Excavations in the crypt of St Paul's Cathedral, 1996–7 (SPU96)

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Contents

Appended after bibliography, in paper copy only:
Radiocarbon Date Certificates from Radiocarbon Dating Laboratory, Palaeoecology Centre, School of Archaeology and Palaeoecology, Belfast with supporting material
Finds Inventory for SPU96 (printout of file spu96finv.xls, stored separately).
Finds report not in digital form here:
Saint Paul's Cathedral, Ceramic Building Materials, by Terence Paul Smith (not dated, but 2002), 12 pages [includes reporting on material from PWT00 (a shaft dug to find the Wren drain outside the west end in 2000) and SAT00 (investigations below the crypt under the south transept also in 2000)].

Figures

Tables

Summary

Excavation in 1996–7 was carried out ahead of refurbishment of the crypt. Two recording exercises were recorded under the same sitecode, SPU96:

Areas A to D, chambers at the SW part of the cathedral to form a conference centre (now the Wren Suite), which included the digging of a tunnel from the main chamber below the chapel of St Michael and St George, W through the E wall of the SW tower at crypt level; and digging or monitoring of trenches for drains and other duct work both for the centre and for a restaurant to be placed in the main nave crypt at the W end. The archaeological work was by J Schofield and T Thomas of MoLAS. Excavation nowhere exceeded 1.2m in depth. Only features from the 1670s onwards were observed; but this included the reuse in Wren's foundations of stones from Jones's portico of 1635–42.

Beneath the floor in the bay at the W end of the central aisle of the nave, a temporary drain formed by two walls of soft red brick, unmortared (but sampled bricks had mortar on them, implying they were reused), survived five courses high, running E-W for a recorded distance of 1.2m. There were traces of timber boarding which originally formed a cover or top, at 12.5m OD. The drain was later put out of use: pebbles and sand had either fallen or been pushed into the drain, over the board, marking its disuse. Similar sand and gravel and then dark grey silt lay above. Above this lay a spread of grey-yellow mortar over the whole small excavation (ie going off in all directions), and then traces of a series of timbers, of which five showed in the excavation, laid horizontally E-W. These were covered by compact mixed yellow sandy mortar. This is interpreted as a temporary mixing area for mortar.

A branch of the main Wren drain system (ie not a temporary run on the construction site) lies under the corridor which is N of the SW tower and the adjacent crypt to the E; like the other branches, the drain runs from E to W. The top of this drain was exposed during the Site C excavation, but was not broken open.

The tunnel through the foundation between the SW tower and the main chamber at crypt level to the E produced 77 fragments of moulded stone, including at least 45 identified as being from the portico of Inigo Jones (1635–42), reused as rubble. A small part of the inner core of the tower foundation may be seen behind a hinged panel on the N side of the new passage. A shallow trench along the passage from the W end of area B to the domed chamber beneath the SW tower, excavated to a depth of about 200mm, uncovered backfilled test pits dug here in 1932. The pits had revealed lengths of the foundations beneath the circular Wren basement wall, possibly showing different parts, and had excavated a previous pit which is interpreted as the removal by Wren's workmen of a Roman kiln.

In the trench along the corridor on the N side of the main chamber, part of a truncated foundation, of ragstone and chalk fragments in a yellow sandy mortar lay roughly N-S (though at right-angles to the general line of the medieval cathedral, not the Wren building), and protruded S into the narrow trench from the N side. The length showing was 1.8m N-S by about 1.5m E-W. Within it were two parallel slots evidently formerly containing timbers, later covered by crushed chalk presumably when the structure was destroyed or removed. It may be the base of a raking timber support used in the demolition.

Area E: observation of a trench dug for a drain in a passage on the N side of the nave, outside the N wall of the nave but with its E end crossing the lowest part of a Wren foundation, the wall above having been removed probably in 1909. This was excavated by T

Thomas. Thirty one human skeletons were recorded in the narrow trench. Five bone samples were dated by C14 to 1170 ± 18 years BP (780AD ± 18), 1208 ± 16 BP (742AD ± 16), 1178 ± 18 BP (772AD ± 16), 1103 ± 21 BP (847AD ± 21 and 1094 ± 17 BP (856AD ± 17) (Radiocarbon Dating Laboratory, Palaeoecology Centre, School of Archaeology and Palaeoecology, Belfast, UB-4741, UB-4742, UB-4743, UB-4744, UB-4745). A medieval foundation from the 15th-century Pardon Cloister was also seen, and more architectural fragments recovered from in and around the truncated Wren wall foundation at the E end of the trench.

1. Introduction

1.1 Site location, circumstances and dates of fieldwork

The Museum of London excavation site code SPU96 refers to two separate but related excavations of 1996–7 within the west part of the crypt of St Paul's Cathedral in the City of London and a related passage on the north side. The first was supervised by the writer as Cathedral Archaeologist with Tony Thomas of the Museum of London Archaeology Service (MoLAS); and the second was the work of Tony Thomas alone. The two excavations are referred to here as the first and second parts of the excavation SPU96 (Fig 1). The first took place in the south-western chambers and at the west end of the crypt of St Paul's, in several linked spaces (Areas A to D). The second comprised a single trench ahead of a drain in the corridor leading from the north-west corner of the north transept at crypt level westwards to the works department; thus it lay on the north side of the nave of the Wren building, but also crossed the site of the foundation of the west wall of the north transept of the Wren building (Area E). In the site recording, contexts SPU96[1] to [136] are from the first part (Areas A to D); and contexts [137] to [358] are from the second part (Area E).

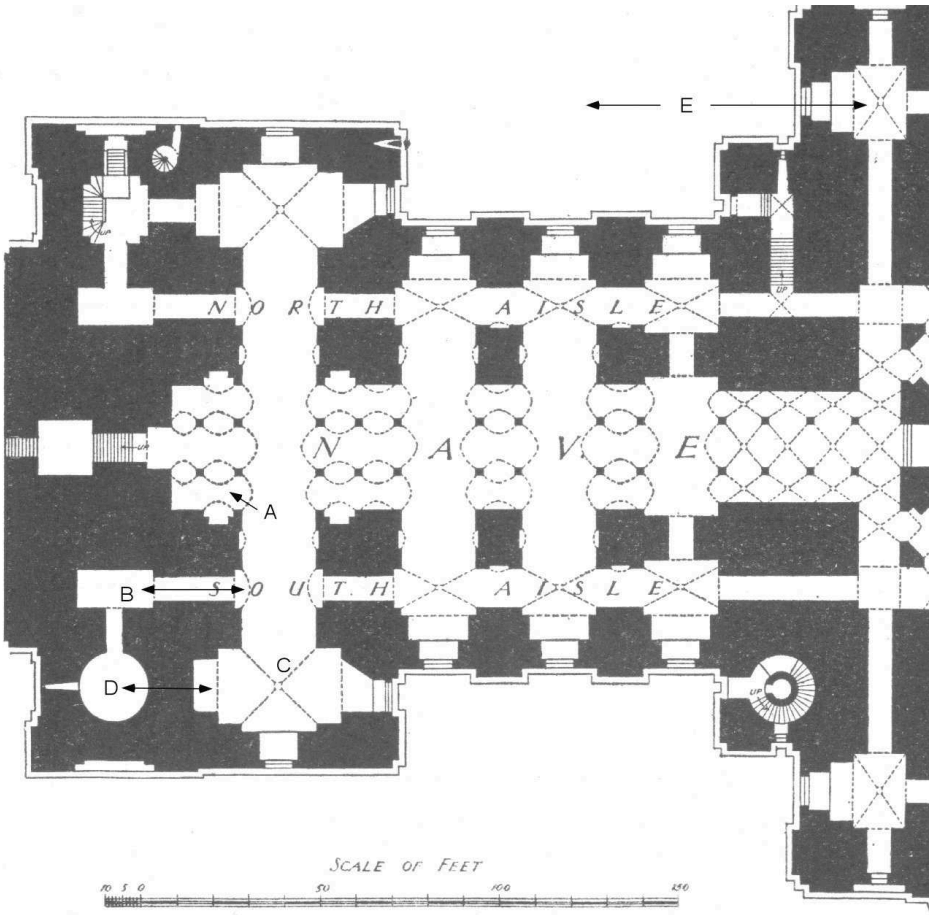


Fig 1 General location of the parts of SPU96 (Areas A to E) within the west crypt of St Paul's Cathedral, marked on an extract from the crypt plan in RCHM(E) 1929

Immediately prior to 1993 the chambers of the west end, including those beneath the two western chapels, comprised a mixture of rooms for cathedral staff, including a canteen or

refectory, and storage spaces. The more public space in the centre of the crypt was laid out as an exhibition space dealing with the history of the cathedral, which included Wren's Great Model (1673; restored 1993 and moved into the Trophy Room off the north nave triforium), and a small museum or treasury was inserted into the space beneath the north transept (where there had been war damage) in 1981. In 1994 recording took place during the adaptation of the north aisle of the crypt for new public toilets and the piercing of the north wall of the crypt for a passage (sitecode SPL94; Thomas 1995).

The south-west part: Areas A to D

In 1994 also the Dean and Chapter proposed to extend the recent refurbishment of the crypt into several spaces beneath the west end of the cathedral. The transference of the cathedral shop from the west end of the nave to the central part of the crypt having been undertaken, the intention was now to

(i) make more usable the space formerly occupied by the Duke of Wellington's funeral carriage, in the westernmost bay of the middle aisle of the crypt, by establishing a cafe and servery there (this would require excavation in the areas called Area A);
(ii) make a conference centre in the two spaces of the chamber below the chapel of St Michael and St George, then used as a scaffolding store, and the adjacent small domed chamber beneath the south-west tower (Areas B-D) (Fig 1; Fig 2);
(iii) take up and relay the central part of the crypt floor in a number of connected spaces, to complete the programme of relaying and levelling the floor already begun under the previous phase. This part of the work was monitored archaeologically but produced no records.

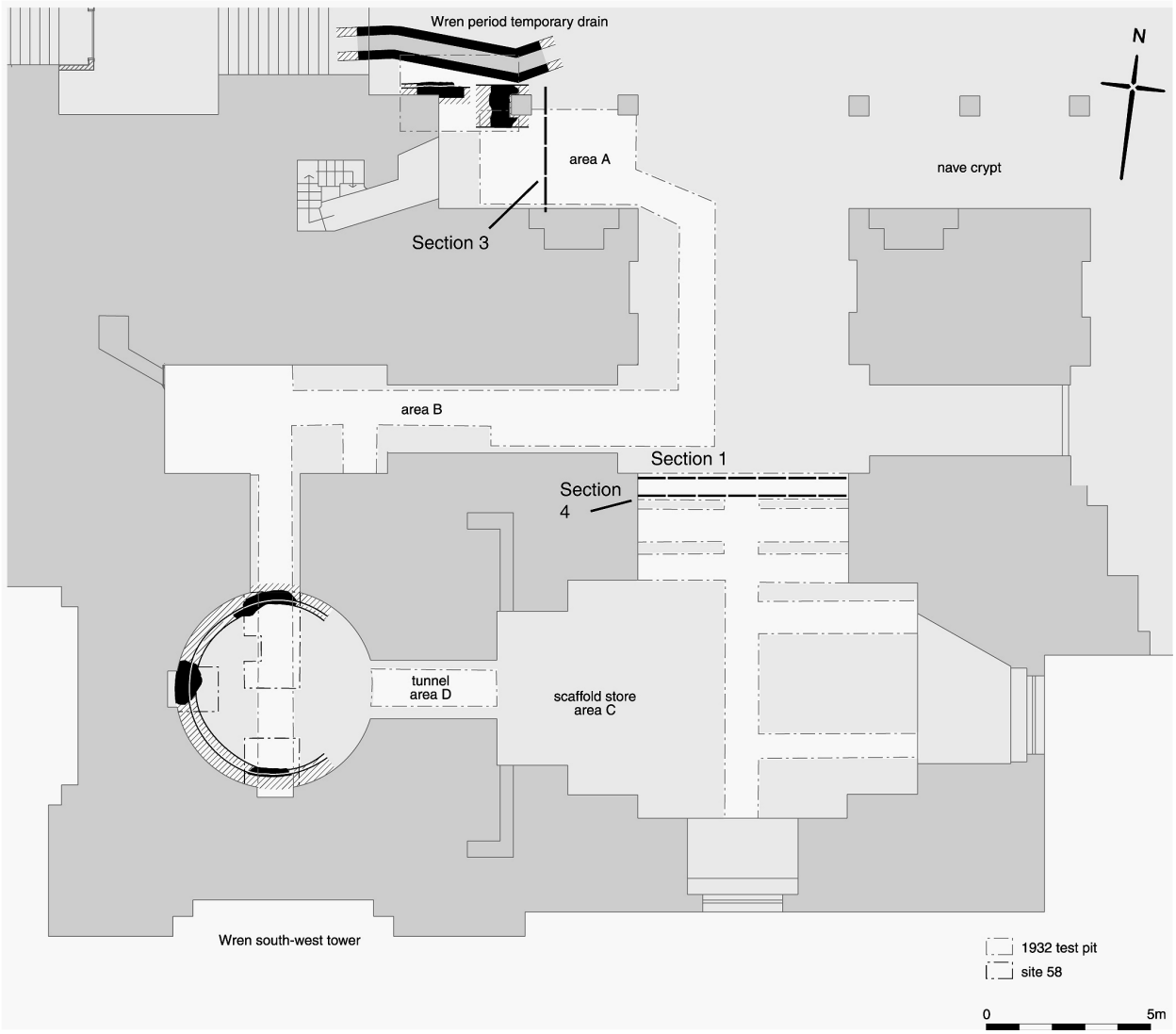


Fig 2 Overall site plan, Areas A to D, showing section lines and location of Gibb-Freeman trial pit 9 of 1932 (C Lemos, MOLA; Schofield 2011, 307, fig G6); Sections 1, 3 and 4 added

These proposals, forming Phase 2 of the crypt development, were the subject of an archaeological assessment (Schofield 1995). The creation of the café in the central bay of the west end would involve a small amount of new drainage beneath the floor and the adaptation of existing ducts. The creation of the conference centre would involve several excavations requiring archaeological presence: the digging of a tunnel about 5m long from the scaffolding store westwards through the foundation forming the east side of the south-west tower, to connect the spaces; several trenches for foundations for new walls in the scaffolding store; and new drains in the passage which currently connected the scaffolding store with the tower by entering the tower basement on its north side. This would expose one of the Wren period drains which lay along its line. The excavation work, by contractors Bakers of Danbury on the tunnel, and by the archaeologists elsewhere, took place in June–August 1996.

The investigations in the south-west part of the crypt, the first part of the SPU96 excavation, comprised the following areas (for plan, Fig 2):

- Area A: an excavation about 5m square, and ultimately about 0.6m deep, at the west end of the nave aisle of the crypt, to investigate ahead of an intended drain;
- Area B: excavation with contractors of the floor below the passage leading from the scaffolding store westwards along the north side of the foundations of the south-west tower of the cathedral, and a trench 0.37m deep along the north-south passage from the first into the domed chamber (Fig 3);
- Area C: trenches in the area between the main piers in the north part of the scaffolding store and trenches in the main room to the south (Fig 4);
- Area D: excavation of a new tunnel from the scaffolding store west to the domed chamber beneath the south-west tower (Fig 27 below).

Fig 3 The N-S passage (part of Area B) from the domed chamber beneath the SW tower (foreground), looking N; the scale rests on the masonry of the Wren foundation forming the passage floor, between the foundation for the west end (left) and the first pier (right) (MOLA neg 384/96/3)

Fig 4 SPU96: Area C looking SE, showing outline and character of trenches (MOLA neg 384/96/2)

The tunnel produced 77 fragments of moulded stone, including at least 45 identified as being from the portico of Inigo Jones (added to the west end of the medieval cathedral in 1633–41). There were also some medieval fragments; two were left in situ at the east opening, as they were partly broken through to form the opening. They are now behind the new fittings. A small part of the inner core of the tower foundation may be seen behind a hinged panel on the north side of the new passage.

Before the excavation, and when the scaffolding in the store had been removed, the walls of the space below the chapel of St Michael and St George were examined. Although some areas were clearly composed of stones with irregular shapes, almost certainly pre-Fire rubble, only one stone showed its mouldings outwards into the crypt, in the eastern reveal of the south window of the scaffolding store (Fig 5). The form of the stone (voussoir or horizontal element) is not certain, but the decoration is of the middle of the 12th century; this is discussed among the other stonework of this period below (and in Schofield 2011, 96–7, fig 4.45).

Fig 5 Stone <72> in the east reveal of the south window in the main chamber (Area C) (MOLA neg 303/96/1)

During the subsequent refurbishment, a large statue of Thomas Watt was removed from its position in the main part of the crypt, just outside the scaffolding store, to be transferred to Herriott Watt University in Edinburgh. The removal of this statue in 1996 enabled the wall behind, one of the walls in the crypt facing west, to be seen. A second medieval moulded stone with its mouldings facing into the crypt was revealed. It is an identical moulding of the 12th century. This has been left in situ, but has not been photographed for the present report. Unlike the first example, it is covered in several layers of (modern) paint.

The walls of the room intended to be the new conference centre were cleaned and repointed. At the suggestion of the author to the Surveyor Martin Stancliffe, however, the west wall of the main room above the passage, up to the semicircular vault of the room, was left with the stones pointed to a lesser extent. This area, being up near the vault, is made up of a high proportion of angular and sometimes rounded stones, and can still be seen there.

In the following report, use is made of records of two trial pits dug within this area of the crypt, recorded in the Gibb-Freeman book of trial pits of 1932 (in the St Paul's Cathedral Architectural Archive, hereafter SPCAA), that is Trial Pits 9 and 10 in that book. Trial pit 9 (Fig 11 to Fig 13 below) was a group of three pits dug in the domed chamber beneath the Wren south-west tower; one of these pits was crossed by a trench in 1996, but the pit was not excavated. Trial pit 10 (Fig 22 and Fig 23 below) lay immediately north of the excavation in 1996 called Area C, in the westernmost bays of the central crypt. Although it was outside and next to the area of excavation, the trial pit found a temporary drain of the Wren construction period exactly like one uncovered in Area C, and they are discussed together.

The trench in the north corridor: Area E

In late 1996 and early 1997 recording took place ahead of a new drain run and related excavations in the basement corridor leading from the north-west corner of the north transept at crypt level to the works department (for general location, see Fig 6, and compare with the

photograph which follows, Fig 7. A plan of the trench is given in Schofield 2011, 308, fig G7, where this second part of SPU96 is given a separate site letter within the volume, Site D). This corridor had been built as part of the works department by the Surveyor M Macartney in 1909, and he published a short note of archaeological observations made by him during those works (Macartney 1913), as described in section 2.1 below. The 1996–7 recording is termed Area E in the present report. The contractor's works being observed (Fig 7) comprised a single east-west trench 10.7m long, 0.7m wide and on average 1.2m deep in the east-west arm of the corridor, and removal of a small section of the foundation of the west side of the north transept of the Wren building; the foundation wall had been pierced previously for the passage, but the lowest part of the Wren foundation had been left below the floor of the passage as a slight hump (where the letters 'F/T' are on Fig 6). This was to be reduced to make the passage level, and the new drain would cross it. This drain run was the only intrusion into archaeological strata.

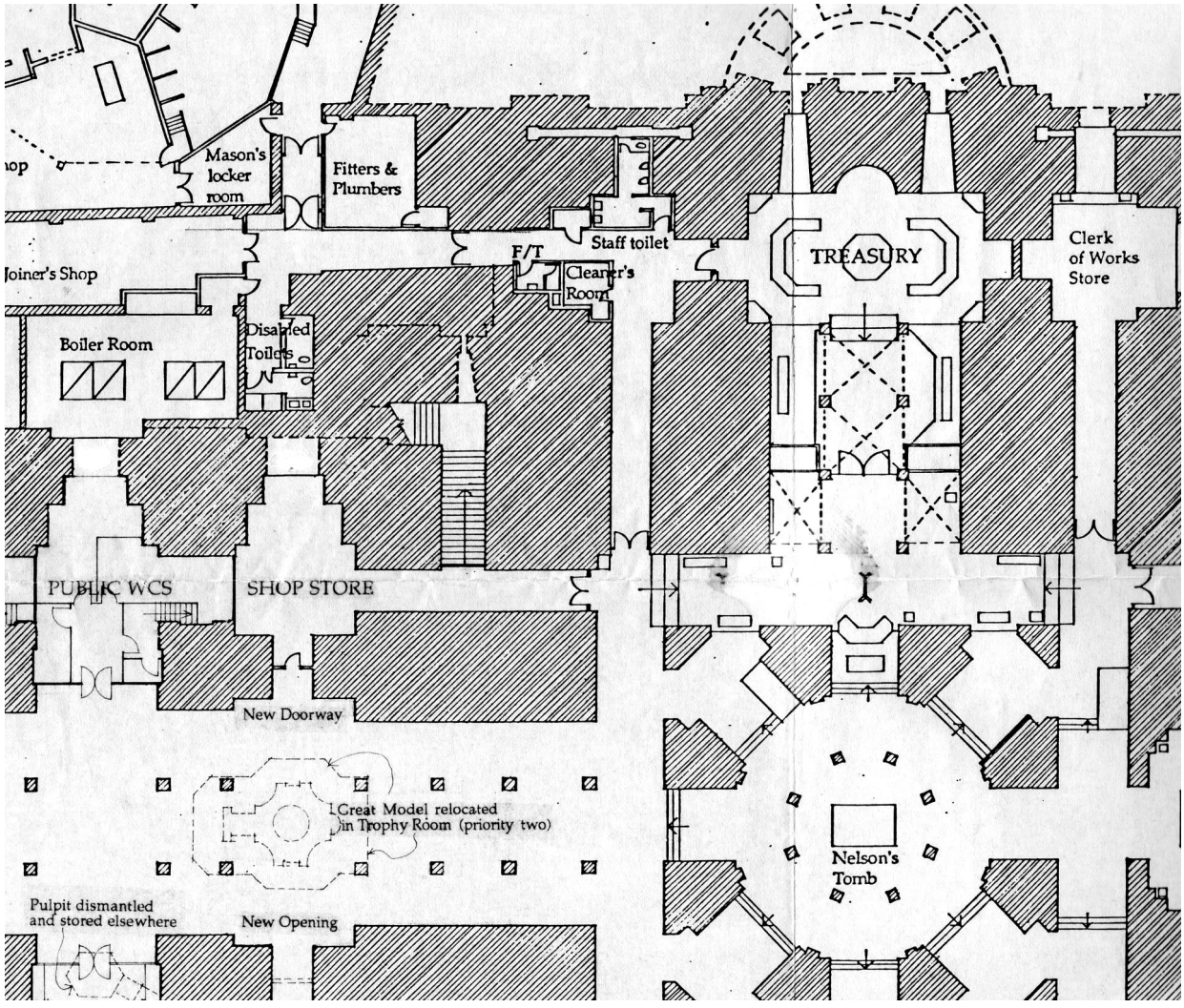


Fig 6 SPU96 N trench (Area E):this extract from a plan of 1992 by Martin Stancliffe Architects (drawing SP101 of November 1992) shows the general arrangements in the northern rooms of the crypt before development started in 1993. The trench observed as SPU96 Area E was to be dug in the passage running E–W towards the top of the plan, outside the room marked 'Fitters & Plumbers'

Fig 7 SPU96: the trench in the north crypt corridor (Area E), looking E (MOLA neg 1/97/4). The tags in the trench, bottom right, show the extent of one of the 8th- or 9th-century skeletons

Though cut by later features (particularly graves), natural gravel survived to a height of 13.0m OD. Roman deposits and features consisting of a ditch, pits, postholes and slots represent buildings. These were overlaid by graveyard deposits surviving 0.6m below the concrete slab. The remains of 31 individuals were recorded and excavated, along with evidence of a pit containing many disarticulated bones. At the east end of the trench some of the burials were cut by a chalk foundation which seems to be part of the Pardon cloister, of either 13th- or 15th-century date.

Lowering of the Wren foundation in the passage produced a further group of moulded stones; medieval, one important Jones piece (a large fragment of a window from the nave or transept clerestory) and some pieces, yet to be completely identified, which may be from 19th-century works. They had been buried in the passage floor. For details, see Table 9, stones 91–137 (context [194]).

These two sites are reported in archive as two parts of SPU96; they share a single run of context numbers. For the publication of all St Paul's sites of 1969 and 1994–2001 (Schofield 2011), they have been split into two sites, known in the final published series as site C (=SPU96 SW part, Areas A to D) and site D (=SPU96 north corridor trench, Area E). Contexts 1–136 are on site C, and contexts 137–358 on site D.

Unfortunately a significant portion of the site records for the north crypt corridor trench have been mislaid at some time between 1996 and 2000. During this time T Thomas left the Museum, and the present account is compiled by J Schofield from what remains. All the artefacts and skeletal remains, and photographs, are intact. The post-excavation work has proceeded as normal, including the analysis of samples from five skeletons for C14 dating, but the partial absence of stratigraphic records means that only broad groupings can be made, and for this reason the strata of the north trench (Area E) are grouped into only four broad groups. The C14 dating certificates are appended to this report.

The refurbishments of the western nave crypt, when they were finished in 1996, are shown in the architect's plan, Fig 8.

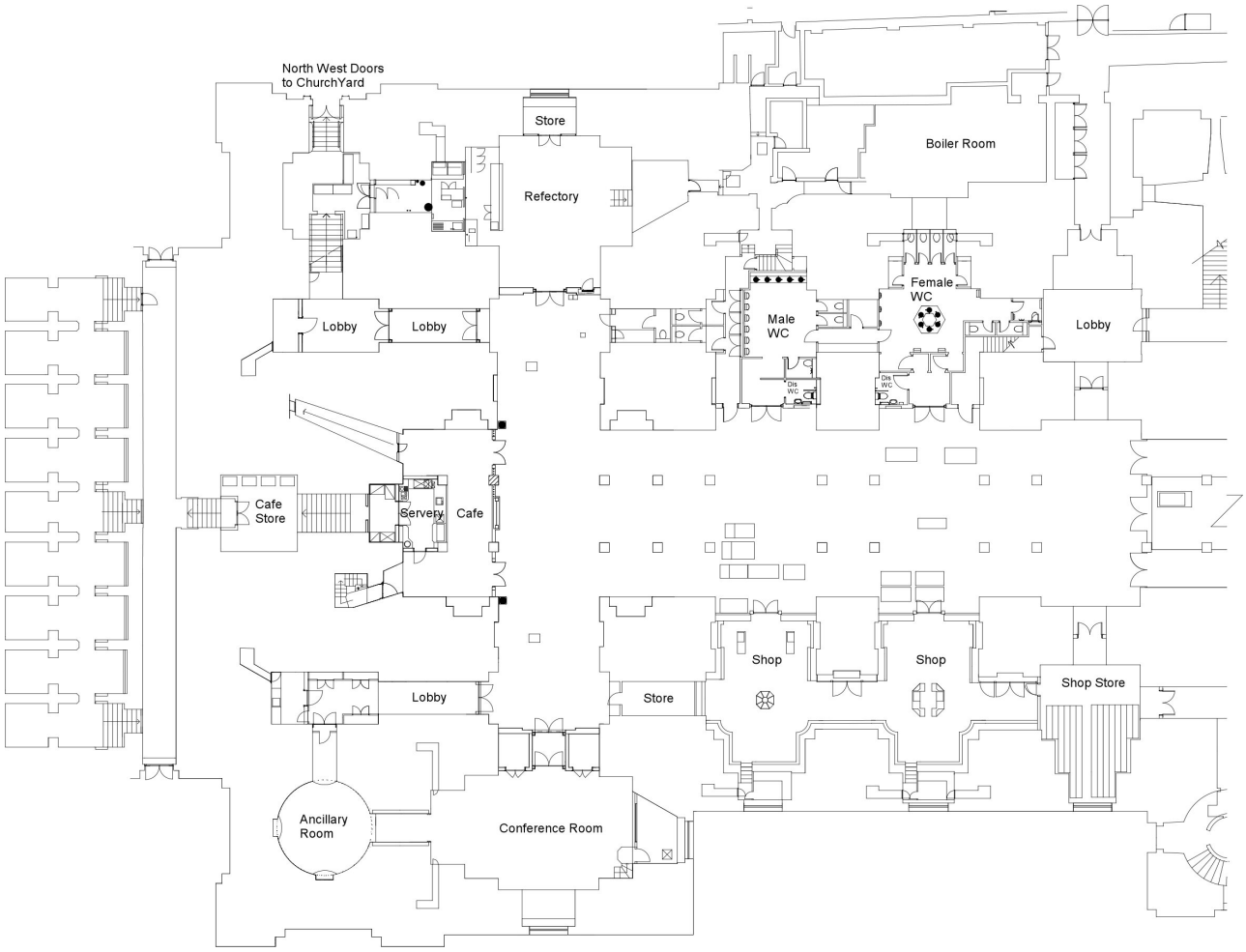


Fig 8 Extract from Martin Stancliffe Associates plan showing the completed refurbishmments in the nave crypt of 1994–6. Area A of the SPU96 excavation lay in the southern third of the 'Café' at the west end; Area B was the 'Lobby' and the passage at its west end into the 'Ancillary Room'; Area C was the 'Conference Room'; Area D the tunnel into the 'Ancillary Room' from the 'Conference Room'; Area E was the separate observation of a contractor's trench in the corridor leading east (right) at the top right corner of the plan

1.2 Organisation of the report

The contexts are grouped into stratigraphic Groups. The south west part of the excavation is covered by Groups 1–22 (Table 1) and the north corridor by Groups 23–6 (Table 2). The publication of these sites (Schofield 2011) retains the Group numbers for the north corridor (Gps 23–26) to provide linkage with this report, while at the same time calling the north corridor exercise a separate site, Site D.

