner coffin of wood, a lead shell, and an outer wooden case, upholstered and elaborately decorated with studs and coffin fittings. Triple coffins were very much more expensive than their simpler single wooden counterparts, and indicated the wealth of the Pratt-Cudd family, a family of local butchers. This modest affluence is consistent with their burial within brick shaft graves within the churchyard – usually the preserve of the artisan and middle classes of this period.

Coffin Fittings

From the early eighteenth century the upholstery of the wooden case was decorated with upholstery studs and a suite of metal coffin fittings or furnishings. The number and materials used for the fittings was eloquent of the wealth of the deceased and the family. However, it is important to note that even the humble went to considerable pains to bury their loved ones with as many accoutrements as they could afford.

A full suite of coffin fittings comprised one to four *departum* plates (an inner and outer breastplate, a headplate, and a footplate), lid motifs, escutcheons, grips, and grip plates. In addition, brass or iron studs, originally used to secure the upholstery to the wooden case, had became a decorative device, being arranged to create complex patterns on the lid and side panels of the coffin. Grips were produced by casting, but the rest of the coffin fittings were stamped using dies. Between 1720 and 1730 hand-operated die-stamping machines were used, but after this such machines became power-assisted. Coffin fittings could then be produced *en masse* and were financially accessible to a wide clientele by the mid-Georgian period.[133]

Excavations of the eighteenth- to nineteenth-century churchyard and crypt of Christ Church, Spitalfields, undertaken in the 1980s, revealed a large number of coffin fittings. The taxonomy compiled from these fittings forms the basis for identification of the styles in vogue throughout this period.[134] The coffin fittings of St Peter-le-Bailey Church were compared with this catalogue and with additional styles recorded from numerous post-medieval sites excavated by OA.

Upholstery Textile and Studs

Upholstery textile did not survive well in the burials of St Peter's churchyard, with fabric recorded from only five coffins (32, 44a, 45, 67a, and 99). Interestingly all five were within brick shaft graves. Upholstery textile appeared to be either velvet or baize, one recorded as black and another (67a) having brown edging, although some discolouration may have occurred after the burial.

Upholstery was indirectly attested by the presence of upholstery studs in thirty-five coffins (25 per cent). In one coffin these were of copper alloy, while iron studs were used in twenty coffins. The type of metal used in the remainder was not recorded. Single and double rows of studs were recovered from many coffins, probably outlining the margins of the coffin lid and side panels. The coffins were too poorly preserved to identify studwork patterns.

Grips

Grips were recovered from sixty post-medieval coffins (42.9 per cent). The number of grips varied between one and nine per coffin. The metal of grips from forty coffins was recorded (66.7 per cent). All were of iron. Unfortunately corrosion hampered the identification of decorative styles and motifs, and in only eight coffins could the styles be identified. Direct comparisons with the Christ Church Spitalfield's (CCS) grip styles were made in five cases, with coffin 433 identical to CCS 2b.[135] In the remainder the outlines of the grips were similarly shaped to CCS counterparts, but details of the motifs could not be discerned, due to the extent of the corrosion. The outlines of grips 92 and 242 were similar to CCS 4, while grip 101 resembled CCS 2a, grip 433 resembled CCS 2b, and grip 261, CCS 7. The grip style of coffin 67a was not identified at CCS, but previously had been recorded in a coffin from St Mary the Virgin Church, Kirtlington.[136]

131 C. V. Boston, 'Coffins and coffin fittings of the Baptist burial assemblage', in R. Brown and A. Hardy, *The Archaeology of the Newland: Excavations in King's Lynn, Norfolk, 2003–5*,' East Anglian Monographs (forthcoming).

132 Litten, *English Way of Death*, p. 90.

133 Ibid.

134 Jez Reeve and Max Adams, *The Spitalfields Project. I: The Archaeology: across the Styx*, CBA Research Report 85 (York, 1993).

135 Ibid.

136 'St Mary the Virgin Church, Kirtlington, Oxon, archaeological watching brief report' (OA TS report, 2008).

