Excavations in Christ Church Cathedral Graveyard, Oxford

By Angela Boyle

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SUMMARY

The Oxford Archaeological Unit excavated three trenches within Christ Church Cathedral graveyard during the summer of 1998 in advance of the proposed extension of the graveyard. A total of 37 skeletons ranging in date from the 7th to the 11th century were excavated. The assemblage is perhaps most notable for the marked predominance of males in the group: only three females were identified. Three of the skeletons were radiocarbon dated. All were west-east aligned sub-rectangular graves. The burials were all supine extended and unaccompanied with the exception of one who was wearing a copper alloy belt buckle. A number of graves had stone linings while one had possible 'ear-muffs' and there was evidence for ?wooden coffins in the form of iron nails and probable iron coffin fittings.

The Oxford Archaeological Unit carried out an archaeological excavation within Christ Church Cathedral graveyard during the summer of 1998 (Fig. 1). A total of three trenches were excavated. Trench 1 measured 2 m.[2] and was excavated to a depth of 1.80 m. In addition a sondage was excavated to a depth of 2.80 m. below ground level to determine the depth of natural gravel. Trench 2 measured 3 x 2.75 m. and was excavated to a maximum depth of 2 m. Trench 3 measured 1.34 x 0.84 m. and was excavated to a depth of 0.90 m. Shoring was required in both trenches 1 and 2.

LOCATION AND GEOLOGY

Christ Church Cathedral is located to the east side of St. Aldate's Street,[1] the main north-south thoroughfare (medieval 'Fish Street') which leads from Carfax at the centre of the medieval core of Oxford southwards over Folly Bridge (formerly 'Grandpont'). The graveyard is located immediately to the south of the Cathedral. The site is at an elevation of *c.* 60.30 m. above Ordnance Datum. The Ordnance Survey Geological Survey (Sheet 236, 6th impression, 1972) shows the area to be a 'tongue' of first or floodplain gravel terrace extending to the south of the centre of Oxford. Where exposed during this excavation, the upper surface of the gravel was located between 57.88 m. and 58.40 m. OD. Natural gravel has previously been located under the cloister at 59.40 m. OD[2] and under the Latin Chapel and eastern end of the north choir aisle at 58.90 m.[3] While the natural surface of the gravel

[1] R. Tyler, 'Archaeological Investigations during Refurbishment of St. Aldate's Church, Oxford', *Oxoniensia*, lxvi (2001), fig. 1.

[2] C. Scull, 'Excavations in the Cloister of St. Frideswide's Priory, 1985', *Oxoniensia*, liii (1988), 21-74, fig. 17, section N.-S. 1.

[3] D. Sturdy, 'Excavations in the Latin Chapel and outside the East End of Oxford Cathedral, Winter 1962/3', *Oxoniensia*, liii (1988), figs. 38 and 42, pp. 81, 87. His observation of natural gravel in Cuttings 1 and 2E at 2.10 m. below the Latin Chapel (61.00 m. OD) and in cutting 5 at 1.70 m. below modern ground level in the angle between the choir and the N. choir aisle (60.60 m. OD) can both be calculated at 58.90 m. OD.

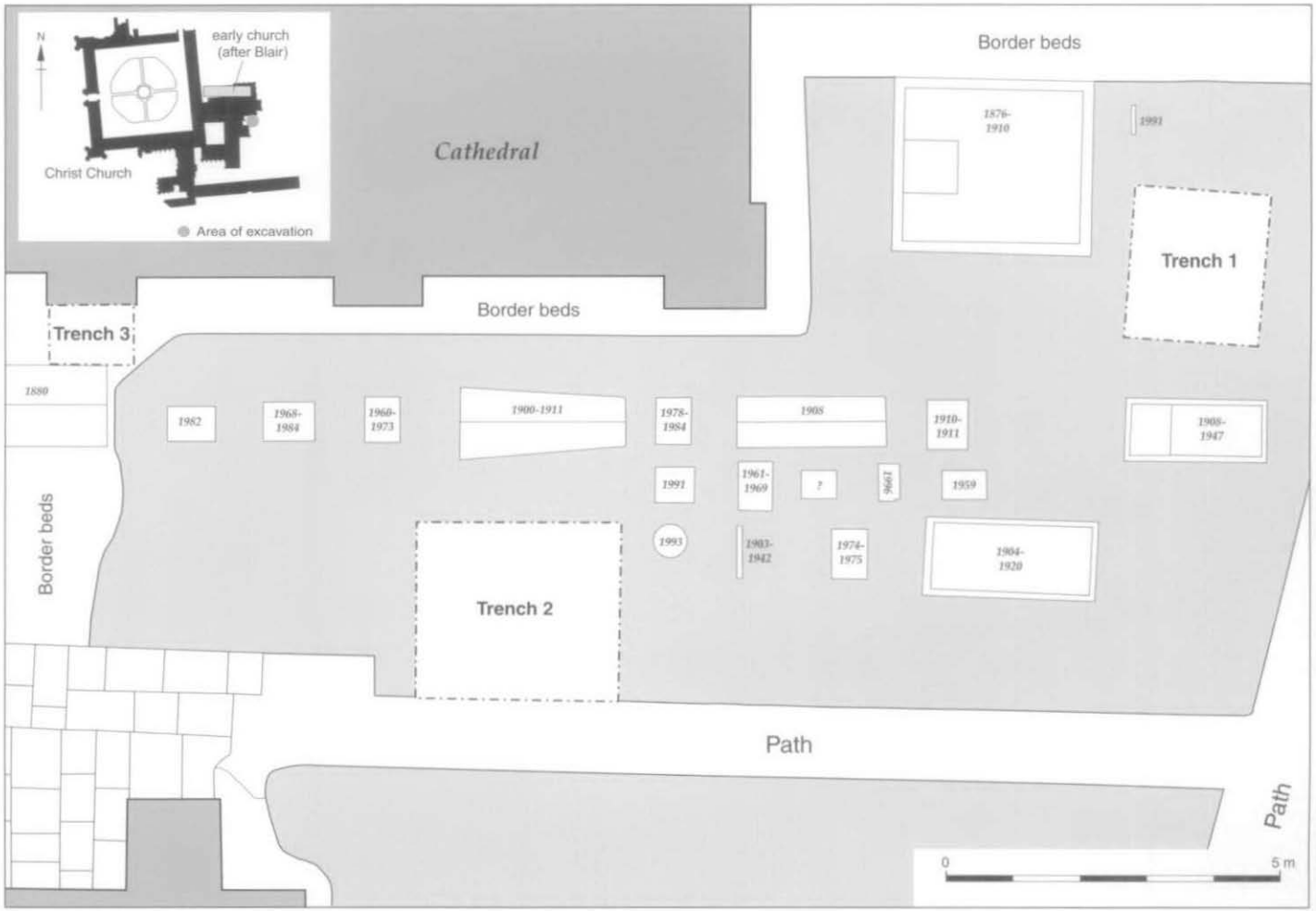

Fig. 1. Christ Church Cathedral graveyard: trench locations and previous excavations.

did not survive in any of the latter contexts, and had evidently been lowered slightly under the north-east chapels, it is clear enough that the church and the cloister occupy an essentially flat expanse of gravel.[4]

ARCHAEOLOGICAL DESCRIPTION

Trench 1 (Figs. 2 and 3)

There were 40 contexts in Trench 1. The features comprised six skeletons in four graves, one charnel pit, two pits, two demolition layers, four dump layers and two ditches. One of the graves contained three skeletons and all four graves cut a dump layer which contained 11th-century pottery.

The natural gravel (139) was reached at a depth of 2.50 m. below modern ground surface (57.88 m. OD) and was cut by a possible pit or ditch (136). The primary fill (137) represented a fall of the natural gravel and was overlain by a silty sandy gravel (138) which contained small quantities of late Saxon pottery and animal bone. This feature was cut by (133), also a possible pit or ditch. It was filled by layers 134 and 135. The secondary fill (135) contained substantial quantities of pottery, animal bone and burnt stone. The pottery was of possible 10th-century date.

These features were overlain by a sequence of four dump layers (132, 131, 130, 107) the uppermost of which contained quantities of charnel presumably representing earlier disturbed graves, perhaps comparable in date range with the first phase of burials identified in Trench 2. Pottery from 132, 131 and 130 was assigned a probable late 11th-century date. The uppermost dump layer (107) was cut by a group of four graves (110,

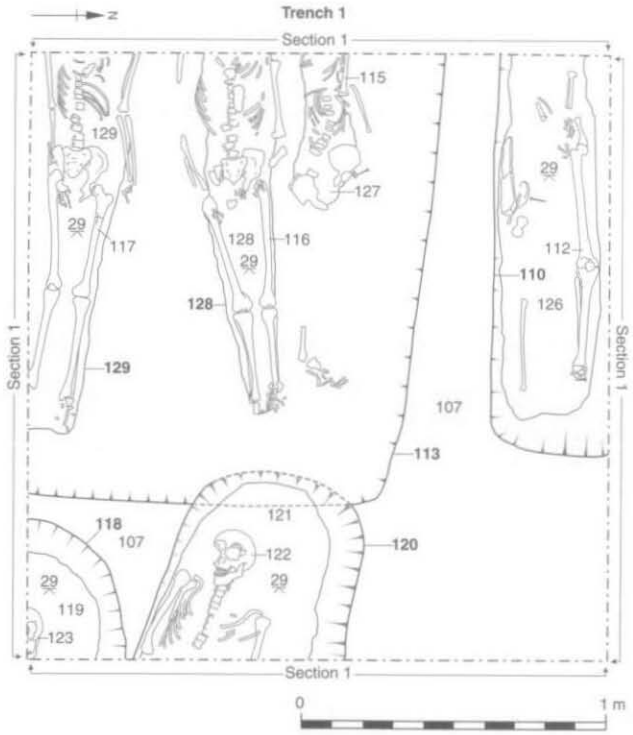

Fig. 2. Trench 1, plan showing graves 110, 118, 113 and 120.

[4] J. Blair, 'St. Frideswide's Monastery: Problems and Possibilities', *Oxoniensia*, liii (1988), 228.

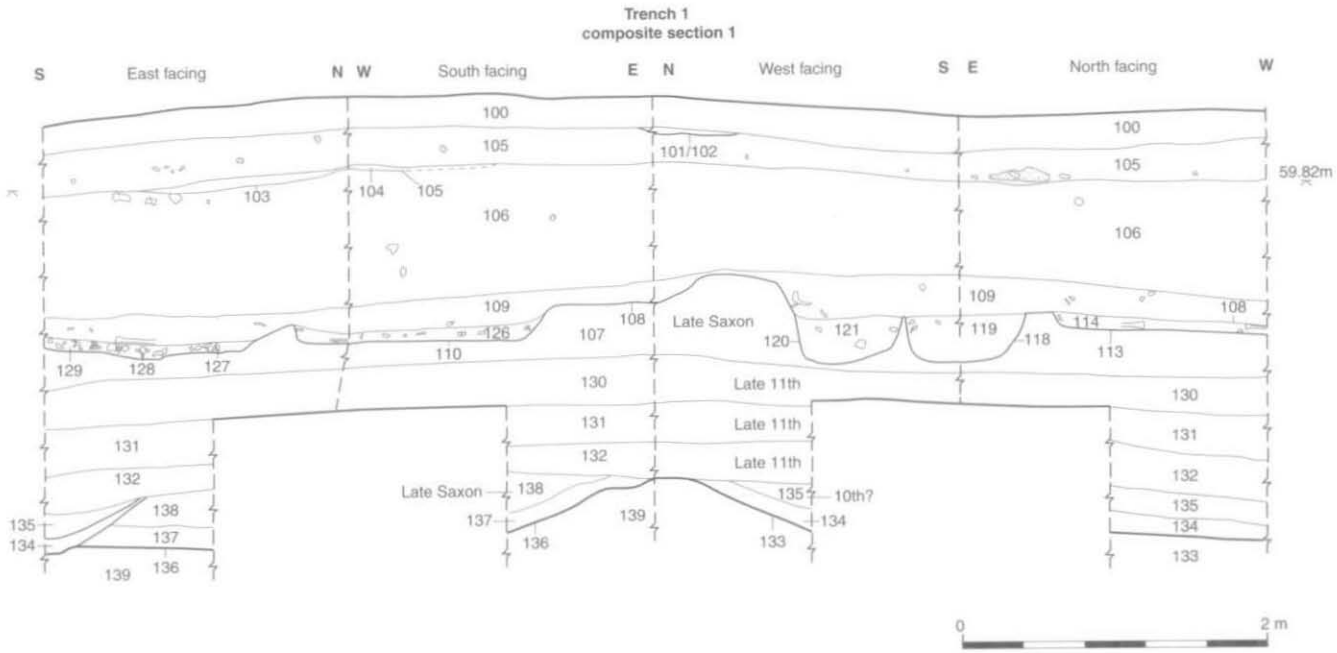

Fig. 3. Trench 1, composite section.

