

St Cross Church Oxford



Archaeological Watching Brief Report

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Prepared by: Deirdre Forde
Position: Historic Buildings Archaeologist

Checked by: Jon Gill
Position: Senior Projects Manager (Historic Buildings)

Approved by: Julian Munby Signed.....
Position: Head of Buildings Archaeology
Date: May 2011

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Illustrated by: Hannah Kennedy

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Oxford Archaeology

Janus House

Osney Mead

Oxford OX2 0ES

t: (0044) 01865 263800

e: oasouth@oxfordarch.co.uk

f: (0044) 01865 793496

w: www.thehumanjourney.net

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St. Cross Church, Oxford

Archaeological Watching Brief

Written by Deirdre Forde

With contributions from Róisín McCarthy and Paul Leader

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St. Cross Church, Oxford

Summary

Balliol College is undertaking a development at St Cross Church in Oxford, which will see the conversion of the large majority of the church into the college's archive store. OA was commissioned by Montgomery Architects, on behalf of Balliol College, to carry out a watching brief during the programme of ground works. OA had previously been commissioned to undertake an Historic Assessment of the church (February 2009) and a programme of Archaeological Recording of features within the floor which had been exposed by the removal of pews and floorboards (November 2009). Features exposed were to be expected in a church of this size and date. However, the foundations for the new archive units need concrete rafts at a maximum depth of 300 mm below the existing floor level, on permanent shuttering. In some areas of proposed development, voids were as shallow as 220mm, which raised issues concerning the impact of the development on the archaeology of the church.

Subsequent ground works involved the removal of limestone slabs in the central aisle and the west side of the south aisle and the lowering of the floor surface to a depth of 300mm in these areas. A trench 1500mm wide running north south underneath the tower needed to be reduced by 700mm. Another smaller trench, 300mm deep, was cut around the south west exterior of the church.

An archaeological watching brief was maintained for the duration of these ground works, during which at least seven more burials were exposed as well as human remains in the trench on the south west exterior. Mortar floor packing was exposed the south aisle and 19th and 20th century services activity in the area of the font in the west end of the south aisle. Two test trenches were excavated archaeologically into the area of the proposed service trench under the tower to investigate potential significant archaeological activity. A watching brief was maintained during the removal of the remainder of the trench, during which an adult skeleton, thought to be medieval, was exposed, excavated and re-buried within the church. Partially articulated human remains, previously disturbed, were found in the narrow trench dug from the west exterior to the south exterior.



1 INTRODUCTION

1.1 Background

- 1.1.1 Balliol College is undertaking a development at St Cross Church in Oxford, which will see the conversion of the large majority of the church into the college's archive store. OA was commissioned by Montgomery Architects, on behalf of Balliol College, to carry out a watching brief during the programme of ground works.
- 1.1.2 OA has previously undertaken an Historic Building Assessment of the church (February 2009) and a programme of Archaeological Recording of features within the floor which had been exposed by the removal of pews and floorboards (November 2009). Features exposed, such as dwarf walls, Victorian services and burial vaults, were to be expected in a church of this size and date.
- 1.1.3 The current document is intended to be read alongside the assessment report and there are various elements in the previous study such as the historical background, maps and memorials catalogue which are relevant to the current work, but which have not been fully reproduced here.

1.2 Aims and objectives

- 1.2.1 The main aim of the watching brief element of the overall project was to record the presence or absence, extent, condition, character, quality and date of any archaeological features within the area affected by the removal of historic fabric and redevelopment of the church.
- 1.2.2 Other principal aims were to produce a photographic record of the historic fabric of the church and any archaeological features detected prior to removal or displacement, and to make available the results of the investigation.

1.3 Methodology

- 1.3.1 A watching brief was maintained during the period of ground works that may have affected or revealed unknown archaeological features.
- 1.3.2 The main element of this recording was a photographic survey using both digital photographs and archivally stable black and white film carried out during ground works. A complete floor plan of exposed features within the church was also produced after the removal of the limestone floor and wooden pews from the nave, aisles and tower areas of the church.
- 1.3.3 The watching brief also involved recording of burials and excavation of human remains where necessary. Human remains were subsequently reburied within the church.
- 1.3.4 A written report was then produced to accompany and further understanding of both the photographic survey and the archaeologically annotated plan.

2 HISTORICAL BACKGROUND

2.1 Introduction

- 2.1.1 As referred to above the previous assessment report (OA, Feb 2009) contained a detailed historical background and although this has not been reproduced here a short summary would be of use. The background was based on research undertaken at the Oxfordshire Record Office and the Centre for Oxfordshire Studies. It was also based on a Pastoral



Measures Report undertaken by Joseph Elders and useful information supplied by Dr JH Jones (Senior Fellow, Balliol College).