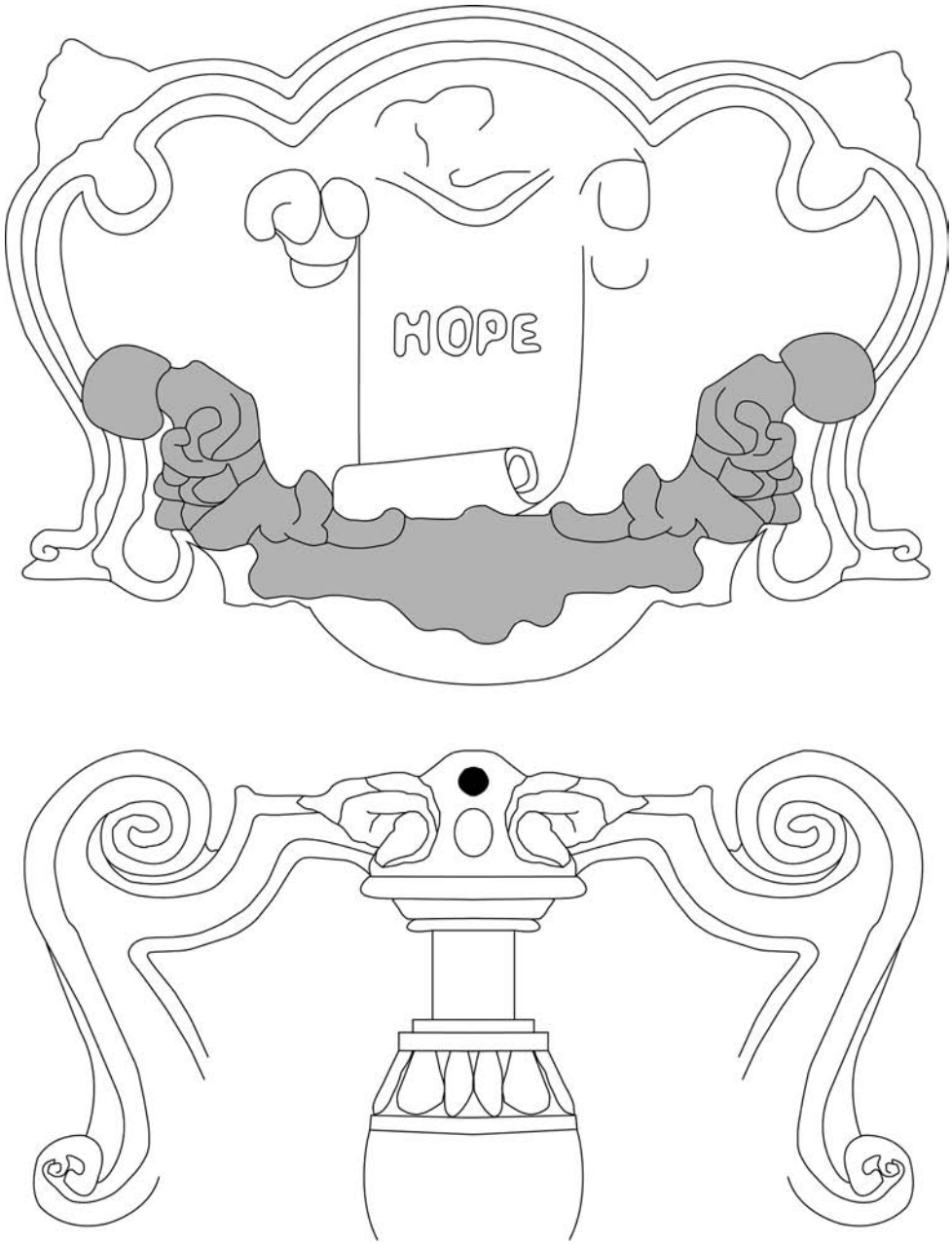

Fig. 18. Coffin 99, Grip OXBOSQ1 and grip plate, and grip plate from burial 67a

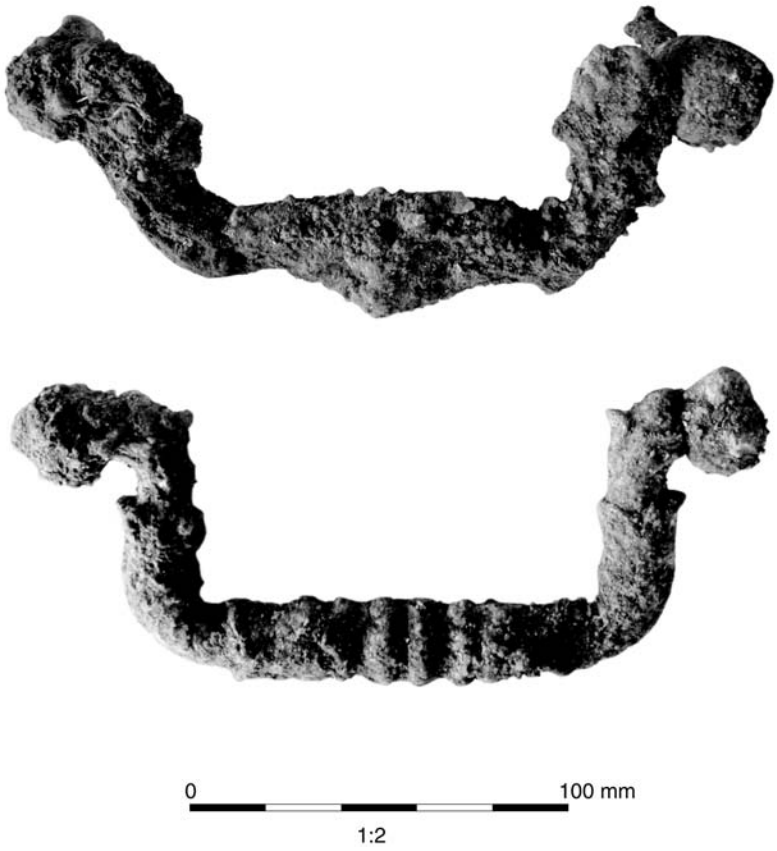

Fig. 19. Coffin 102, Grips OXBOSQ1 and 2

Coffins 99 and 102 included grip styles not previously recorded either in the CCS or OA coffin catalogues (the grip from coffin 99 can be seen in Fig. 18). Coffin 102 is interesting in having two new grip styles associated with the same coffin (Fig. 19). These three new styles have been included in the OA catalogue as OXBOSQ 1, 2, and 3, respectively.

Grip Plates

Grips were usually associated with grip plates – decorative, stamped metal plates bearing motifs, often of flowers, swirling foliage, drapes, cartouches, and cherubim. Greater variation in metal was possible in these coffin fittings than in the grips, with the most common being brass and iron, and the less common comprising tin or ormolou. Grip plates were recorded in thirty post-medieval coffins (21.4 per cent).

Like the grips, most of the grip plates in St Peter's churchyard were made of iron. In coffin 67a from brick shaft grave 67, some grips appeared to have been dipped in tin, a more expensive metal, thereby creating the illusion of greater affluence.[137] Painting of the grip plates was noted in coffins 32 and 44b, both from brick shaft graves.

Corrosion of the thin iron plates had destroyed or obscured the design of all but two plates (67a and 99). Neither type had been previously recorded in the CCS or OA catalogues. These new styles are illustrated in Figure 19, and in future will be referred to as OXBOSQ 1 and 2.

[137] Litten, *English Way of Death*, p. 107.