Group	Interpretation	Contexts [all SPU96]
Area A (centre of west end of crypt)		
1	natural gravel	111
2	temporary drain	108–10
3	disuse of drain	105–7
4	mixing area	72, 103–4
5	? wall foundation	43, 47–8
6	Wren sleeper wall	30–2, 42, 44–6
7	Wren period scaffolding traces	16–29
8	construction surfaces	9–11, 13, 15
9	more Wren scaffolding traces	6–8, 14
10	makeup dumps for present crypt floor	2–5, 12, 116–17
Area D (tunnel)		
11	excavation of tunnel through Wren foundation	1, 33
Area B (E-W passage along N side of former scaffolding store)		
12	brickearth and chalk layers	68, 76, 80–2
13	possible raking shore foundation	65, 73–5
14	Wren foundations and drain, Area B	66–7, 69, 70, 77–9, 83, 114–15
15	modern drainage pipe	63–4
Area C (former scaffolding store, now Wren Suite)		
16	redeposited brickearths - ? Roman	125–8
17	disturbed layers, Wren construction	93–7, 133–5
18	Wren foundations and construction surfaces	84–6, 88, 90, 101–2, 118–24, 129–31, 136
19	Wren period dumps and construction surfaces	56–9, 60–2, 87, 91–2, 98–100, 112–13
20	dark soil with bones	55
21	post-Wren cuts and surfaces beneath crypt floor	50–4
22	modern slab of crypt floor	49

Table 1 Groups, interpretations and contexts, south-west part (Areas A to D)

Area E		
23	Roman deposits	151, 158–84, 194, 292–313, 316–26, 331, 335–8, 341–2, 350–1, 358
24	Saxon period deposits (burials)	145–50, 152–7, 197–235, 237–9, 241–4, 250–61, 263, 267, 276, 287,

		292, 314–15, 329–30, 340
25	Medieval deposits (cloister foundation)	140–4, 193, 196, 245–9
26	Wren period and later deposits	137–40, 185–92, 195, 236, 240, 262

Table 2 Groups, interpretations and contexts, north corridor trench. The assignment of contexts to their period group is not always certain due to the nature of the records

It should be noted that apart from moulded stones, there were no accessioned finds from the south-west part (contexts [1] to [136], Areas A to D); the small number of Roman and later artefacts were all recovered in the second part, from the north corridor trench (Area E). Pottery of Roman and later date was similarly only recovered from the north corridor trench. Thus there is virtually no artefactual dating evidence for the first part excavation in the west central bay and south-west area of the crypt (Areas A to D) (the exceptions being a few clay pipe stems and a piece of 17th-century pantile).

The greater part of the finds reporting apart from moulded stones, up to 2002, is contained in a report put together by Fiona Seeley of the Museum of London Specialist Services in 2002 called 'Analysis reports on the finds from St Paul's Cathedral, London'. This contains several finds reports on different aspects which are noted here separately, and much of the text in them is taken forward to the publication of all the St Paul's sites, Schofield 2011. The reports, several of which also consider material from Robert Crayford's observations on the Works Department site in 1969 (finds now coded GM307 in LAARC), are on Roman pottery (Symonds 2002), post-Roman pottery (Pearce 2002), accessioned finds (Keily 2002), ceramic building materials (Smith 2002) human remains (White 2000) and clay pipes (Heard 2002). The reports by Symonds, Pearce, Keily and White are appended here as Appendices 2–5 within the report (and in its digital form). The report by Smith is appended to the paper copy of this report. A separate report on the geology of medieval and post-medieval stones by Joan Blows, with a note by Bernard Worssam, is incorporated into the publication prepared during these years and published in 2011 (Schofield 2011; the geological report on p284–90). The C14 certificates for samples from five Anglo-Saxon skeletons recorded in the north corridor trench are appended at the end of this report (Radiocarbon Dating Laboratory, Palaeoecology Centre, School of Archaeology and Palaeoecology, Belfast, UB-4741, UB-4742, UB-4743, UB-4744, UB-4745).

2. Historical and archaeological background

2.1 The south-west part (Areas A-D)

The correspondence between the outlines of the medieval cathedral and the Wren building, as proposed by Penrose in the 1880s and now being tested by current work, is given in Fig 9. The progress of work at the west end of the new building in 1680 to 1688 can be reconstructed in detail from the building accounts. During the early years of construction, which started at the east end, the west end of the cathedral was left alone. In February 1680 the foundations of the north wall of the new nave were being dug (WS XIII, 127), and by November 1681 labourers digging out the nave had got to the west end (WS XIII, 157). In June 1682 the 'old Portico at the west end' is mentioned for the first time; perhaps labourers were at first only removing fallen or burnt stones (WS XIII, 162–3). Demolition of the south-west corner tower (Lollards' Tower), which is shown largely intact by Wyck around

1672, began in October to December 1685 (WS XIV, 3). The portico was evidently still standing, since stones from the Lollards' Tower were stored there out of the way (WS XIV, 3). In the following January to March, the old west gable began to be demolished: labourers were paid for 'breaking in pieces the great flawed and fire crackt stones to be used for Ruble, and wheeling and drudging them and the rest of the said Stones and pileing them up in convenient heapes nere the Westward foundations wch are yet unlaid, that they may be used therein' (WS XIV, 4). This shows that stones from the former west gable were to be incorporated into the foundations of the west end of Wren's cathedral.

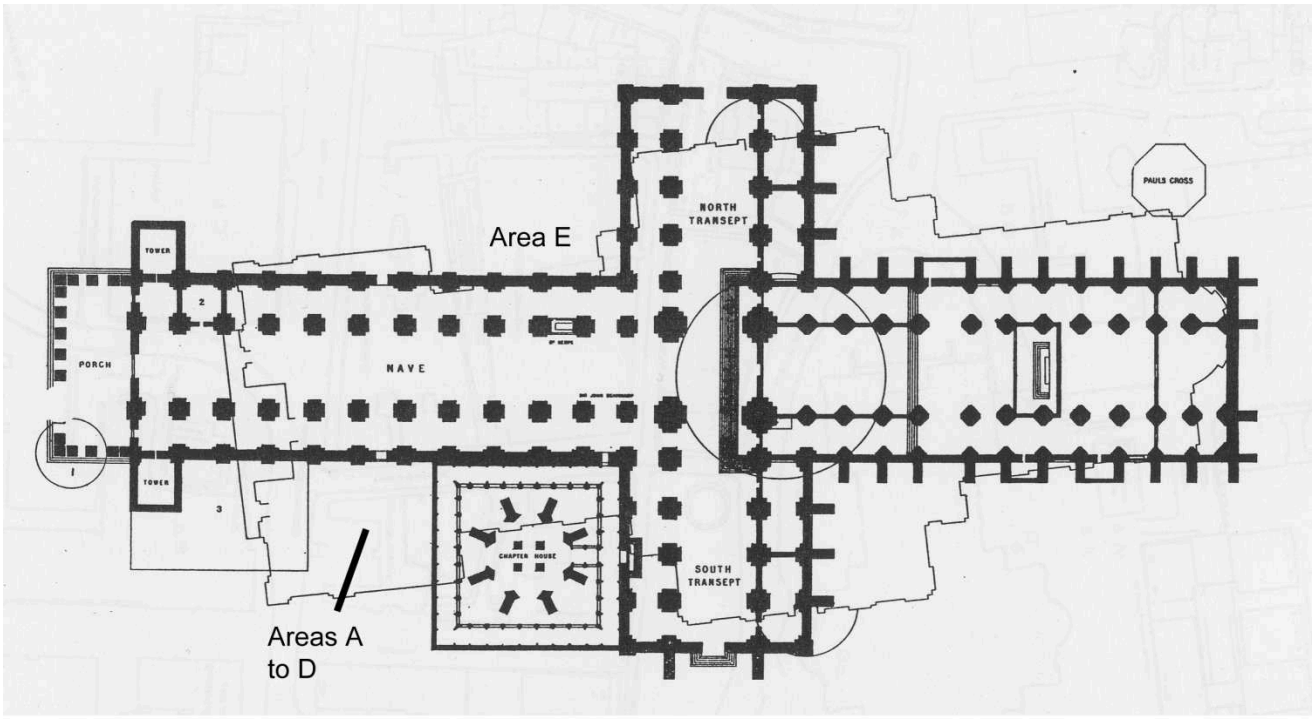


Fig 9 Correspondence between Wren and medieval building (Penrose), with general locations of the two parts of SPU96 shown: Areas A to D in the south-west part of the crypt, and Area E just outside the footprints of both medieval and Wren buildings

Then there was pause of about a year and a half. In September 1687, the space for the future south-west chapel (now the chapel of St Michael and St George) was being dug out by south Satchell and others; and Satchell was paid 'to take down 714 yds of the old W gable wall from the Stooles [sills] of the Windows to the top of the Capitalls equal with the top of the great dore case' (WS XIV, 29). By December 1687, the pre-Fire west gable and portico had finally been removed (WS XIV, 32). In July 1688 bricklayers were paid for turning the vault in the foundation of the north-west tower (WS XIV, 45), and in August J Thompson was paid for the foundations of the south-west tower (WS XIV, 47).

2.2 The north corridor trench (Area E)

From the north-west corner of the north transept crypt a corridor leads first north and then turns west (Fig 6). This is assumed to be the work of Surveyor Mervyn Macartney who built the first stage of the cathedral works department, at basement level outside the north side of the nave, in 1909–10. Some archaeological notes of coffins and part of the inner wall of the

Pardon Cloister were published by Macartney (1913; Fig 10). The northern and larger part of the works department was built in 1969, and observations in salvage conditions were made here by Robert Crayford (records in St Paul's Cathedral Architectural Archive, SPCAA; finds now in LAARC under sitecode GM307); he recorded Roman pits, more of the Pardon Cloister, a structure possibly the Becket Chapel which lay within the cloister, medieval and post-Fire buildings, and the Wren drain which crosses the works department site. The Area E trench crossed, from east to west, the line of the west wall of the north transept of the Wren building, at crypt level, and then the line of the east walk of the (? 13th- or 15th-century) Pardon Cloister. Though most of the Cloister was demolished in 1549, it seems likely that this east walk was allowed to remain, as it supported Sherrington's library (built in the first half of the 15th century) on the first floor above, against the medieval cathedral's north transept.

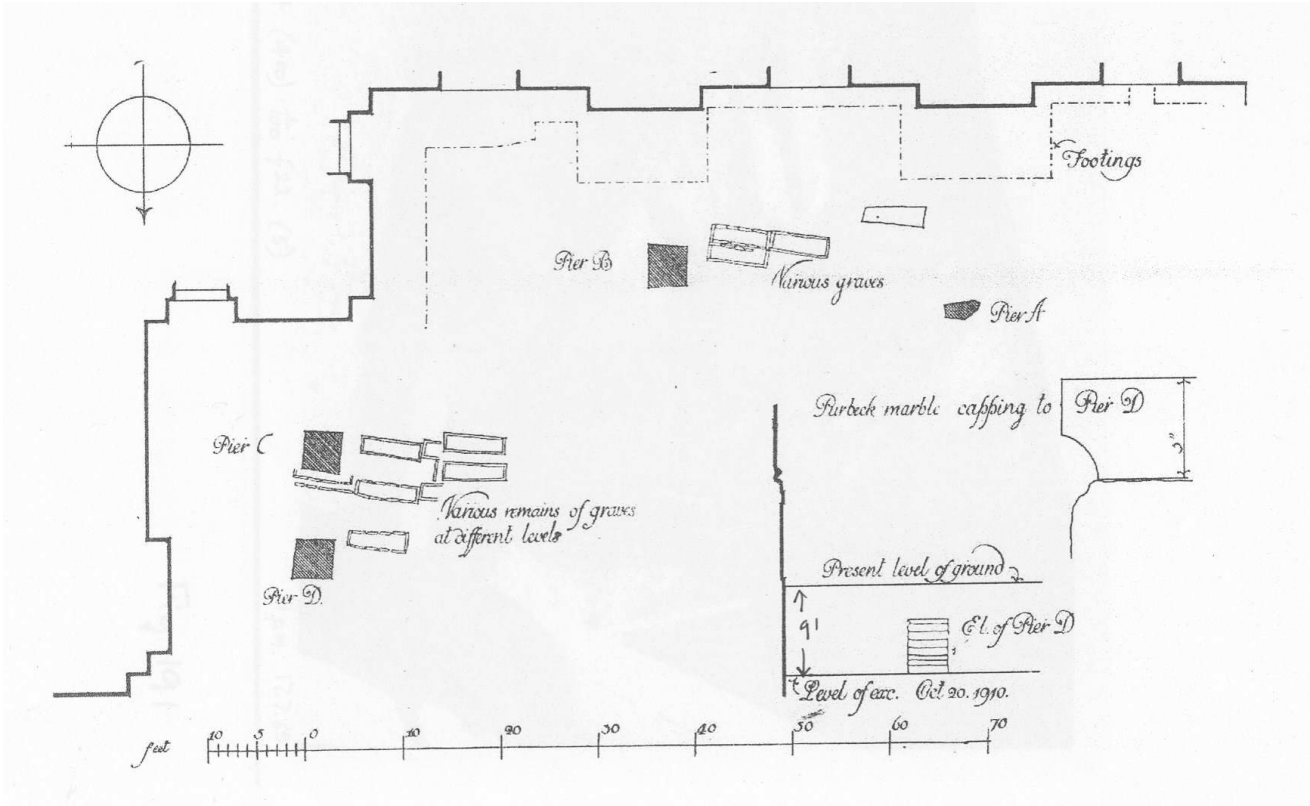


Fig 10 Observations by Macartney on the site of the first part of the works department underground building, 1909 (from Macartney 1913). North is to the bottom; the nave of the Wren building is shown at the top, and the Wren north transept is to the left

For the present purpose, the trench of 1997 will be described, but all the correlation with surrounding previous discoveries has been largely left to the text published in 2011 (Schofield 2011, 165–73). It is however necessary to suggest how some of the recorded features in 1996 fit into those recorded nearby in previous excavations.

3. Original research aims

The following objectives were in mind:

1. To characterise the deposits immediately below the Wren crypt floor in areas at the west end of the crypt, as far as the required interventions would permit;

2. To monitor the tunnel being dug through the east wall of the south-west tower at crypt level, and to recover any intact moulded stones from the previous building which would be incorporated in the wall;

3. To investigate the historic features likely to be exposed, i.e. the Wren drain in the south-west part, any foundations of the medieval cathedral and its ancillary buildings, the Pardon Cloister on the north side and any underlying stratigraphy, i.e. burials or Roman deposits.

4. On the north side in the corridor trench (Area E) to investigate the strata if surviving below the corridor floor, to see what the extent of Macartney's work in 1909 was, and to correlate any findings in the strata below the floor with his work, which would be of strata removed for the corridor itself, i.e. above those to be investigated.

4. Site sequence (first part of excavation, south-west part, Areas A to D)

4.1 Introduction: relevance of Gibb-Freeman trial pit 9 of 1932

An overall site plan for Areas A to D, showing the section lines illustrated in this report, is given in Fig 2. The findings are presented and discussed by broad period.

One of the internal series of trial pits dug by Gibb and Freeman in 1932 (book in SPCAA) lay beneath the trench being dug in the corridor north of the domed room beneath the south-west tower, and across the diameter of the room itself. The trench of 1996, less than 0.3m deep, uncovered the tops of the pits which together make up the Gibb-Freeman trial pit 9. The records of this group of pits are presented here and are to be fitted into other archaeological evidence. Within all the observations reported here, the Gibb-Freeman pit is the only one which went below about 1m below the Wren crypt floor, so it is important within the cathedral archaeological records for its probing into natural and Roman deposits. The Gibb-Freeman pit records are a group of water-colour drawings packed tightly on a single page, and they will be expanded into three extracts here.

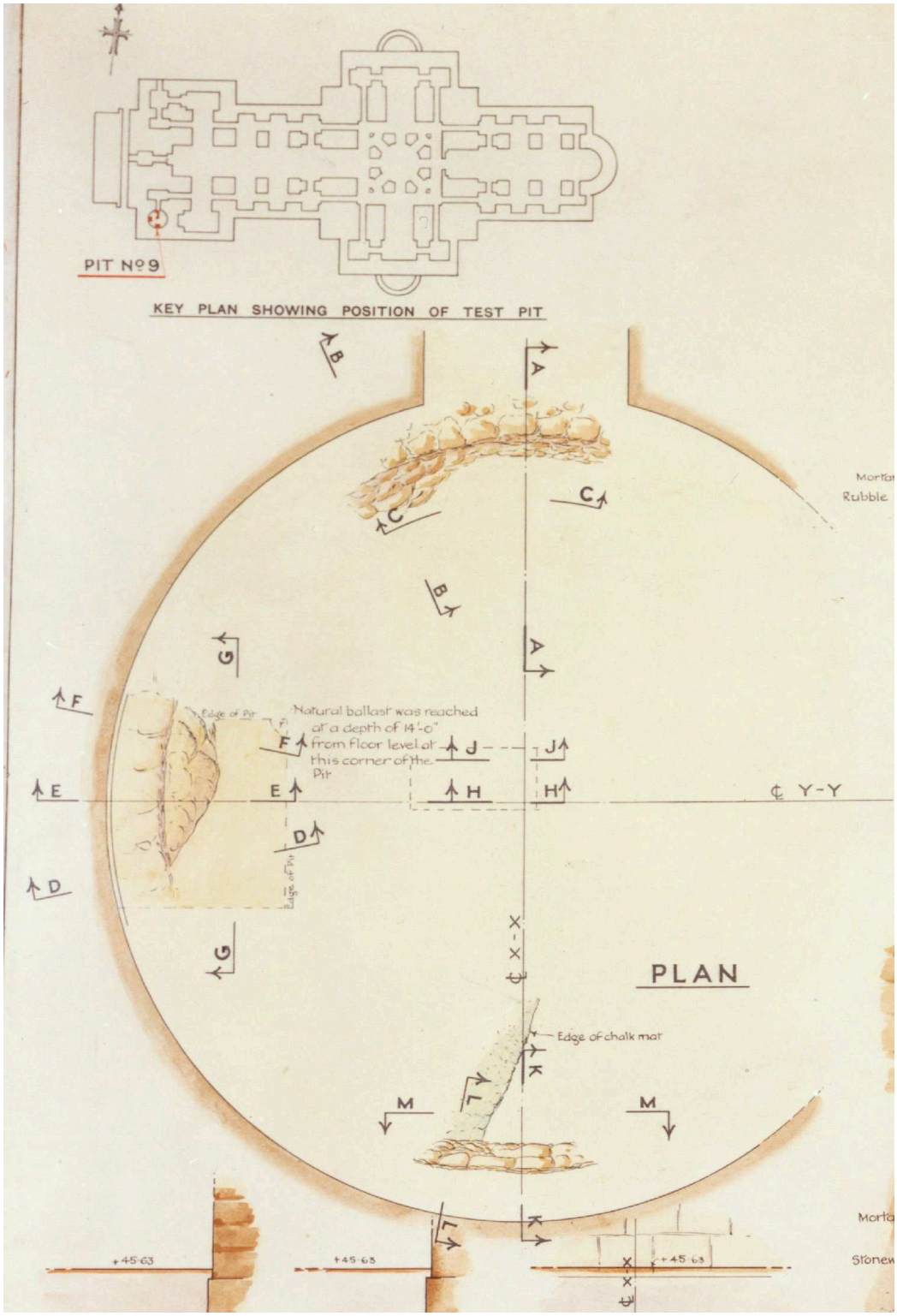


Fig 11 Gibb-Freeman test pit 9, 1932: plan of the group of pits within the domed chamber under the south-west Wren tower (SPCAA). Compare with the plan of excavations in 1996, Fig 2

The 'pit' comprised three pits (Fig 11), called here the north pit, the west pit, and the south pit. The depths are given in feet, and here have been both converted to metric and adjusted from Liverpool to Newlyn Ordnance Datum. In all twelve sections across the three holes are

shown. The level of the crypt floor was at 13.52m OD, and ‘natural ballast’ was reached at a depth of 14ft (4.27m). The detailed sections are now given as Fig 12 and Fig 13.

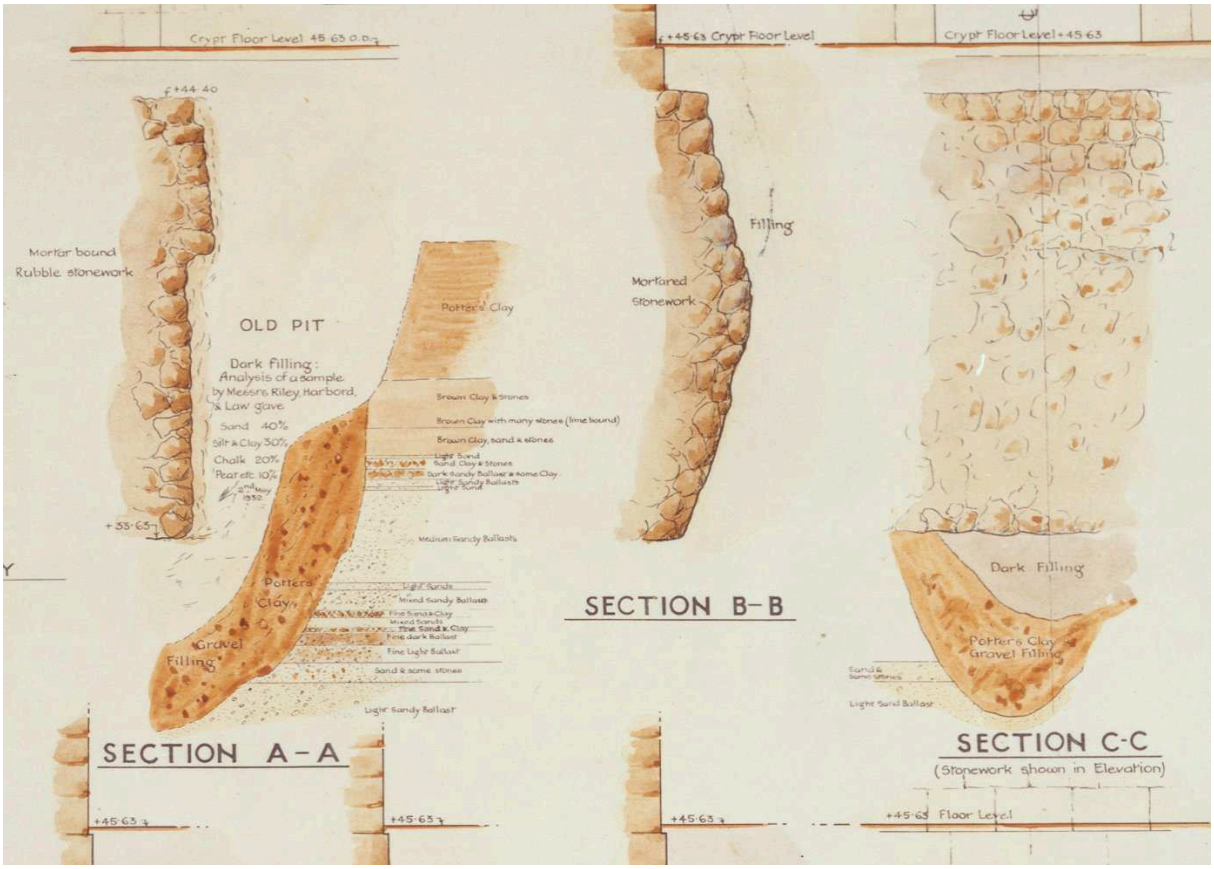


Fig 12 Gibb-Freeman test pit 9 record, sections A-A, B-B and C-C (SPCAA). Section A-A is shown in larger detail in Fig 17

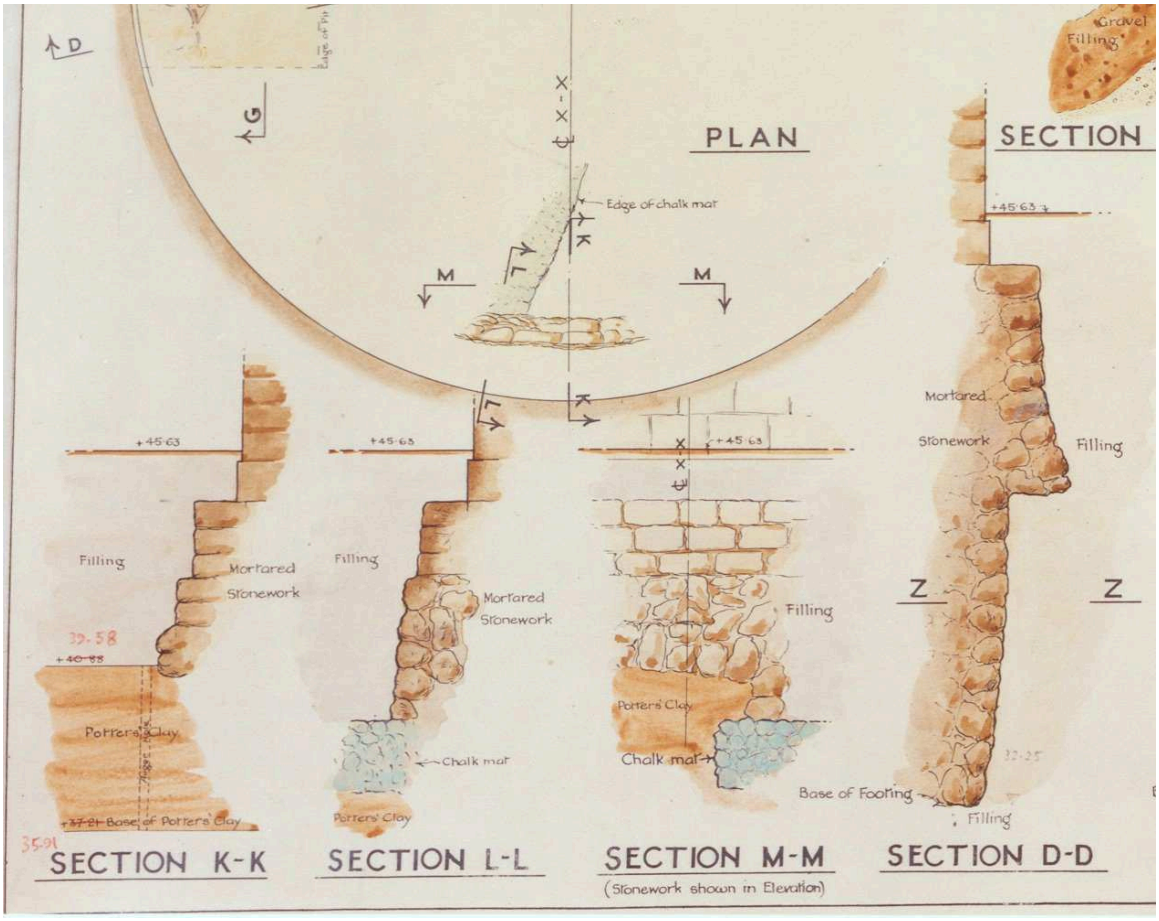


Fig 13 Gibb-Freeman test pit 9 record, sections K-K, L-L, M-M and D-D (SPCAA)