113, 118, 120) details of which appear in the catalogue below. In excavation it was determined that all the graves in this trench were cut by charnel pit (108) which contained large quantities of human bone in its fill (109). However, it is now thought more likely that this pit (cut 108, fill 109) was a dump layer which sealed the graves (see Fig. 3). The dump layer was overlain by two demolition layers (106 and 105). Both contained quantities of pottery, animal bone, ceramic building material, glass and window lead. Layer 106 was cut by a pit 103 (fill 104). Layer 105 was cut by pits 101 and 104 which were sealed by topsoil 100.

Grave 110, skeleton 112, coffin 124, fill 126: ? x ? x 0.30 m. Sub-rectangular, west-east aligned, ?supine extended young adult female (18-25 years). A wooden coffin (124) was represented by two iron nails and an iron coffin handle. The upper body of the skeleton was beyond the limit of excavation but it is likely to have been supine extended (Fig. 2).

Grave 113, fill 114, skeletons 115, 116 and 117, ?coffin 125, fills 126, 127, 128 and 129: ? x ? x 0.10 m. Sealed by 108/109, cuts 107. Sub-rectangular, west-east aligned, all skeletons supine extended. A single iron nail was found within the cut. Skeleton 115 was an adolescent aged 14-16 years. Skeleton 116 was an adult male aged upwards of 40 years with spinal degeneration. Skeleton 117 was a young adult male (Fig. 2).

Grave 118, fill 119, skeleton 123: ? x ? x 0.35 m. Sealed by 108/109, cuts 107. ?Sub-rectangular, west-east aligned, supine extended adult male aged 25-40 years. Charnel in fill (Fig. 2).

Dentition

- - - - - - - - - - -	- - - - - - - - - - -
NP 7 6 5 4 3 2 1	1 2 3 4 5 X 7 NP
	C

Grave 120, fill 121, skeleton 122: ? x ? x 0.50 m. Sealed by 108/109, cuts 107. Sub-rectangular and aligned WNW.-ESE. containing skeleton 122, a supine extended adult male aged 25-40 years. The grave fill contained a disturbed skull (Fig. 2).

Dentition

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

Trench 2 (Figs. 4-9)

Natural gravel (218) was reached at a depth of 2.30 m. below modern ground surface (58.40 m. OD) (see Fig. 7). It was cut by grave 401 which was the earliest of a sequence of up to four superimposed graves sealed by a plough or dump layer (246)(Fig. 4). Grave 401 was cut by grave 419 and charnel pit 299. The truncated grave 419 (not shown) was in turn cut by grave 422 which was cut by double grave 439. Pit 446 cut natural gravel and in turn was cut by grave 417 which was also sealed by 246. A layer (436) above natural was only seen in the north-western quadrant of the trench. It was cut by grave 426 which was overlain by grave 429, in turn cut by charnel pit 437. Graves 404 and 432 also cut layer 436 and all were sealed by plough or dump layer 246 which may represent a hiatus in burial activity. Disarticulated human bone was recovered from this layer which was not independently dated. However, layer 246 sealed two radiocarbon dated skeletons: 402 in grave 401 (1369±32; NZA-12343) and 418 in grave 417 (1197±33 BP; NZA-12344) (see Fig. 4 and Table 1). In addition, layer 246 was stratigraphically earlier than grave 276 containing skeleton 277 which produced a radiocarbon date of 1135±29 BP (NZA-12354; see Table 1).

Phase 1 graves comprise 401, 404, 417, 419, 422, 426, 429, 432, 439 (Fig. 4), all of which are sealed by dump layer 246. All remaining features post-date layer 246.

Layer 246 is then cut by a complex sequence of intercutting graves (described below; Figs. 5-6) and charnel pits (241, 244, 259, 291, 409, 411, 412, 434; Figs. 5-9), all of which are sealed by dump layer 203=204 which contained 13th-century pottery. Subsequent features are later medieval and post-medieval in date and include two robber trenches (208 and 209; 212 and 213), a capped stone drain (210 and 211), a brick drainage culvert (205, 206 and 207) and a wall (202) within cut 254. The uppermost layer was topsoil 200.

Grave 217, fill 215, skeleton 216: Cuts skeleton 224, fill 225, dump layer 246. Sub-rectangular, west-east aligned, a supine extended adult male aged upwards of 40 years. Charcoal and mortar in fill. Contained a copper alloy buckle frame and pin (see Allen below) (Fig. 6).

Grave 219, fill 221, stone lining 222, skeleton 220: ? x ? x 0.75 m. Cut by culvert 205, cuts dump layer 246. Sub-rectangular, west-east aligned, a supine extended adult male. Stone lined, oolitic limestone (Fig. 6).

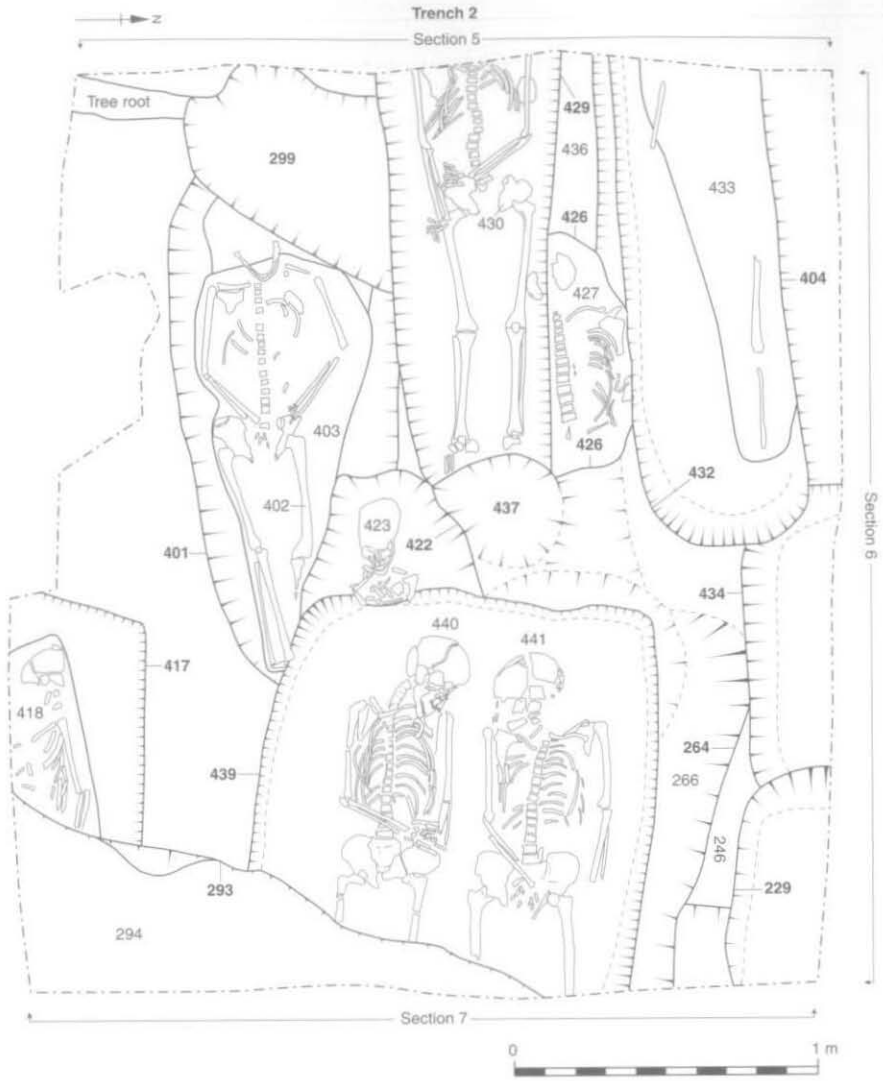

Fig. 4. Trench 2, earliest phase of burials.

Grave 223, skeleton 224, fill 225: ? x ? x 0.14 m. Cut by graves 217 and 226, cuts dump layer 246 and fill 266. Sub-rectangular, west-east aligned, a supine extended adult male. Charcoal in fill (Fig. 6).

Grave 226, skeleton 227, fill 228, coffin 250: ? x ? x 0.13 m. Cuts fill 215, skeleton 216, natural 218, skeleton 224, fill 225, fill 231, dump layer 246, fill 260. Sub-rectangular, west-east aligned, a supine extended adult male aged 25-40 years. Charcoal and charnel in fill. Coffin represented by single iron nail (Fig. 6).

Dentition

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

Grave 229, skeleton 230, fill 231: ? x ? x 0.30 m. Cut by grave 226, cuts natural 218, dump layer 246, fill 435. Sub-rectangular, west-east aligned, a supine extended adult male aged 25-40 years (Fig. 6).

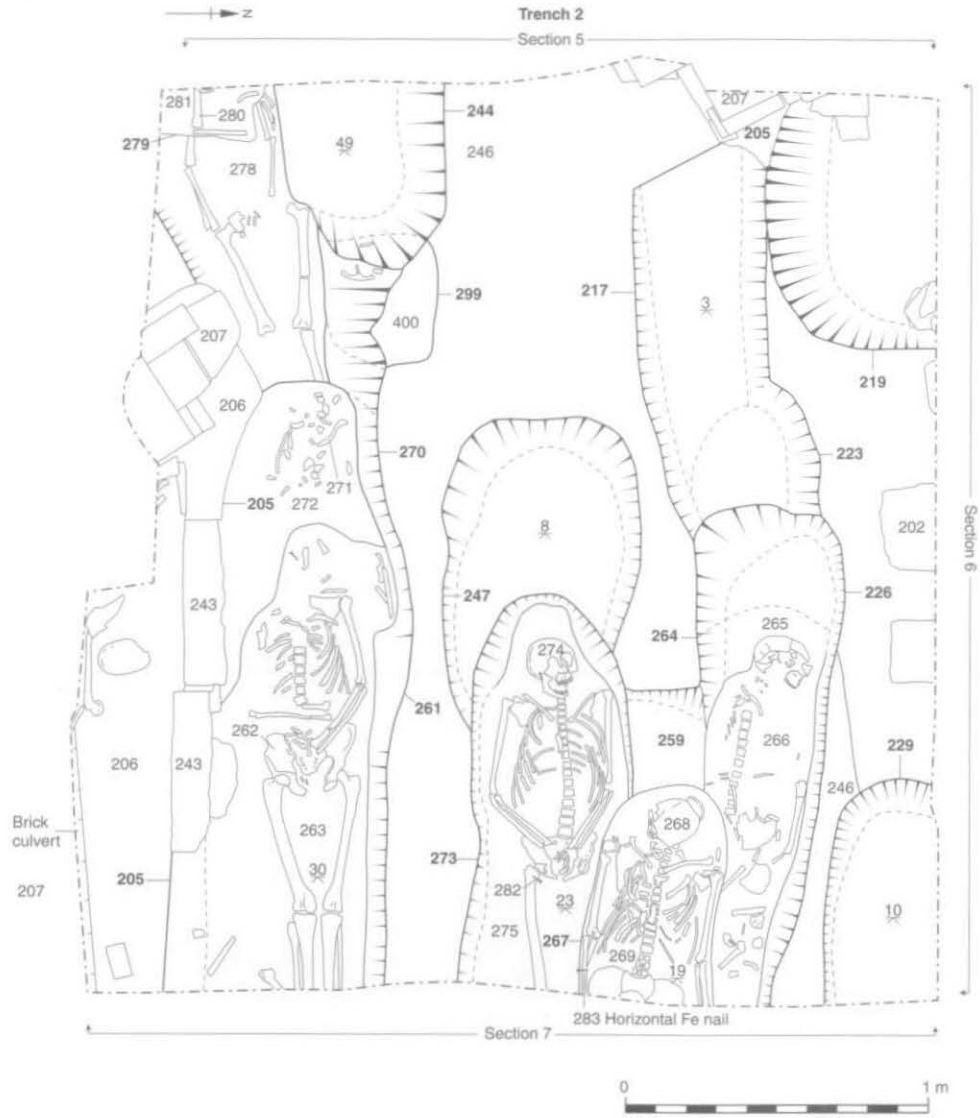

Fig. 5. Trench 2, Saxon burials.