Breastplates

The incomplete remains of sixteen breastplates were recovered from sixteen graves (9.4 per cent). Breastplates were large sheets of metal attached to the coffin lid. The name of the deceased, their title, date of death, and age at death were either painted on to cheaper plates, or inscribed on the more expensive ones. No examples of the painted breastplates were recorded in the St Peter-le-Bailey assemblage – possibly due to their poor preservation. Stamped lead, iron, and tin breastplates commonly bore swirling flower, foliage, and drapery motifs, as well as crowns, shields, angels, and urns, which surrounded the central panel on which the identity of the deceased was displayed. In many brass breastplates stamping of motifs did not occur, the plate being a plain tapered, rectangular, or lozenge plate, sometimes with a simple border, and occasionally inscribed with the crest of a family or organization with which the individual was associated. Examples of such breastplates are known from St Luke's Church, Islington, Rycote Chapel, and St George's Church, Bloomsbury, and are generally associated with high-status burials, because they were expensive to produce.[138]

The breastplates recovered from St Peter-le-Bailey churchyard largely comprised large stamped sheets of iron, most of which were incomplete and badly corroded. Due to this poor preservation, it was not possible to identify their styles, and hence no comparison with other assemblages could be made. Nevertheless, evidence of stamped motifs was identified from the reverse of corroded fragments of many of the iron breastplates.