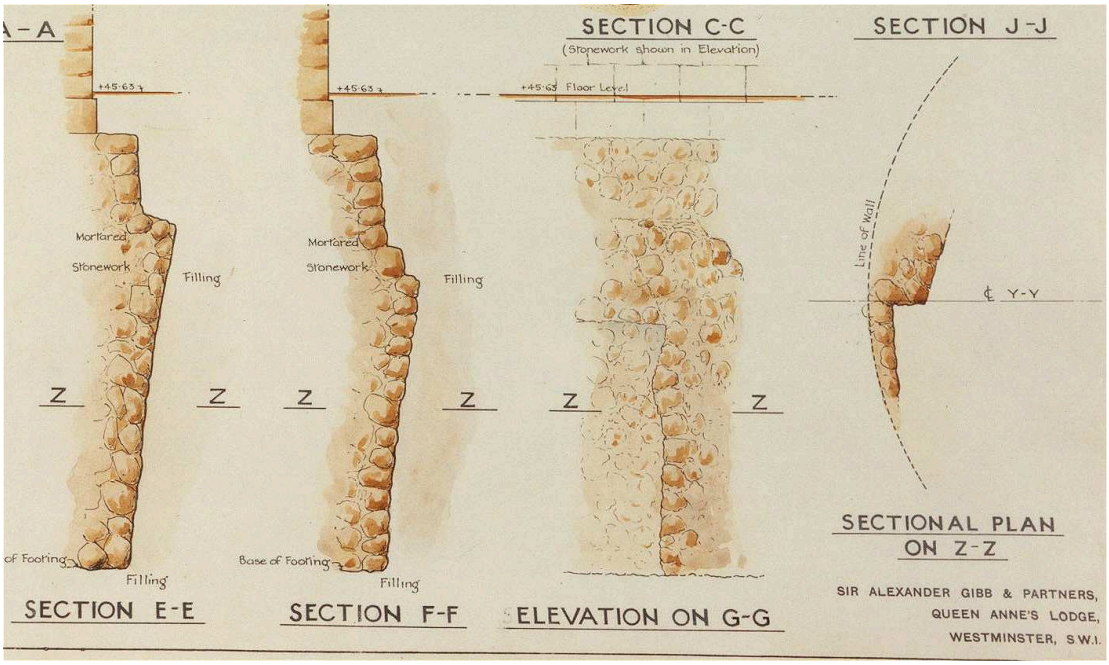


Fig 14 Gibb-Freeman test pit 9 record, sections E-E, F-F, G-G and its associated plan (SPCAA)

An overall site plan showing the lines of sections is given in Fig 2, and a view of the excavations in progress from the north in Fig 4. A Harris matrix of the excavated contexts is given in Fig 15 and Fig 16.

This complicated test pit record now has to be explained. The plan of the circular chamber and the locations of the sections are shown in Fig 11. The internal side of the foundation of the wall, which also circular, was drawn at several points: Sections A-A, B-B, C-C (an elevation, not a profile of the foundation), D-D, E-E, F-F, G-G (another elevation), K-K, L-L, M-M (another elevation) (details in Fig 13 and Fig 14). Sections H-H and J-J were small sections of strata in the middle of the room. Pre-Wren features recorded were the east edge of a chalk 'mat' on the south side (L-L and M-M) and a pit cut through Roman strata (A-A and C-C). The cutting of the pit and its backfill cannot be dated, and could have been done by Wren's workmen. As far as the foundations of the Wren walls are concerned, two different pieces of building seem to have coincided in the middle of the west side as shown in G-G and the associated plan; the foundation for the north-west quadrant was wider (Fig 14).

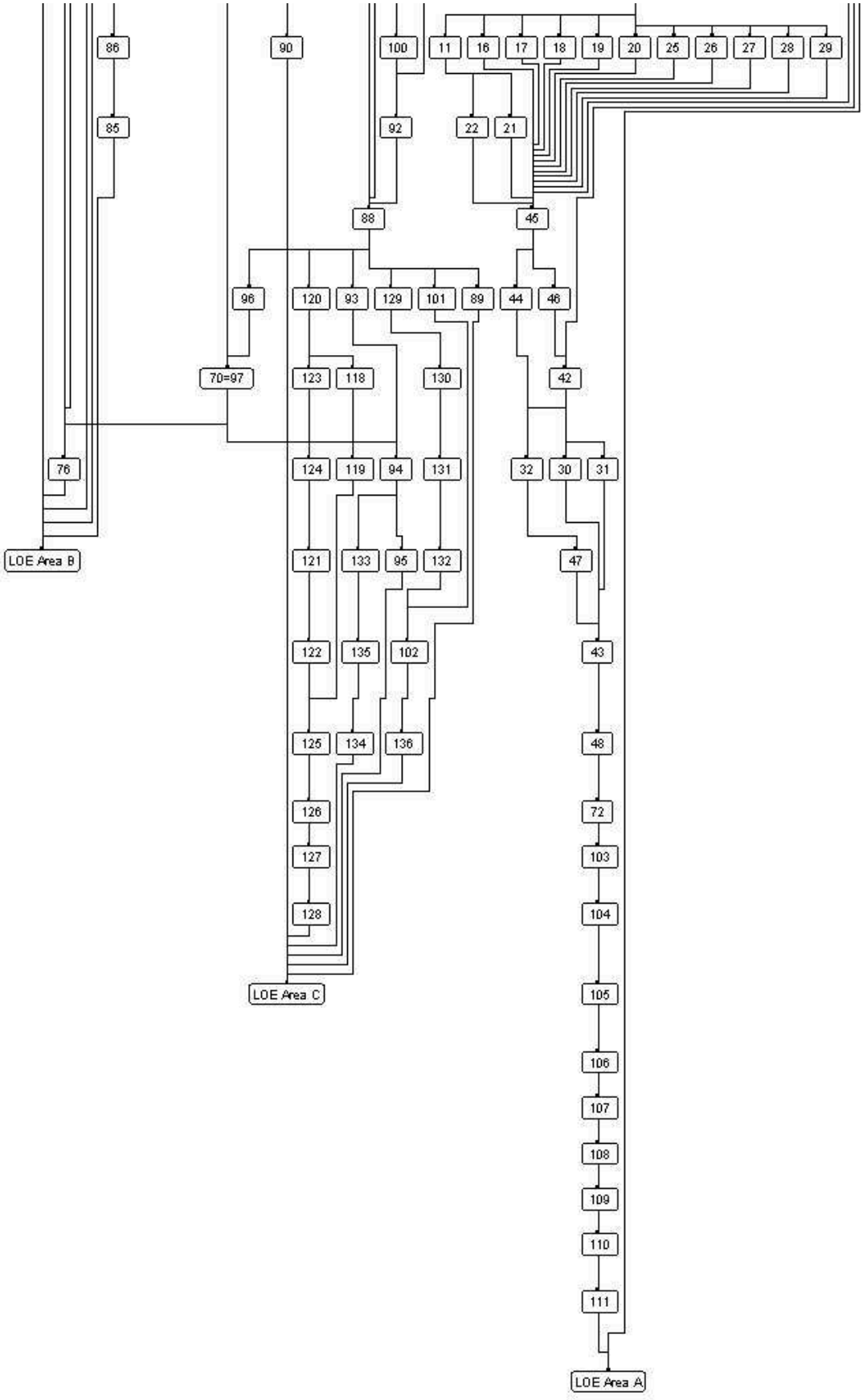


Fig 15 Harris Matrix for contexts in first part of SPU96, in south-west part of cathedral; lower part of matrix

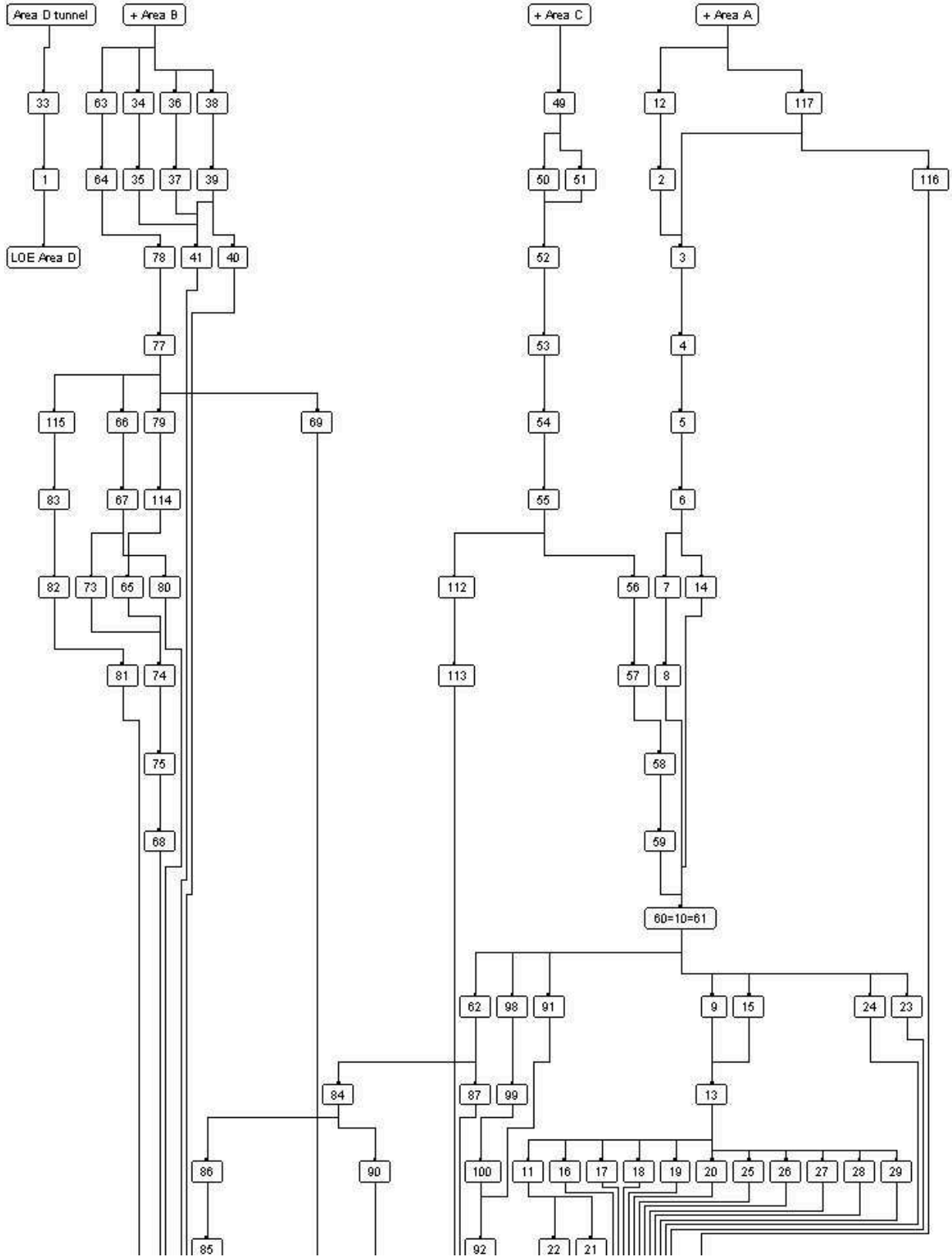


Fig 16 Harris Matrix for contexts in first part of SPU96, in south-west part of cathedral; upper part of matrix

4.2 Natural and Roman period

Group 1
[111] compact mid-yellow sand and gravel, at about 12.7m OD.

What was probably natural sand and gravel was also observed in the Gibb-Freeman test pit 9 holes beneath the south-west tower; the natural strata are reported with the probable Roman strata in the next section of this text for clarity. Roman stratigraphy was not observed in the SPU96 trenches in Areas A to D, but a glimpse of the underlying Roman strata is given by the watercolour record of Gibb-Freeman test pit 9 which was dug as three holes in the domed chamber beneath the south-west Wren tower (Fig 17). The shallow trench of 1996 crossed over the backfilled test pits, and they were not re-excavated.

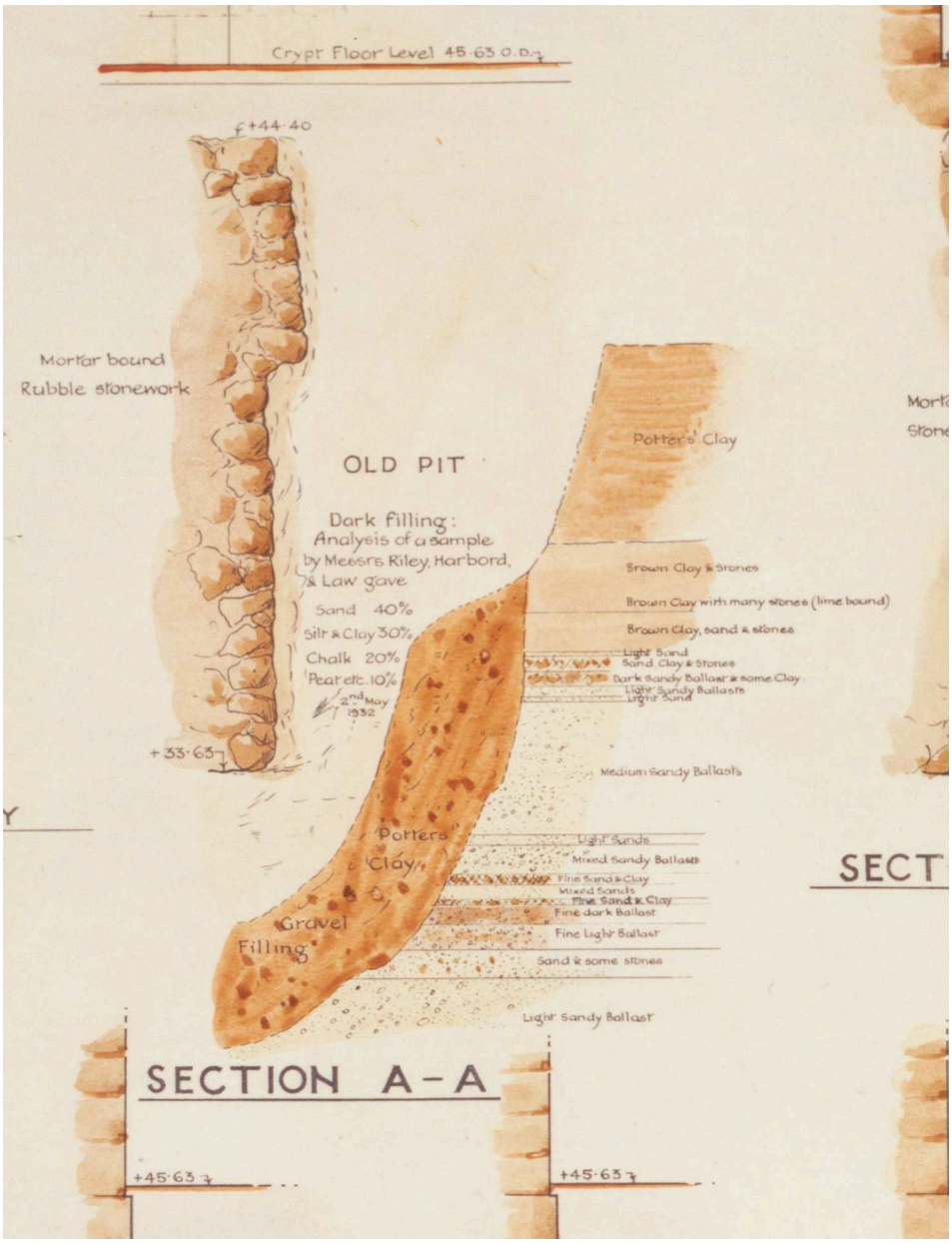


Fig 17 Detail of Gibb-Freeman record of Test Pit 9, showing 'Section A-A', a pit dug through horizontal strata (SPCAA)

From the earliest strata upwards, the holes show:
(i) in section A-A (Fig 17), layers of ballast (gravel) and sand were recorded from a maximum lower level of 9.11m OD to a junction with the brickearth ('potter's clay') at 11.01m OD. The brickearth survived 1.07m thick, its surviving top being therefore at 12.08m OD.
(ii) from the surviving (and truncated) top of the brickearth a large pit had been cut, of which the S side was seen in sections A-A and C-C. It was about 3.66m deep and at least 1.8m across. Its main and lower surviving fill on the E side was of 'potter's clay and gravel filling', evidently darker than the surrounding strata. A second layer within it shown in section C-C was 'dark filling'; this was analysed, according to a note on the drawing (section A-A) and found to comprise 'Sand 40%, Silt and Clay 30%, Chalk 20% and 'Peat' etc 10%'. This pit could have been dug at any date from the Roman period up to 1688. There is nothing in the test-pit record to suggest substantial Roman stratigraphy (e.g. brickearth walls or notes of finds) or a kiln.

4.3 Saxon and medieval

There were similarly no certain Saxon or medieval deposits recorded in the 1996 trenches, but observations in the Gibb-Freeman test pit 9 record are relevant.

In the southern of the three holes, and seen in sections L-L and M-M (Fig 13), was the east edge of a 'chalk mat'. The observed edge ran south-west/north-east for at least 1.14m; the mat was laid directly on the brickearth, and was 0.53m deep and at least 0.84m wide east-west. It lay beneath the foundation of the south wall of the tower (section M-M), but also protruded into the centre of the tower area for its length of 1.14m. This is possibly a chalk mat put down by Wren's workmen; but it also coincides with the likely line of the east end of the church of St Gregory.

4.4 Post-medieval: Wren construction period

The strata and finds, including many architectural fragments from the Jones portico reused in the wall of the crypt between two of its chambers, are described by Area (for plan, see Fig 2):
Area A was the bay at the west end of the crypt on the alignment of the middle of the crypt;
Area B was the passage along the north side of the former scaffold store, and the passage leading from its west end into the domed chamber beneath the south-west tower;
Area C was the former scaffold store (rebuilt as part of this refurbishment into a conference centre called the Wren Suite);
Area D was the tunnel dug in this refurbishment between the scaffolding store and the domed chamber beneath the tower.

In the cases of Areas A and D, discussion of their findings is placed next to the contexts concerned.

Area A

Group 2
temporary drain

[109] (in cut [110]) a drain formed by two walls of soft red brick (individually 0.21m x 0.1m x 0.05m), unmortared, surviving five courses high, running east-west for a recorded distance of 1.2m (Fig 18). There were traces of timber boarding [108] which originally formed a cover or top, at 12.5m OD. The east face of this trench is shown in Section 3 (Fig 19).

Fig 18 Wren-period temporary drain [109], looking SE. For a detail of the hard mortar surface[104] overlying it, immediately beneath the crypt floor, see Fig 20. Scale is 2 x 100mm (MOLA neg 415/96/1). The E side (top) is drawn in Fig 19

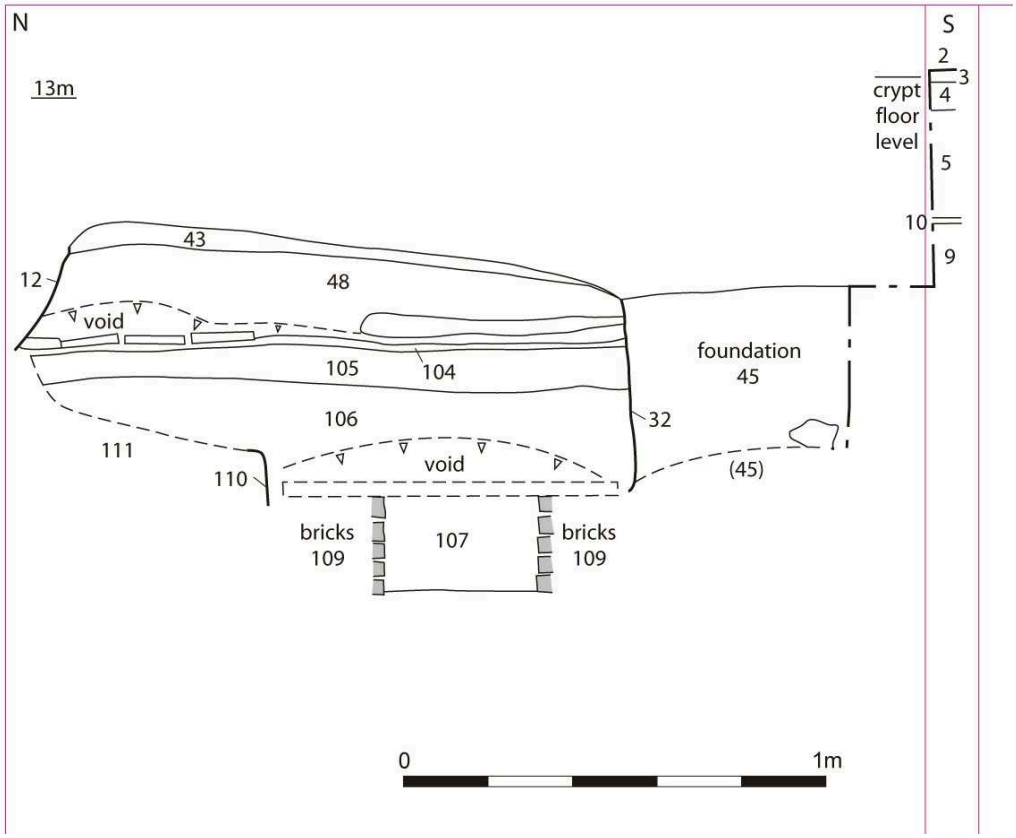


Fig 19 Archive Section 3: E side of Area A, showing the temporary drain [109]

The bricks from the drain and from two other Wren construction layers were sampled (Table 3) and details are in the report by Smith (2002). It is possible that the bricks used to make the temporary drain were Dutch imports.

Context	Brick fabrics	Date and comments
[10]	3033	Wren construction surface, 1680s
[13]	3033	Dump within Wren construction sequence, 1680s
[109]	3047	Temporary drain, 1680s; possibly Dutch imports

Table 3 Sampled bricks from SPU96

Group 3
disuse

Pebbles and sand 0.24m deep [107] had either fallen or been pushed into the drain, over the board, marking its disuse. Similar sand and gravel [106] and then dark grey silt [105] lay above, bringing the strata to 12.85m OD.

Group 4
mixing area

Above this lay a spread of grey-yellow mortar only 0.02–0.03m thick over the whole small excavation (i.e. going off in all directions) [104] and then decayed traces of a series of timbers, of which five showed in the excavation, laid horizontally north-south [103]. These were covered by compact mixed yellow sandy mortar 0.06m deep [72], at 12.95m OD. This is interpreted as a temporary mixing area for mortar (Fig 20).

Fig 20 Area A: impressions of planks in mortar [104], interpreted as part of a mortar-mixing area within the area of the crypt, looking E. Scale is 2 x 100mm (MOLA neg 415/96/2)

For reporting
Group 5
? wall foundation with Wren building works

Above the Group 4 strata were three layers which might be either simple dumps of material or the remains of temporary structural works. Compact dark grey gravel and silt over much of the area, and up to 0.6m deep [48] was followed by compact white and yellow sand and chalk surfaces, 0.2 to 0.4m deep [43] and then more local compact sand and gravel [47] (Fig 21).

Fig 21 Area A, looking W; the Group 7 post-holes and surrounding surfaces. The adjacent pier of the Wren crypt is shown top right, on its foundation. Scale is 5 x 0.1m units (MOLA neg 384/96/6)

Group 6
Wren sleeper wall on east side of Area A

Along the north and east sides of the trench, sleeper walls for the piers of the crypt vault were seen laid on the Group 5 layers, in foundation trenches [30–32]. The walls [42] were only observed on their sides, and were of unknown depth, but up to 0.8m deep; of roughly coursed mortared masonry, probably Kentish ragstone. There was also a pier foundation at the south west [44] which was in the same stratigraphic position. The wall foundation trench was backfilled with silt and pebbles [46] and a similar layer dumped in the square thus formed [45].

Group 7
Wren period scaffolding or disturbances, Area A

Into dump [45] of Group 6 were cut a number of holes and depressions, making no sense in the small area available, but generally presumed to be disturbances during the construction process, and possibly representing scaffolding and other works associated with the construction of the crypt vaults [16–29] (Fig 21).

Group 8
Wren construction surfaces

Construction surfaces followed, overlapping the postholes and indicating a further period of building work after the Group 7 timbers had been removed. The surfaces comprised compact white-yellow mortar containing occasional human bone fragments and a clay pipe stem [11] (shown in Fig 21), compact dirty brown-grey gravels [13], loose mortar and stone fragments [9], compact dirty brickearth [15] and compact mixed mortar and gravel [10], with its top at about 13.2m OD. Brick samples were taken from [13] and [10] (Table 3).

Group 9
more Wren scaffolding

Onto layer [10] a horizontal timber [8] was laid north-south, at least 0.56m long and going into the south baulk, by 0.21m wide. It was decayed but survived 0.05m deep. This seemed to be a plank laid carefully to support timber work, perhaps for the crypt vault. Nearby was a square stakehole [14]. Loose stone fragments and decayed mortar [7] covered the plank, followed by mortar and silt [6].

Group 10
make up dumps for present floor of crypt

Then followed a series of dumps which formed levelling for the present floor of the crypt: grey silt with builders' debris such as fragments of stone and tile (with occasional fragments of human bone) [4–5]; a compact surface of mortar [3] which was bedding for fragments of a red tile floor [2], seen on the south side. The plinths of the foundations of the piers, where observed, had been cut back to accept this floor. A modern pit [12] and a concrete slab on the north side of the trench [116–17] were also recorded.

The limited excavation in Area C found a short length of an east-west temporary drain, of bricks covered originally with timber, which was put out of action and overlaid by a dump of mortar and planks, interpreted as a mortar-mixing area.

A second temporary Wren-period drain was recorded in the Gibb-Freeman trial pit 10 in 1932, in the next bay of the crypt on the north side of Area C, that is immediately adjacent (Fig 22, Fig 23). This is shown in the general site plan, Fig 2 above and labelled site 41 (as it is in Schofield 2011, 330–1). The construction of the drain, complete with inferred timber top, was identical. Thus we have two similar temporary brick drains at this place on the construction site. Observation of their direction (ie fall) was not possible in either case, but it is very likely that they drained to the west.