- 2.1.2 The earliest parts of the current church at St Cross (the chancel and part of the chancel walls) probably date from the first half of the 12th century. This chapel would probably have merely comprised a nave and chancel and it would have served a small extra-mural settlement at Holywell, which had grown outside the East Gate of the town in the Saxon period.
- 2.1.3 During the 13th century a tower was added to the west end of the nave and the north and south aisles, which had by this date been constructed, were extended west to flank the tower.
- 2.1.4 In the 15th century part of the tower appears to have collapsed, causing damage to the aisles, and in 1464 it was rebuilt (and possibly heightened) by Henry Sever, Warden of Merton College (RCHM, 1939). Possibly following this collapse the aisles were pulled down other than the western bay of the north aisle (as shown on Logan's map of 1675) and the eastern bay of the south aisle (the chapel).
- 2.1.5 A porch was added in 1572 to the south aisle (shown on early 19th-century views Fig 6 and 7) and in 1685 the north wall of the nave was rebuilt. In 1837-8 a new north aisle was added which extended from the east end of the nave to the lean-to adjacent to the tower which had been used as a vestry.
- 2.1.6 Reused 15th-century windows were inserted in the wall of the north aisle and clerestory windows were added to the south wall of the nave.
- 2.1.7 In 1843-4 the remains of the former south aisle were also taken down, together with the small lean-to on the north side of the tower. A new south aisle was built the full length of the nave and tower and the north aisle was extended at its west end (replacing the vestry lean-to) to match. A new porch, to replace the previous one, was also built to the south aisle. Clerestory windows were added at this time to the south wall of the nave.
- 2.1.8 In 1874 the tower was repaired and the parapet rebuilt. A vestry and an organ chamber were added in 1876 to the north of the chancel. In 1892-4 new clerestory windows were added (or enlarged) by EP Warren and the tower was repaired again in 1908.

3 WATCHING BRIEF

3.1 Introduction and General Description

- 3.1.1 It was clear from the character of the paving that there had been a wholesale re-flooring of the church probably in the 19th or early 20th century, probably in association with replacement of pews or installation of a new heating system. A heating plan dated 1898 (PAR199/17/MS1/18) suggests that the layout of floorboards and pews was at that date largely the same as that which survived until their recent removal. The plan suggests that the pipes extended around the edge of the church rather than along the length of the nave and aisles. This suggests that the heating system would not have caused extensive disturbance to below-ground features.
- 3.1.2 Three new areas in total were exposed, further to the six areas exposed by the pew removal in November 2009. The west end of the south aisle where the font stood was cleared along with the area under the tower and the limestone causeway running east to west through the nave. The south aisle was also subject to further reduction by approximately 10cm during ground works.



3.1.3 Attempts had been made to locate burials with radar survey, with limited success. The removal of pew platforms had allowed for a more direct investigation of visible remains during the recording in November 2009. During the watching brief, a further seven burials as well as some disturbed human remains were identified.

3.2 South Aisle

3.2.1 After the original clearance of the south aisle in November 2009, a collapsed vault structure had been partially exposed which appeared to be a shaft grave at the eastern end of the south aisle (**Burial 1**). This is orientated north to south and is c.85 cm wide with some bones visible inside. It is truncated by some red bricks in the centre supporting the stone edge. It was not necessary to investigate this further as it was below the 300mm required reduction.

3.2.2 Much of the rest of the south aisle was approximately 100mm above the required reduction, therefore it was necessary to reduce it further. No more defined burials were visible at this level, although various large fragments of human bone were found throughout the area during brushing back, particularly in the south west corner. Further reduction of a hard pale mortar surface in the area was carried out by archaeologists with mattocks and trowels.

3.2.3 An additional two burials and a third possible burial were found in the north east corner of the aisle. One of these was immediately adjacent to the eastern most pillar separating the aisle from the nave on the south side (**Burial 8**). On the surface, it consisted of three large slabs fixed with a hard, compact white lime mortar. The centre slab appeared to be a broken Ogee topped headstone and has the initials 'MB' inscribed in it (Plate 1). The east and west stones were much rougher and appeared to be undressed from the surface. A hole at the east end of the burial allowed for photos of the interior to be taken. It is a red brick, coffin shaped chamber, orientated east west with the head towards the west, the base of which is obscured by debris but pieces of coffin timbers and fixtures can be seen. The brick is laid in a stretcher bond and the base of the stones appeared to be dressed (Plate 2).

3.2.4 Almost immediately south east of this is another possible burial (**Burial 9**), which on the surface is made up of three rough stone slabs, fixed in a hard, compact white lime mortar, and orientated east west. Approximately a metre to the south of the first burial is a further possible burial (**Burial 10**). From the surface, two rough stone slabs, fixed in a hard, compact lime mortar, orientated east west were detected (Plate 3). It was unnecessary to investigate any of these burials further as they were at an appropriate level below the necessary reduction.