Dentition

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

Grave 232, skeleton 233, fill 234: cut by culvert 205 and grave 247. Cuts fill 245 and dump layer 246. Sub-rectangular, west-east aligned, a ?supine extended adult of uncertain sex. Charcoal and charnel in fill (Fig. 6).

Grave 235, skeleton 236, fill 237, coffin 251: ? x 0.60 x 0.12 m. Cut by wall 202. Cuts skeleton 233, fill 234, dump layer 246, fill 249, coffin 252, charnel pit 259. Sub-rectangular, west-east aligned, a supine extended adult male. Charcoal and mortar lumps in fill (Fig. 6).

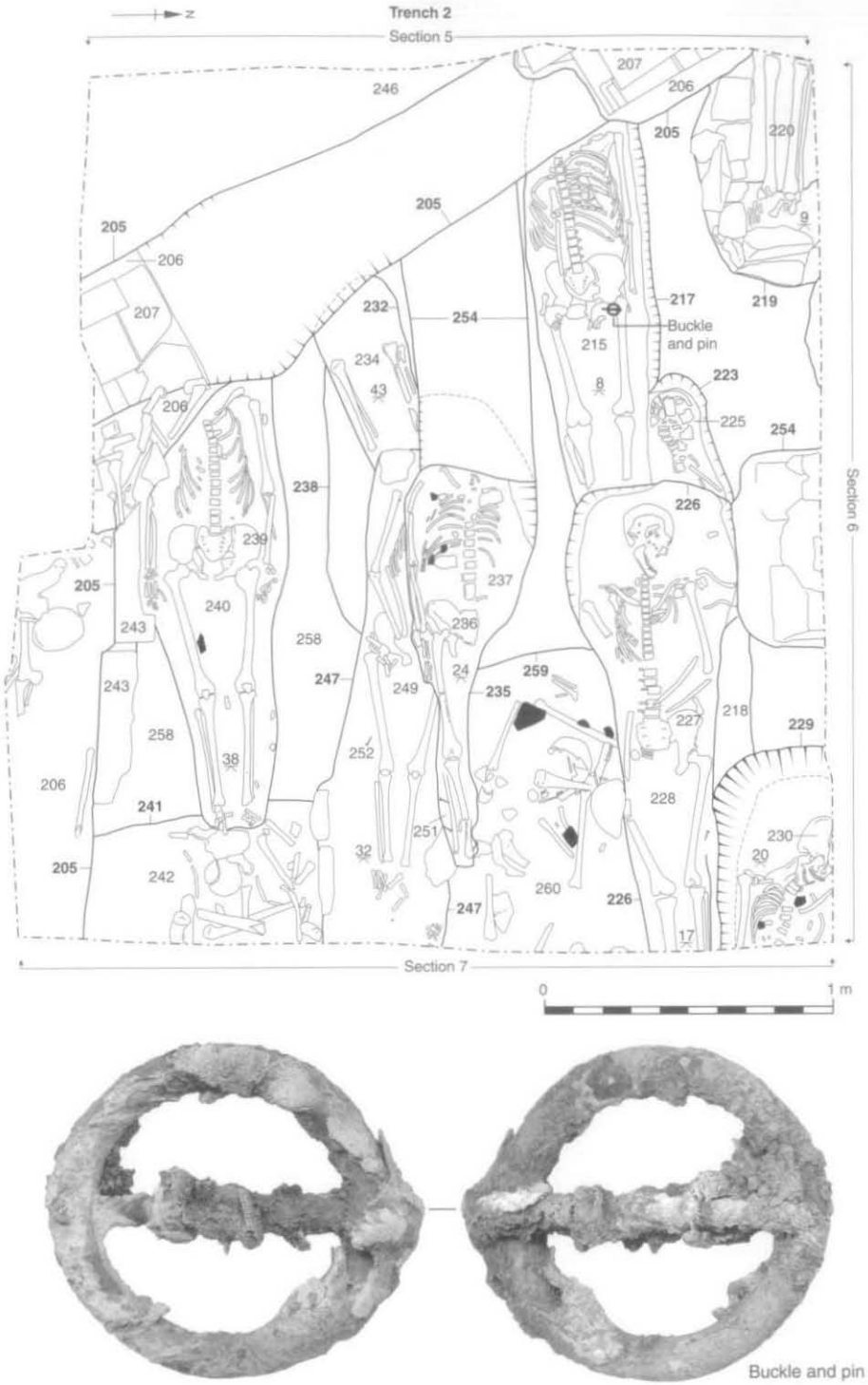

Fig. 6. Trench 2, latest phase of Saxon burials and the copper alloy buckle.

Grave 238, skeleton 239, fill 240, stone lining 243, fill 258: ? x 0.70 x 0.08 m. Cut by culvert 205, cuts fill 242, dump layer 246. Sub-rectangular, west-east aligned, a supine extended adult male. Charcoal and charnel in upper fill 240; sandy-silt lower fill 258. Oolitic limestone lining (Fig. 6).

Grave 247, skeleton 248, fill 249, coffin 252, stone lining 253: Cut by grave 235 and wall 202, cuts fill 242 and dump layer 246. Sub-rectangular, west-east aligned, a supine extended adult male. Charcoal in fill. Iron coffin nails. Single course of stones, one faced ashlar corner block, three unfaced limestone rubble blocks (Fig. 6).

Grave 261, skeleton 262, fill 263: Cut by culvert 205, charnel pit 241 and grave 238, cuts dump layer 246, skeleton 271, fill 272. Sub-rectangular, west-east aligned, a supine extended adult male aged upwards of 40 years (Fig. 5).

Grave 264, skeleton 265, fill 266, coffin 284: ? x 0.44 x 0.23 m. Cut by grave 267 and charnel pit 259, cuts natural 218 and dump layer 246. Sub-rectangular, west-east aligned, a supine extended adult male aged 35-45 years. Charnel in grave fill. Six iron nails and one possible iron handle, all disturbed (Fig. 5).

Dentition

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

Grave 267, skeleton 268, fill 269, ?coffin 283: ? x 0.47 x 0.13 m. Cut by charnel pit 259, cuts dump layer 246, skeleton 265, fill 266, fill 275, ?coffin 284. Sub-rectangular, west-east aligned, a supine extended adult male aged 25-40 years. One iron nail (Fig. 5).

Dentition

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X 7 6 5 4 3 2 X	1 2 3 4 X X X X
C A	

Grave 270, skeleton 271, fill 272: Cut by culvert 205 and graves 238 and 261, cuts dump layer 246 and fill 278. West-east aligned, heavily truncated, adult of uncertain sex (Fig. 5).

Grave 273, skeleton 274, fill 275, ?coffin 282: ? x 0.63 x 0.25 m. Cut by charnel pit 259 and grave 267, cuts 246. Sub-rectangular, west-east aligned, supine extended adult male aged 35-45 years. One iron coffin nail (Fig. 5).

Dentition

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

Grave 276, skeleton 277, fill 278: Cut by charnel pit 244 and graves 270 and 279. Sub-rectangular, west-east aligned, supine extended adult male. Radiocarbon date (Table 1).

Grave 279, skeleton 280, fill 281: Cut by charnel pit 244, cuts fill 278. Heavily truncated, left arm only, adult of uncertain sex (Fig. 5).

Grave 285, skeleton 286, fill 287, stone lining 295: Cut by charnel pit 291, cuts dump layer 246 and fill 290. Sub-rectangular, west-east aligned, supine extended young adult male. Charcoal in fill. Stone lining comprises one course of unfaced limestone blocks.

Dentition

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
E	

Grave 288, skeleton 289, fill 290: Cut by grave 285, cuts dump layer 246. Sub-rectangular, west-east aligned, supine extended adult male aged 25-40 years. Charcoal in fill.

Fig. 7. Trench 2, east-facing section.

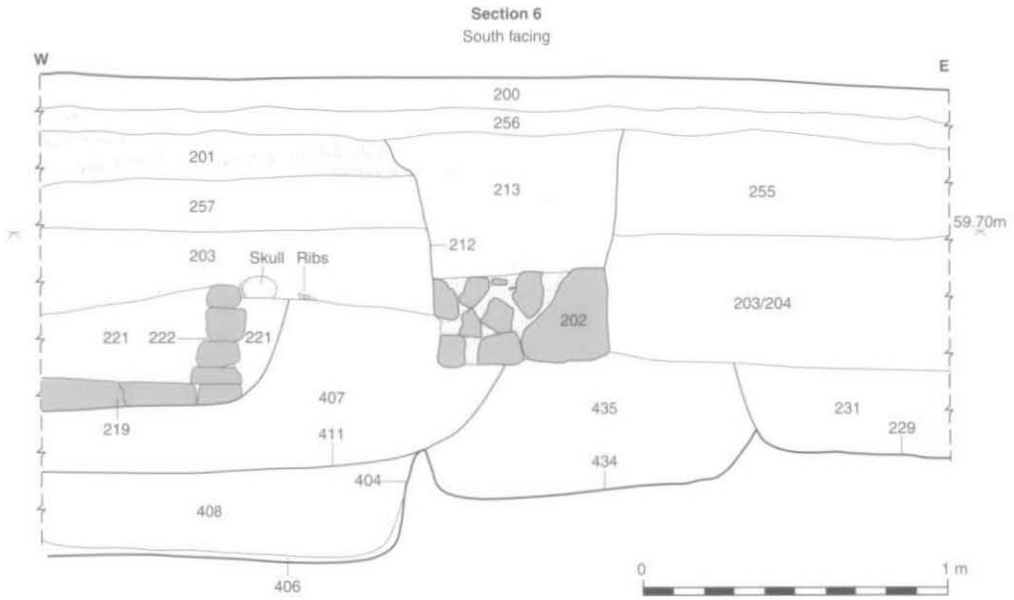

Fig. 8. Trench 2, south-facing section.

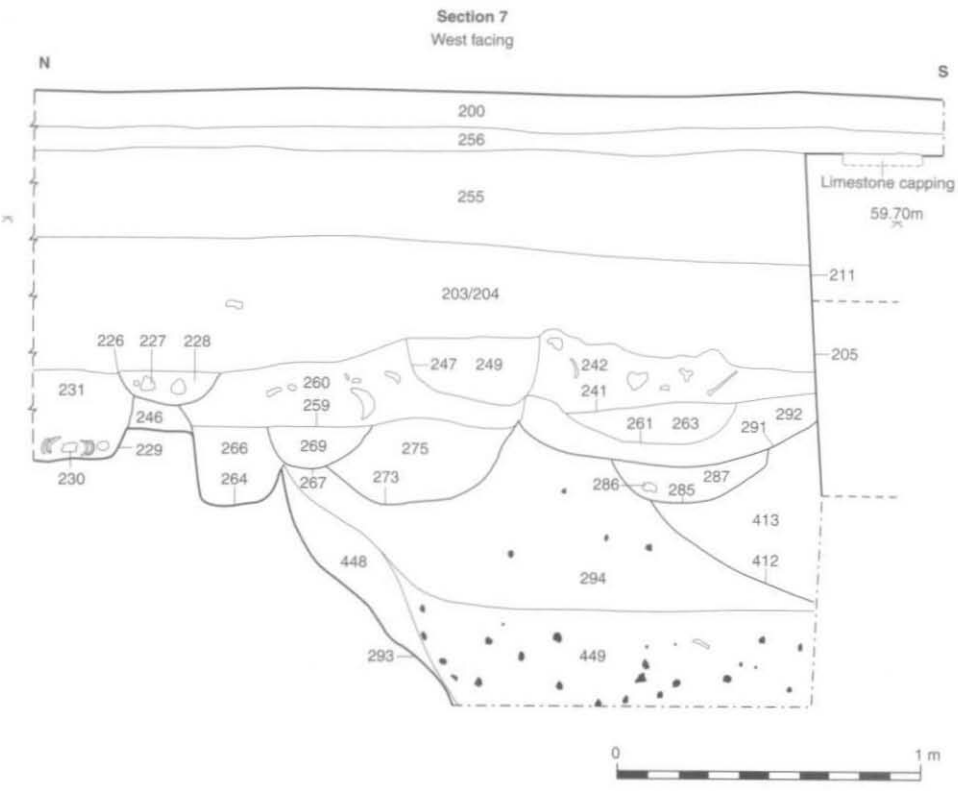

Fig. 9. Trench 2, west-facing section.