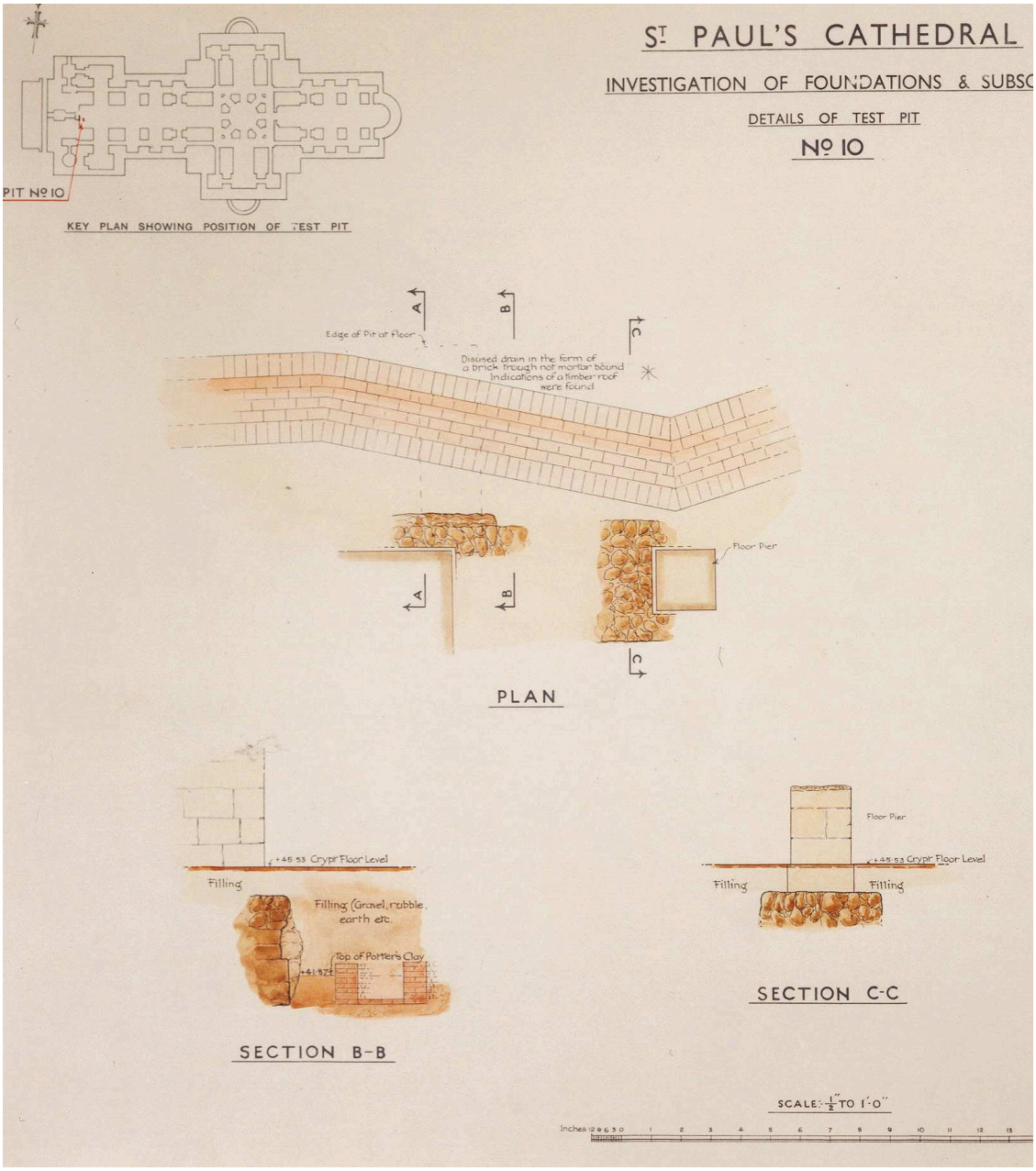


Fig 22 Gibb Freeman test pit 10 record; left hand part of drawing (SPCAA). The square Wren pier shown in the plan is that at the NW corner of the 1996 excavation, Area A

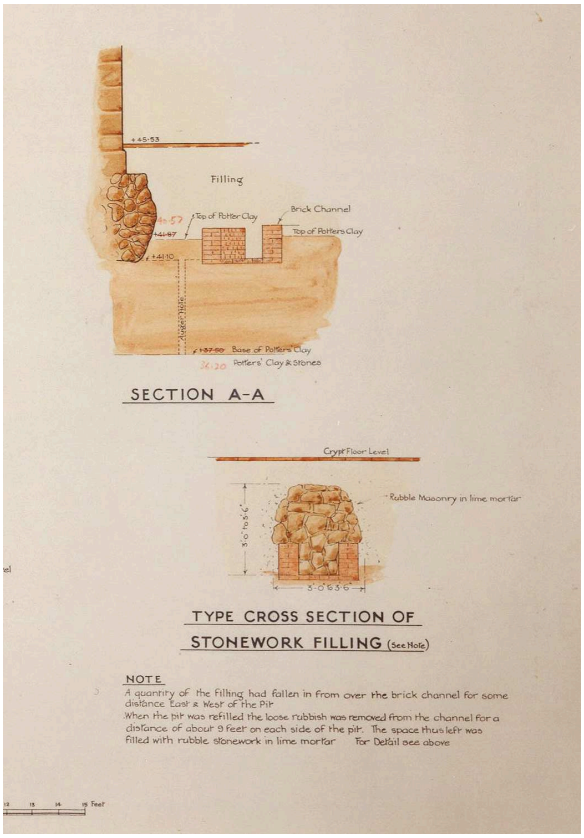


Fig 23 Gibb Freeman test pit 10 record; right hand part of drawing (SPCAA). Compare Fig 22

Area B

Group 12

In Area B, the east-west passage north of both the main chamber and the south-west tower, a trench similar to the others about 1.1m wide and 0.7–0.8m deep was dug by the contractors. The deepest layers recorded were an area of crushed chalk [81] and compact gravel and silts [76], with a top at about 12.55m OD. These were overlaid by brickearth [82] and compact gravel [80]; followed by brickearth [68]. These layers were undated, and mostly unexcavated.

Group 13

Cut into layer [68] was part of a truncated chalk foundation, [74] (Fig 24) in cut [75], of ragstone and chalk fragments in a yellow sandy mortar; it lay roughly north-south (though at right-angles to the supposed line of the medieval cathedral, not the Wren building), and protruded south into the narrow trench from the north side. The length showing was 1.8m north-south by about 1.5m east-west. Within it were two parallel slots evidently formerly containing timbers, later covered by crushed chalk presumably when the structure was destroyed during the Wren construction [65]. From its alignment perpendicular to the

medieval building rather than the Wren building, it is thought to be something to do with the former. It could have been a foundation for the base of a raking shore at the time of dismantling the south side of the nave, which would have been a short distance to the north.

Fig 24 Area B, the E-W passage along the north side of the SW tower, looking E: foundation [74] on the left and the top of the Wren drain [78] on the right. Scale is 5 x 0.1m units (MOLA neg 393/96/6)

Group 14 and Group 15

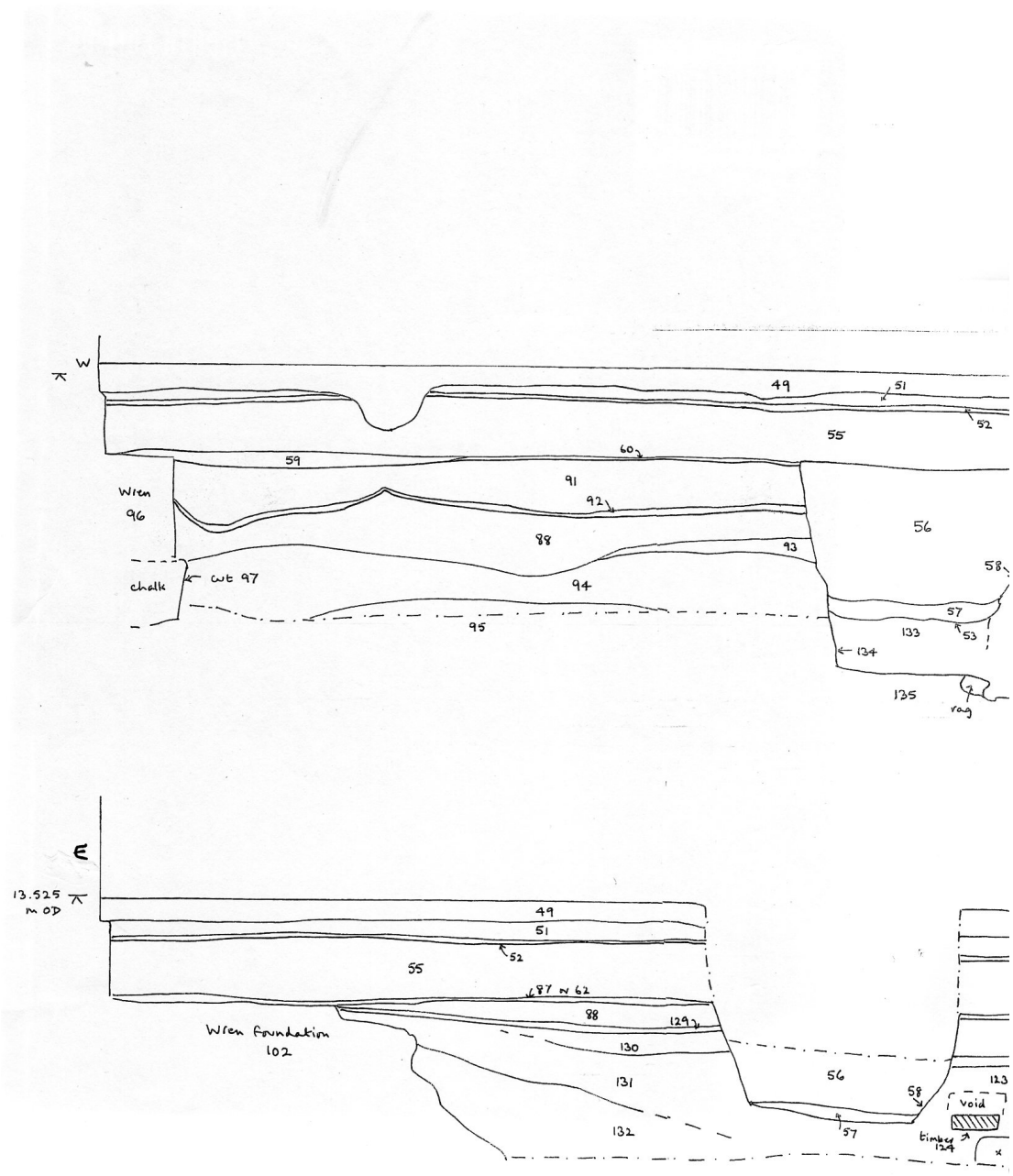
Here are assigned parts of foundation trenches [83] and [114] for Wren foundations at least 0.3m deep; where recorded as cut [70], another part of the foundation trench was the same as [97] in Group 17 below. The backfill of the trench comprised mixed mortar and brickearth [115]. There was also a cut and fill of unknown function [66, 67]. A dump [77] over the chalk foundation [74] mixed with the backfill [79] for a cut [114] which was for the drain [78] running along the line of the passage. This was only recorded from above, its roof of horizontal stone slabs; the sides were only seen as two rows of bricks on beds of off-white mortar with chalk and charcoal flecks. The stone slabs were a mixture of Portland and other stones, not identified, and the slabs were roughly 0.9m square. At the west end of the

passage, where the observed drain ran under the wall, another drain came in from the north-west and emptied into it, but this could not be observed fully in the cramped conditions (Fig 25; and see plan of context 78 in archive). There was also a ceramic pipe which lay on one side of this second drain (also shown on the plan for context 78) – this seems to be recorded as context [63] in a cut [64], and these two are put in Group 15, but the records are deficient.

Fig 25 Area B: where the Wren drain [78] (on the left; showing two stone slabs of its cover) passed underneath the foundation of the west end of the Wren building, looking W. Scale is 5 x 0.1m units (MOLA neg 413/96/2)

Area C

Area C was the main chamber, the previous scaffolding store. Contexts here were not planned, being seen only in the sections. Two sections are presented here, called Sections 1 and 4 (Section 2 has not survived) (Fig 26). Their positions are shown on the site plan, Fig 2. They were two sides (Section 1 on the N, Section 4 on the S) of one of the E-W trenches dug by contractors. The trench was the northernmost of three parallel trenches which were cut between the two Wren piers at the entrance to the scaffolding store. As they were only about 1m apart, many of the described layers were seen in both sections.



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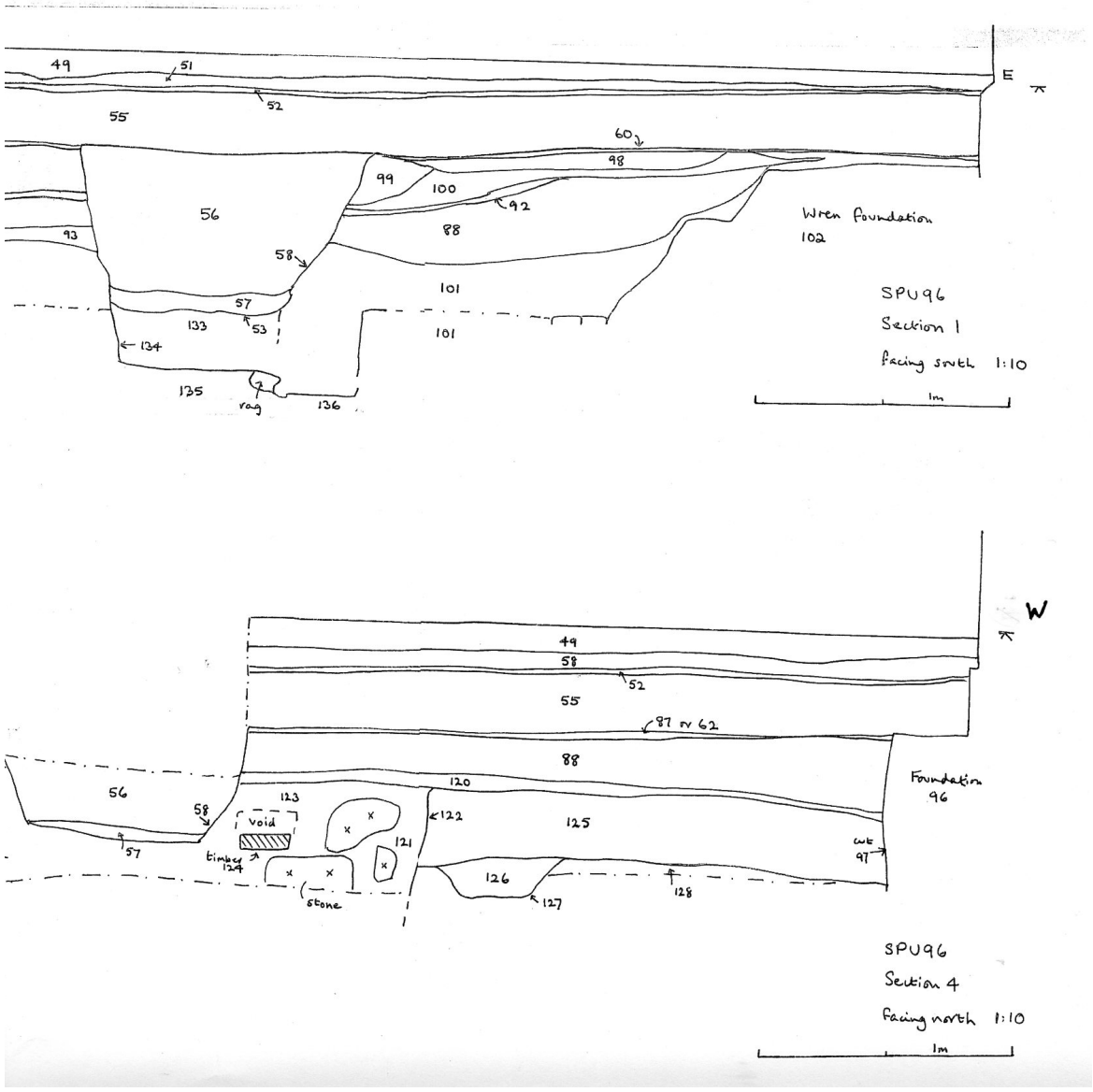


Fig 26 Area C: Sections 1 and 4 [2 pages]

Group 16
redposited brickearths, possibly disturbed layers, Wren

The lowest layers excavated here were redeposited brickearth [128] in which was a slot [127] filled with dirty brickearth [126] and overlaid by mixed gravels [125] reaching about 12.95m OD (Section 4).

Group 17
disturbed layers, Wren

This was a further group of disturbed layers and cuts, culminating in the foundation trench [97] for one of the Wren foundations [96]. In the site notes the excavator T Thomas suggests that [135] may be the remains of some kind of structural walling or foundation, but this is not pursued. A cut [134] 0.85m wide and traced for 0.8m south of Section 1, its base at 12.18m OD, was filled with compact ragstone fragments in mortar 0.2m deep [135] and then loose light grey-brown mixed silt with chalk and ragstone fragments, 0.4m deep [133]. Nearby, but not planned, was a dump of sandy mixed gravels at least 0.1m deep, not fully excavated [95]. This layer and [133] were overlaid by compact dark grey-brown gravel with occasional fragments of red tile, traced at least 2.6m E-W and between 0.1m and 0.3m deep [94]. Above it was compact crushed chalk, a maximum of 0.06m deep [93]. Into this the N-S foundation trench [97=70] for the east side of a Wren foundation [96] was cut; only 0.3m of its depth was noted in the trench. For the position of foundation [96], see the plan fig *; it formed a stone ledge about 0.4m wide on the east side of the pier which formed the west side of the opening from the main crypt on the north into the scaffolding store chamber (now the conference centre). This pier is part of the basement foundation of the NE corner of the SW tower. The top of [96] was at between 12.9m OD and 13.1m OD.

Group 18
Wren foundations and construction surfaces

This group is of other Wren crypt foundations and dumps around them. At the limit of excavation, a layer of compact white-grey mortar of unknown depth [136] seemed to be a construction surface at between 12.45m and 12.5m OD on which foundation [102] was constructed. This was the stepped foundation for the west side of the east pier forming the entrance to the scaffolding store, matching [96] on the other side of the entrance. It comprised mortared rough ragstone blocks with some chalk, laid horizontally. The observed edge was battered on a 45° slope, i.e. as though chamfered. Its top was at between 12.9m OD and 13.1m OD, just like [96]. Presumably there was a foundation trench, but it is not recorded as a trench. According to the records, the ‘trench’ or ‘foundation cut’ was filled with grey stone rubble [132], the same mixed with black silt [131], compact yellow gravel [130], topped with a 20mm spread of grey mortar [129]. A layer of rubble [101] also overlay the foundation.

Nearby an irregular cut [122] at least 0.4m into the underlying layer [125] of Group 16 was filled with mixed mortar and rubble [121] at least 0.3m deep. On this were decayed traces of timber in a void, traced 1.5m N-S and 0.2m deep, perhaps indicating the section of the timber [124] and then dark grey angular gravel [123]. A second cut with two observed sides at right angles [119], also cutting at least 0.6m into [125], was filled with compact dark grey gravel [118]. Both [123] and [118] were then overlaid by a horizontal spread of compacted crushed chalk and yellow sandy mortar [120] (nearly all these contexts appear on Sections 4 and 5).

Limited recording was possible at the south end of the N-S trench in Area C, where it exposed a short length of the foundation for the south wall of the chamber, i.e. the south wall of the crypt beneath the chapel of SS Michael and George. The foundation below crypt floor level [90] stepped out on the north side by 0.2m; the foundation was of mortared irregular

ragstone blocks, with one course of ashlar forming its top before the start of the wall. Nearby (Section 2) were dumps of mortar [85, 86, 84, 89]. A general dump [88] was seen to overlie dumps [89], [129], [101], [120] and foundation [96].

Group 19
Wren period dumps and construction surfaces

This group of dumps and construction surfaces was stratigraphically later than dump [88] in Group 18, but they are summarised here en bloc, in three sub-groups: (i) [87], [62] (a mortar floor or surface) and [61] (another surface); (ii) [92] (a mortar surface), [100], [99], [98], [91] (with fragments of brick), [60] (probably the same as [61] and context [10] in Group 8 above), [59], a cut [58] filled with [57] and [56]; (iii) [113] (a mortar surface) and [112]. These are shown in Sections 1, 4 and 5. These surfaces and dumps now reached about 13.0m OD.

Group 20
dark soil with bones

Over all of Area C, covering the Group 19 layers and lapping over the stepped out Wren foundations, was a layer of dark soil with occasional fragments of oyster shells, clay pipe stems, stone and brick fragments, and frequent loose human bone fragments [55]. Its average depth was 0.23m – 0.3m, and its top at 13.45m OD. In this area, cemetery soil had therefore been used to level up the ground by about a foot. This is attributed to the Wren construction period.

Group 21
post-Wren cuts and surfaces beneath crypt floor

Into the dark soil [55] of Group 20, an E-W cut [54] was recorded, at least 0.69m deep, filled with a loose grey mixture of chalk, brick and stone rubble, again with oysters and clay pipe stems [53], a compact mortar surface [52] and dump [51] which may have been the base for the remains of a red tile floor [50], of which only two tiles survived. These were directly under the present concrete floor of the chamber [49].

Group 22
modern slab of crypt floor

This comprised the concrete floor of the chamber [49] , which was laid on broken tile fragments possibly from the former floor (Group 21). The top of this floor is on average at 13.50m OD.

The inclusion of fragments of the portico into the foundations of the tower, as discovered in 1996, is dated to the first half of 1688 by the Wren building accounts summarised in section 2.1 above. The construction dumps and surfaces which were then tipped in to form a base for the future crypt floor should be datable to 1688 or shortly after. This is also taken as the date,

within a year or two, of the temporary mortar floor and temporary drain, whatever its purpose, in the central aisle of the crypt, Area A (Group 4).

Area D

Group 11

Fig 27 The outline of the east end of the tunnel marked out on the west wall of the main chamber in Area C, with some of the facing stones already removed (scale is 5 x 100mm units) (MOLA neg 345/96/1)

Fig 28 The Area D tunnel being excavated by drilling; looking west from the main chamber of Area C (MOLA neg 365/96/1)

Area D comprised only a tunnel [33] which was excavated by drills through the wall [1] at basement level between the main chamber beneath the Chapel of Saint Michael and Saint George and the basement of the adjacent south-west tower (Fig 27; Fig 28). The tunnel was 2.1m high at its apex, 1.8m wide, and 3.75m long from west to east, the width of the foundation. As it was meant to be for communication between the two spaces, the floor of the tunnel was approximately at the floor of the two chambers. The fabric of the wall [1] was seen to comprise ragstone, chalk and occasional broken brick laid roughly to courses 140mm to 200mm high depending on the sizes of the stones, bonded with a light grey mortar with moderate flecks of chalk and occasional lumps of charcoal; there were also occasional lumps of chalk, up to 10mm across. The fragments of brick were observed only in the upper part, above where the vault of the chamber beneath the south-west tower began.

Fig 29 The excavated tunnel in Area D, looking W from the main chamber into the domed chamber beneath the SW tower (MOLA neg 393/96/1)

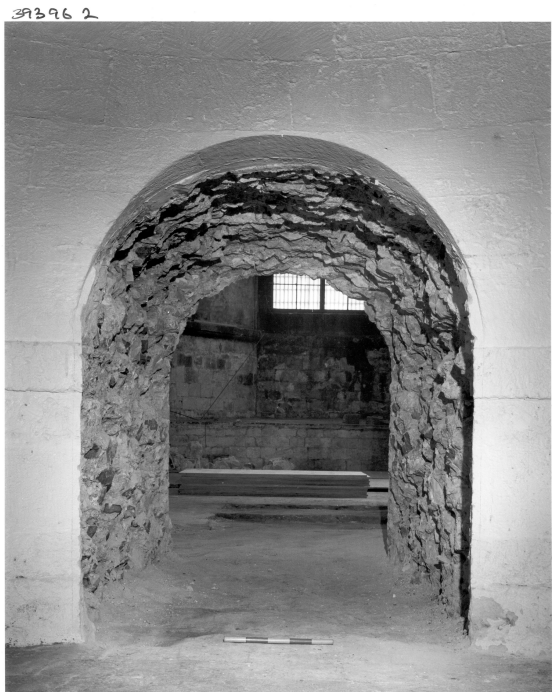


Fig 30 The excavated tunnel in Area D, looking E from the domed chamber beneath the SW tower towards the main chamber (MOLA neg 393/96/2)

All the loose moulded stones from earlier structures derived from this excavation came from excavation of the tunnel: stones SPU96 <1> to <69>. In addition, two stones were recorded in the west wall of the scaffold store chamber where the tunnel opening had cut through them: they had both been turned so that an ashlar face faced into the chamber, but when cut through they could be recognised as medieval mouldings, <70> and <71> (on the south and north sides respectively). These were left in situ and have been covered by the new doorframe at the east end of the tunnel. All the moulded stones (examples, Fig 31; Fig 32; Fig 36; Fig 38) are analysed separately (Samuel 1999, developed by M Samuel in Schofield 2011, 265–74); for listing of all the stones, see Appendix 1 of this report.

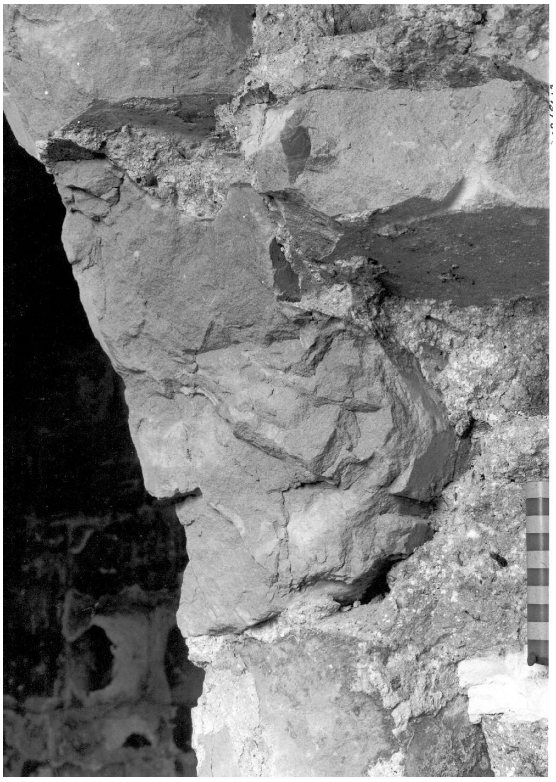


Fig 31 Stone SPU96<70>: a medieval window sill stone, cut through by the passage; looking south. The horizontal bed has been set vertically to form part of the ashlar facing of the chamber to the left (now the main conference room). This stone has been left in position, but is obscured by the woodwork of the new doorway at the east end of the passage, constructed after the excavation. The moulding dates to between 1325 and 1450. Scale is 10x10mm units (MOLA neg 393/06/3)

Fig 32 Stone SPU96<71>: a fragment of medieval window jamb, cut through by the passage on the north side, at its east end (looking north). This moulding also dates to between 1325 and 1450. Like the moulding in the previous figure, it is now obscured by new woodwork. Scale is 10x10mm units (MOLA neg 393/96/4)

The two stones shown in Fig 31 and Fig 32 were cut by the opening for the tunnel at its west end, and have remained in situ. The rubble from the tunnel included many moulded stones of the medieval and Jones (1635–42) periods. These are listed in the appendix to this report, but some examples are given here. All stones were either damaged or battered, either from their original demolition, or in some cases due to their removal from the hard mortar of the Wren foundation by pneumatic drills.