3.2.5 Immediately south of the possible burial described in 3.2.1, and running alongside the south wall of the aisle, there is a feature which is possibly a robbed out wall. It measures approximately 2.35m x 0.7m and it is orientated east to west (Plate 4). It consists of large stones, packed into the earth within a darker context than the rest of the aisle and stops abruptly at the west end. It is slightly irregular and not quite parallel with the south wall of the aisle, therefore it may simply be some packing that was laid down to create an even ground surface.

3.2.6 The western half of the south aisle (immediately east of the font area) was packed with a very hard, compact white lime mortar surface (Plate 5). Within this were areas of large packing stones. The area is approximately 3.15m x 2.5m within the south aisle area and is deeper than the required 300mm below datum.

3.3 Western end of South Aisle (Font Area)

- 3.3.1 Before the limestone floor was removed from this area, the large 19th century font was removed and placed in the chancel while works commenced. Beneath the limestone floor, the ground was loose and friable around a large red brick plinth, constructed as a base for the font (Plate 6). This consisted of three courses of solid brick with a hollow, most likely a font drain, in the centre.
- 3.3.2 Approximately 1.5m north of the plinth is another small red brick feature. It consists of four bricks laid in a square creating a small square void in the centre. There are at least three courses of bricks and the centre is full of debris. It was only necessary to remove the top course of brick as the second course was below the required reduction level. It is most likely associated with Victorian services activity in the area.
- 3.3.3 West of the plinth, there is some modern activity. Beneath the limestone floor was a layer of concrete and under this was two red brick dwarf walls run parallel with each other, from the plinth to the west wall. From the inside edges of brick, they are spaced 87cm apart and 4.33m in length from east to west. In between the bricks, the ground is packed with sand and evenly placed broken stones (Plate 7). The stones are of good quality and are most likely broken pieces and debris from past structural works in the church or pieces of broken floor stone. This arrangement appears to be relatively modern, or has been disturbed in recent years, as a piece of plastic bag was found in between some stones. A red brick drain runs from the north side of this feature and continues under the tower area (See 3.5).
- 3.3.4 In the south west corner of the church, another burial was found (**Burial 11**) slightly out of line with the south wall of the south aisle (Plate 8). On the surface, it consisted of three large rough slabs fixed with a hard, compact white lime mortar. These slabs were removed as they lay above the level of necessary floor reduction. Beneath was a red brick coffin shaped chamber, orientated east west with the head towards the west, 2.18m in length and 0.73m in width at its widest. The base is obscured by debris including pieces of coffin timbers and fixtures. Some human remains were visible. The brick is laid in a stretcher bond and the base of the stones appeared to be dressed. It was not necessary to disturb the red brick chamber or the remains and it was covered over with strong wooden ply board to protect it from the floor surface, which was to be inserted.

3.4 Central Nave

- 3.4.1 The removal of the limestone causeway in the central nave revealed four more burials. Excavation was unnecessary as all were below the level of floor reduction. The first is in the very centre of the nave (**Burial 12**) and only two rough partially buried slabs were exposed after the reduction. There is a wide gap between the slabs where part of one has crumbled and visible below was part of the the red brick lined chamber (Plate 9). Inside, debris was visible with some broken coffin timbers towards the west end.
- 3.4.2 At the east end of the nave, at the south side of the entrance to the chancel, a hole was uncovered over a small brick lined passage leading east to a larger chamber under the chancel (**Burial 13**). It is a deep brick lined chamber and at least three decayed coffins can be identified (Plates 10 & 11).
- 3.4.3 About a metre south west of this hole is an almost fully exposed red brick vault (Plate 12). It is orientated east west and the bricks of its convex, vaulted covering are laid in rows east to west with no distinguishable bond. It is approximately 56cm wide and 1.15m in length where exposed. This was identified as **Burial 6** (See *the Archaeological Recording of the floor at St. Cross, OA 2009*).

- 3.4.4 In the north east corner of the nave is a further burial, orientated east west, covered with approximately three large rough stone slabs fixed with a very compact pale lime mortar (**Burial 14**). The eastern most slab is broken in two pieces and was too precarious to allow a camera inside without the risk of further damage (Plate 13).