Dentition

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

Grave 296, skeleton 297, fill 298: ? x 0.40 x 0.11 m. Cut by graves 217, 223 and 264 and charnel pit 411, cuts dump layer 246. Sub-rectangular, west-east aligned, supine extended young adult male.

Grave 401, skeleton 402, fill 403: ? x 0.76 x 0.9 m. Cut by charnel pit 299 and graves 419, 422 and 439, cuts natural 218. Sub-rectangular, west-east aligned, supine extended adult female aged upwards of 40 years (Fig. 4). Radiocarbon date (Table 1).

Dentition

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X 7 6 5 4 3 2 1	1 2 3 X 5 6 X X

Grave 404, skeleton 405, stone lining 406, fills 408 and 444: ? x 0.5 x 0.35 m. Cut by grave 219 and charnel pit 411, cuts natural 218, fill 433, 436, skeleton 445, sealed by dump layer 246. Sub-rectangular, WSW.-ENE. aligned, supine extended adult female. Very decayed stone lining. Fill 444 between grave cut and stone lining (Fig. 4).

Grave 414, skeleton 415, fill 416. ? x ? x 0.10 m. Cut by charnel pit 411, cuts fills 298 and 408. Heavily truncated. Probable male adult, lower right leg only.

Grave 417, skeleton 418, fill 443: ? x ? x 0.32 m. Cut by culvert 205 and pits 291 and 295, Cuts skeleton 216 and fill 447. Sub-rectangular, west-east aligned, probable adult male (Fig. 4). Radiocarbon date (Table 1).

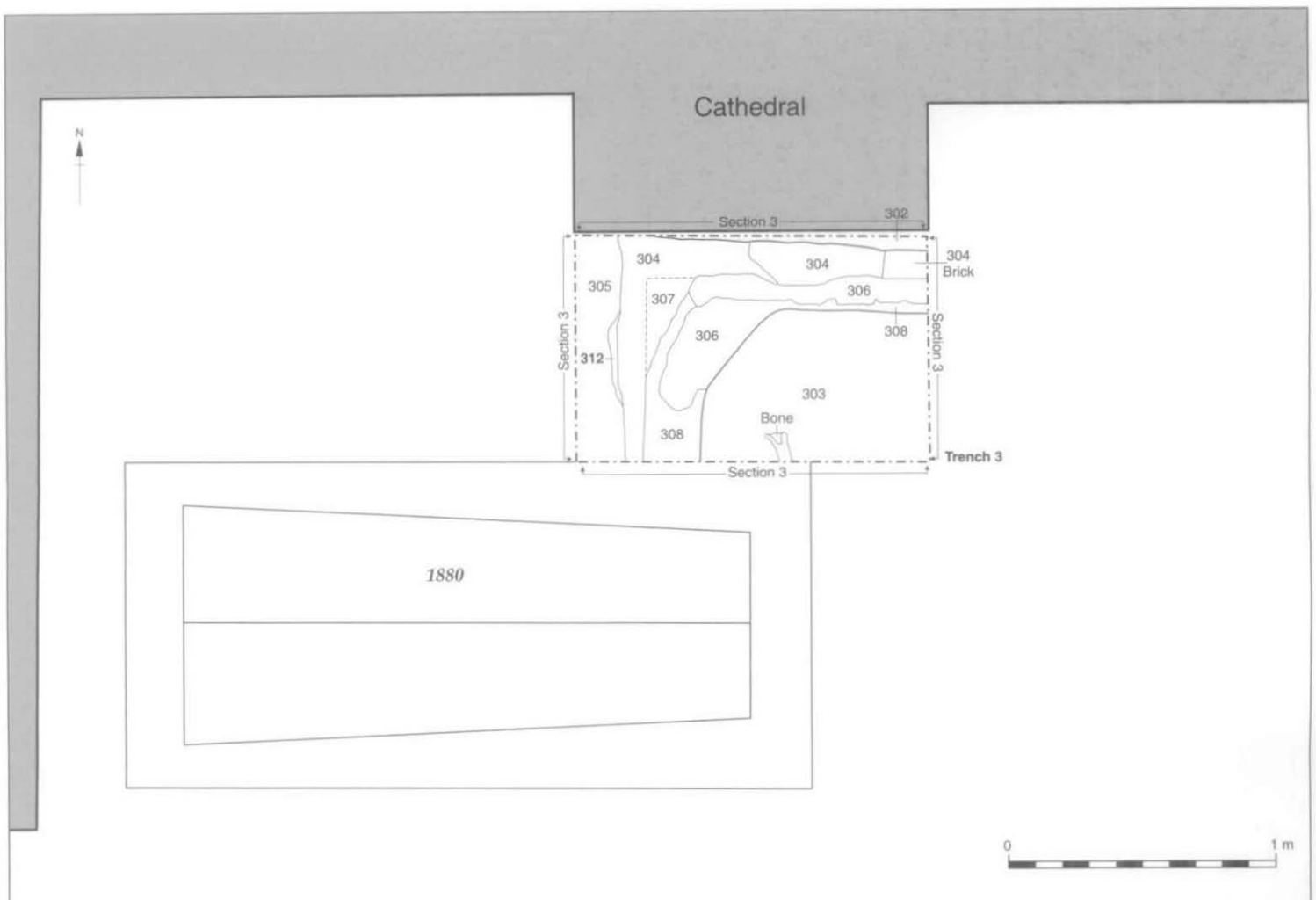

Fig. 10. Trench 3, plan.

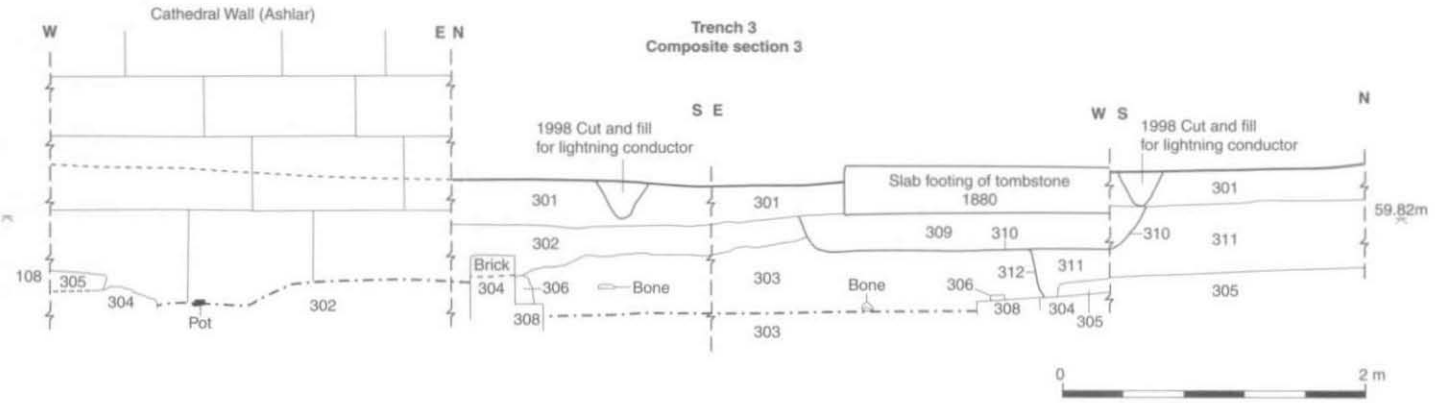

Fig. 11. Trench 3, composite section.

Dentition

XXXXX3X1	X23XXXXX

Grave 419, skeleton 420, fill 421: ? x ? x 0.12 m. Cut by graves 288 and 422 and charnel pit 299, cuts fill 403. Heavily truncated adult male.

Grave 422, skeleton 423, stone lining 424, fill 425: ? x 0.50 x 0.20 m. Cut by 439, cuts natural 218, skeleton 402, fill 403, skeleton 420 and fill 421. Sub-rectangular, west-east aligned, young adult male. Two limestone blocks placed over skull, which may suggest that the grave was originally stone lined although the level of truncation makes it impossible to be certain, or they may possibly represent 'ear muffs' (Fig. 4).

Dentition

E	UE
87654321	PM2345678
-7654321	1 234567-

Grave 426, skeleton 427, fill 428: ? x ? 012 m. Cut by grave 429 and pit 432, cuts natural 218 and supra-natural 436. West-east aligned, supine extended, adult of uncertain sex (Fig. 4).

Grave 429, skeleton 430, fill 431: ? x 0.50 x 0.12 m. Cuts natural 218, skeleton 427, 428 and supra-natural 436. ?Sub-rectangular, west-east aligned, supine extended adult male aged 25-40 y. Charnel in fill (Fig. 4).

Grave 439, skeleton 440, skeleton 441, fill 422: ? x 1.3 x 0.20 m. Cut by ?ditch 293, cuts natural 218, skeleton 402, fill 403, skeleton 423 and ?stone lining 424. Sub-rectangular, west-east aligned. Double grave, both skeletons supine extended, 440 was a young adult male, 441 was an adult male aged 25-40 years. The burials were facing each other (Fig. 4).

Dentition, skeleton 440

E	
8765432/	--34567-
-7654321	12345 67-

Dentition, skeleton 441

-7 6 543--	----------
XXX54321	12345X7X

Trench 3 (Figs. 10-11)

Trench 3 was located against the south wall of the cathedral. The earliest feature (313) was an ashlar wall/pier which was abutted by wall 304. It comprised a single skin wall of red unfrogged bricks bonded by cream-coloured mortar. Only the upper two courses were removed. The wall appeared to define the extent of sarcophagus 308. Sarcophagus 308 was constructed with Cotswold limestone blocks bonded by a cream mortar. The visible portion of the structure had tapered ends. Only the top two courses were exposed.

Grave cut 312 was capped by a mortar slab (305). This grave was cut by a grave dating to 1880 (310, 309, 314). All features were overlain by topsoil (301).

RADIOCARBON DETERMINATIONS by PETER MARSHALL

A series of bone samples were taken from three stratigraphically related burials in Christ Church Cathedral graveyard (402, 418 and 277) and were submitted to Rafter Radiocarbon Laboratory, New Zealand for high precision radiocarbon dating. Each sample was split into three sub-samples, which were measured independently, and the results combined by calculating the weighted mean of the separate ^{14}C ages. Errors are the larger of the weighted error and the standard of each group of three. In addition the results were calibrated using OXCAL v3.5 by Alex Bayliss (Scientific Dating Co-ordinator for English Heritage). Two of the graves cut natural and were sealed by a dump layer. These represent the earliest phase of burial activity. The

TABLE 1. RADIOCARBON DATES FROM LATE SAXON OXFORD

Laboratory number	*Material*	*Context number*	*Radiocarbon age (BP)*	$\delta^{13}C$ (‰)	*Calibrated date range (68% confidence)*	*Calibrated date range (95% confidence)*	*Estimated date range (95% confidence)*
St. Aldate's							
NZA-12347	bone, human	846	1147±28	-19.3	cal AD 880-960	cal AD 780-990	*cal AD 860-980*
NZA-12349	bone, human	835	1210±36	-19.7	cal AD 770-890	cal AD 690-940	*cal AD 830-960*
NZA-12348	bone, human	855	1107±28	-19.2	cal AD 890-990	cal AD 880-1000	*cal AD 780-790 (1%) or cal AD 820-960 (94%)*
Christ Church Cathedral graveyard							
NZA-12343	bone, human	402	1369±32	-18.9	cal AD 640-680	cal AD 620-690	*cal AD 600-720 (93%) or cal AD 750-770 (2%)*
NZA-12344	bone, human	418	1197±33	-18.8	cal AD 770-890	cal AD 690-960	*cal AD 800-900 (64%) or cal AD 910-960 (31%)*
NZA-12354	bone, human	277	1135±29	-18.9	cal AD 880-980	cal AD 780-990	*cal AD 830-840 (1%) or cal AD 860-970 (94%)*
Christ Church cloister							
HAR-6817	bone, human	F96	1160±40	-21.1	cal AD 780-960	cal AD 770-990	*cal AD 780-900 (66%) or cal AD 910-950 (29%)*
HAR-6818	bone, human	F119	1150±40	-20.7	cal AD 780-970	cal AD 770-990	*cal AD 820-960*
HAR-6819	bone, human	F123	1110±40	-19.3	cal AD 780-960	cal AD 770-990	*cal AD 830-850 (1%) or cal AD 860-980 (94%)*
HAR-6820	bone, human	F127	1250±40	-20.0	cal AD 680-810	cal AD 660-890	*cal AD 820-900 (61%) or cal AD 920-960 (34%)*
Tom Quad							
HAR-190(S)	charcoal, *Quercus* sp. (young wood) (P G H Franklin)	Grave 2	1110±100	-28.4	cal AD 780-1030	cal AD 680-1160	*cal AD 810-970*