Three examples of the medieval stones are given as Fig 33 and Fig 34.

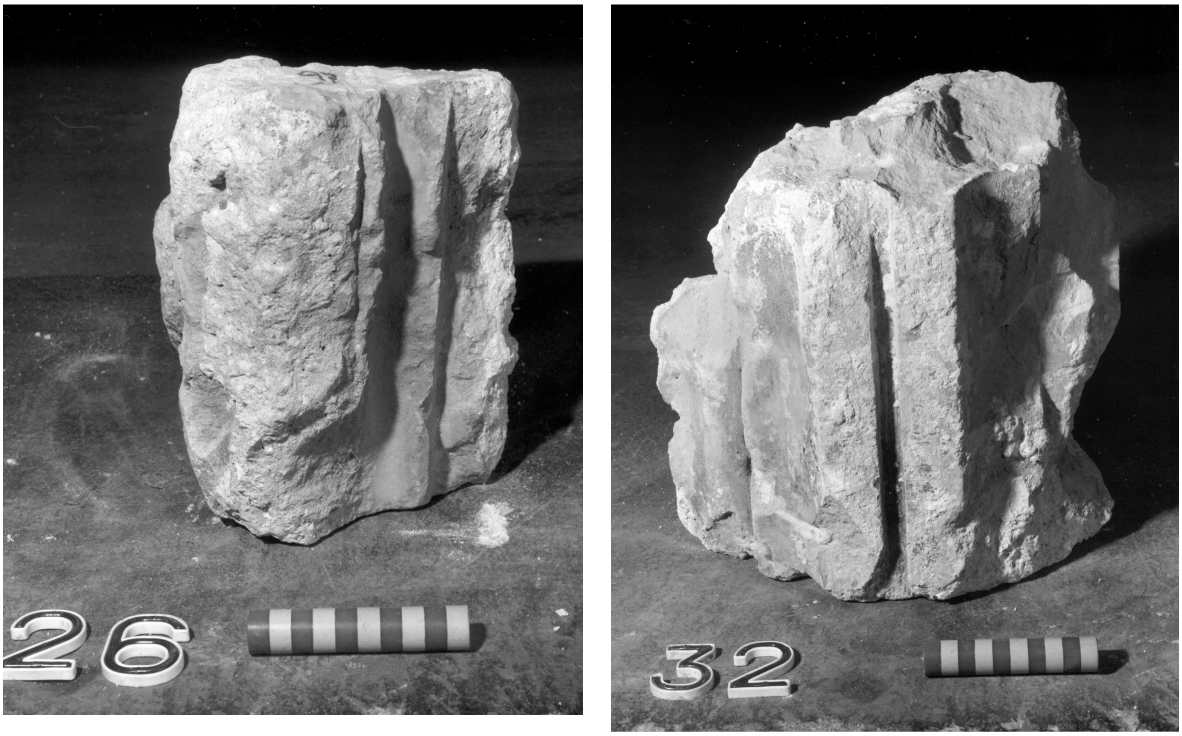


Fig 33 Stones <26> and <32>, medieval window mullions (negs 427/96/15, 427/96/21)

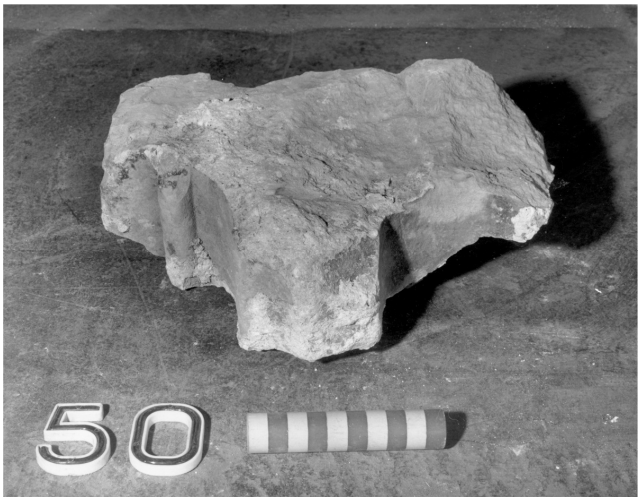


Fig 34 Stone <50>, from a medieval tomb (MOLA neg 427/96/35)

The chief group of recovered moulded stones were however of 17th-century date, and can be identified as from the portico erected at the west end of the medieval cathedral in 1635–42 by Inigo Jones. This would have been just demolished when the cathedral foundations for the south-west tower were being laid, in 1687–8. An historical summary of the Jones portico has been given above (2.1). Until the excavation of 1996 the extent and character of any inclusion of fragments of the portico in the Wren foundations was totally unknown. A lion's head in relief, now identified as from the portico, was in the historic collection of moulded stones in the present south triforium, but its presence was virtually unrecognised and there was no documentation as to where it came from. It was therefore a pleasant surprise when in August 1996 the writer recognised that many of the moulded fragments being produced by the drilling for the tunnel in Area D were fluting, and clearly from the portico columns.

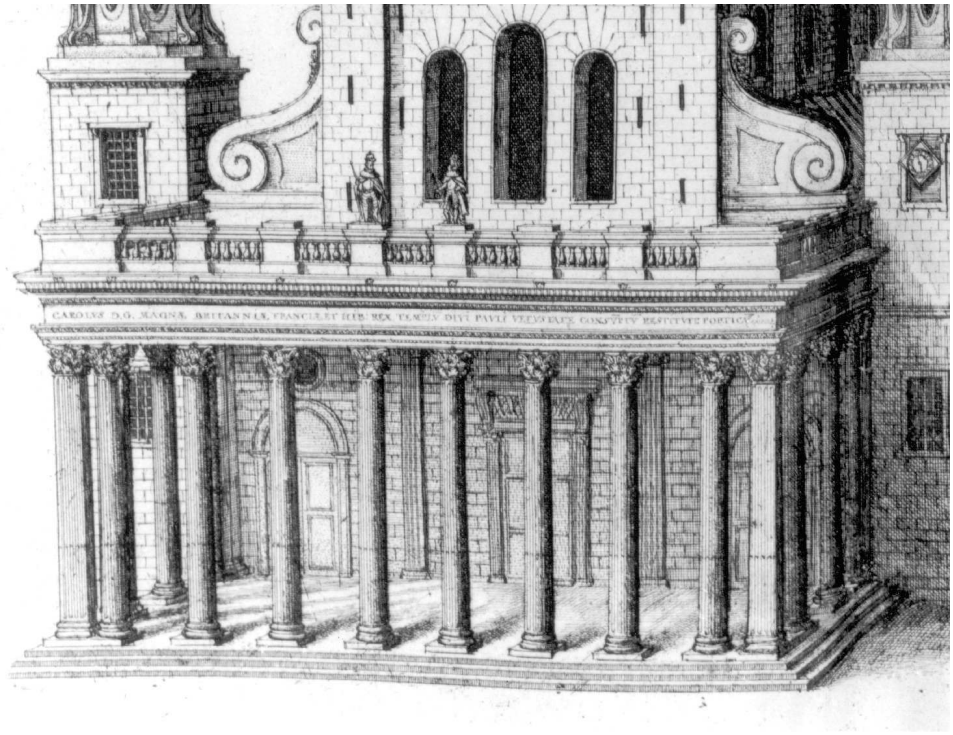


Fig 35 The portico at the west end of the cathedral: a detail of Hollar's engraving of the west end, 1657

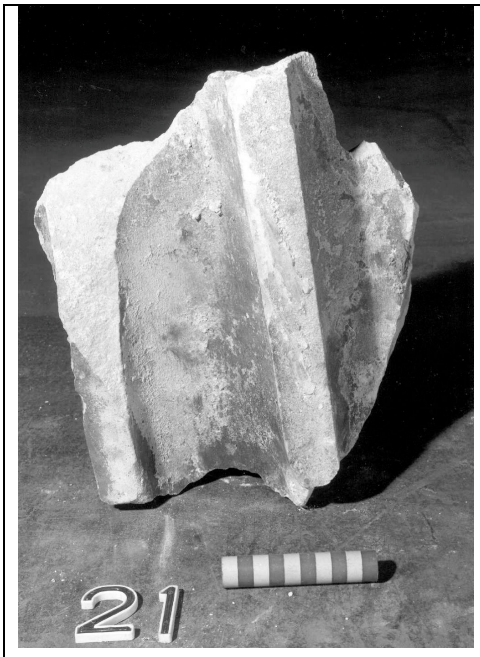


Fig 36 Jones stones: one of the column shaft fragments: stone SPU96 <21> (MOLA neg 427/96/9)

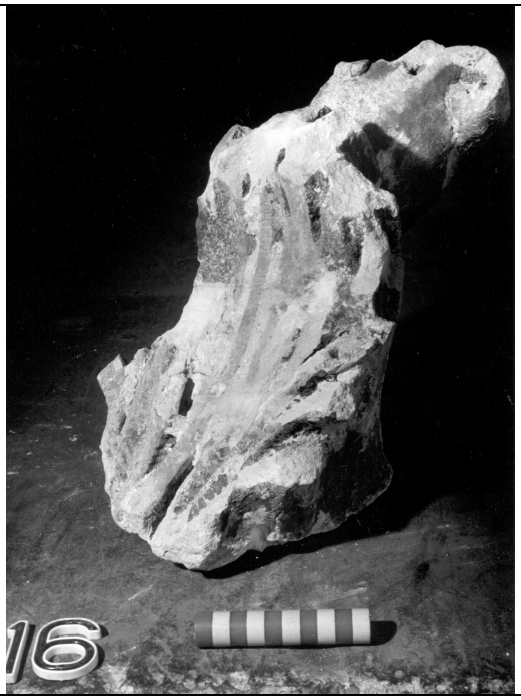


Fig 37 Rear view of capital fragment <16>, showing rough hollowing out inside the capital (MOLA neg 427/964A)

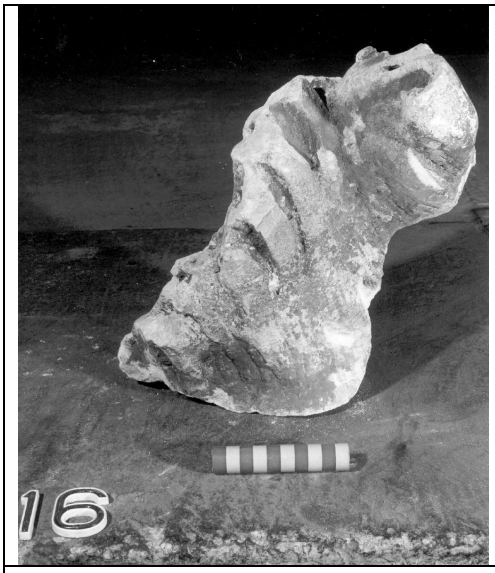


Fig 38 Fragment of capital, SPU96<16>. Scale for these fragments is 10 x 10mm units (MOLA neg 427/96/4B)

Two examples of M Samuel's reconstruction of other fragments of Jones work are given here. The first is reconstruction of a capital from the portico, based on fragments found in the foundation of the Wren south-west tower (Fig 39). The second is reconstruction of a stone doorway, probably (from engravings and other graphic evidence) the north nave door, as put in by Jones (Fig 40). The specialist report by Mark Samuel also reconstructs one of the Jones windows from a fragment of semi-circular arch (Fig 41). These stones are reported in Schofield 2011, 195–207.

Fig 39 Reconstruction of a capital from Jones's portico, including fragments from SPU96 (from Samuel 1999); the middle fragment is stone <16>, as shown in Fig 38

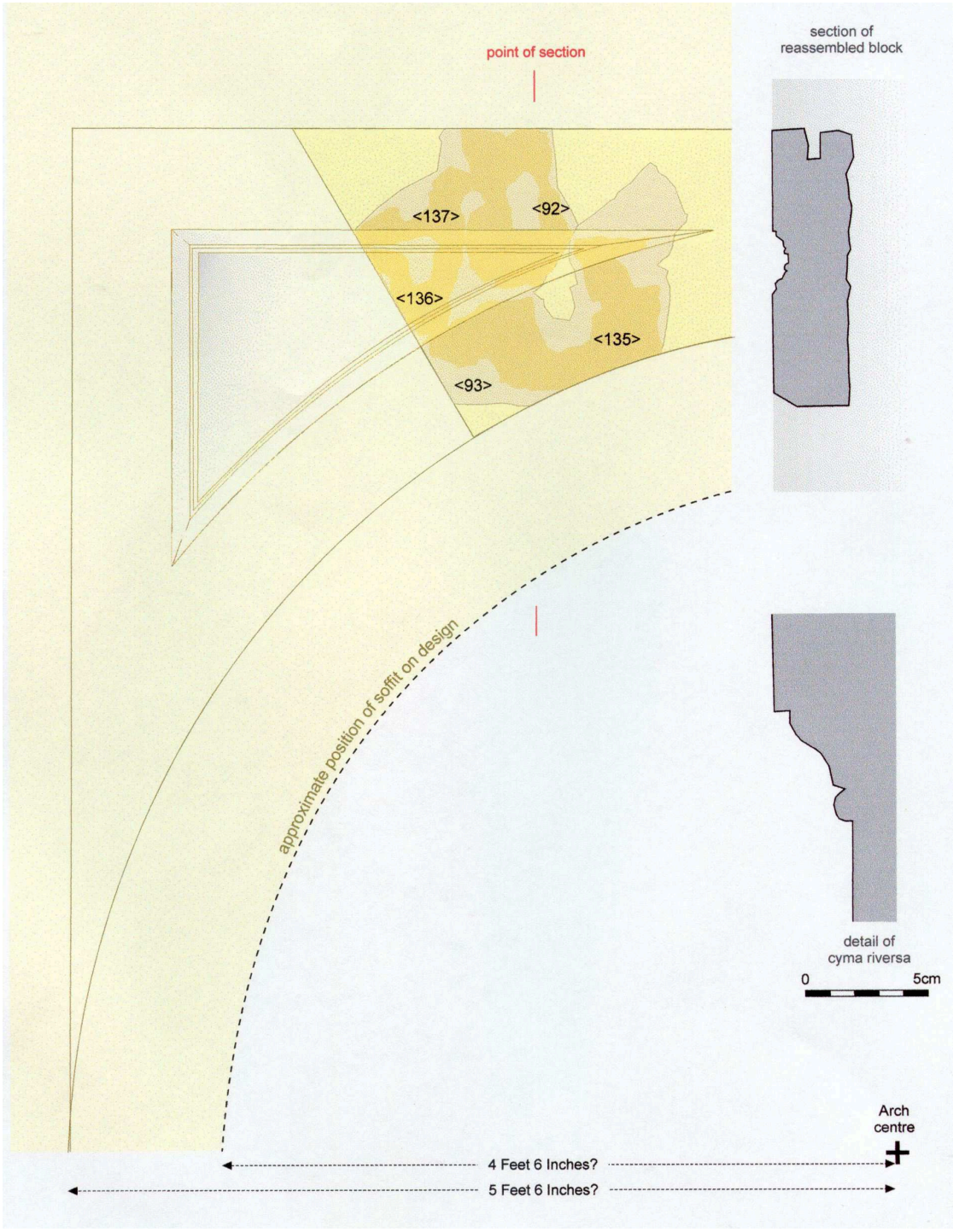


Fig 40 Reconstruction of part of a Jones period doorway, perhaps the north transept doorway, from stones from SPU96 (from Samuel 1999)

Fig 41 Stone <120>, part of the top of a window, attributed on style to the Jones rebuilding (MOLA neg 51/97/33)

5. Site sequence (second part of excavation, north corridor trench, Area E)

The site location is shown in Fig 6 and a Harris matrix of excavated contexts, as far as can be reconstructed, in Fig 42 (Roman period), Fig 43 (Saxon period) and Fig 46 (medieval and later periods). This matrix does not include all the contexts, since the relationships of a few cannot be determined. The groups are numbered 23 (Roman deposits), 24 (Saxon and Viking period), 25 (medieval) and 26 (Wren period and later); the contexts are assigned to these groups in Table 2 above. The following summary is derived from the small amount of documentation that survives.

5.1 Group 23, Roman

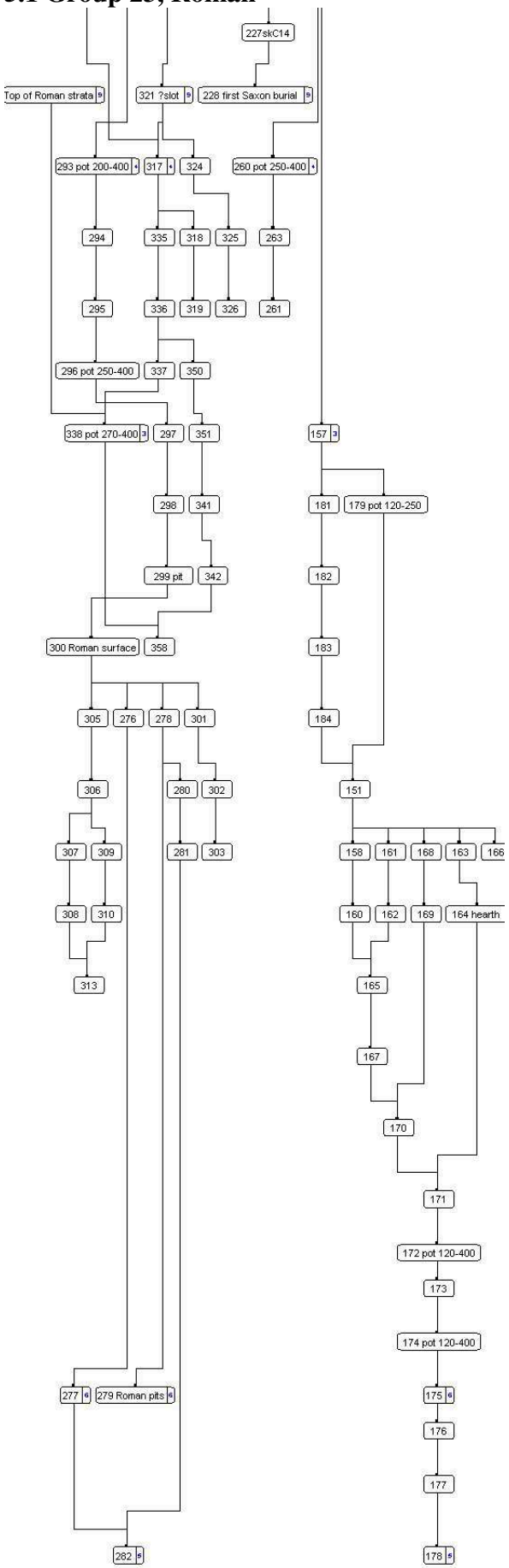


Fig 42 Harris matrix for contexts excavated in second part of SPU96, north corridor: Roman period

Cutting into natural gravel were small pits, a post-hole and what appears to be the sunken part of a small building or structure with a hearth on its west side. Because of the restricted area observed, this is called Structure 1. It comprised a west wall apparently of brickearth [not numbered, but cut for it [175]) and internal floors or slabs [174] and [173], a hearth [164] and another floor level [172]. This was covered by [151] of unknown character which overlay the brickearth wall [175]. Immediately to the W, a slot [177] filled with [176] was also overlaid by [151] and so might have functioned with the structure.

This building and the cut features were overlaid with gravel up to 0.15m thick (apparently not numbered, but at the same level as [151]). One of the cut features below the gravel was recorded as containing the bones of a neonate infant [276] (in the recording this number was given to the fill of the cut, in which the bones were found). The interpretation here is that this burial is Roman, below the gravel layer (un-numbered, but equated with [300]) which sealed adjacent Roman pits. The top of the gravel was at 13.15m OD, and this may be taken as a general upper level for the late Roman stratigraphy.

Another gravel layer [300] lay to the west of the un-numbered gravel which covered 'Grave 24', and this seems to have been the same as an extension [292]. This was in turn contained by a N-S slot [323], beyond which was more gravel [336] a few centimetres lower. This suggests that the gravel surfaces and slot functioned together, and that the slot [323] may be another trace of a building or structure. The west end of the gravel [336] was cut by the 17th-century Wren drain trench crossing the site. Above [336] was another thin layer, [317].

The pottery from these contexts, all Roman, is shown in Table 4.

Context	Pot types	Early date	Late date
158	BB1 2 AL; HWC+ 2 AL; SAMCG 4 DEC	160	250
159	LOXI 9A	90	160
161	HWBR	40	100
163	BB1 4G; SAMCG	120	160
171	VRW 2H?	100	160
172	BB1 5J	120	400
174	BB1 4/5; BB1 5J	120	400
179	BB1 9A CL	120	250
235	BB2 2F; BB2 4/5	120	250
302	LOXI 9A	90	160
303	BB1 9A CL	120	250
306	BAETE 8DR20	50	170
317	LOXI?	90	160
322 [*?rem]	LOXI? 9A	90	160
334	LOMI 5	70	120
335	VRW 2H	100	160
338	BBS 4M; OXRC	270	400

Table 4 Roman pottery from earliest layers at Site D

This indicates that the possible building(s) were likely to have been of Roman date. The surface of the highest gravel deposit was at 13.15m OD, and it was directly overlain by cemetery soil. The latest dating evidence from [338] was pottery in the range 270–400, i.e. late 3rd or 4th century. This is taken to be an error for [337], a layer filling a cut [338] at the base of the sequence. The pottery would date the gravel surfaces, and perhaps the slot [323] and whatever feature it represented, to the late Roman period.

A pit was dug into the gravel layer [300] (cut [299]). This was filled with several layers [298, 297, 296, 295, 294, 293] before being covered with another gravel layer [not numbered]. The pottery from [293] and [296] is of 200–400 (Table 5).

293	MHAD, AHFA1	200	400
294	VCWS	70	200
295	HWC 4F; VRMI	70	160
296	AHFA	250	400
298	BB1 4G; VRW 1H	120	160

Table 5 Pottery from layers [293] to [298], fill of a pit [299]

5.2 Group 24, Saxon and Viking periods (400–c 1050)

Cut into the earlier deposits of Group 1 were 29 graves (Table 6). In all parts of 31 skeletons were recorded, but all were partial and not complete, since the trench was so narrow. Only three skeletons were sufficiently within the boundaries of the narrow trench to be recorded in their full extent by individual photography.

This cemetery is called Open Area 4 (matrix, next page)

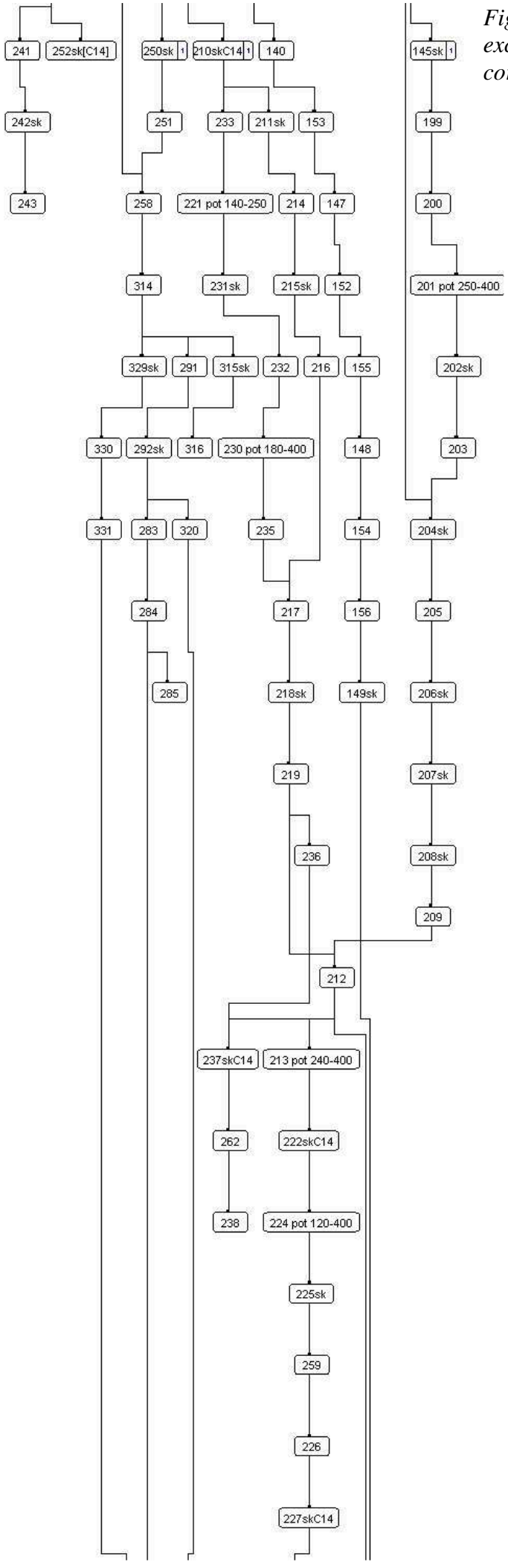


Fig 43 Harris matrix for contexts excavated in second part of SPU96, north corridor: Saxon period. sk=skeleton

Burial	Skeleton context	Sex	Age (years)	Notes
1	145	F?	17-25	
2	146*$	M	Adult	burial also contained bones of a child and further fragments
3	147*	U	Adult	
4	149	U	Adult	
5	202	F	26-45	
6	204*	U	Adult	
7	206*	U	Adult	
8	207	F?	Adult	
9	208*	F	17-25	
10	210	F	Adult	C14: 889–986
11	211	U	Adult	
12	215	F	Adult	
13	218	M	Adult	
14	222$	M	Adult	DISH; C14: 788–895
15	225*	F	26-45	
16	227$	M?	Adult	C14: 773–883
17	231	M	17-25	
18	237$	U	17-25	C14: 785–893
19	242	F	45+	
20	250	F	Adult	
21	252	M	26-45	C14: 894–986
22	255*$	F	26-45	
23	267$	U	Adult	
24	276$	U	Neonate	*may be Roman
25	287$	U	Adult	
26	292	U	Adult	
27	315$	U	Adult	
28	329	M?	Adult	
29	340$	F	17-25	

*Table 6 Site D: Burials 1 to 29, with C14 dates and one note of a skeletal condition. Those marked * were photographed in situ*

Key:- M=Male, F=Female, U=unknown; $=not on matrix

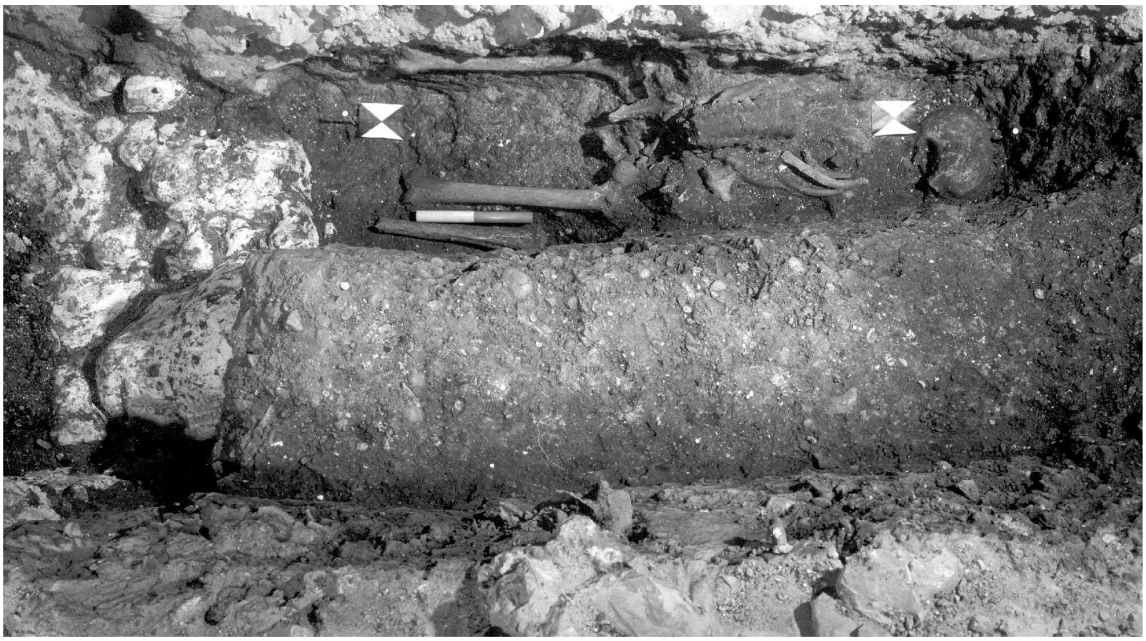
Five samples of human bone were sent for C14 analysis, and the results are given in Table 7.