3.5 Area below Tower

- 3.5.1 A trench approximately 70cm deep and 1.5m wide was cut north to south across the area under the tower for services. Before the work was carried out, two test pits were excavated by archaeologists to the north and south sides of the entrance. In the southern trench (**Test Pit 1**), which was approximately 1.5m x 1m and 70cm deep, the first 10cm layer constituted a powdery mortar and mixed limestone rubble (**A**) making up a post Victorian levelling. Partially within and partially below this, 19th century services were exposed (Plate 14). A red brick drain ran north to south and carried on to where the removed drain meets the red brick feature in the front area of the south aisle (See 3.3.3). Around this is loose, red brown sandy silt layer (**B**) and below it is a moderately friable, orange brown sandy silt with 3-6% small stones (**E**). In the east side of the trench, the footing for the south east pillar of the tower is exposed (**C**). This consists of large limestones, semi roughly faced at the exposed west side of the north west corner. Behind this, to the south, are smaller more irregular limestones (**D**) making up the middle of the footing.
- 3.5.2 In the northern test trench (**Test Pit 2**), which was approximately 1.5m x 1m and 70cm deep, the first 10cm layer constituted a powdery mortar and mixed limestone rubble (**A**) making up a post Victorian levelling. Below this, 19th century activity was exposed in a moderately friable, orange brown sandy silt with 3-6% small stones (**E**). A lead pipe runs north west to south east and underneath it, a red brick wall runs in line with it (Plate 15). The wall is one brick in thickness (11cm) and two and a half courses were exposed. Another line of bricks was exposed on the immediate north east side of this wall but only the top of the bricks were visible at 70cm. In the south east corner of the trench, both the pipe and the wall turn in a straight southerly direction.
- 3.5.3 Once test trenches were fully excavated, work began on the remaining parts of the services trench by ground workers while an archaeological watching brief was maintained. Approximately 15-20cm below the surface, approximately 10cm below (**A**), human bone was detected. Investigation with trowel and leaf trowel revealed the articulated skeleton of an adult female which had been truncated below the pelvis by 19th century services activity (**Burial 15**). Part of the femurs remained and a few phalanges were found in the soil around the truncation (*See Appendix B for full Discussion, Results and Conclusion of human remains analysis*). The remains were interred in a simple, shallow earth-cut grave (**F**) with no associated coffin material (Plate 16). No discernible grave cut was visible. The soil around the remains was an orange brown, friable sandy silt with very occasional pebbles (**G**). Remains were excavated with a leaf trowel and small brush and reburied in **Burial 12**.
- 3.5.4 The earth immediately to the east of (**F**) contained the remains of the continued red brick services between **Test Pit 1** and **Test Pit 2**. Surrounding it was a moderately friable, orange brown sandy silt with 3-6% small stones (**E**)
- 3.5.5 Parts of another articulated skeleton were discovered at the base of the trench under the area of **Burial 15** orientated east west with the head towards the west. Only parts of the ribs and a few skull fragments were exposed. The lower half of the remains lay underneath the side of the trench on the east side. Remains were left undisturbed and appropriately covered over before the base of the trench was lined.



3.6 Extra-mural Watching Brief

- 3.6.1 *Service Trench* (By Paul Leader) In the area to the west of the church a grey brown topsoil overlay a red brown, gravelly sand subsoil. This extended from the church wall to the west to the boundary wall to the east and from the path to the West door to the north to the terrace of the grave yard to the south (Figure 2). The deposit was c. 0.2m deep and is most likely C19th/C20th topsoil for an area that was previously turfed.
- 3.6.2 The subsoil was only disturbed during the excavation of the service trench rather than the wider, pathway trench. This was the lowest deposit observed so had a depth greater than 0.25m.
- 3.6.3 To the south side of the church an existing flag stone path was lifted where necessary. This exposed a yellow brown, sandy gravel make-up for the path. This deposit was a mix of subsoil, disturbed natural and make-up for the pathway and possibly dates from the 1840's when the church was extended to the southern side.
- 3.6.4 The deposit showed signs of further truncation with disturbed human remains and modern drainage although it was not possible to define any cuts or phasing due to the modern and mixed nature of the deposit.
- 3.6.5 No further deposits were encountered
- 3.6.6 To the west side of the church very little material was recovered. A small amount of unarticulated and previously disturbed human bone was recovered, c.50-100 pieces including a fragmented skull and long bones. Remains were deposited into the church crypt.
- 3.6.7 To the wouth side of the church significantly more human bone was recovered. From the south-west corner of the church to the southern Door a wide range of human bone was recovered including three fragmented skulls, a previously disturbed burial consisting of the legs and feet as well as charnel remains of the rest of the skeleton, deposited where the pelvis would have been (Plate 17). A large amount of disarticulated remains where recovered from the trench in general. All of the remains were deposited in the church crypt.
- 3.6.8 One articulated skeleton was found in the service trench to the south side of the church (**Burial 16**). The skeleton was revealed as far as the pelvis but it was decided to leave this in situ and divert the service trench accordingly. The skeleton appeared complete (as far as the pelvis), apart from the skull which may have been disturbed during the installation of drains and may have been one of the three skulls found in the trench to the west, although this was not proven.
- 3.6.9 *Argonite Store* A rectangular trench was dug in the garden of Holywell Manor garden, which is immediately north of St. Cross Church (Plate 18). The trench was dug at the south side of the garden adjacent to the boundary wall of St. Cross church for the purposes of foundations for an Argonite store. The trench is 900mm deep and approximately 400mm wide and traces the footprint of the Argonite store, which is 3.3m north to south and 2.1m east to west.
- 3.6.10 The trench was dug with a spade and under the grass is a dark brown loamy topsoil, which was relatively easy to remove. At a depth of about 75cm, a harder grittier layer of brownish yellow natural soil was exposed and remained consistent to the depth of 900mm.