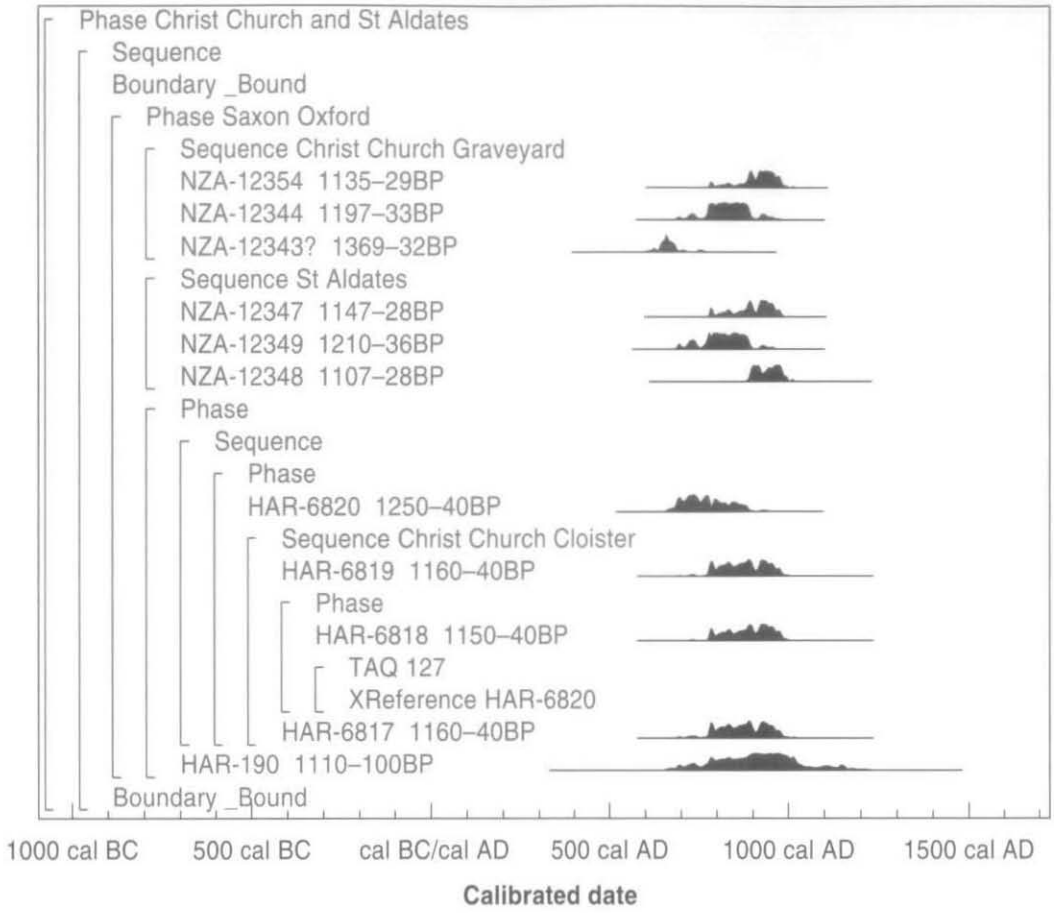

Fig. 12. Probability distributions of dates from late Saxon Oxford: each distribution represents the relative probability that an event occurred at a particular time. These distributions are the result of simple radiocarbon calibration (Stuiver and Reimer 1993).

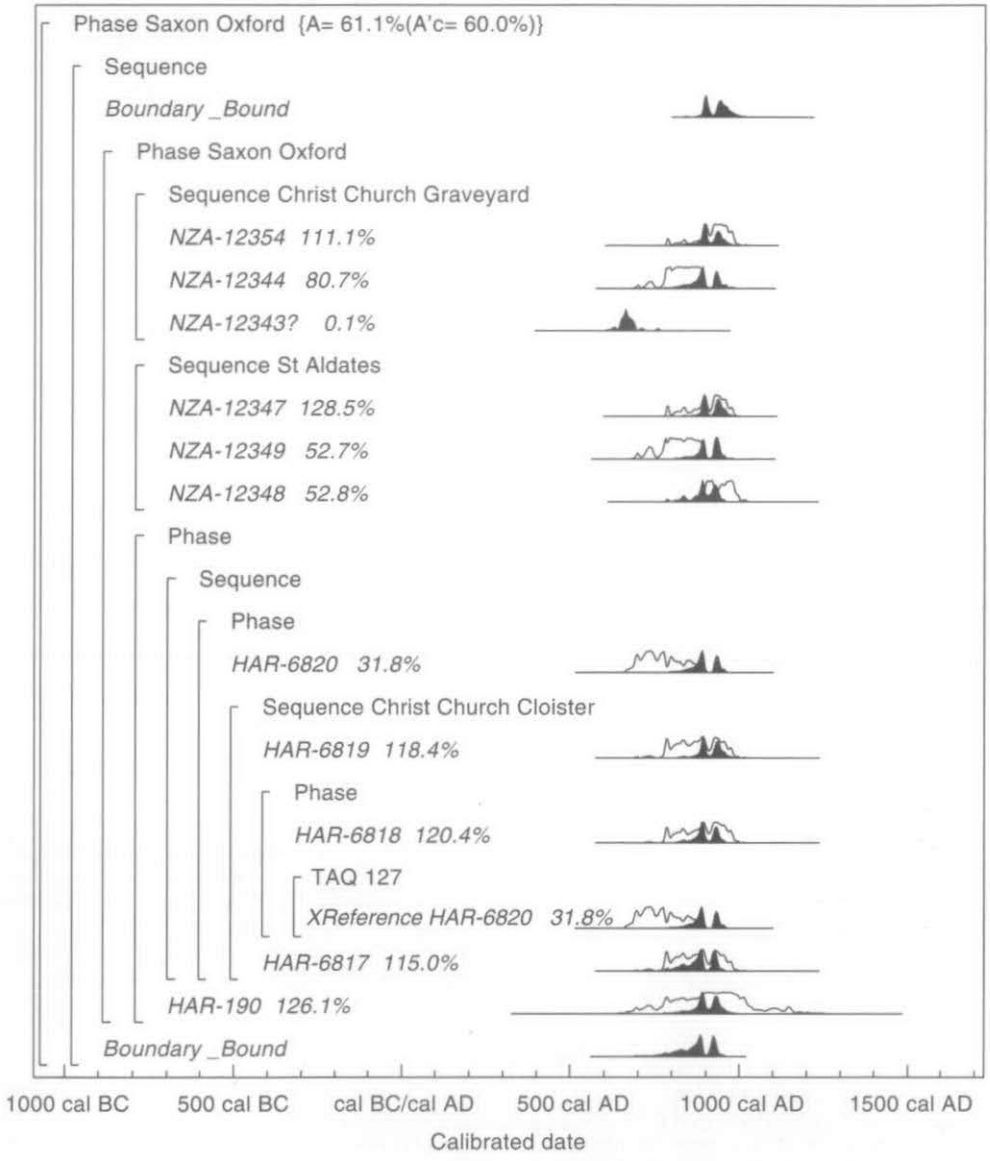

Fig. 13. Probability distributions of dates from late Saxon Oxford: each distribution represents the relative probability that an event occurred at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The large square brackets down the left hand side along with the OxCal keywords define the model exactly.

subsequent phase of burials, above the dump layer, appears to be late Saxon/11th century-13th century on the basis of the limited pottery evidence.

The results, given in Table 1, are conventional radiocarbon ages,[5] and are quoted in accordance with the Trondheim convention.[6] The dates obtained from skeletons in St. Aldate's (this volume), Christ Church cloister and charcoal from a burial in Tom Quad are also shown, and discussed below.

Calibration

The radiocarbon determinations have been calibrated with data from Stuiver et al.[7] using OxCal (v3.5).[8] The date ranges have been calculated according to the maximum intercept method,[9] and are cited in the text at two sigma (95% confidence). They are quoted in the form recommended by Mook,[10] with the end points rounded outwards to 10 years. The probability distributions (Fig. 12) are derived from the usual probability method.[11] Those ranges printed in italics in the text are derived from mathematical modelling of archaeological problems.

Analysis and Interpretation

A Bayesian approach has been adopted for the interpretation of the chronological data[12] using the program OxCal version 3.5.[13] Such a methodology allows the results of the radiocarbon analyses to be combined with other information, such as stratigraphy, to produce realistic estimates of dates of archaeological interest. The algorithms used in the models described below can be derived from the structure shown in Fig. 13.

In the analyses undertaken a uniform prior distribution has been imposed on the spread of dates while assuming that the dated samples represent independent events and a random sample of a relatively constant level of human activity.[14] Such an approach has been used because when radiocarbon dates are constrained by relative dating information it has been shown that there is a danger that the posterior density distributions may be spread evenly across a plateau in the calibration curve, irrespective of the actual age of the material dated.[15] This is due to the fact that the statistical weight of a group of measurements naturally favours longer overall spans. The model for the chronology of Saxon activity in Oxford is shown in Fig. 13.

Discussion

The samples from Christ Church Cathedral graveyard were from a group of stratigraphically related graves. Grave 402 was the earliest, with 418 above it. Above 418 was a layer of dumped material, and the dump layer was cut by 277. The model shown (Fig. 13) provides an estimate for the date of the burial of *cal AD 810-970 (at 95% confidence)*. If all three of these samples are included in the model, then it shows poor agreement (A=48.4%). Therefore it seems more likely that sample 277 (NZA-12348) relates to an early phase of Saxon activity in Oxford, probably at some time in the 7th century cal AD. If NZA-12348 is excluded from the overall model the index of agreement increases (A=61.1%.) Given the number of excavated burials from the Christ Church Cathedral graveyard further radiocarbon determinations may help in confirming this early Saxon phase of activity in the city.

[5] M. Stuiver and H.A. Polach, 'Reporting of 14C data', *Radiocarbon*, 19 (1977), 355-63.

[6] M. Stuiver and R.S. Kra, 'Editorial Comment', *Radiocarbon*, 28(2B) (1986), ii.

[7] M. Stuiver, P.J. Reimer, E. Bard, J.W. Beck, K.A. Hughen, B. Kromer, G. McCormac, J. van der Plicht and M. Spurk, 'INTCAL98 Radiocarbon Age Calibration, 24,000-0 cal BP', *Radiocarbon*, 40 (1998), 1041-83.

[8] C. Bronk-Ramsey, 'Radiocarbon Calibration and Analysis of Stratigraphy: The OxCal Program', *Radiocarbon*, 37 (1995), 425-30; C. Bronk Ramsey, 'Probability and Dating', *Radiocarbon*, 40 (1998), 461–74.

[9] M. Stuiver and P.J. Reimer, 'A Computer Program for Radiocarbon Age Calculation', *Radiocarbon*, 28 (1986), 1022-30.

[10] W.G. Mook, 'Business Meeting: Recommendations/Resolutions adopted by the Twelfth International Radiocarbon Conference', *Radiocarbon*, 28 (1986), 799.

[11] M. Stuiver and P.J. Reimer, 'Extended 14C Data Base and Revised CALIB 3.0 14C Age Calibration Program', *Radiocarbon*, 35 (1993), 215-30.

[12] E. Buck, W.G. Cavanagh and C.D. Litton, *Bayesian Approach to Interpreting Archaeological Data* (1996).

[13] http://www.rlaha.ox.ac.uk/orau; Bronk-Ramsey (1995), op. cit. note 8.

[14] For further details of its implementation, see C. Bronk Ramsey, 'Comment on "The use of Bayesian Statistics for 14C Dates of Chronological Ordered Samples: a Critical Analysis"', *Radiocarbon*, 42 (2000), 199-202.