Sampled skeleton	2-sigma date range AD	Sample reference
D[252]	894–986	UB-4745
D[210]	889–986	UB-4744
D[237]	785–893	UB-4743
D[222]	788–895	UB-4741
D[227]	773–883	UB-4742

Table 7 C14 determinations from five skeletons on site D, with the samples arranged in approximate stratigraphic order (most recent at the top)

Twenty-nine individuals were adult, but only seven could be sexed : two male and five female. Burial 2, on examination of bones in the laboratory, proved to be also of a child and a third person represented by fragments. The total number of people represented is therefore 31.

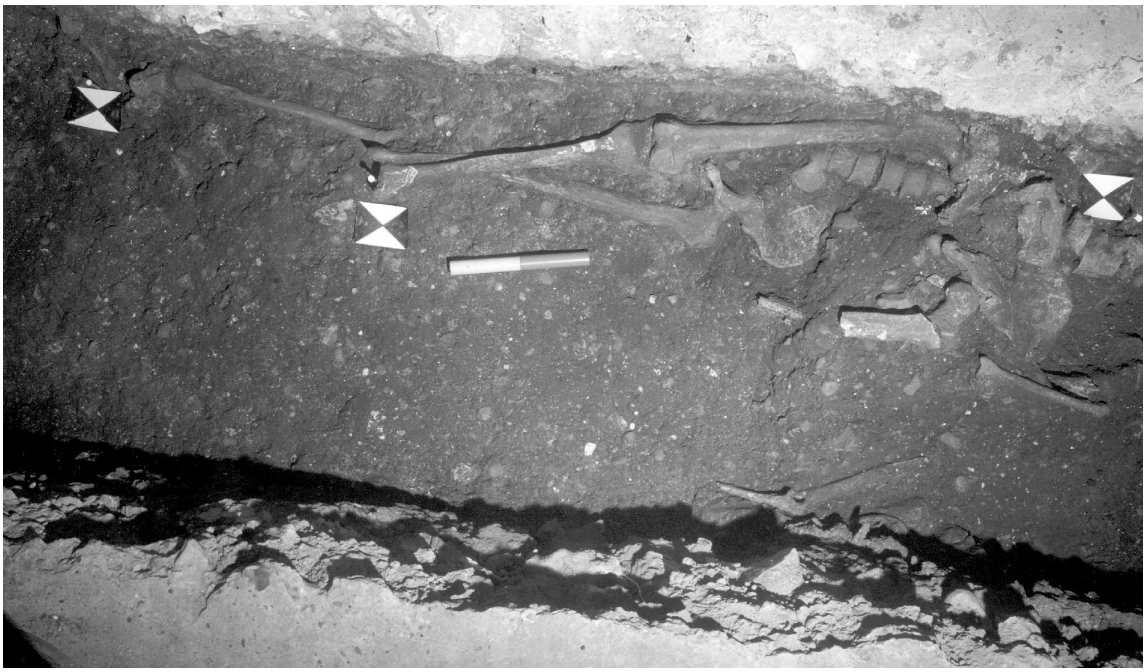
Where skeletons were substantially within the confines of the narrow trench, they were photographed, and this provides records of skeletons [146], [147], [204], [206], [225] and [255] (Fig 44). As an aid to future work particularly on producing a plan of some at least of these burials, scans are here provided from the corresponding 35mm colour slides which are in the site archive (Fig 45).



skeleton [146] (MOLA neg 1/97/2)

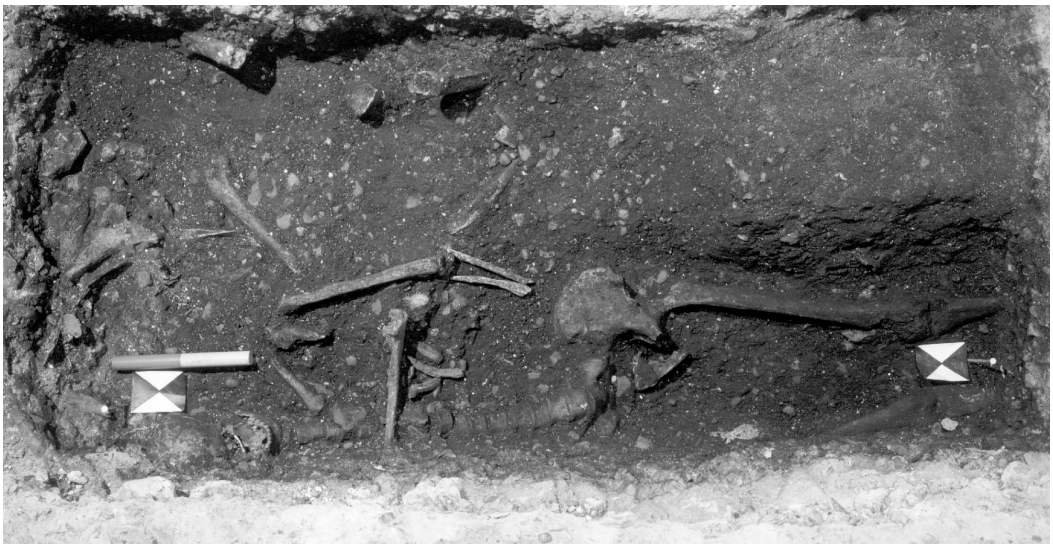
skeleton [147] (MOLA neg ***

skeleton [204] (MOLA neg 9/97/2)



skeletons [206] and [208] (MOLA neg 9/97/1)

skeleton [225] (MOLA neg 9/97/3)



skeleton [255] (MOLA neg 1/97/3)

Fig 44 Skeletons [146], [147], [204], [206] and [208], [225] and [255]; for colour versions of some of these photographs see Fig 45

	skeleton [146]
	skeleton [147]
	skeleton [204]

skeletons [206] and [208]

skeleton [225]

skeleton [255]

Fig 45 Scans from 35mm colour images of skeletons [146], [147],[206], [208], [225] and [255]

Note: the following burials are not at present on the matrix for lack of information:

Context	Burial
146	2
255	22
267	23
287	25
315	27
340	29

Ceramic dating of the cemetery: there was an amount of late Roman pottery, from the following layers and graves in the cemetery phase (Table 8).

Context	Pot types	Early date	Late date
144	VRW	50	160
145	BAETE 8DR20	50	170
150	VRMI 5J	70	120
283	AHBB 2 AL; BB2F 4/5	160	250
284	BB2 4/5	120	250

289	AHFA 4M	250	400

Table 8 Roman pottery in late Saxon cemetery strata in Area E. Contexts [283] to [298] were layers in a single pit

5.3 Group 25, medieval

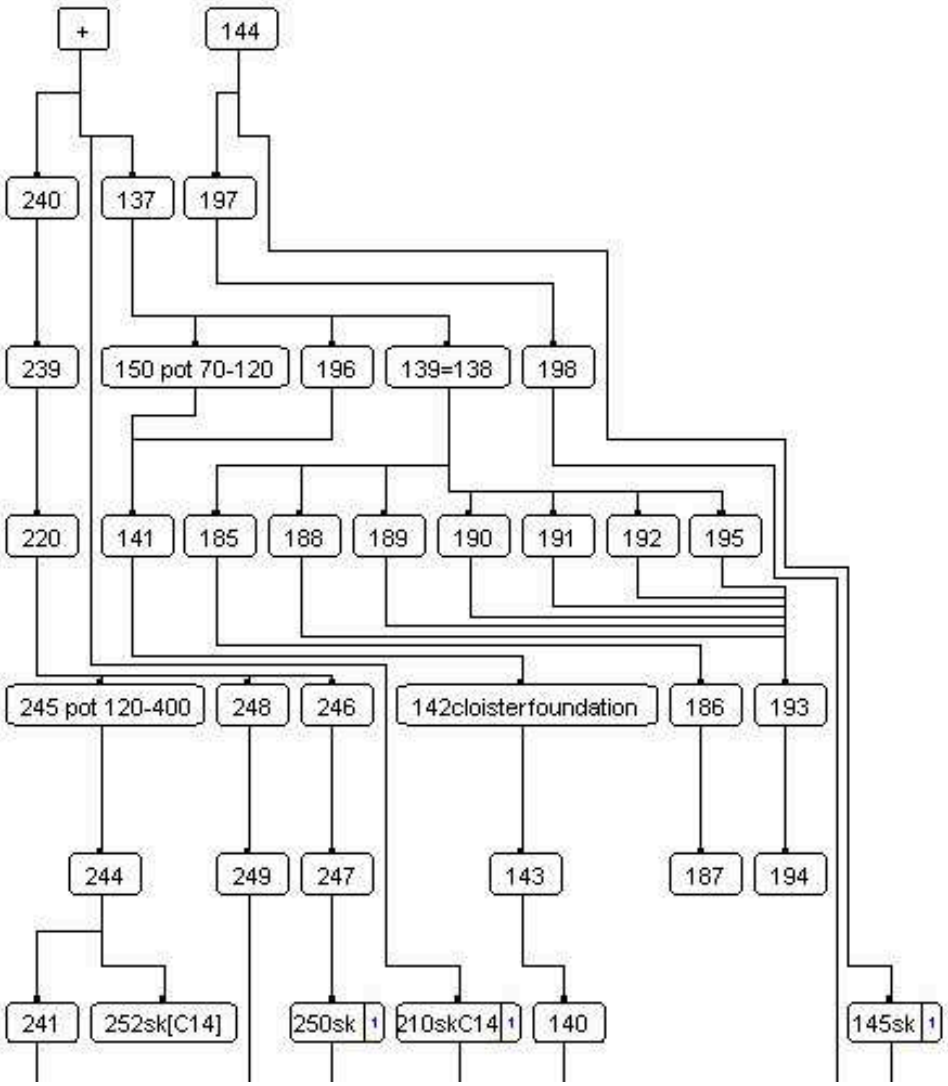


Fig 46 Harris matrix for contexts excavated in second part of SPU96, north corridor: medieval and later periods. sk=skeleton

A square or rectangular foundation of mortared chalk [141=142] in a foundation trench [143] filled with unknown material [150] was found immediately below the corridor floor (Fig 47; Fig 48). It survived at least 0.8m deep, from the surviving top at 13.5m OD; it was not bottomed. It is almost certainly the lower part of the southernmost pier foundation on the east side of the medieval Pardon Cloister, as recorded by Macartney (1910, 'Pier C').

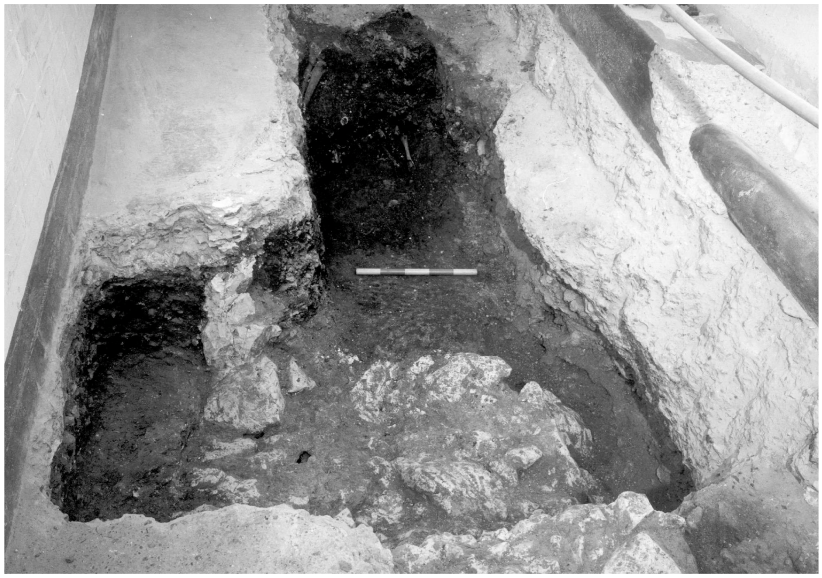


Fig 47 Area E, looking E; in the foreground, remains of the chalk foundation [142] as left by Macartney in 1909 (MOLA neg 537/96/1)

Fig 48 Area E, looking W: the chalk foundation [142] (MOLA neg 537/96/2)

5.4 Group 26, Wren period and later

Where the remains of the underlying foundation of the west side of the Wren north transept crossed the corridor, there was a slight hump in the floor (possibly from 1909, but possibly also last laid in the 1960s). The hump and underlying stonework of the foundation were removed by contractors with drills (the area affected shown in Fig 49). This was observed and moulded stones recovered, from two contexts, [138] and [194]. Unfortunately there are no site records for these contexts, but is likely that they represent the Wren foundation. For listing of the stones, see Appendix 1.

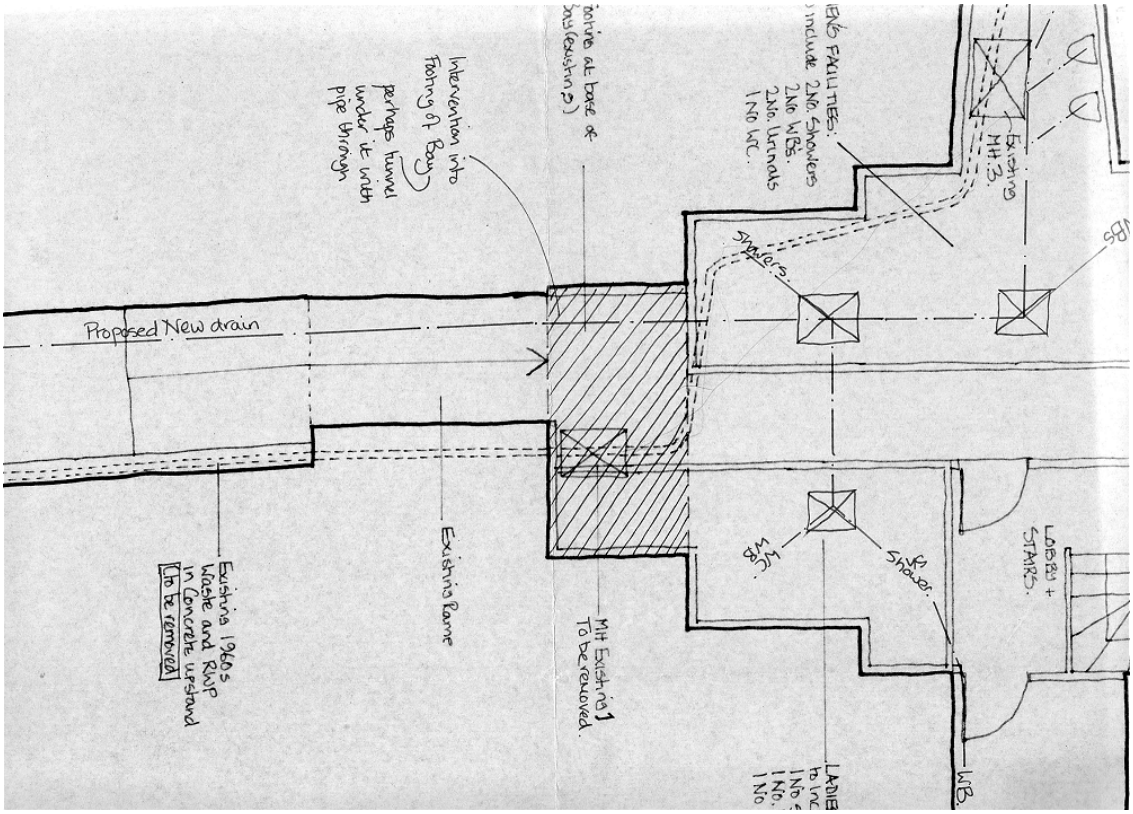


Fig 49 Extract from architect's sketch prepared in 1996 (MS Architects drawing SP.481) showing the area of the slight hump in the floor of the corridor, over the Wren foundation, which was to be lowered and pierced for the proposed drain (the line of which is shown on the left). For location, compare with Fig 6

The east end of the trench would have been very near the site of another of the Gibb-Freeman test pits of 1932, Test Pit 7, which was dug on the east side of the Wren foundation of the west wall of the transept as it met the north wall (Fig 50). This hole, about 6ft 6in (1.98m) east–west by 6ft 3in (1.9m) north–south, found the east side (inside) of the spreading foundation for the west wall of the transept. It located the bottom of the foundation, on 'potter's clay', that is the earliest Roman strata or possibly natural brickearth, at 12.2m OD. The precise location of Test Pit 7 is not clear, but it must be in the top right-hand part of the site plan shown in Fig 50; probably coinciding with the site of one of the manholes shown there.

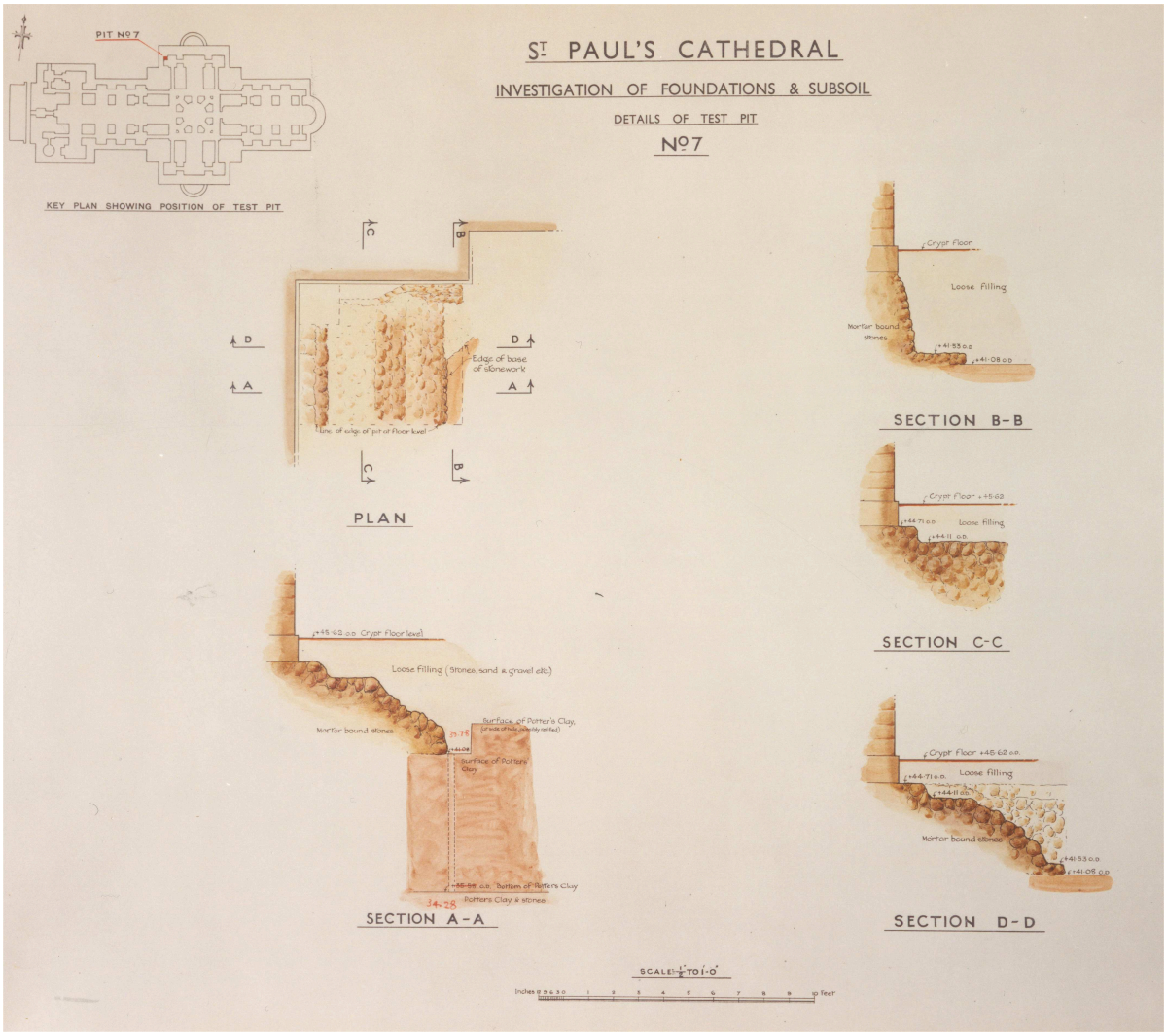


Fig 50 Gibb-Freeman Test Pit 7 (1932) (SPCAA)

5.5. Discussion of Area E

Roman

The loss of the site records means that little can be said about the Roman strata; but from memory, the trench crossed both horizontal strata (ie buildings) and pits, some of 4th-century date. The Roman strata survive well hereabouts.

Saxon

Remains of 31 human skeletons were recovered; C14 sampling of five gave a date-range of 773–883 to 894–986 (2 sigma). The cemetery here was therefore in use in the 9th and 10th centuries. No traces of coffins was noted. The burials were of men, women and children.

Medieval

The ordinary burials of the Saxon period were overlaid by the more prestigious burials in stone-lined graves, recorded by Macartney directly above them. These he recorded ‘at

different levels', but did not specify more exactly. The construction of the east range of the Pardon Cloister about 1420 cut into these stone-lined graves, as shown in Macartney's report of 1910 (Fig 10).

6. Conclusions: publication proposals

The observations recorded here were limited in scope, and their results have been incorporated in the survey of all excavations in and around the cathedral since the time of Wren, Schofield 2011 (especially in the gazetteer section, under Sites C and D, p306–9). The finding of pieces of the Jones portico in foundations for the first time was a major discovery, and the degree to which they allow new suggestions about the character of the portico is being explored, for instance in Higgott 2004 and in Schofield 2011, 195–215.

To summarise and comment on the original research aims (above, Section 3):

1. To characterise the deposits immediately below the Wren crypt floor in areas at the west end of the crypt, as far as the required interventions would permit;

2. To monitor the tunnel being dug through the east wall of the south-west tower at crypt level, and to recover any intact moulded stones from the previous building which would be incorporated in the wall;

3. To investigate the historic features likely to be exposed, i.e. the Wren drain in the south-west part, any foundations of the medieval cathedral and its ancillary buildings, the Pardon Cloister on the north side and any underlying stratigraphy, i.e. burials or Roman deposits.

4. On the north side in the corridor trench (Area E) to investigate the strata if surviving below the corridor floor, to see what the extent of Macartney's work in 1909 was, and to correlate any findings in the strata below the floor with his work, which would be of strata removed for the corridor itself, i.e. above those to be investigated.

The original research aims have been met, as far as the limited trenches permitted, and useful base information gained about the character of the strata for the first 1m or so below the Wren crypt floor in several locations, mostly inside the crypt but also beneath the corridor west of the north transept and immediately outside the nave wall. These findings will also inform future management schemes and are a contribution to future parts of the cathedral's Conservation Plan, when it turns to these topics.

The significance and wider setting of all the findings in this report are developed in Schofield 2011, for the period up to 1666, and in Schofield in prep, for the Wren period. But the chief results may be summarised as a general understanding of the Wren-period dump layers beneath the crypt floor; some temporary works such as the temporary drains and possible base for a raking shore; location of the top of one of the Wren drains, here inside the building; and the recovery of 45 architectural fragments, mostly from the Jones portico, reused as rubble in the crypt walls. In the trench to the north in Area E, the earliest human skeletons to be so far excavated on the cathedral site were recorded, and dated by C14 to the 8th or 9th centuries.

7. Acknowledgements

The excavations and post-excavation analysis which form the majority of this report were funded by the Dean and Chapter of St Paul's Cathedral. Financial support for the post-excavation work was also given by the Museum of London and English Heritage. The project has been assisted throughout by the Surveyor to the Fabric, Martin Stancliffe, and by the Cathedral Conservator, Suzie Wright, the Cathedral Librarian, Jo Wisdom, and the Cathedral Fabric Archivist, Christine Faunch. It is a pleasure also to acknowledge the assistance of the Clerk of Works, Martin Fletcher, and his team. Research on the pottery and artefacts was co-ordinated by Fiona Seeley of the Museum of London Specialist Services. Other assistance was provided by Richard Lea and Tim Tatton-Brown. The C14 analysis was undertaken by The School of Archaeology and Palaeoecology at Queen's University Belfast.

Appendix 1: Moulded stones (architectural fragments)

Table 9 is a summary by Mark Samuel and John Schofield, of all the moulded stones from SPU96 (both parts) individually accessioned on site. All these stones are kept at the cathedral.