- 3.6.11 No finds of archaeological significance were exposed during the excavation of the trench. The articulated bones of a small dog were uncovered at a depth of about 400mm in the south west corner of the trench and deposited elsewhere in the garden.

4 CONCLUSION

- 4.1.1 Burials exposed during groundworks were to be expected in a church of this size and date. The presence of intramural graves in the church suggests an upper middle to upper class congregation and those buried within the church would have been families of high status within the parish. Concerns over the premature disturbance of remains and an increase in the use of death ritual as a social display in the 18th and 19th centuries led to the establishment of brick-built family vaults and shaft graves within the churches and these graves often hold the remains of multiple burials. Subterranean, intramural burials were marked with memorial stones set into the floor or on walls close to the burial within the church. Close to the location of **Burials 6, 13 and 14** were two such memorial stones, situated in the walkway in front of the chancel. These read: Near this place lieth / GEORGE SEIDEL D. D. / Dyed 20 Oct. 1761 / Aged 81 and Here / Lyeth the Body of / SOPHIA AUGUSTA SEIDEL / who died June 24 / 1712 (?) / Aged (?). A corresponding wall memorial gives her age at time of death as 56 years and the date as 1752.
- 4.1.2 The fact that the greatest concentration of burials are in a line on the north side of the nave however, is a little more unusual (See Fig. 2). This would suggest that there was an aisle here at some point. This is made all the more unusual by the fact that any aisle that existed here would have been in line with the north east pillar of the tower and this is unlikely. There were pews covering this area as far back as the mid 19th century but perhaps it was once more exposed allowing for the concentration of burials. In the 1860s, burials within the church ceased.
- 4.1.3 The extra-mural human remains found to the west side of the church are most likely due to disturbance and rebuilding in and around the church over a broad period of time, which has led to the bones being redeposited within the topsoil and subsoil.
- 4.1.4 To the south side of the church the more significant and intact human remains probably relate to the graveyard prior to the extension of the church in the nineteenth century. Currently the graveyard slopes down sharply from the south to the pathway at the south side of the church with the drop in height being around 1.5-1.8m. With the extension standing around 5-6m from the original church this area would have once been part of the grave yard. When the area was terraced to accommodate the extension, burials would have been disturbed, and perhaps leaving these disarticulated remains. The shallow graves of the articulated remains (**Burial 16**) are also probably due to the terracing which has left them only c. 0.1-0.2m below the current ground surface.

Deirdre Forde

May 2011



APPENDIX A. BIBLIOGRAPHY

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APPENDIX B. SPECIALIST REPORT ON HUMAN SKELETAL REMAINS FROM ST. CROSS CHURCH, OXFORD (SITE CODE: OXCRS10)

By Róisín McCarthy

April 2010

Introduction

The partial remains of an adult female were recovered during test-pit excavations inside St. Cross Church, Oxford in advance of restoration works. The remains were interred in a simple, shallow earth-cut grave (Burial **16**, Grave Cut **F**) with no associated coffin material. No discernible grave cut was visible. The position of the remains indicated a supine extended burial of west-east orientation, with the head in the west, and the arms and hands extended by the side of the body. The skeleton was heavily truncated at the eastern end as a result of 19th century ground-works disturbance relating to the installation of pipes in the Church during this period. The depth of burial indicated that the remains were likely to be Medieval in date, being approximately 0.45m beneath the modern Church floor.

Osteological Analysis

Preservation

The partial remains included the pelvic region up to and including the thorax and skull. Many of the bones were clearly intact *in situ* but fragmented into smaller pieces, despite extra care, when lifted. Truncation of the burial had resulted in the loss of the legs and feet. The cranium was heavily fragmented, particularly the bones of the face, whilst the lower jaw (mandible) was largely intact.

The majority of bone fragment surfaces were in a good state of preservation and qualified according to the Brickley and McKinley (2004) preservation grade system as Grade 0: '*bone surfaces morphology clearly visible with fresh appearance to bone and no modifications*' to Grade 1: '*slight patchy surface erosion*'.

Despite minimal erosion, the bones were highly friable, breaking into much smaller pieces once lifted. Bones composed of 'spongy bone' (*i.e.* trabecular bone) such as the vertebrae and ribs were noted as being particularly susceptible to fragmentation. The poor condition of the bones in this respect may be an indication of an aggressive burial environment, perhaps related to overly acidic soil. The positioning of the burial in direct line with the main church entrance (and therefore directly below the main flow of foot-traffic into the building) coupled with the shallow depth of the burial almost certainly contributed to disturbance of the burial context. The absence of a coffin also meant the skeletal remains were afforded little in the way of protection from these types of disturbances.

Faint markings were noted on the external surfaces of the arm bones and are probably the result of minor root action. All of the bones were stained an orange/tan colour as a result of contact with the surrounding soil.