Four coffins (67a, 91, 92, and 151) appeared to be of high status in that their breastplates were composed of copper alloy, probably brass. An incomplete rectangular or tapered breastplate of copper alloy was identifiable from burial 151, bearing stamped motifs of an urn, foliage, and flowers, within a double border surrounding the central panel. Another incomplete copper-alloy breastplate was recovered from earth cut burial 91. It was stylistically similar to breastplate 64 from Rycote Chapel crypt.[139] Breastplate 67a was the best preserved. It was a plain, tapered plate without decoration, and did not appear to have been stamped. It bore the only legible inscription recorded in the St Peter's assemblage, which read as follows:

Edwin William Lee/ Died/ March 26 1865/ Aged 61 Years

Sawdust within Coffins

The base of two inner coffins appeared to be overlaid by sawdust. Sawdust is commonly found in eighteenth- to nineteenth-century coffins, and numerous other wooden coffins in St Peter's churchyard also contained it. Sawdust served the useful function of absorbing body fluids escaping from the corpse prior to burial.

In this period it was customary for the corpse to be laid out in an open coffin for viewing in the house of the deceased or their family for several days before interment.[140] Writing in 1843, Chadwick reported that in working-class families the corpse often remained in the house for between five and twelve days before burial. The length of this period was partly determined by the day of the week on which the person died, working-class funerals most commonly taking place on a Sunday – the only non-working day of the week. In addition, the corpse sometimes lingered in the house while relatives raised money for the funeral. The cheapest wooden coffin in 1840 cost around 3*s.* 6*d.* – a considerable sum to the more indigent of Victorian society.[141] The delay between death and interment was an issue that raised serious sanitation and public health concerns. In view of such delays, it was desirable to contain body fluids effectively, and hence the presence of sawdust in the coffins of St Peter-le-Bailey served an important sanitary as well as aesthetic function.

APPENDIX 3: POTTERY by PAUL BLINKHORN

The pottery assemblage comprised 117 sherds with a total weight of 2041 g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference was 0.31. It comprised a range of late Saxon and later wares, with the range of types present indicating that there was no pottery deposition of any note at the site between the early thirteenth and the early to mid-sixteenth century – the time of the medieval graveyard.

138 Boston and Boyle, 'Burial practice and material culture', in Boyle, Boston, and Witkin, 'St Luke's Church, Old Street, Islington', pp. 82–127; C. V. Boston, 'Rycote Chapel – coffin recording' (OA TS report, 2007); C. V. Boston, 'Burial practice and material culture', in C. V. Boston, A. Boyle, J. Gill, and A. V. Witkin, *In the Vaults Beneath: Archaeological Recording at St George's Church, Bloomsbury*,' OA Monographs Series (forthcoming); Litten, *English Way of Death*, p. 107.

139 Boston, 'Rycote Chapel'.

140 May, *Victorian Undertaker*, p. 16.

141 Ibid., p. 17.

The pottery was recorded using the coding system and chronology of the Oxfordshire County type-series, as follows:[142]

F100: OXR: St Neots Ware type T1(1), 850–1100. 5 sherds, 57 g, EVE = 0.09.
F200: OXAC: Cotswold-type ware, 975–1350. 28 sherds, 326 g, EVE = 0.09.
F202: OXBF: North-east Wiltshire Ware, 1050–1400. 2 sherds, 36 g, EVE = 0.05.
F300: OXY: Medieval Oxford ware, 1075–1350. 12 sherds, 154 g, EVE = 0.08.
F352: OXAM: Brill/Boarstall ware, 1200–1600. 9 sherds, 87 g, EVE = 0.
F408 OXAM: Brill/Boarstall 'Tudor Green' wares, 1475–1600. 1 sherd, 3 g, EVE = 0.
F410: OXCE: Tin-glazed Earthenware, 1613–1800. 1 sherd, 1 g.
F411: OXRESWL: Polychrome Slipware, 17th century. 2 sherds, 39 g.
F412: OXST: Westerwald stoneware. *c.*1590–1800. 1 sherd, 6 g.
F418: CRM: Creamware, mid-18th to early 19th century. 11 sherds, 61 g.
F425: OXDR: Red Earthenwares, 1550+. 13 sherds, 192 g.
F430: OXFI: Chinese Porcelain, *c.*1650+. 4 sherds, 45g.
F433: OXFM: Staffordshire White-glazed English Stoneware, 1730–1800. 1 sherd, 11g.
F436: OXEST: London stoneware. *c.*1680+. 3 sherds, 220 g.
F451: OXFH: Border wares, 1550–1700. 5 sherds, 69 g.
F1000: WHEW: Mass-produced white earthenwares, 19th–20th century. 19 sherds, 734 g.