SPU96	Archaeol. context	Extant: not discarded	Building stone	Approximate date span	Comments	photo	Type st.	Any related Typest.?	Dupl. of	Extant drawing record	Requires publicn illustration
1	1	Yes	Portland	1634-1642	Non-orientable and owes its form to chance spalling through heat	427/96/1	N/a	N/a	N/a	Sketch	no
2	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	21	Sketch	no
3	1	Yes	Portland	1634-1642	Corinthian capital, fragment of lower tier of fronds	427/96/2	Yes	16.19,62	N/a	Sketch A4 [DO]	Yes (already illustrated)
4	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	21	Sketch	no
5	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	22	Sketch	no
6	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	22	Sketch	no
7	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	22	Sketch	no
8	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	38	Sketch	no
9	1	Yes	Portland	1634-1642	Nib of fluting (*c*.34mm) from ?upper end of column.	427/96/2	Yes	21,22,27,38,28, 64,65,54	N/a	Sketch	No (requires mention)
10	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	21	Sketch	no
11	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/2	No	N/a	21	Sketch	no
12	1	Yes	Portland	1634-1642	Nib of fluting from column, too damaged for classification.	427/96/3	No	N/a	17	Sketch	no

13	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/3	No	N/a	27	Sketch	no
14	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/3	No	N/a	21	Sketch	no
15	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/3	No	N/a	22	Sketch	no
16	1	Yes	Portland	1634-1642	Central acanthus frond and tendril motif from capital	427/96/4A and 4B	Yes	3,19,62	N/a	Sketch, A4 (X2)[DO]	Yes (already illustrated)
17	1	Yes	Portland	1634-1642	Nib of fluting from column, too damaged for classification. 'Catch-all' for this category	427/96/5	Yes	9,21,22, 27,28,38, 54,64,65	N/a	Sketch	No
18	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/5	No	N/a	21	Sketch A3	no
19	1	Yes	Portland	1634-1642	Fragment of Corinthian capital, deriving from lower tier of acanthus fronds	427/96/6	Yes	3,16,62	N/a	Sketch, A4 (X2)[DO]	Yes (already illustrated)
20	1	Yes	Caen	1200-1400	Ashlar dated by tooling	427/96/7	Yes	No	N/a	Sketch	No
21	1	Yes	Portland	1634-1642	Important column fragment with two nibs and one flute. Reconstructed column diam. = *c.*1.05m (?upper end). See <65>.	427/96/9	Yes	9,18, 22, 27,28,38, 54,64,65	N/a	Sketch, A3	Yes
22	1	Yes	Portland	1634-1642	Important column fragment with two nibs and one flute. Reconstructed column diam. = *c.*1.18m (?intermediate point on column)	427/96/10	Yes	9,18, 22, 27,28,38, 54,64,65	N/a	Sketch, A3	Yes (already illustrated)
23	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/11	No	N/a	27	Sketch	No
24	1	Yes	?	?	Unclassified	427/96/12	N/a	N/a	N/a	Sketch	No
25	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/13	No	N/a	27	Sketch	no
26	1	Yes	Reigate	1290-1400	Complex moulding from internal label of ?window; traces of red paint.	427/96/14, 15	Yes	no	N/a	Sketch A3	Yes

					Not from main campaign?						
27	1	Yes	Portland	1634-1642	Important column fragment with two nibs and one flute. Reconstructed column diam. = *c*.1.11m (?intermediate point on column)	427/96/16	Yes	9,18, 21, 22, 28,38, 54,64,65	N/a	Sketch, A3	Yes
28	1	Yes	Portland	1634-1642	Important cabled column fragment with two nibs and one flute. Reconstructed column diam. = *c*.1.22 m (lower 3rd of column)	427/96/17	Yes	9,18,21 22,27, 38,54,64,65	N/a	Sketch, A3	Yes (already illustrated)
29	1	Yes	?	?	Unclassified fragment	427/96/18	N/a	N/a	N/a	Sketch	No
30	1	Yes	Caen	1300-1375	Casement and fillet from ?window surround	427/96/19	Yes	No	N/a	Sketch, A3	Yes
31	1	Yes	Portland	?	Unclassified fragment	427/96/20	N/a	N/a	N/a	Sketch	No
32	1	Yes	?Oxon Oolite	1350-1540	Window mullion with glazing groove (minor form). Widespread Perpendicular style	427/96/21	Yes	no	N/a	Sketch, A3	Yes
33	1	Yes	Kentish ragstone	?	Pavior	427/96/22	N/a	N/a	N/a	sketch	No
34	1	Yes	?	?	Unclassified fragment	427/96/23	N/a	N/a	N/a	Sketch	No
35	1	Yes	Reigate	1225-1325	Voussoir or stairwell ashlar. Requires further recording.	427/96/24	N/a	N/a	N/a	Sketch	Yes
36	1	Yes	Portland	1634-1642	Cabled column fragment with one nib and one flute.	427/96/25	N/a	N/a	28	Sketch,	No
37	1	Yes	Portland	1634-1642	Nib of fluting from column, too damaged for classification.	427/96/26	No	N/a	17	Sketch	no
38	1	Yes	Portland	1634-1642	Complete flute with two conjoined nibs from column. Reconstructed diam. = *c*. 1.14m (?Upper third).	427/96/27	Yes	9,18,21 22,27,28 54,64,65	N/a	Sketch	no
39	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/28	No	N/a	27	Sketch	no
40	1	Yes	Reigate	1350-1540	Unclassified fragment	427/96/5	N/a	N/a	N/a	Sketch	No
41	1	Yes	Taynton	?	Weathered ashlar block	427/96/28	N/a	N/a	N/a	Sketch	No

42	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/31	No	N/a	21	Sketch A3	no
43	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/31	No	N/a	21	Sketch A3	no
44	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/31	No	N/a	17	Sketch A3	no
45	1	Yes	?Taynton	1680-1710	Wren ashlar apparently recut from 12th century work.	427/96/32	N/a	N/a	N/a	Sketch	Yes (mention)
46	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/33	No	N/a	27	Sketch	no
47	1	Yes*	Caen	1275-1350	*Not observed 1999. Ashlar from ?*New work*	427/96/33	N/a	N/a	N/a	Sketch	Yes (mention)
48	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/34	No	N/a	17	Sketch	no
49	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/34	No	N/a	17	Sketch	no
50	1	Yes*	Reigate	1634-1642	*Not observed 1999.	427/96/35	No	N/a	27	Sketch	no
51	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/36	No	N/a	17	Sketch	no
52	1	Yes	Portland	?	Unclassified fragment	427/96/36	N/a	N/a	N/a	Sketch	no
53	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/36	No	N/a	21	Sketch	no
54	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/36	Yes	9,18,21 22,27,28,38,64, 65	N/a	Sketch	no
55	1	Yes	Portland	?	Unclassified fragment	427/96/36	N/a	N/a	N/a	Sketch	no
56	1	Yes	Portland	?	Unclassified fragment	427/96/37	N/a	N/a	N/a	Sketch	no
57	1	Yes	Portland	?	Unclassified fragment	427/96/37	N/a	N/a	N/a	Sketch	no
58	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/37	No	N/a	17	Sketch	no
59	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/37	No	N/a	27	Sketch	no

60	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/37	No	N/a	38	Sketch	no
61	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/37	No	N/a	17	Sketch	no
62	1	Yes	Portland	1634-1642	Corinthian capital, fragment of lower tier of fronds.	427/96/38	No	3,16,19	N/a	Sketch, A4 (DO)	Yes (already illustrated)
63	1	Yes	Portland	?	Unclassified fragment	427/96/39	N/a	N/a	N/a	Sketch	no
64	1	Yes	Portland	1634-1642	Nib of fluting from column. ?Same as <54>	427/96/40	Yes	9,18,21 22,27,28,38,54, 65	N/a	Sketch	no
65	1	Yes	Portland	1634-1642	Nib of fluting from column. Reconstructed diameter of *c*. 1.08m (?near top). See <21>	427/96/40	Yes	9,18,21 22,27,28,38,54, 64	N/a	Sketch	Yes
66	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/40	No	N/a	22	Sketch	no
67	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/41	No	N/a	22	Sketch	no
68	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/41	No	N/a	22	Sketch	no
69	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/41	No	N/a	9	Sketch	no
70	Sectioned by modern passage (Plan 1)	*In situ* re-used stone	Reigate	1325-1450	Recut as ashlar facing of scaffold store (now conference chamber). Window jamb moulding with glazing groove and casement. Not fully recorded.	Yes	Yes	no	N/a	Sketch*	Yes (mention)
71	Sectioned by modern passage (Plan 1)	*In situ* re-used stone	Caen	1325-1450	Recut as ashlar facing of scaffold store (conference chamber). ?Domestic window sill with glazing groove. Not fully recorded.	Yes	Yes	no	N/a	Sketch*	Yes (mention)
72	Intact	*In situ* re-used	Caen?	1100-1150	Set visibly in window of scaffold store (conference chamber). *Palmette*	Yes	Yes	Another example seen	N/a	Sketch*	Yes

		stone			ornament radiused label						
73	1	Yes	Portland	1634-1642	Nib of fluting from column	427/96/42	No	N/a	27	Sketch	no
74	1	Yes	Portland	?	Unclassified fragment	427/96/43	N/a	N/a	N/a	Sketch	no
75	+	Yes*	Caen	1290-1540	*Not seen 1999. Moulding: junction of window casement with wall	427/96/44	Yes	No	N/a	Sketch	No
76	+	Yes*	Caen	1290-1540	*Not seen 1999. Moulding: junction of window casement with wall	427/96/44	Yes	No	N/a	Sketch	No
77	71	Yes	Portland	1670-1710	Fragment of one side of stone drain (non-architectural)	427/96/45	N/a	N/a	N/a	Sketch	No
78	-	Yes	Portland	?	Unclassified fragment	427/96/46	N/a	N/a	N/a	Sketch	no
79	138	Yes	Portland	1670-1710	Drain cover with three apertures. Broken into four pieces	51/97/1	N/a	N/a	N/a	Sketch	Yes (mention)
79 A			Portland	1634-42	fluting fragment; double numbered 79, noticed later	427/96/47					
80	138	Yes	Portland	1670-1710	Drain cover with three apertures. Broken into two pieces	51/97/2	N/a	N/a	N/a	Sketch	Yes (mention)
81	138	Yes	Portland	?	Unclassified fragment	51/97/3	N/a	N/a	N/a	Sketch	no
82	138	Yes	Portland	?	Unclassified fragment	51/97/4	N/a	N/a	N/a	Sketch	no
83	138	Yes	Portland	?	Unclassified fragment	51/97/5	N/a	N/a	N/a	Sketch	no
84	138	Yes	Portland	1670-1710	Structural fragment	51/97/6	N/a	N/a	N/a	Sketch	no
85	138	Yes	Portland	1670-1710	Structural fragment	51/97/7	N/a	N/a	N/a	Sketch	no
86	138	Yes	Portland	1670-1710	Structural fragment	51/97/8	N/a	N/a	N/a	Sketch	no
87	138	Yes	Portland	1670-1710	Structural fragment	51/97/5	N/a	N/a	N/a	Sketch	no
88	138	Yes	Portland	1670-1710	Structural fragment	51/97/9	N/a	N/a	N/a	Sketch	no
89	138	Yes	Portland	1670-1710	Structural fragment	51/97/10	N/a	N/a	N/a	Sketch	no
90	+	Yes	Portland	1634-1642	*Ovolo* mould. Orientation unknown.	51/97/11	Yes	No	N/a	Sketch, A4	Yes (already illustrated)
91	194	Yes	Caen	1050-1190	*Quirk-and-hollow* base or abacus	51/97/12	Yes	No	N/a	Sketch A4	Yes (already illusrated)
92	194?	Yes	Portland	1634-1642	Fragment of Jonesian spandrel from ?S. Transept Entrance, broken up on	51/97/13	Yes	93,120, 135,136,	N/a	Sketch , A4, A3	Yes (already

					recovery. Six pieces recovered.			137		(X2)	illustrated)
93	194	Yes	Portland	1634-1642	Fragment of Jonesian spandrel from ?S. Transept Entrance, broken up on recovery. Six pieces recovered.	51/97/14	Yes	92,120, 135,136, 137	N/a	Sketch , A3 (X2)	Yes (already illustrated)
94	194	Yes	Caen?	?	Unclassified fragment	51/97/15	N/a	N/a	N/a	Sketch	No
95	194	Yes	Caen?	?	Unclassified fragment	'missing'	N/a	N/a	N/a	Sketch	No
96	194	Yes	?	?	Unclassified fragment	51/97/16, 51/97/19	N/a	N/a	N/a	Sketch	No
97	194	Yes	Taynton	1080-1180	Semi-circular attached shaft. 0.388m diam.	51/97/17	Yes	SPC94 <55>	N/a	Sketch, A3	No
98	194	Yes	Taynton	1080-1180	Undercut semi-circular shaft *c*.0.27m diam	51/97/18	No	N/a	121	Sketch, A3	No
99	194	Yes	Taynton	?	Unclassified fragment	51/97/19	N/a	N/a	N/a	Sketch	No
100	194	Yes	Caen?	1080-1250	Fragmentary shaft, reconstructed diam. = *c*.0.19m	51/97/20	Yes	no	N/a	Sketch, A4	Yes
101	194	Yes	Taynton	1080-1180	Arcade arch? Major order with *six inch* roll. 'brown paint' in rebate	51/97/21	No	N/a	108	Sketch	Yes (Analyse paint)
102	194	Yes	Taynton	1080-1180	Casemented and roll-moulded ?blind arcade voussoir. Arch centre *c*.0.98m (?one *yard*)	51/97/22	Yes	no	N/a	Sketch, A4, A3	Yes
103	194	Yes	Taynton	1080-1180	Fitted corner shaft (?six *inches*) from wall arcading [in two parts]	51/97/23	No	N/a	117	Sketch	No
104	194	Yes	Taynton	1080-1180	Fitted corner shaft (?six *inches*) from wall arcading	51/97/23	No	N/a	117	Sketch	No
105	194	Yes	Taynton	?	Unclassified fragment	51/97/17	N/a	N/a	N/a	Sketch	No
106	194	Yes	?	?	Unclassified fragment	51/97/24	N/a	N/a	N/a	Sketch	No
107	194	Yes	Taynton	?	Unclassified fragment	51/97/24	N/a	N/a	N/a	Sketch	No
108	194	Yes	Taynton	1080-1180	?*Triple rolls in echelon* with *six inch*	51/97/2	Yes	no	N/a	Sketch,	Yes

					roll. Deteriorated paint traces. Arch centre = *c*.1.3m from extant roll.	5				A3	including mortar analysis.
109	194	Yes	'grey limestone'	1350-1540	Fragment of mullion from glazed ?oriel.	51/97/26	Yes	no	N/a	Sketch	Yes
110	194	Yes	Taynton	?	Unclassified fragment	51/97/27	N/a	N/a	N/a	Sketch	No
111	194	Yes	Taynton	1080-1180	Fitted corner shaft (?six *inches*) from wall arcading	51/97/20	No	N/a	117	Sketch	No
112	194	Yes	Caen?	?	Unclassified fragment	51/97/24	N/a	N/a	N/a	Sketch	No
113	194	Yes	Taynton	1080-1180	Fragmentary *quirk-and-hollow* abacus. ?External.	51/97/24	Yes	no	N/a	Sketch, A4	Yes
114	194	Yes	Taynton	?	Unclassified fragment	51/97/27	N/a	N/a	N/a	Sketch	No
115	194	Yes	Taynton	1080-1180	Fitted corner shaft (?six *inches*) from wall arcading	'missing'	No	N/a	117	Sketch	No
116	194	Yes	Taynton	?	Unclassified fragment	51/97/29	N/a	N/a	N/a	Sketch	No
117	194	Yes	Taynton	1080-1180	Fitted corner shaft (?six *inches* diam.) from wall arcading	51/97/30	Yes	no	N/a	Sketch, A4	Yes
118	194	Yes	Taynton	1080-1180	Semi-circular pier shaft element	51/97/31	no	N/a	128	Sketch	No
119	194	Yes	Taynton?	?1080-1180?	Chamfered plinth (?eight *inch* rise)	51/97/32	No	N/a	132	Sketch	Yes
120	194	Yes	Portland	1634-1642	*Cyma-reversa* ?window arched head. ?Aisle window recasing.	51/97/33	Yes	no	N/a	A3	Yes (already illustrated)
121	194	Yes	Taynton? Caen?	1080-1180	Undercut semi-circular pier shaft element. 0.273m diam.	51/97/34	Yes	no	N/a	Sketch, A3	Yes
122	194	Yes	Caen?	?1080-1180?	Unclassified fragment of semi-circular pier shaft	51/97/35	N/a	N/a	N/a	Sketch	No
123	194	Yes	Taynton	1080-1180	Sub-circular pier shaft element. ?Recut as ashlar. ?cut to fit angle?	51/97/35	No	N/a	97	Sketch, A3	Re-examine
124	194	Yes	Caen?	?	Unclassified fragment	51/97/37	N/a	N/a	N/a	Sketch	No
125	194	Yes	Reigate?	?	Unclassified fragment	51/97/3	N/a	N/a	N/a	Sketch	No

						8					
126	194	Yes	Caen?	?	Unclassified fragment	51/97/39	N/a	N/a	N/a	Sketch	No
127	194	Yes	Caen?	?	Unclassified fragment	51/97/40	N/a	N/a	N/a	Sketch	No
128	194	Yes	Taynton	1080-1180	Sub-circular pier shaft element.	51/97/41	Yes	SPC94 <5,66,74183>	N/a	Sketch, A2	No
129	194	Yes	Portland	?	Unclassified fragment	51/97/42	N/a	N/a	N/a	Sketch	No
130	194	Yes	Taynton	1080-1180	Sub-circular pier shaft element.	51/97/43	No	N/a	128	Sketch	No
131	194	Yes	Taynton	?	Unclassified fragment	51/97/44	N/a	N/a	N/a	Sketch	No
132	194	Yes	Taynton?	?1080-1180?	Chamfered plinth (?eight *inch* rise)	51/97/45	Yes	no	N/a	Sketch	Yes
133	194	Yes	Taynton	1080-1180	Unclassified sub-circular pier shaft element.	51/97/46	N/a	N/a	N/a	Sketch	No
134	195	No, too large to move	Granite?	1710-1996	Basis of free-standing memorial	No photograph	Yes	N/a	N/a	N/a	No
135	194	Yes	Portland	1634-1642	Fragment of Jonesian spandrel from ?N. Transept Entrance, broken up on recovery. Six pieces recovered.	Yes (colour)	Yes	93,120, 135,136, 137	N/a	Sketch , A4(X2), A3 (X2)	Yes (already illustrated)
136	194	Yes	Portland	1634-1642	Fragment of Jonesian spandrel from ?S. Transept Entrance, broken up on recovery. Six pieces recovered.	Yes (colour)	Yes	93,120, 135,136, 137	N/a	Sketch , A4, A3 (X2)	Yes (already illustrated)
137	194	Yes	Portland	1634-1642	Fragment of Jonesian spandrel from ?S. Transept Entrance, broken up on recovery. Six pieces recovered.	Yes (colour)	Yes	93,120, 135,136, 137	N/a	Sketch , A4, A3 (X2)	Yes (already illustrated)
-	Area A, E. Wall	*In situ* re-used stone			*As <72>, but heavily obscured by paint. Discovered when statue of James Watt was removed.						

Table 9 Individually accessioned moulded stones from SPU96

Appendix 2: Roman pottery

R P Symonds; with a contribution by Kay Hartley

General note by JS, June 2004: this report has been edited as follows. As it was a contribution to the report in preparation which appeared later as Schofield 2011, and it therefore studied Roman pottery from several sites, not just SPU96, the following listing of sites is used:

Site A: GM307, salvage excavation north of the nave, 1969
Site B: SPL94, N aisle of nave below crypt, 1994
Site C: SPU96, south-west part of nave, contexts [1] to [136]
Site D: SPU96, corridor on north side of nave, contexts [137] to [194]
Site E: SPV98, crypt below St Dunstan's Chapel, west end, 1998
Site F: PWT00, drain shaft west of cathedral, 2000
Site G: SAT00, crypt below south transept, 2000
(gazetteer entries in Schofield 2011, 299–314)

This report on the pottery did not differentiate clearly between the two separate parts of the SPU96 excavation, but considered them together (a pardonable error as there was only one series of context numbers). JS has placed the site letter D in front of relevant contexts to provide some differentiation.

The pottery examined for the purposes of this report comes from five separate excavations (Sites A and C–G). The earliest of these, the 1969 excavation (Site A), is here treated as a single context (without stratification) which contained a total of 192 sherds or 75 rows (records) of Roman pottery (along with a smaller amount of post-Roman pottery and other finds). Two further excavations in the cathedral in 1996 (Sites C and D), included a total of 1286 sherds or 525 rows of Roman pottery. Two small sites, F and G, contained 6 sherds / 6 rows and 24 sherds / 11 rows respectively.

Acronym	Ware name	Source	Date range
AHBB	Alice Holt black-burnished ware	BRIT	160–250
AHFA	Alice Holt/Farnham ware	BRIT	250–400
BAETE	early Baetican Dressel 20/Haltern 70 fabric	SPAIN	50–170
BB1	black-burnished ware 1	BRIT	120–400
BB2	black-burnished ware 2	BRIT	120–250
BB2F	black-burnished ware 2 (fine fabric)	BRIT	140–250
BBS	black-burnished style ware	BRIT	120–400
HWBR	Highgate Wood red-slipped ware B	BRIT	40–100
HWC	Highgate wood ware C	BRIT	70–160
LOMI	Local mica-dusted ware	BRIT	70–120
LOXI	Local oxidised ware	BRIT	90–160
MHAD	Much Hadham ware	BRIT	200–400
OXRC	Oxfordshire red/brown colour-coated ware	BRIT	240–400
OXWW	Oxfordshire white ware	BRIT	180–400
SAMCG	Central Gaulish samian ware	CGAUL	120–250
SAND	unsourced sand-tempered wares	BRIT	50–400

VCWS	Verulamium region coarse white-slipped ware	BRIT	70–200
VRMI	Verulamium region mica-disted ware	BRIT	70–120
VRW	Verulamium region white ware	BRIT	50–160

Table 10 Roman wares codes used in this report

The two main assemblages (Site A and Sites C and D considered together) include pottery of broadly similar date-ranges, but they are quite different from each other in character, while neither one seems especially representative of the pottery production in the vicinity of St Paul's which was observed by Conyers in 1677; the site of his recording is currently placed as coinciding with the north-east corner of the north transept (Schofield 2011, 34–6, Site 29). Although it may have been expected that some of the pottery from the 1969 (Site A) and 1997 (Site D) excavations might be associated with that production, in fact these assemblages include very few of the elements which might normally be found in pottery associated with production. There are, for example, no obvious wasters, and while there are some burnt or sooted sherds, these are neither more striking nor more numerous than would normally be expected in any ordinary occupation assemblage found elsewhere in Roman London.

While there is no evidence of pottery production in the two assemblages, they are quite different from each other, in two specific aspects. The first of these may in fact be a spurious difference: the 1969 (Site A) assemblage contains a substantial number of complete or nearly whole vessels, or large pieces, whereas the Sites C and D group includes very few pieces which would normally be considered worthy of drawing. This could perhaps be a result of deliberate selection of vessels for retention during the 1969 excavations. We must be grateful, however, that the vessels retained do include a substantial range of types, and even if there is no associated stratification the types which are worthy of illustration give quite a clear picture of the types of pottery present in the area, something which is in fact more difficult to glean from the more fragmentary evidence provided by the 1997 excavations.

The second distinguishing aspect is the curious occurrence of an unusual number of lids in the pottery from Site D in 1997. This is shown very clearly in Fig 52, which shows lids reaching 17.1% by rows and 32.1% by sherd-count of the identifiable forms from Site D, compared with 3.7% or 3.1%, respectively, for London as a whole. It would be tempting to see such remarkably high percentages as evidence in some way connected with nearby pottery production, were it not for the fact that the lids in question actually occur a variety of fabrics, some of which are very obviously not local. Table 11 shows the variety of fabrics represented, while Fig 51 shows a comparison of form types represented at Site D with percentages of form types found in London as a whole.

The explanation for this high number of lids is not at all obvious. Lids are a form which has seldom been subjected to detailed analysis, perhaps in part because there seems to be a degree of prejudice against such analysis. In his 1958 volume Hull remarks 'lids have never much appealed to the student of pottery…' (138), and in 1963 'coarse ware lids…: This is a dull and perhaps unprofitable subject…' (134); in London, Green notes that 'lids… are as usual undiagnostic, and are difficult to relate to the fabrics of the jars and bowls' (1980, 54). In terms of typology, the lids from St Paul's are no more interesting than those described by the above writers, but they are certainly distinguished by their concentration. This is illustrated both in Fig 51 and in Fig 52, where the data from the selected contexts which

were fully quantified is compared with London as a whole, showing lids as a percentage of all the identified pottery from each pottery grouping.

Fabric	Code	Rows	% Rows	Sherds	% Sherds
Romano-British fine ware					
'Ring and dot' beaker fabric	RDBK	1	2.0%	1	0.5%
Black-burnished-type wares					
Black-burnished 1 ware	BB1	5	9.8%	7	3.8%
Black-burnished-style ware	BBS	1	2.0%	1	0.5%
Reduced wares					
Highgate 'C' sand-tempered ware	HWC	8	15.7%	49	26.8%
Miscellaneous sand-tempered ware	SAND	7	13.7%	17	9.3%
Tempered wares					
Grog-tempered ware	GROG	1	2.0%	1	0.5%
Oxidised wares					
Local oxidized ware	LOXI	10	19.6%	65	35.5%
Miscellaneous oxidised ware	OXID	9	17.6%	22	12.0%
Fine oxidised fabric	OXIDF	1	2.0%	3	1.6%
Verulamium region coarse white-slipped ware	VCWS	2	3.9%	4	2.2%
Verulamium region white ware	VRW	6	11.8%	13	7.1%
	Total	51	100.0%	183	100.0%

Table 11: the fabrics of Roman lids from Sites C and D, in terms of rows and sherds

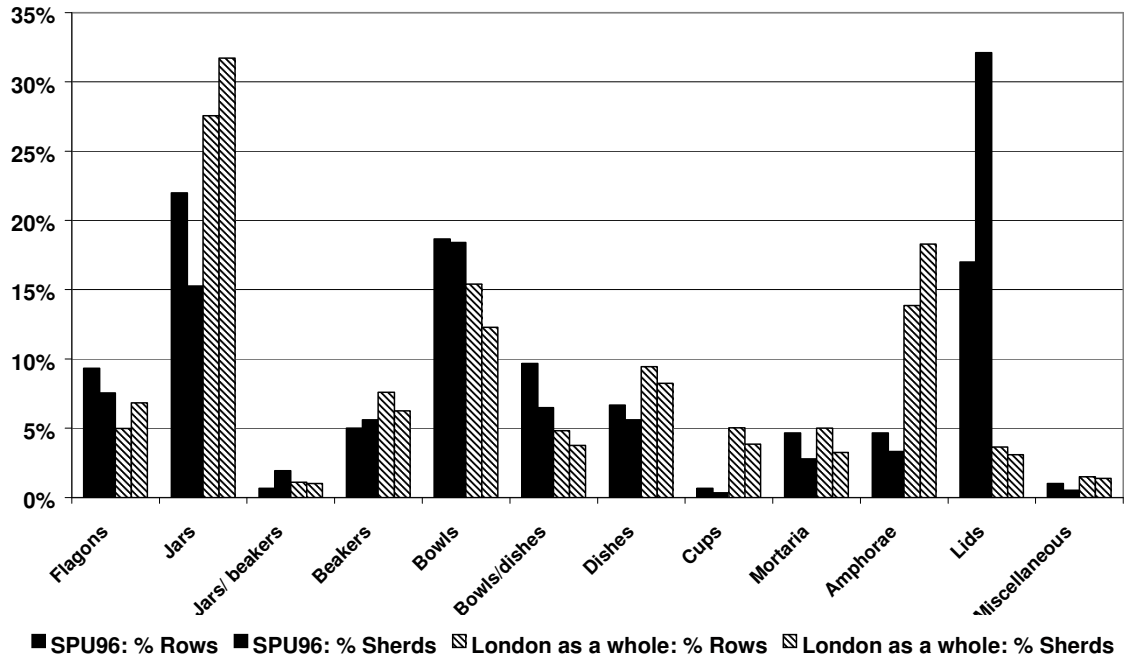


Fig 51: Comparison of identifiable pottery forms from Site D (shown as SPU96) with forms from London as a whole, in terms of rows and sherds. The London data comes from the MoLAS / MoLSS Oracle database (post-1995)

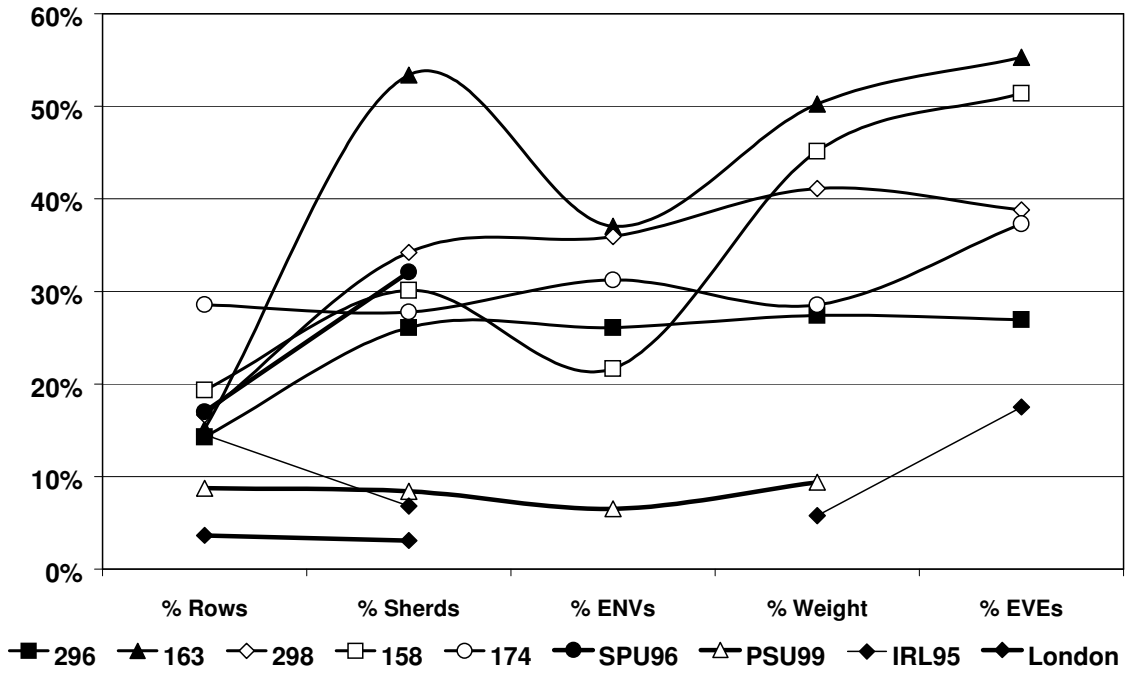


Fig 52: Lids, as a percentage of all the identifiable forms in five selected contexts from the 1996 excavations, compared with the site as a whole (SPU96), with a nearby Paternoster Square site (PSU99), with a site in Ironmonger Lane (IRL95) and with London as a whole

It is worth noting that somewhat above-average percentages of lids have also been observed at a nearby Paternoster Square site (PSU99) and at a site in the heart of the Roman City at Ironmonger Lane (IRL95; Symonds in prep), and these have therefore been included in Fig 52. These sites do not, however, offer any further evidence for why such concentrations of lids may occur. Only a few lids are illustrated here (nos 10 and 23–5), mainly because in general lids offer only a limited range of typological variation, which has not so far been shown to have any definable significance in terms of fabrics or chronology. The only lids which normally have any decoration are those in Black-burnished wares, such as no. 24.