Minimum Number of Individuals (MNI)

There was no duplication of skeletal elements indicating a minimum of one individual was present.

Estimation of Biological Sex and Age



Biological sex estimation was determined via observations of sexually dimorphic traits of the skull and pelvis. As the pelvis reflects skeletal adaptation to child-bearing in females it is considered the most reliable indicator of biological sex (Roberts 2009). Supplementary post-cranial measurements of the humeral heads known to exhibit sexually dimorphic ranges between males and females were also taken (Ferembach *et al.* 1980). Observations of these traits and measurements indicated that the skeleton was that of a female.

Age estimation was determined using observations of epiphyseal fusion (Scheuer and Black 2000), morphological changes on the sternal end of the ribs (Iskan and Loth 1986) and degenerative changes of the auricular surface (Buckberry and Chamberlain 2004) and pubic symphyses of the pelvis (Brooks and Suchey 1990). An age estimate of middle adult with an age-at-death range of between 35-45years was achieved based on these observations.

Stature

Stature estimation is usually determined by measuring complete long-bone lengths and applying a regression formula which relates to the sex of the individual to translate this initial figure into height during life (REF). Estimates based on measurements of the lower long bones are intrinsically more reliable than those of the upper limb bones. In the present case only the upper limb bones were present, however they were insufficiently complete to be useful for stature estimation.

Pathology

Observable teeth and the surviving portions of upper and lower jaw were examined for signs of pathological changes; primarily evidence of caries (*i.e.* dental decay), calculus (*i.e.* levels of tartar), periapical abscesses, dental enamel hypoplasia, periodontal disease and dental anomalies (*e.g.* overcrowding and malocclusion). The dentition of the individual exhibited minimal levels of attrition and very slight flecks of calculus on the lingual surface of the anterior tooth crowns and at the cemento-enamel junction of the surviving molars. Calculus, (colloquially termed ‘tartar’), results from the mineralization of microorganisms that have become embedded in a matrix of protein and saliva adhering to the teeth (Hillson 1996). Calculus formation has been linked to diets high in protein and/or carbohydrates. High levels of calculus in archaeological populations may therefore be an indication of diet but also of oral hygiene practices.

Table 1 Dental Inventory

8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8

*Key: X= Lost post-mortem, --- = Jaw not present

Skeletal manifestations of age-related disease were noted on a number of extraspinal and spinal joints of the individual. Marginal osteophytosis (new bone formation at the articular margins of a joint) were noted on several joint margins, but was most severe on the hip joints. These lesions are commonly seen in mature-old adults and a thus commonly associated with age degeneration in the skeleton (Rogers and Waldron 1995).

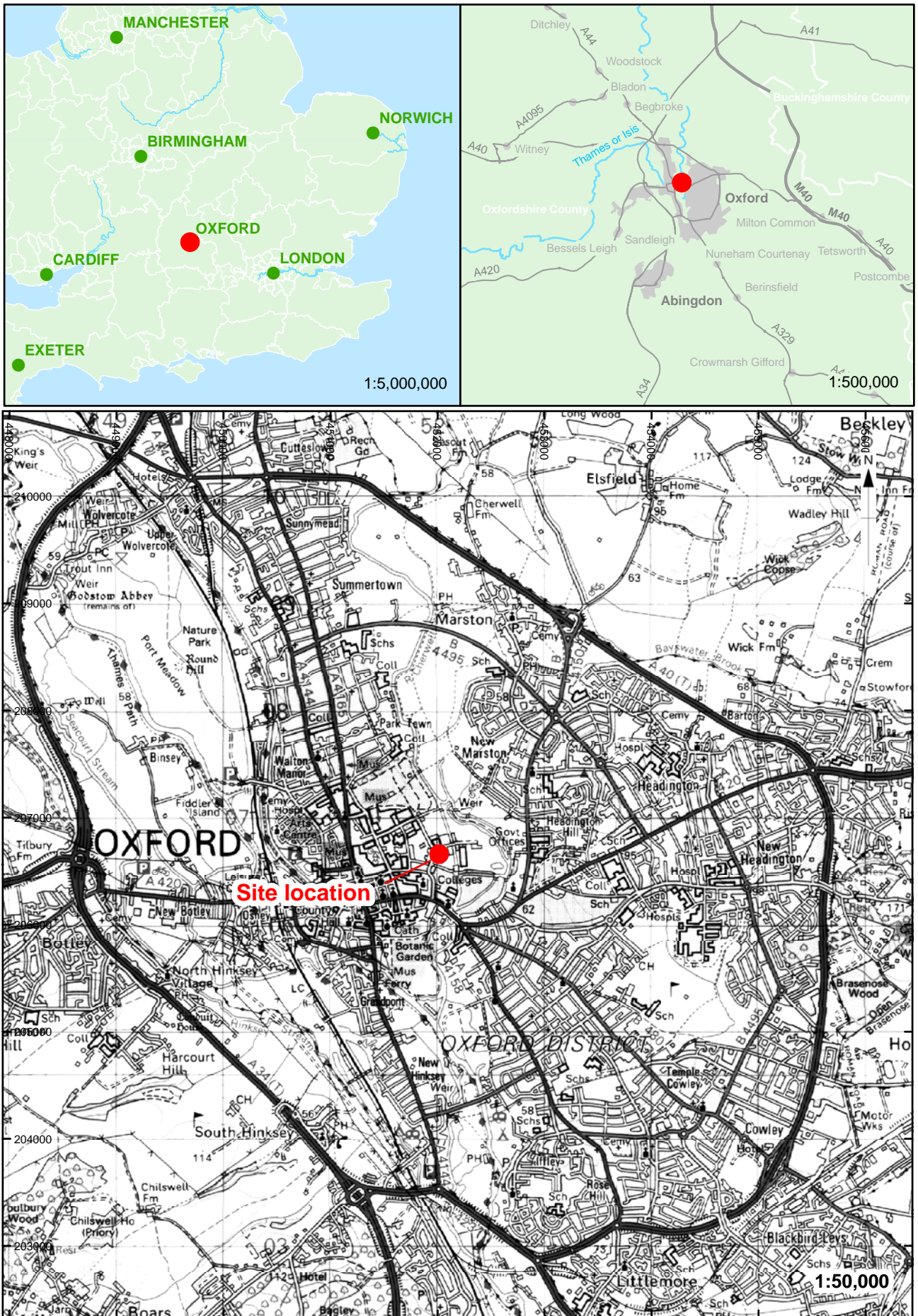
Osteophytosis and surface pitting was also observed on bones of the lower back region, and involved the surfaces of the 3rd, 4th and 5th lumbar vertebral bodies. These changes are also commonly linked to age degeneration in the spine where there is breakdown of the intervertebral disc and thus the intervertebral space; a disease process referred to as ‘degenerative disc disease’ (Rogers and Waldron 1995, 27).