[15] P. Steier and W. Rom, 'The Use of Bayesian Statistics for 14C Dates of Chronological Ordered Samples: a Critical Analysis', *Radiocarbon*, 42 (2000), 183-98.

Burials found in Tom Quad in 1972[16] and Christ Church Cathedral cloister in 1985[17] are thought to be from the same cemetery. A sample of oak charcoal (identified as 'young wood') (HAR-190) from the layer of charcoal, up to 10 cm. deep, that lined the bottom of the earliest of two graves excavated in 1972 in Tom Quad, cannot be stratigraphically related to the other burials excavated from the same cemetery, however, it can be assumed to relate to the same phase of activity. Human bone samples from four stratigraphically related inhumations (F96, F119, F123, F127), two of which (F96, F123) bracketed the same stratigraphic sequence, excavated in 1985 in Christ Church Cathedral cloister were dated at the AERE Harwell Laboratory in 1986. Burial F96 (HAR-6817) is the earliest in the sequence and was cut by F119 (HAR-6818) and F123 (HAR-6819); F127 (HAR-6820) also cut F96 but could not be stratigraphically related to the other two burials.[18] As the relationship between F96 and F127 is archaeologically well established we have included it in the model (Fig. 13) even though the index of agreement for HAR-6820 is rather low (A=31.9%), and brings down the overall agreement undesirably (A=61.1%).

Excavations at St. Aldate's Church (this volume) located a group of 19 burials, 3 of which (all 'charcoal' burials) were submitted for radiocarbon analysis at the Rafter Radiocarbon Laboratory. The three samples of human bone from St. Aldate's (skeletons 855, 835, and 846) are all stratigraphically related with grave 858 containing skeleton 855 cut by grave 837 containing skeleton 835. Grave 837 was overlain by a disturbed grave (cut 843, fill 844) with no skeletal remains. This was in turn overlain by grave 845 containing skeleton 846. In the overall model the index of agreement for NZA-12348 (A=52.3%) and NZA-12349 (A=53.0%) is low even though these two burials have a well-established archaeological relationship. However, because of the relationship they have both been included in the model.

The model estimates that the start of this phase of burial activity in Oxford (excluding sample 277) began in *cal AD 870-1010 (at 95% confidence)* (Fig. 13). As further Saxon burials are recovered and dated in Oxford it will become possible to further refine this estimate for the start of this phase of activity in the city.

THE ARTEFACTS

Pottery by PAUL BLINKHORN

The pottery has been quantified and spot dates are provided in Tables 2 and 3. It was recorded using the codes of the Oxford Archaeological Unit medieval pottery fabric series.[19]

Copper alloy by LEIGH ALLEN

Two copper alloy pins and a fragment of twisted wire were recovered from a dump layer and a culvert fill.

A complete annular buckle frame and pin (SF 4) was recovered from the waist area of skeleton 215 (Fig. 6). The buckle frame, with an external diameter of 45 mm. and a circular cross section, is plain. The pin is cast and has a decorated moulding at the loop end. The tip of the pin is curved where it rests on the frame. There are areas of textile preserved on the back of the buckle. Annular buckles are the simplest form of buckle and served a variety of purposes as belt buckles, shoe buckles and elements of horse gear, from the medieval period onwards.

16 T.G. Hassall, 'Excavations at Oxford, 1972: Fifth interim report', *Oxoniensia*, xxxviii (1973), 270-4.
17 Scull, op. cit. note 2, pp. 21-74.
18 Ibid. fig. 10 for site matrix.
19 R. Haldon with M. Mellor, 'Late Saxon and Medieval Pottery', in B.G. Durham, 'Archaeological Investigations in St. Aldate's, Oxford', *Oxoniensia*, xlii (1977).

TABLE 2. SUMMARY OF POTTERY ASSEMBLAGE FROM TRENCH 1

	LBA		*OXR*		*Stamford*		*OXAC*		*OXAQ*		*OXAM*		*North French OXY*				*Red Earthenwares*		*19th/ 20thC*		*Terminus Post Quem*
Cxt	*No*	*Wt(g.)*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	
100											2	39							3	40	20thC?
102																	1	1			M16thC+?
104																			5	54	19thC?
105															1	13	3	31			M16thC+?
106							9	94	4	64					1	17					L11thC?
107							1	3													L.Saxon?
109			4	32			14	159	4	21											11thC
127							2	25													L.Saxon?
130	1	4	3	35	3	7	55	401	17	133					4	16					L11thC?
131			2	8	1	1	62	428	17	88			1	10	13	83					L11thC?
132					2	20	74	681	11	95					20	148					L11thC?
135			2	5			3	17													10thC??
137							1	5													L.Saxon?
138							2	25													L.Saxon?
Total	1	4	11	80	6	28	223	1838	53	401	2	39	1	10	39	277	4	32	8	94	

TABLE 3. SUMMARY OF POTTERY ASSEMBLAGE FROM TRENCH 2

	RB		*OXR*		*OXAC*		*OXAQ*		*OXY*		*OXAM*		*Red Earthenware*		*German Stonewares*		*Misc 19th/ 20thC*		*Terminus Post Quem*
Cxt	*No*	*Wt(g.)*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	*No*	*Wt*	
201			1	9	7	95	1	9	4	84	11	149	9	78	3	53	9	48	20thC?
204					4	42					1	5							13thC?
206												121							15thC
210									2	13		13					1	1	15thC?
228									1	10									11thC?
231					1	7			1	8									11thC?
237			1	3	1	2			2	16									11thC?
240					1	16													L.Saxon?
242									2	13									11thC?
245									1	10									11thC?
249					2	25			1	8									11thC?
260					1	4			2	22	1	13							13thC?
263					1	5			1	11									11thC?
266					1	4	1	3	3	7									11thC?
275	1	1					1	5											11thC?
292					2	4													L.Saxon?
294					4	17	1	16											11thC?
407					1	5													L.Saxon?
413					1	6													L.Saxon?
449					4	66			3	20									11thC?
Total	1	1	2	12	31	298	4	33	23	222	13	301	9	78	3	53	10	49	

THE ENVIRONMENTAL EVIDENCE

The human skeletal assemblage by ANGELA BOYLE

Methodology

Assessment of sex was based on diagnostic morphological features and to a lesser degree metric analysis.[20] Estimation of adult age was based on a number of factors: dentition,[21] appearance of the auricular surface,[22] pubic symphysis,[23] and processes of degenerative change.[24] Stature was calculated using the regression formulae of Trotter and Gleser.[25] The standard range of non-metric traits was scored.[26] Dental notation is as follows, based on Brothwell:[27]

/ post mortem loss	X ante mortem loss
C caries	A abscess
NP not present	U unerupted
E erupting	– jaw not present

Skeletal summary (Table 4). A total of 36 skeletons were recovered from Trenches 1 and 2 and all were osteologically recorded during fieldwork. The assemblage comprised 27 males or probable males, 3 females, 5 adults of uncertain sex and 1 adolescent. Stature ranged from 1.55-1.61 m. for females and 1.61-1.82 m. for males.

A limited range of pathology was noted. A total of 10 skeletons exhibited vertebral degeneration in the form of osteophytes, porosity and Schmorl's nodes (116, 216, 224, 248, 262, 265, 268, 274, 427 and 441). In the case of skeleton 216 the osteophytes were sufficiently large to have caused fusion of the eighth through to tenth thoracic vertebrae. There were two healed fractures: the left distal fibula of skeleton 262 and the body of the left scapula of skeleton 268.

Only 12 of the skeletons had any surviving dentition. The data is summarised in Table 5 and it can be seen that the incidence of ante mortem loss and in particular caries and abscess is very low.

The Animal Bone by BETHAN CHARLES

A total of 279 fragments of bone were recovered by hand (Table 6). In addition to the hand-collected material, 1127 fragments of bone were recovered through environmental processing (Table 7) in >10 mm., 10–4 mm. and 4–2 mm. sieves. The fish bone from the sieved material has not yet been identified to species.

Condition

The animal bone was in good condition. Forty-nine fragments had butchery knife and chop marks almost all of which were from late Saxon contexts. Most of the chop marks were on the sheep long bones whilst all the knife marks were on vertebrae and rib fragments, probably as a result of the splitting of the carcass.

Animal gnawing, probably dog, was seen on seven fragments. In addition, a sheep astragalus bone from context 131 appeared to have been digested. A total of 18 small fragments had been burnt. All but two of these fragments were recovered from the sieved material from contexts 131, 134, 137 and 294.

[20] Workshop of European Anthropologists, 'Recommendations for Age and Sex Diagnoses of Skeletons', *Jnl. of Human Evolution*, 9 (1980), 517-49.

[21] D.R. Brothwell, *Digging Up Bones* (1981), 72.

[22] C.O. Lovejoy, R.S. Meindl, T.R. Pryzbeck and R. Mensforth, 'Chronological Metamorphosis of the Auricular Surface of the Ilium: A New Method for the Determination of Adult Skeletal Age at Death', *Am. Jnl .of Physical Anthropology*, 68 (1985), 15-28.

[23] D. Katz and J.M. Suchey, 'Age Determination of the Male os pubis', *Am. Jnl. of Physical Anthropology*, 69 (1986), 427-35.

[24] P. Sager, *Spondylosis cervicalis* (1968-69, Årsberetn. Københavns Univs Medic.-Hist. Inst. Mus.), 185-224.

[25] M. Trotter and G.C. Gleser, 'Estimation of Stature from Long Bones of American Whites and Negroes', *Am. Jnl. of Physical Anthropology*, 10 (1952), 463-514; 'A Re-evaluation of Estimation of Stature Based on Measurements of Stature taken during Life and Long Bones after Death', *Am. Jnl. of Physical Anthropology*, 16 (1958), 79-123.

[26] A.C. Berry and R.J. Berry, 'Epigenetic Variation in the Human Cranium', *Jnl. of Anatomy*, 101 (1967), 361-79.

[27] Brothwell, op. cit. note 21, p. 53.

TABLE 4. SUMMARY OF SKELETAL DATA

Skel. no.	*Preservation and completeness*	*Age*	*Sex*	*Stature*	*Skeletal pathology*	*Dental pathology*
Trench 1						
112	Condition good, missing skull and mandible	Young adult	F	1.61 m. (5' 3")		
115	Condition fair, missing skull and mandible	14-16 y	–			
116	Condition good,missing skull and mandible	40+ y	M	1.64 m. (5' 4")	Thoracic and lumbar osteophytes	
117	Condition good, missing skull and mandible	Young adult	M	1.61 m. (5' 3")		
122	Condition good, missing lower body	25-40 y	M	1.81 m. (5'9")		
123	Condition good, skull, mandible and upper cervical	25-40 y	M			Caries
Trench 2						
216	Condition fair, missing skull and mandible	40+ y	M	1.69 m. (5' 5")	Vertebral degeneration, T8-12 fused by osteophytes	
220	Condition good, lower legs only	adult	M	1.82 m. (5'9.7")		
224	Condition fair, skull and upper torso only	adult	M		Vertebral degeneration, osteophytes and porosity	
227	Condition fair, virtually complete	25-40 y	M	1.75 m. (5'7.4")		
230	Condition fair, skull and upper body only	25-40 y	M	1.71 m. (5' 6")		Moderate alveolar resorption, crowding of mandibular incisors.
233	Condition poor, lower legs only	adult	?			
236	Condition poor, missing skull and mandible	adult	M	1.75 m. (5' 7")		
239	Condition fair, missing skull and mandible	adult	M	1.76 m. (5'7.5")		
248	Condition fair, missing skull, mandible, left leg	adult	M	1.68 m. (5'5")	Schmorl's nodes	
262	Condition fair, missing skull, mandible, upper body	40+	M	1.79 m. (5'8.7")	Lumbar osteophytes, Schmorl's nodes,left distal fibula has healed fracture	

continued...