The pottery occurrence by number and weight of sherds per context by fabric type is held in the archive. Each date should be regarded as a *terminus post quem*. All the fabric types are well known in Oxford and its hinterland. It appears significant that Brill/Boarstall ware (fabric OXAM) is extremely rare at this site, and also that 'Tudor Green' type wares (fabric OXBN) and Cistercian wares (OXCL) are entirely absent. All but one sherd of the Brill/Boarstall types present are in late medieval or early post-medieval fabrics. All these types are usually very common at medieval sites in Oxford, and the period from the thirteenth to the sixteenth centuries usually contains by far the largest groups from medieval sites in the city. Here early medieval types (OXAC, OXBF, and OXY), eleventh and twelfth century, are present in reasonable quantities and probably derive from late Saxon activity on the site. The absence of later medieval wares suggests very strongly that there was a hiatus in activity at the site, in terms of ceramic deposition, between the early years of the thirteenth century and the early to mid-sixteenth century.

Each context-specific assemblage was given a seriated phase date, based on the wares present, as shown in Table 10. The data shows that, as noted above, there is an almost complete lack of medieval pottery dating from after 1200. Stratified pottery from the eleventh to twelfth centuries is relatively common, and there is a small group of such material (10 sherds, 199 g) redeposited in nineteenth-century contexts. The fact that these earlier types are present in quantity in residual contexts means that the lack of later medieval pottery cannot be due to post-medieval truncation of earlier strata. The presence of a cemetery on the site is a very obvious reason for this hiatus; one would not expect refuse to have been dumped in a 'living' graveyard. The eighteenth-century pottery may have been deposited once the medieval church had collapsed and during the construction of the eighteenth-century church.

TABLE 10. CERAMIC PHASE CHRONOLOGY AND DEFINING WARES AND POTTERY OCCURRENCE BY NUMBER AND WEIGHT OF SHERDS PER PHASE

Phase	Date	Defining Fabric	No. Sherds	Wt Sherds
CP 1	early-late 11th c.	OXAC	9	145
CP 2	late 11th –12th c.	OXY, OXBF	17	174
CP 3	13th – 14th c.	OXAM, OXBG, OX68	1	5
CP 4	14th c.	OXAM	0	0
CP 5	15th – late 15th c.	OXBN	0	0
CP 6	late 15th – mid-16th c.	OXCL, OXAM, OXST	2	7
CP 7	mid-16th – 17th c.	OXDR, OXFH	11	174
CP 8	17th – mid-18th c.	OXREWSL, OXCE	15	236
CP 9	mid- to late 18th c.	OXFM, CRM	2	213
MOD	19th c.	WHEW	60	1087

142 Maureen Mellor, 'A summary of the key assemblages. A study of pottery, clay pipes, glass and other finds from fourteen pits, dating from the sixteenth to the nineteenth century', in T. G. Hassall et al., 'Excavations in St. Ebbe's, Oxford, 1967–1976. Part II: Post-medieval domestic tenements and the post-Dissolution site of the Greyfriars', *Oxoniensia*, 49 (1989), pp. 181–219; Maureen Mellor, 'Oxford pottery: a synthesis of middle and late Saxon, medieval and early post-medieval pottery in the Oxford region', *Oxoniensia*, 59 (1994), pp. 17–217.

APPENDIX 4: OTHER FINDS by ANDREW NORTON, CYNTHIA POOLE, IAN SCOTT, and RUTH SHAFFREY

Full reports of the following finds assemblages can be found in the archive. A total of forty-three metal fragments, comprising twelve iron fragments, five copper-alloy fragments, one fragment of lead, and twenty-five non-ferrous fragments from metalware were recovered from the site. The material comprised a number of household items, none of which need date from later than the late eighteenth or early nineteenth centuries. The small glass assemblage comprises twenty-eight sherds, with sixteen sherds of vessel glass and twelve sherds of window glass. The metalware and glass was recovered from graveyard soils and the construction backfill of an eighteenth-century wall. Fifteen fragments of clay tobacco pipes were also recovered from redeposited graveyard soils. The assemblage was recorded using standard OA methodology and dated by reference to Oswald's general typology.[143] Only one bowl was present in the assemblage, which was comparable with a London type 21G (1700–40). No decoration, makers' marks, or stamps were observed on the bowl or any of the stems. Three fragments of ceramic tile, a fragment of a perforated rectangular limestone medieval roof tile, and several small fragments of the same stone type were recovered from graveyard soils. A very small fragment of slate, probably from a roof, and a piece of burnt stone were also recovered.

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143 Adrian Oswald, *Clay Pipes for the Archaeologist*, BAR BS, 14 (1975).