Finally, a number of Schmorl's nodes were identified on the lumbar vertebral body surfaces. These are identified on dry bone as shallow to deep areas of bone resorption on the vertebral end plates. They represent 'pressure defects' arising when the intervertebral disc herniates allowing the nucleus pulposus to bulge out putting pressure on the underlying bone (Rogers and Waldron 1995). The most marked Schmorl's node in the present case was identified on the superior body surface of the 3rd lumbar vertebra. These lesions are commonly reported in archaeological populations (*ibid.*, 27)

Summary of Results and Conclusions

- The skeletal material submitted for analysis largely consisted of the partial articulated remains of a middle-adult female, aged at between 35 to 45 years at her time of death.
- Skeletal manifestations of disease on the individual related to typical age-related degenerative changes (*i.e.* osteophytosis) affecting most notably the lower spine and hip joints. Dental disease was minimal with very slight levels of calculus and dental wear noted on the surviving teeth.
- The skeletal elements were highly friable most likely as a result of the shallow burial depth and the grave's position directly in front of the main Church entrance. Bone surface morphology was very clear whilst the bones were in situ and meant that osteological observations could be made with regard to biological age, sex and pathology. Stature estimation was not possible due to the fragmentary nature of the surviving longbones.



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Figure 1: Site location

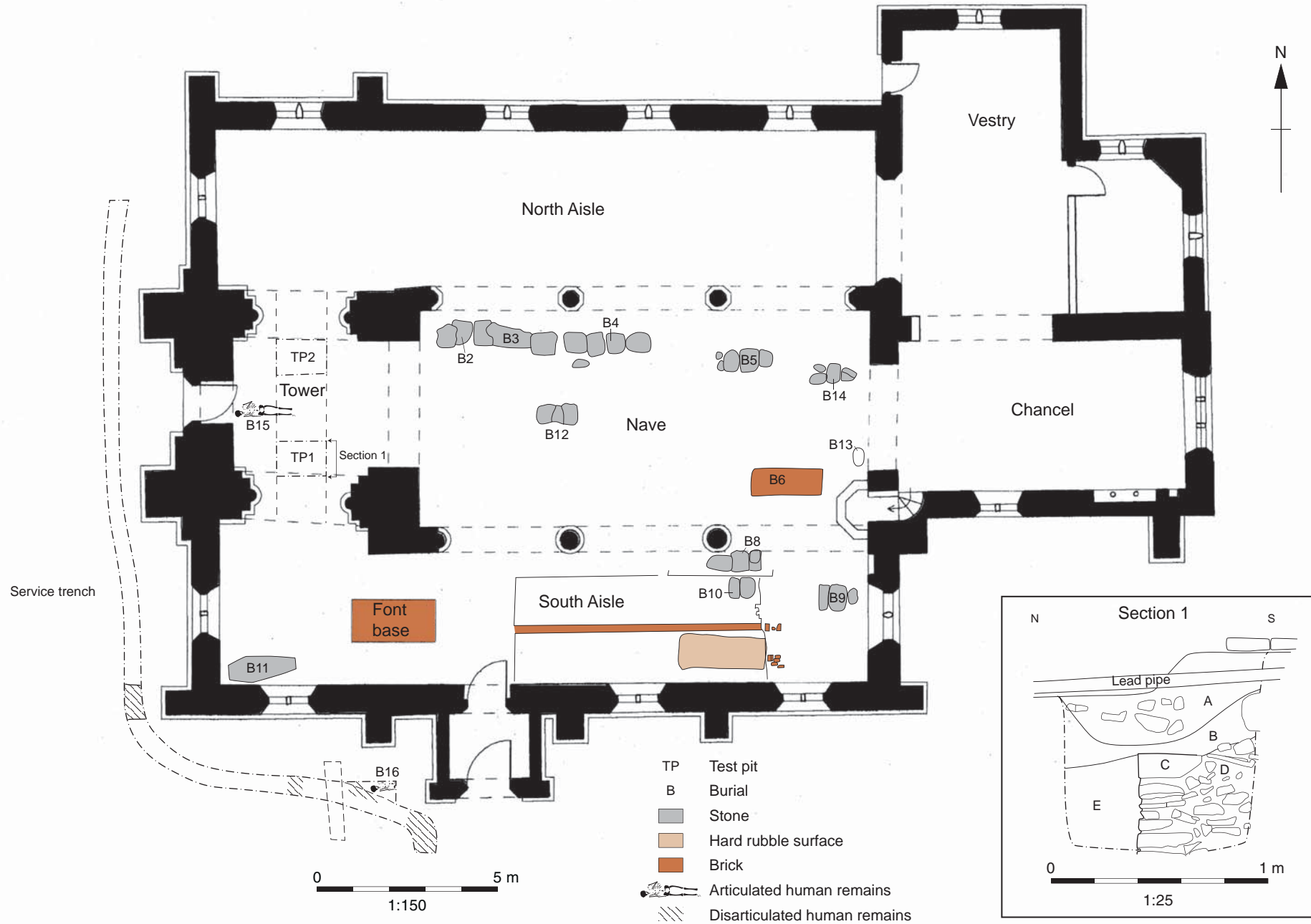


Figure 2: Plan of St Cross Church, Oxford, showing burials and section 1



Plate 1: Burial 8, facing north



Plate 2: Interior of Burial 8, facing west



Plate 3: Burial 10, facing east