265	Condition fair, virtually complete	35-45 y	M	1.69 m. (5' 5")	Mild osteophytes	
268	Condition fair, missing legs	25-40 y	M	1.78 m. (5' 8")	Healed fracture of body of left scapula, vertebral degeneration, osteophytes and Schmorl's nodes	Advanced alveolar resorption, caries, abscess
271	Condition poor, fragmentary torso only	adult	?			
274	Condition fair, virtually complete	35-45 y	M	1.76 m. (5' 7")	Thoracic and lumbar osteophytes	
277	Condition fair, missing skull and mandible	adult	M	1.65 m. (5' 4")		
280	Condition poor, torso and right arm only	adult	?			
286	Condition fair, missing lower body	Young adult	M			
289	Condition fair, virtually complete	25-40 y	M	1.63 m. (5' 3")		Impaction and rotation of left lateral incisor and canine
297	Condition fair, right side of body only	Young adult	M			
402	Condition fair, missing skull	40+ y	F	1.55 m. (5' 1")		
405	Condition fair, missing skull, mandible and upper arms	adult	F	1.60 m. (5' 2")		
415	Condition fair, right lower leg only	adult	M?	1.80 m. (5'9")		
418	Condition poor, skull, mandible and left arm only	adult	M?			
420	Condition fair, right leg only	adult	M			
423	Condition poor, skull and upper body only	Young adult	M			Crowding and rotation of incisors and canines
427	Condition poor, skull vault and upper body only	adult	?		Schmorl's nodes and mild osteophytes	
430	Condition fair, missing skull and mandible	25-40 y	M	1.68 m. (5' 5")		
440	Condition fair, virtually complete	Young adult	M			caries
441	Condition fair, virtually complete	25-40 y	M	1.68 m. (5' 5")	Schmorl's nodes	
445	Condition poor, left leg and right arm	adult?				

TABLE 5. SUMMARY OF DENTAL DATA

Skeleton no.	*Ante mortem loss*	*Caries*	*Abscess*
122	0/31	0/30	0/31
123	1/14	1/13	1/14
230	0/16	0/16	0/16
265	0/32	0/29	0/32
268	6/16	1/10	1/16
274	6/32	0/26	0/30
286	0/32	0/32	0/32
289	0/32	0/28	0/32
402	4/16	0/12	0/16
423	0/30	0/29	0/29
440	0/27	0/26	0/27
441	5/21	0/16	0/21
Total	22/299 (7.4%)	2/267 (0.75%)	2/296 (0.68%)

Methodology

The assemblage was recorded through the use of a simple recording sheet. This enabled a quick calculation of totals to be made along with a rough estimation of the number of individuals in each context and in total. All elements were recorded including vertebrae, ribs and teeth. The Minimum Number of Individuals (MNI) was not calculated due to the small number of bones identified.

An attempt was made to separate the sheep and goat bones using the criteria of Boessneck,[28] Prummel and Frisch,[29] in addition to the use of reference material housed at the OAU. However, since only one goat bone was clearly identified from the assemblage, all caprine bones are referred to as sheep in the text.

Ageing was based on dental eruption, dental wear and epiphyseal fusion, although the latter is less reliable. Dental eruption and dental wear were measured using a combination of Payne's[30] and Grant's[31] data for sheep. The timing of epiphyseal closure for cattle, sheep and pig was based on Silver;[32] indicative elements from other species were absent.

The metric measurements taken were those defined by von den Driesch.[33] However, again, the small number of elements complete enough for measurements to be taken did not allow meaningful comparison with other assemblages of similar date. The measurement and ageing data can be found in the archive.

[28] J. Boessneck, 'Osteological Differences in Sheep (*Ovis aries* Linné) and Goat (*Capra hircus* Linné)', in D. Brothwell and E. Higgs (eds.), *Science in Archaeology* (1969), 331-58.

[29] W. Prummel and H-J. Frisch, 'A Guide for the Distinction of Species, Sex and Body Size in Bones of Sheep and Goat', *Jnl. of Archaeol. Science*, 13 (1986), 567-77.

[30] S. Payne, 'Kill-Off Patterns in Sheep and Goats: The Mandibles from Asvan Kale', *Anatolian Studies. Jnl. of Brit. Inst. of Archaeol. at Ankara*, 23 (1973), 281-303.

[31] A. Grant, 'The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates', in B. Wilson, C. Grigson and S. Payne (eds.), *Ageing and Sexing Animal Bones from Archaeological Sites* (BAR Brit. Ser. 109, 1982), 91-108.

[32] I.A. Silver, 'The Ageing of Domestic Animals', in Brothwell and Higgs, op. cit. note 21, pp. 283-302.

[33] A. von den Driesch, 'A Guide to the Measurement of Animal Bones from Archaeological Sites', *Peabody Mus. Bull.* 1 (1976).

Results

The vast majority of the bone derives from late Saxon contexts (Tables 6-7). The quantity of material is too small to facilitate interpretation of animal husbandry and exploitation, other than to indicate the presence of the animals at the site.

The majority of the late Saxon material came from dump fills in Trench 1 (contexts 131 and 132). This included almost all of the cattle (19 fragments) and sheep (95 fragments) bone as well as most of the pig, domestic fowl and a single identified goat horncore.

Sheep bones were the most numerous elements recovered from the assemblage and consisted largely of rib, long bone, skull and mandible fragments. The tooth wear stages of three sheep mandibles from contexts 131, 132 and 135 were recorded and showed sheep of various ages from 2 to 3 years, 3 to 4 years and 6 to 8 years. It is clear that at least some of the sheep were being kept until old age.

Cattle bones were the second most numerous and comprised teeth, vertebrae, rib and foot bones.

TABLE 6. NUMBERS OF ANIMAL BONE RECOVERED BY HAND ACCORDING TO PERIOD AND SPECIES

Period	*Cattle*	*Sheep*	*Goat*	*Pig*	*D. Goose*	*D. Fowl*	*Bird*	*Frog*	*Unid.*	*Total*
L.Saxon	22	109	1	10	1	5	0	3	104	255
Medieval	0	0	0	2	0	0	1	0	0	3
Modern	5	1	0	1	0	0	0	0	12	19
Undated	1	0	0	0	0	0	1	0	0	2
Total	28	110	1	13	1	5	2	3	116	279

TABLE 7. NUMBERS OF SIEVED ANIMAL BONE ACCORDING TO PERIOD AND SPECIES

Period	*Sheep*	*Pig*	*Rodent*	*Bird*	*Fish*	*Frog*	*Unid.*	*Total*
L.Saxon	16	7	2	2	24	129	882	1062
Undated	0	0	0	0	0	0	65	65
Total	16	7	2	2	24	129	947	1127

Conclusion

Sheep bones constitute the majority of the identified bones from the site and may have provided the majority of the meat to the inhabitants. The old age of the sheep indicated by tooth wear stages implies that the meat was likely to be a secondary product, with the animals being kept primarily for their wool, milk and dung. A few cattle bones were also recovered. Again it is likely that the meat was a secondary product with the cattle being used in traction as well as for their milk. A few pig bones were recovered; pigs would only have been kept for their meat and fat. It appears that the inhabitants of the site had some variety in their diet with a mixture of domestic fowl, domestic goose and fish. This may indicate a mid- to high-status site. However, the small number of bones recovered in addition to the majority from the two dump fills limits the interpretation of the assemblage for the site as a whole.

Charred plant remains by RUTH PELLING

A total of seven samples were retained for analysis. Three came from the vicinity of skeletons 115, 116 and 215, while four came from 10th- and 11th-century middens and ditch fills (131, 134, 137, 294). Samples of 5 to 32 litres in volume were processed by bulk flotation on a modified siraf type machine and flots collected onto a 250 μm mesh sieve. Dried flots were sorted under a binocular microscope at x10 to x20 magnification.

Results

Five of the samples contained charred seeds and chaff. All quantifiable items were extracted and identified by morphological characteristics and by comparison with modern reference material. The results are displayed

TABLE 8. CHARRED SEEDS AND CHAFF

	Sample	*1*	*3*	*4*	*5*	*7*
	Context	*114*	*131*	*134*	*137*	*294*
	Volume	*5*	*32*	*32*	*32*	*28*
	Date		*L.Saxon*	*L.Saxon*	*L.Saxon*	*9thC?*
	Feature	*Grave*	*Dump*	*Ditch*	*Ditch*	*Pit/ditch*
Triticum sp.	Wheat, free-threshing grain	–	6	2	2	–
Triticum sp.	Wheat grain	–	4	3	1	1
Triticum sp.	Rachis node	–	–	–	–	1
Hordeum vulgare	Barley grain	–	2	3	1	–
Avena sp.	Oat grain	–	1	3	2	1
Cerealia indet	Indeterminate grain	1	13	6	6	1
Cerealia indet	Detached embryo	–	–	1	–	–
Vicia/Pisum sp.	Vetch/Bean/Pea	–	1	3	–	–
Corylus avellana	Hazel nut shell fragment	–	4	2	–	1
Chenopodiaceae		–	–	–	1	–
Vicia/Lathyrus sp.	Vetch/Vetchling/Tare	–	2	1	–	–
Medicago/Trifolium/ Lotus sp.	Medick/Clover/Trefoil	–	–	1	–	–
Umbelliferae		–	–	–	–	1
Rumex acetosella gp.	Sheep's Sorrel	–	–	–	1	–
Rumex sp.	Docks	–	–	1	–	–
Polygonaceae		–	–	1	–	–
cf. *Odontites verna*	Red Barstia	–	–	–	1	–
Galium aparine	Goosegrass	–	–	1	–	–
Anthemis cotula	Stinking Mayweed	–	–	8	8	2
Compositae		–	–	1	1	–
Eleocharis palustris	Common Spikerush	–	–	–	1	–
Carex spp.	Sedges	–	2	–	–	–
Bromus subsect *Eubromus*		–	1	–	1	–
Gramineae	Grass, large seeded	–	2	5	–	–
Gramineae	Grass, small seeded	–	1	1	–	–
Indet			–	3	–	–1

in Table 8. Nomenclature and taxonomic order follow Clapham, Tutin and Moore.[34] While the concentration of remains was low in all samples, some general comments can be made about the assemblages. The preservation of material was generally poor and the grain was very 'tarry' and pitted, which is characteristic of burning at high temperatures and of post-depositional abrasion.

Cereal grains were the most numerous item recovered from the samples. The identification of free-threshing *Triticum* sp. (wheat), *Hordeum vulgare* (barley) and *Avena* sp. (oats) was based on the presence of grain. Chaff was limited to one fragment of *Triticum* rachis, although it was not possible to establish if a free-threshing variety was represented or to identify it to ploidy level. These cereals are all commonly encountered on sites of Saxon date within the Oxford region[35] and at sites further afield such as West Cotton in Northamptonshire[36] and Wraysbury in Berkshire.[37] The paucity of chaff seen in the samples is often associated with free-threshing cereals as the cereals are more likely to be brought into the site in a fully processed state. Cereal chaff also generally survives charring less well than cereal grains, particularly in the case of the free-threshing cereals.[38] In addition to the cereals, occasional indeterminate pulses and fragments of *Corylus avellana* (hazel nut shell) represent possible food debris.

Weed seeds were present in four of the samples. Most of the species represented are common arable or ruderal weeds such as *Rumex acetosella* (sheep's sorrel), *Odontites verna* (red barstia), *Galium aparine* (goosegrass) and *Anthemis cotula* (stinking mayweed). Generally these species suggest the cultivation of heavy clay soils, although *Rumex acetosella* is more usually associated with light, sandy soils. *Eleocharis palustris* and *Carex* sp. tend to be more associated with damp ground habitats although they do often occur in charred cereal assemblages, suggesting the cultivation of possibly marginal ground, or ground adjacent to damp areas. The grasses and the leguminous weeds (*Vicia/Lathyrus* sp. and *Medicago/Trifolium/Lotus* sp.) are not strictly arable weeds, although they can occur in arable fields either invading from field margins, or colonising through manuring.

The low concentration of remains and the poor preservation suggest that the material is likely to have been redeposited and reworked. As might be expected for a cemetery site, the range and concentration of the material does not suggest cereal processing on any scale. It is possible that the material was present as background 'noise' and was used to backfill features.

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Clearly, the marked intercutting of graves and the considerable quantities of charnel indicate that the cemetery was intensively used over a lengthy period. At least two broad phases of burial were identified, most notably in Trench 2: nine graves were sealed by dump layer 246 possibly representing a hiatus in burial activity which was succeeded by a complex sequence of intercutting graves, again sealed by a dump layer, 203=204. Grave 422 had stones placed around the head (possible so-called 'ear-muffs') and several were outlined by stones, a typical feature of later Anglo-Saxon burial practices.[39]

Oxford was developed as a fortified *burh* around the turn of the 10th century; however there is mounting evidence which suggests that it was preceded by settlement and activity along the line of the Thames crossing throughout the mid Saxon period.