Plate 4: Possible robbed out wall in south aisle, facing south



Plate 5: South aisle, facing east



Plate 6: Red Brick plinth for font in south aisle, facing west



Plate 7: Red Brick and rubble feature in south aisle, facing west



Plate 8: Burial 11, facing south



Plate 9: Burial 12, facing north



Plate 10: Entrance to Burial 13, facing east



Plate 11: Interior of Burial 13, facing east



Plate 12: Burial 6, facing south



Plate 13: Burial 14, facing south



Plate 14: Test Pit 1, Area under tower



Plate 15: Test Pit 2, Area under tower



Plate 16: Burial 16, showing truncated remains of adult female skeleton



Plate 17: Burial 17, Showing extra-mural truncated human remains



Plate 18: Excavation for Argonite store in Holywell Manor garden



Head Office/Registered Office/ OA South

Janus House
Osney Mead
Oxford OX2 0ES

t: +44 (0) 1865 263 800
f: +44 (0) 1865 793 496
e: info@oxfordarch.co.uk
w: <http://thehumanjourney.net>

OA North

Mill 3
Moor Lane
Lancaster LA1 1GF

t: +44 (0) 1524 541 000
f: +44 (0) 1524 848 606
e: [oanorth@thehumanjourney.net](mailto: oanorth@thehumanjourney.net)
w: <http://thehumanjourney.net>

OA East

15 Trafalgar Way
Bar Hill
Cambridgeshire
CB23 8SQ

t: +44 (0) 1223 850500
f: +44 (0) 1223 850599
e: [oaeast@thehumanjourney.net](mailto: oaeast@thehumanjourney.net)
w: <http://thehumanjourney.net>

OA Méditerranée

115 Rue Merlot
ZAC La Louvade
34 130 Mauguio
France

t: +33 (0) 4.67.57.86.92
f: +33 (0) 4.67.42.65.93
e: [oamed@thehumanjourney.net](mailto: oamed@thehumanjourney.net)
w: <http://oamed.fr/>

OA Grand Ouest

7 Rue des Monderaines
ZI - Ouest
14650 Carpiquet
France

t: +33 (0) 2 49 88 01 01
f: +33 (0) 2 49 88 01 02
e: [info@oago.fr](mailto: info@oago.fr)
w: <http://oago.fr>



Director: David Jennings, BA MIFA FSA

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