[34] A.R. Clapham, T.G. Tutin and D.M. Moore, *Flora of the British Isles* (3rd edn. 1989).

[35] M. Robinson and B. Wilson, 'A Survey on Environmental Archaeology in the South Midlands', in H.C. Keeley (ed.), *Environmental Archaeology: A Regional Review*, vol. 2 (HBMC Occas. Paper No. 1, 1987), 16-100.

[36] G. Campbell, 'The Preliminary Archaeobotanical Results from Anglo-Saxon West Cotton and Raunds', in J. Rackham (ed.), *Environment and Economy in Anglo-Saxon England* (CBA Res. Rep. 89, 1994), 65-82.

[37] G. Jones, 'The Charred Plant Remains', in G.G. Astill and S.J. Lobb, 'Excavation of Prehistoric, Roman, and Saxon Deposits at Wraysbury, Berkshire', *Archaeol. Jnl.* 146 (1989), 124-8.

[38] S. Boardman and G. Jones, 'Experiments on the Effects of Charring on Cereal Plant Components', *Jnl. of Archaeol. Science*, 117(1) (1990), 1-12.

[39] D.M. Hadley, *Death in Medieval England* (2001), 40.

There is very limited evidence for early Saxon activity at Oxford.[40] This includes a settlement of 6th- to early 7th-century date at Oxford Science Park, Littlemore[41] and a probable 6th-century gold and garnet brooch found at Iffley. Two probable cemeteries are known from the site of the Radcliffe Infirmary[42] and Kingston Road. Other burials have been found in the vicinity of Park Town and Crick Road, and also Summertown.[43]

Archaeological evidence for mid Saxon activity at Oxford is almost exclusively restricted to the south edge of the second gravel terrace and beyond. It comprises evidence for the establishment and maintenance of a river crossing, for settlement and activity along the line of the river crossing and for the existence of St. Frideswide's minster.[44] A timber recovered from deep tunnelling at St. Aldate's gave a radiocarbon date of cal AD 660-890 (GU 5333).

There is a long though slightly confused tradition that a Mercian sub-king founded a monastery at Oxford in the early 8th century at the instigation of his daughter Frideswide, who became its first abbess. The existence of a monastery or minster is first confirmed in written sources in a charter of Ethelred II dated to 1004.[45] This was in reparation for damage caused two years previously during the massacre of St. Bryce's day, when the Danes of Oxford had been burned in St. Frideswide's Church after taking refuge there. The minster's existence is subsequently confirmed by Domesday Book, which records that the canons of St. Frideswide held their land during the reign of King Edward and in 1086. The minster was refounded as a house of regular Augustinian canons during the reign of Henry I, probably around 1120,[46] surviving until it was suppressed by Cardinal Wolsey in 1524 for the establishment of his new foundation of Cardinal College. On Wolsey's death in 1529 Cardinal College reverted to Henry VIII, who refounded it as Christ Church in 1532 following a short lapse in building work. The priory church became the cathedral of the new diocese of Oxford in 1546.

The tradition of St. Frideswide survives in three 12th-century accounts: a brief account included by William of Malmesbury in his *Gesta Pontificum* and two Lives of St. Frideswide, one written *c.* 1100-30 by an unknown author, and the other written *c.* 1140-70, probably by Master Robert of Cricklade, Prior of St. Frideswide. The Lives have been edited and reviewed in detail by Blair.[47] The accounts differ slightly, but in essence the stories tell that a sub-king called Didan ruled in the Oxford area around the early 8th century, and had a very pious daughter called Frideswide. Didan built a church at Oxford dedicated to the Holy Trinity, the Virgin Mary and All Saints, and soon afterwards Frideswide founded a community of nuns there with her father's support, and became the abbess. After Didan's death Frideswide was pursued by King Algar of Leicester, who wished to marry her. She evaded him and fled to Bampton where she remained for three years before returning to her minster at Oxford. She died there, according to the earlier Life, on 19th October 727, leaving orders that she was to be buried on the south side of St. Mary's Church, which the later Life states was next to the River Thames.

[40] A more detailed discussion of the evidence for Saxon activity in Oxford will be published by the OAU in 'Oxford Before the University' (Thames Valley Landscapes Monograph, in prep.).

[41] J. Moore et al., 'Excavations at Oxford Science Park, Littlemore, Oxford', *Oxoniensia*, lxvi (2001), 163-219.

[42] T. Dickinson, 'The Anglo-Saxon Burial Sites of the Upper Thames Region, and their Bearing on the History of Wessex, c. AD 400-700' (Oxford Univ. unpubl. DPhil thesis, 1976), vol. II, no. 114, Oxford I.

[43] Ibid. nos. 115-17, Oxford II-IV.

[44] OAU, op. cit. note 33.

[45] S.R. Wigram (ed.), *The Cartulary of the Monastery of St. Frideswide*, i (Oxf. Hist. Soc. xxviii, 1894), no. 2.

[46] Ibid. i, no. 5; but also see J. Blair, 'St. Frideswide Reconsidered', *Oxoniensia*, lii (1987), 71-127, 227 and n. 45.

[47] Blair, op. cit. note 39, pp. 71-127.

It has been suggested that the legends may preserve a garbled memory of genuine information.[48] Blair has argued that the Upper Thames Valley saw the foundation of a whole series of minsters along the Thames and its tributaries during the later 7th and early 8th centuries, under the patronage of Mercian kings and sub-kings.[49] The Frideswide legend's suggestion of a minster at Oxford, presided over by the saintly daughter of a Mercian sub-king and in existence by the early 8th century would fit well with what is reliably known from elsewhere.

Although no structural evidence has yet been found for the Anglo-Saxon minster, the consensus of current opinion is that it is likely to have been located in the same place as the later Augustinian priory, on the site that is today occupied by Christ Church and Oxford Cathedral; that is at the edge of the Second Gravel Terrace, overlooking what would at the time have been a steep drop to the Thames channels below. Information from the second Life suggests that the church of St. Mary, in which the Saint was believed to have been buried, would have lain under the north side of the present cathedral building. Blair has suggested[50] that the original dedication to the Holy Trinity, the Virgin Mary and All Saints mentioned by the Lives could imply the original existence of a line of three churches that may be perpetuated in the alignment of the north side of the present cathedral and the churches of St. Aldate's and St. Ebbe's to the west. No conclusive evidence has been found for the layout and extent of the Anglo-Saxon minster precinct, although the steep natural slope of the ground and the river channels may have defined its south-east and east sides.[51] The upper surface levels of the gravel found in the graveyard trenches[52] could be seen to support a falling away of the gravel under the east end of the cathedral; however, this is inconclusive since it is uncertain how far the upper surface has been cut by archaeological features. Blair has suggested[53] that an early ditch found in excavations to the west at Church Street could have been the minster's original boundary.

The most compelling archaeological evidence for the existence of a mid Saxon minster at the site comes from burials found in the vicinity, which suggests the presence of a large cemetery during the 10th century, but also probably earlier. Burials have been excavated in four locations at Christ Church since the 1960s. Graves found by Sturdy in 1963 beneath the north-east chapels of Oxford Cathedral[54] are probably of 12th-century date, but two burials recorded by Hassall in Tom Quad in 1972[55] provided the first evidence of a possible mid Saxon presence. The skeletons were found lying on beds of charcoal, and a sample of charcoal from the earlier grave was submitted for radiocarbon dating; the result was interpreted at the time as indicative of a date in the second quarter of the 9th century,[56] although subsequent recalibration has given a much wider date range of cal AD 680-1160 (Table 1). During excavations in Christ Church cloister in 1985,[57] 14 inhumations were found cut into the red-brown loam topsoil. Radiocarbon dates were obtained on bone

48 Blair, op. cit. note 4; J. Blair, *Anglo-Saxon Oxfordshire* (1994), 52-4, 61-3.
49 Blair (1994), op. cit. note 41, pp. 59-65, fig. 41.
50 Blair, op. cit. note 4, pp. 233-5; Blair (1994), op. cit. note 41, pp. 61-3.
51 Blair, op. cit. note 4, p. 230, fig. 92.
52 See above, 'Location and Geology'.
53 Blair, op. cit. note 4, p. 235.
54 Sturdy, op. cit. note 3.
55 Hassall, op. cit. note 16, pp. 270-4, fig. 2.
56 Ibid. p. 271.
57 Scull, op. cit. note 2.

samples from four stratigraphically related burials. Three of these were similar, and broadly of the later 8th to 10th century but the fourth was significantly earlier, dated to the range cal AD 668-884. Some doubt was expressed in the original report about the validity of this date[58] since the radiocarbon dates calibrated to 1 sigma confidence level contradicted the stratigraphic sequence; burial F127, with the early radiocarbon date (HAR-6817). However, at the two sigma confidence level the dates and the stratigraphy are not in conflict, and would be consistent with a date in the late 8th or 9th century for both burials.

The radiocarbon dates from the 1998 excavations are consistent with the stratigraphic sequence, and the later two have broad date ranges between the 8th and 10th centuries. The distribution of probability for one of these (skeleton 418; NZA-12344) suggests a strong likelihood of burial before 900; the distribution of probability for the other (skeleton 277; NZA-12354) suggests a later burial, of the later 9th or 10th century.

The earliest burial of the three gave a very surprising result, however, with a date range of cal AD 620-690 (skeleton 402; NZA-12343). This is the earliest radiocarbon determination yet obtained for Saxon Oxford, and certainly the first to suggest an unequivocal 7th-century date. The skeleton, of a woman aged 40+, came from the bottom of a sequence of burials extending into the 11th century. Provisional results suggest that the sequence was interrupted by a dump layer. Although the dump layer is itself undated, it was cut by skeleton 277 (see above) which strongly suggests that the dump layer was deposited in the later 9th or 10th century, or before. A date early in this range is perhaps suggested by the observation that the dump layer overlay 418, arguably datable to the late 8th or 9th century. All of the pottery from above the dump layer was of late Saxon or 11th-century date. The location of the grave, in an area that was subsequently re-used for burials throughout the succeeding 300 years, suggests that it may be the earliest grave yet known from the cemetery on the site of St. Frideswide's Priory.

Clearly this is not in itself sufficient to confirm the existence of a minster at Oxford in the later 7th century. Indeed the burials do not prove the existence of the minster at any point in the mid Saxon period, although it would be hard to see 10th-century burials in any other context, particularly following the foundation of the *burh*. It is clear from the evidence of isolated mid Saxon cemeteries such as Beacon Hill, Lewknor[59] and Yarnton, Worton Rectory Farm[60] that people in the Oxford region, as elsewhere, were by no means necessarily or even usually buried in minster graveyards during the mid Saxon period, even if the Christian burial rites must have been administered by priests from the church. It remains possible, therefore, that there was originally a cemetery at Oxford without a church. Radiocarbon dates from the six Yarnton burials show that they were a contemporary 9th-century group.[61]

Recent excavations at Newark Castle uncovered a late Anglo-Saxon cemetery containing at least 70 burials and probably many more. All were aligned west-east, unaccompanied by grave goods, and a few had ear-muffs or stone linings. Radiocarbon dates confirmed that they were 10th or 11th century although there was no evidence for an associated church.[62]

[58] Ibid. p. 62, fig. 15, table 9.

[59] R.A. Chambers, 'The Cemetery Site at Beacon Hill, near Lewknor (M40 Site 12): an Inventory of the Inhumations and a Re-appraisal', *Oxoniensia*, xli (1976), 77-85.

[60] G. Hey, 'Yarnton: Saxon and Medieval Settlement and Landscape. Results of Excavations 1990-6' (Thames Valley Landscapes Monograph, forthcoming).

[61] Ibid.

[62] J. Samuels, 'Newark Castle', *Current Archaeol.* 156 (1998), 458-61.

A number of churches built in the 10th or 11th century have been shown to have been preceded by burial grounds, for which there is no evidence of an earlier associated church. Examples are known from two sites in Barton-upon-Humber, Lincolnshire where radiocarbon dates centred around *c.* AD 900; two of the burials had stone linings.[63]

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63 W. Rodwell and K. Rodwell, 'St. Peter's Church, Barton-upon-Humber: Excavation and Structural Study, 1978-81', *Antiq. Jnl.* 62 (1982), 283-315.