More than three-quarters of the pottery from the St Paul's sites was found in contexts dated later than AD 120 and earlier than AD 160. A total of just three contexts (out of 60, or 5%) containing a total of 16 sherds (out of 1310, or 1.2%) were dated to the 1st century (AD 40/50–100), while eleven contexts contained pottery dated later than AD 200, but these included only 14 items (rows) or 16 sherds dated later than AD 200. These figures are for the recent excavations which contained Roman pottery, Site D, Site F and Site G; the same picture pertains for the Site A pottery, wherein four of the 75 rows – 13 out of 192 sherds – were dated to the 1st century, while six rows / 9 sherds were dated later than AD 200. In terms of contexts in the recent sites, the date-ranges are shown in Table 12:

Contexts Early date	Late date								
	100	**120**	**160**	**170**	**200**	**250**	**300**	**400**	**Total**
40	1								1
50	2		5	2				3	12
70		3	6		2				11
90			3						3
100			1						1
120			9		1	8			18
140			2						2
180								1	1
200							1		1
240							1	1	2
250								6	6
270								2	2
Total	3	3	26	2	3	8	2	13	60

Table 12: Date-ranges of contexts in SPU96, PWT00 and SAT00; for summaries of the latter two sites, see Schofield 2011, Sites F and G, p311–14

It should be added that this picture, of essentially Hadrianic to early Antonine pottery, with small amounts of earlier and later pottery, is not really typical for Roman London as a whole. Broadly speaking, most City and Southwark sites have much larger percentages of Neronian, Flavian and Trajanic pottery, and while it is normal for late Roman assemblages to contain substantial percentages of residual pottery, it is fairly unusual for them to contain so few contemporary sherds.

The dating of the largest of these sites is also shown in the date-range graph, **Error! Reference source not found.** (below), in which the date-ranges are shown along with the numbers of sherds present for each context. This image probably exaggerates the amount of late Roman pottery present, since although there are two substantial late contexts, D[293] and D[296], in both cases tha actual amount of late pottery which dates the contexts is very small indeed. In the case of context D[293], there are just four sherds out of the total of 81 which are dated later than AD 200, and just three sherds out of a total of 123 for context D[296]. All of the pottery in contexts dated later than AD 200 amounts to some 132 rows (or records in the MoLSS/MoLAS Oracle database) or 272 sherds, and of these just 14 rows or 16 sherds (between 6% and 10.5%) are actual of pottery types dated later than AD 200, all the rest being residual pottery in later contexts. It is not especially unusual to find high levels of residuality in late contexts in Roman London as a whole, but in this instances the percentages of residual pottery are probably somewhat higher than normal, and it seems likely that occupation on the site after about AD 200 was no more than sporadic for long periods of time.

Catalogue of illustrated sherds and vessels

Site A (N of the nave, 1969 - GM307)

Amphorae

Baetican olive-oil amphorae

P<1> BAETE 8DR20. Handle of Dressel 20 Baetican olive-oil amphora, stamped SAQARP[ ], Callender 1965, no. 1559, fig 16 no. 20 (c AD 80/90–130//40).
P<2> BAETE 8DR20PW18. Rim-sherd of Dressel 20 Baetican olive-oil amphora, Peacock and Williams 1986, fig 65.18, AD 70–110.

Gaulish wine amphora

P<3> GAUL1 8G4. Rim-sherd of Gauloise type 4 flat-bottomed southern Gaulish wine amphora. Not a precisely identifiable form, so dated AD 50–250.

Samian ware

South Gaulish samian ware dish
P<4> SAMLG 5. South Gaulish samian ware dish, missing rim. Stamped OFVIRIII. Virilis of La Graufesenque, dated AD 50–100.

Romano-British fine wares

Local marbled ware
P<5> LOMA 4. Rim and short flange sherd of bowl with very fine white fabric and red 'marbled' external slip. Marsh form 14.1 (1978, fig 6.9), but without rouletting. Dated 70–120.

Local/London mica-dusted/gilt ware
P<6> LOMI 1F. Flagon form 1F; complete rim and top of handle. Dated 70–120.

Reduced wares

Alice Holt/Surrey ware
P<7> AHSU 2C. Complete profile of carinated jar, with about 25% of rim and 70% of body. Dated AD 50–160.
P<8> AHSU 2E. Four rim-sherds and six bodysherds of a necked jar with cordon at base of neck, and rounded shoulder. Dated AD 100–160.

Oxidised wares

Local oxidized ware

P<9> LOXI 7G238. Two joining rim-sherds of a form G238 mortarium. Dated AD 90–100.
P<10> LOXI 9A. Rim-sherd of a lid; sooted. Dated AD 90–160.

Portchester 'D' ware

P<11> PORD 2. Rim-sherd of jar with thick, flat rim; sooted. Dated AD 350–400.

Verulamium Region White ware
P<12> VRW 1B2. Almost complete flagon, missing part of the rim and with a hole in the side. Dated AD 70–120.
P<13> VRW 1C. Pinch-mouthed flagon. Complete top, missing handle. Dated AD 60–160.
P<14> VRW 1D. Rim and top of neck, missing handle. Dated AD 50–100.
P<15> VRW 1D. Broad rim and top of narrow neck, missing handle. Dated AD 50–100.
P<16> VRW 1E. Rim, neck and one handle of a variation of form 1E flagon, with rim similar to form 1J1. Dated AD 50–160.
P<17> VRW 7HOF. Diameter 260mm. 88% EVEs.
The vessel is almost whole except for a hole in the centre of the base which is probably the result of an accident rather than wear; there is a patch of burning on the flange. The maker's stamps survive to both sides of the spout, both from a die giving APRILIS, A with diagonal bar and with *lambda* L. These stamps could be from the same die as one from the Guildhall amphitheatre site; a stamp on a mortarium from Guy's Hospital (MA 2735; unpublished) is similar, but the impression is longer than either of the above. These may be varying impressions from the same die, but more than one die could be involved; the discovery of further examples will clarify this. Nineteen mortaria of Aprilis are now known from Baylham House, Coddenham; Colchester (12, Hartley 1999, 198, S18-20); London (4); Scole, Norfolk; and Snettisham. He used at least eight dies and a minimum of two dies are represented by the stamps on the four mortaria recorded from London (ie if the three above mentioned stamps are assessed as from one die). Three of the four London mortaria are in typical Verulamium region fabric while the fourth, stamped with the distinctly different die, could be in a finer version of the same fabric. Thus, most if not all of his four London mortaria are in Verulamium region fabric and the remaining fifteen mortaria are in Colchester fabric. Activity in two different workshops is clearly indicated. The lack of good stratigraphic evidence makes it impossible to be categorical about the sequence of activity or even whether two contemporary workshops were involved. However, Aprilis was not an important potter and, given the general tendencies of these two industries, a move from Colchester to the Verulamium region seems the more likely explanation. These details aside, there are features of this mortarium which mark it as AD 60–90 in date and probably earlier than AD 90. These are, firstly the use of concentric scoring combined with the trituration grit, both of which extended right up to the bead, and secondly the spout which is typically Flavian in type; the rim-profile is also in keeping with such a date.

P<18> VRW 7HOF. Diameter 280mm. 62% EVEs. Diameter of base 110mm.
The trituration grit, combined with concentric scoring, has been worn away and the hole in the centre of the base is probably the result of wear. Both of the potter's stamps survive, right-facing, MORICAM, (AM ligatured) and left-facing, L·FECIT, the F with a bottom stroke like an E and with a kind of smear going diagonally back from the E. These can be interpreted as Moricamulus *fecit* at *Lugudunum*. MORICAM is probably the full reading of this die. His three other namestamp dies are all associated with FECIT counterstamps made in the same style as the namestamp and obviously designed for use with it. Stamps from two dies giving L.FECIT are well-known and one mortarium survives, from Highgate Wood (unpublished), where the same die of Moricamulus has been used along with the second, smaller, L.FECIT die. L could stand for a man's name, but it is much more likely to represent the placename *Lugdunum* (see Hartley 1972a, 372, and Hartley 1977, 139–140, for further details of its use on mortaria). If the L.FECIT stamp were in the same style as the name stamp one would just assume that it was a counterstamp habitually used with this die of Moricamulus, but it was clearly not designed for use with this or any other of his

namestamps. Neither this namestamp nor the L.FECIT stamps are rare (18 and 16 respectively in addition to the two mentioned above); their exceptional importance in this instance lies in being on the same vessel. This is only the second time this conjunction has been recorded.

Further mortaria with both stamps are needed, but the link seems clear. What is certain is that both dies were being used in the same workshop. Moricamulus operated in the Verulamium region in the period AD 70–110 (Hartley 1972a, nos 29–30; Bishop and Dore 1989, 266, no.130). Mortaria with L.FECIT stamps date to the same period (Hartley 1972a, 375, no. 23). The rim-profile, spout-type and the combination of tiny to small trituration grit combined with concentric scoring applied up to the bead, make the St Paul's example typical for the period AD 60–90, again likely to be earlier than AD 90.

P<19> VRW 7HOF. Diameter 370mm. 65% EVEs.
Very heavily worn and slightly singed. The left-facing stamp survives; this is complete except for the borders and reads DOINVS, DO entwined, S reversed. Doinus is a common potter, but this is a relatively rare stamp (Hartley 1972b, 77, fig 5, Die C for a restored version). It appears that this die-type was intended to be used in combination with a semi-literate counterstamp which could be interpreted as EOE or FOF, but is clearly intended to represent *FECIT*. The die for the name-stamp may have been damaged soon after the die was made because twelve counterstamps survive to only two certain namestamps. Only one mortarium is known with both stamps surviving, from Norton, near Malton, Yorks (unpublished). Though no example is known, he may have made a habit of using the counterstamp on both sides of mortaria after the namestamp was broken. Doinus worked at Brockley Hill in the Verulamium region within the period AD 70–110 (Hartley 1972b). All the rim-profiles associated with the namestamp and counterstamp in question are probably later than AD 80 (Hartley 1995, fig 129, no. 91 for further details of this potter).

P<20> VRW 81J. Flat-bottomed amphora. Two-thirds of the rim, missing both handles. Dated AD 50–100.
P<21> VRW 9. Barrel-shaped vessel, with handle on the top and spout beside it, with a small hole on the other side of the top, and ribbed body below. Each of the three horizontal panels/ribs present is about 2cm high. This might be described as a costrel, but its orientation is vertical, whereas the type example illustrated by Webster (1969, Fig 1.10) is horizontally-oriented. Dated AD 50–160.

SPU96 (Site D)

These are all from the N trench in the corridor.

P<22> Context D[174]. OXID 4A. Oxidised ware, possibly Sugar Loaf court ware, form 4A bowl. AD Dated 50–160.
P<23> D[174]. VRW 9A. Verulamium Region White ware lid. Dated AD 50–160.
P<24> D[298]. BBS 9A CL. Black-burnished-style ware lid. Dated AD 120–60.
P<25> D[298]. LOXI 9A. Local oxidized ware lid.

Appendix 3: Post-Roman pottery

Lyn Blackmore and Jacqueline Pearce

The pottery from SPU96 was assessed by Lyn Blackmore in 1998, and consists of 35 sherds from a minimum of 24 vessels, all but one of which is post-medieval in date. The assessment is not given here. The medieval pottery is published by Blackmore in Schofield 2011, 248.

Jacqueline Pearce continues: None of the sherds shows heavy burning, which would be expected in debris resulting from the Great Fire. Pottery ranging in date from unstratified 16th-century types to late 18th- or early 19th-century Transfer-printed ware was recovered, possibly intrusive. The bulk of the finds, however, date to the mid- to late 17th century, with some vessels probably of early 18th-century date. Most are common types in widespread use throughout the London region at this period, with London redwares (PMR) and Surrey-Hampshire Border wares (BORD) dominant. Fine redwares from Essex (PMFR and PMBL) are also present, together with Tin-glazed ware from London factories, and part of a butter pot in Midlands Purple ware. Imports are represented by the ubiquitous Frechen stoneware, part of a Spanish mercury jar and the base of a small dish in Chinese blue and white export porcelain (see below). A range of domestic forms is represented, including kitchen wares used in cooking and food preparation (tripod pipkin, dripping dish, bowls), tablewares (dishes, saucer), storage (jars) and hygiene (chamber pots).

A piece of Chinese porcelain from Site D

Of particular interest is a piece of Chinese blue and white porcelain, found, without any other associated pottery, in context D[340] (so recorded, but this number was also given to an Anglo-Saxon skeleton also excavated, so there is an error). The complete base of a small dish, comprising three joining sherds, was recovered, measuring 60mm across the footring (Fig 53).

Fig 53 Chinese blue and white porcelain dish from D[340], late 17th–early 18th century (J Pearce)

The central design is a fairly common one and consists of a boy with long sleeves dancing or leaping and waving his arms, and a woman seated on a 'perforated' rock, holding a small branch, or possibly a musical instrument. A tree branch overhead is represented by curvilinear brush strokes and dots. The base alone survives, so the border, probably variation on floral and diaper panels, is missing. The painting is clean and competent, although not of the highest quality. The so-called 'Long Eliza' and 'jumping boy' pattern had a long history as a motif on Chinese export wares, and variations of the theme were in use in the 16th century and also after the Kangxi period. This particular version, however, appears only in the middle Kangxi period (late 17th to early 18th century).[1] Figure designs are particularly common on Kangxi period export porcelains, much more so than they are a generation later; for example in the cargo of the *Geldermalsen*, which was wrecked in the South China seas in 1752. It seems that by the middle of the 18th century, blue and white was used more for landscapes, riverscapes and flower designs, while painting in enamels was favoured for 'imaged' wares, as they were called in contemporary shipping and sale lists.[2] The piece was most likely made in Jingdezhen, in the inland province of Jiangxi, where the vast majority of ceramic wares for both home and export markets was made. Numerous small manufactories

[1] Cyril Beecher pers comm.
[2] Sheaf and Kilburn 1988, 115.

operated here, as well as at the Imperial kilns, probably producing as much as 90% of the exported blue and white wares.[3]

Many museums have examples of the 'jumping boy' pattern in their collections, although these are illustrated in very few catalogues; published parallels are therefore hard to find. The vessels are often marked, and recorded examples include Kangxi reign marks, commendation marks and apocryphal reign marks, falsely indicating manufacture during a particularly prestigious, earlier reign. The St Paul's dish falls into the last category. Instead of the usual four clearly separated characters arranged centrally underneath the base in a square, the mark in this case appears as a close-knit web of characters that cannot be easily disentangled, but which reads 'Chenghua' (1466–87). This was a very common mark in the Kangxi period, when it was generally imperial pieces that used the imperial mark.[4]

The reign of Kangxi (1662–1722) is conveniently divided by modern ceramic historians into three distinct periods. The 'middle period', from which the St Paul's dish dates, starts in 1683 and ends *c* 1710.[5] First period Kangxi is essentially a continuation of the Transitional period, and marks the restoration of stability after the civil war that brought the Ming dynasty to an end, with the establishment of Qing rule. After a period of considerable turmoil in which production at the imperial porcelain factories was interrupted, the middle years of the reign of Kangxi saw the resumption of imperial control and the manufacture of much fine quality porcelain.

In 1915, R L Hobson wrote that 'western collectors have agreed to give the place of honour to K'ang Hsi blue and white.'[6] This is a reflection of the regard in which Kangxi porcelain was held by connoisseurs in the late 19th and early 20th centuries and although the position has now altered somewhat, these wares are still highly collectable and known for their quality. They are justly famous for their pure, sapphire blue decoration, with delicately graded washes of colour, clearly visible on the St Paul's dish. Great care was taken in the preparation of the cobalt, and blue and white was considered to be the ideal medium for decorating porcelain throughout at least the first two periods of Kangxi's reign.[7] The demand for blue and white increased to such an extent during the middle Kangxi period that mass production was widely introduced, particularly important in the manufacture of porcelain for export to the West.

It is not so easy to view these Kangxi porcelains through early 18th-century eyes, although the Kangxi 'jumping boy' design was closely copied by English porcelain makers in the middle of the 18th century, a time when the influence of Chinese blue and white export porcelain was particularly strong and widespread. Examples are known in the early Liverpool porcelain of Richard Chaffers and Co, offering a reasonably faithful version of the Chinese pattern, as on a small plate formerly in the Watney Collection, dated to *c* 1758–60.[8] While the Chinese 'jumping boy' prototypes appear not have been made to go with teabowls or cups of any form, Chaffers versions are often associated with cups, showing that the dishes or plates could be used to serve more than one function. Other forms made by Chaffers with the 'jumping boy' design include octagonal teapots, tea canisters and related teawares, often with pseudo-Chinese reign marks under the base. The pattern was also made

[3] Godden 1979, 119.
[4] Jean Martin pers comm.
[5] Macintosh 1994, 105, 112.
[6] Hobson 1915, 128.
[7] Macintosh 1994, 113.
[8] Watney Collection Part 1, no. 269.

at Samuel Gilbody's Liverpool porcelain works, which operated from 1754/5 to 1761, and was the most common type recovered on the factory site.[9]

The only other English factory known to have used the 'jumping boy' design is Bow, again appearing very close to the original as can be seen from a comparison of the two designs.[10] The pattern was made on underglaze blue wares at Bow in the so-called 'Middle period', 1755–63, at a time of expansion in the factory's operations. When Bow was set up in the 1740s, the proprietors, Alderman Arnold and Co traded on the popularity of imported Chinese porcelain and called their London works 'New Canton'. They made porcelain in imitation of Chinese wares and, unlike Chelsea, concentrated from the beginning on production of 'the more ordinary sorts of ware for common uses'. These were aimed largely at the middle-class market, with utility foremost, and it has been estimated that between the 1740s and mid 1770s probably over 90% of their range used oriental designs, some of them with imitation Chinese marks underneath.[11] The 'jumping boy' is typical of these 'cheap blue and white oriental useful wares',[12] and would have been made alongside more sophisticated ornamental china based on European designs.

By 1700, the English, French and Dutch East India Companies were importing very large quantities, and rich merchants and other men of influence were amassing enviable collections. It is likely that the vessel belonged to a household or individual of relatively comfortable means, and that it was part of a set of similar dishes. Most of the imported porcelains of the first quarter of the 18th century were tea- and tablewares, and they were auctioned by the East India Company not as complete services but as groups of the different components, such as cups and saucers, teapots and so on.[13] It is worth noting that saucers did not necessarily come with cups or teabowls at this time, and so dishes, such as the St Paul's example, could have been purchased as a set on their own and used with drinking vessels of different design, as well as other vessels in completely different materials, such as a silver teapot and tea canister. The St Paul's dish is therefore a good example of the kind of fashionable ceramics favoured by those who could afford to acquire what to much of the population was still something of a luxury.

Appendix 4: Non-ceramic artefacts (all periods)

Jackie Keily

All the artefacts reported here came from Area E, the trench in the north corridor. The <S> and <G> codes are in preparation for publication: <S>= small find and <G> = glass.

[9] Watney 1997, 29, 58.
[10] Watney 1973, pl 56a; Adams and Redstone 1981, pl 86a and b.
[11] Godden 1979, 340.
[12] Adams and Redstone 1981, 161.
[13] Godden 1979, 119.

Bone

<S> Bone tool (*possible illustration)

SPU96<7>, context [340]; (Rpot AD50–160; Ppot 1650–1700)

Complete; L138mm, W 3.5–16mm, Th 3.5–10mm. Made from the proximal end of a cattle metatarsal. The broad end is roughly finished off with cancellous tissue still visible; this end is perforated with a single, small, round hole (diam 2.5mm). The other end tapers to a point. The exact function of this object is uncertain, although it almost certainly dates to the medieval period. The hole is small and regular, without much sign of wear, indicating that it was not used as a needle. Another possibility is that it is a type of pin, either for use in the hair or for fastening clothing, however, it is probably more likely that it was used as a tool, possibly in textile working. Its rather flat section may indicate its use as a pin-beater and its overall shape corresponds to Walton Rogers' type 2 (1997, 1755–6; 1999, 1967–8), a type that dwindles in use from the 12th to the 14th centuries. The present example, however, lacks the high sheen normally found on pin-beaters and either may not have been heavily used or may have been used as a more general tool rather than solely as a pin-beater.

Iron

<S> Iron knife

SPU96<3>, [211]; (pottery dating to AD 250–300)

Incomplete; surviving L85mm, W of blade *c* 15mm. Part of a very corroded whittle-tang knife blade and tang.

<S> Iron coffin handle

SPU96<19>, [340]; (Rpot AD50–160; Ppot 1650–1700)

Complete; rounded style, widening and flattening towards the centre of the grip. The style would appear to be unusual, since pottery recovered from the context has been dated to *c* 1650–1700 and rounded grips are more prevalent from the mid-18th century (Adrian Miles, pers comm). The central area of the grip is very corroded but may have been decorated, which is also a feature of later handles. One of the rivets used for fitting the handle to the coffin is still *in situ*.

Ivory

<S> Ivory handle (*possible illustration)

SPU96<22>, [339]; (Ppot 1600–1800)

Incomplete; surviving L77mm, Diam 17–31mm. Part of a circular-section handle, widening to a globular terminal. The surface is decorated with parallel rounded ridges. The ivory has split down the middle, exposing a drilled central fixing hole and another hole drilled into the

centre of the terminal, presumably for a decorative stud or rivet. This handle would appear to be quite late in date and pottery from the context dates to 1600–1800.

Stone

<S> Stone hone

SPU96<18>, [264]; (Rpot AD50–100)

Incomplete; L85mm, W 27–31mm, Th 10mm. A small, roughly rectangular fragment of fine-grained sandstone (stone identification by Sue Pringle); probably used as a hone.

<S> Stone quern

SPU96<4>, [283]; (post-Roman; Rpot AD140–160)

Incomplete; small fragment with remains of a flat grinding surface; Mayan lava. Querns in Mayan lava are frequently found on sites dating to the Roman and early medieval periods.

Glass

<G> Glass vessel

SPU96<10>, [145]; (post-Roman; Rpot AD50–170)

Incomplete; thin-walled vessel fragment with poorly made, bubbly natural green blue (NGB) glass. This is possibly a fragment of a thin-walled bottle dating to the 2nd century AD (Price and Cottam 1998, 194), as the glass is similar to <15>.

<G> Glass vessel

SPU96<11>, [151]; Roman; Rpot AD120–250; Ppot 1580–1650)

Incomplete; fragment from a globular bodied vessel; natural green glass.

<G> Glass vessel

SPU96<16>, [163]; (Roman; Rpot AD120–160)

Incomplete; two small fragments of a thin-walled vessel in colourless glass; late 1st to early 2nd century AD. Colourless glass is of a higher quality than naturally coloured glass.

<G> Glass vessel

SPU96<17>, [163]; (Roman; Rpot AD120–160)

Incomplete; small fragment of a shallow-ribbed vessel; brown glass; possibly a jug or jar; late 1st to early 2nd century AD.

<G> Glass vessel

SPU96<5> [236] (post-Roman; Rpot AD70–160)

Incomplete; small, curving fragment in natural green blue glass (NGB); the glass is quite thick and is possibly post-Roman in date.

<G> Glass vessel

SPU96<12>, [298]; (Roman; Rpot AD 120–160)

Incomplete; very small fragment; colourless glass with a natural green blue (NGB) tinge.

All of the bottle fragments are from square bottles, Isings form 50.

<G> Glass bottle

SPU96<1>, [158]; (Roman; crossed out and remarked [159] on matrix; Rpot AD 120–160)

Incomplete; thin-walled square bottle fragment in poorly made bubbly natural green blue (NGB) glass; probably dating to the 2nd century AD (Price and Cottam 1998, 194).

<G> Glass bottle

SPU96<6>, [163]; (Roman; Rpot AD120–160)

Incomplete; two thin-walled square bottle fragments in poorly made bubbly natural green blue (NGB) glass; probably dating to the 2nd century AD (Price and Cottam 1998, 194).

<G> Glass bottle

SPU96<15>, [171]; (Roman; Rpot AD70–120)

Incomplete; two fragments of square bottle in poorly made bubbly glass; natural green blue glass (NGB). One of the fragments is from the base and is decorated with moulded concentric circles. The highly bubbled glass and the thinness of the body fragment probably indicate a 2nd century AD date (Price and Cottam 1998, 194).

<G> Glass bottle

SPU96<13>, [298]; (Roman; Rpot AD 120–160)

Incomplete; square bottle body fragment, near corner; body scratched and corner abraded; natural green blue glass (NGB); 1st to 2nd century AD.

Appendix 5: Human skeletal remains assessment

File location: [MOLA] P,\city\804\spu96\enviro\humrep03.doc
Bill White. September 2000

Introduction

The excavations of 1996 disclosed a group of skeletons of pre-Fire date. Because of the rarity of Saxon burials from the London area it would be valuable to identify those in the St Paul's sample. Similarly it would be useful to know the date at which usage of this part of the cemetery ceased. Recommendations are made below as to which of the skeletons ought to be dated *via* radiocarbon assay.

Preservation

As seen from Table 13, 38% of the burials had more than 80% of the skeleton present and a further 9% had more than 50% present. 64.3% had at least part of the skull present, 63.6% parts of the pelvis. 43.6% included both skull and pelvis, important in ageing and sexing the remains.

Amount recovered (%)	*No of skeletons*	*% of total*
10	7	22.5
20	5	16.1
30	4	12.9
40	8	25.8
50	2	6.4
60	3	9.7
70	2	6.4
80	0	0
90	0	0
100	0	0
	31	

Table 13 Variation in the proportion of the skeleton recovered

The physical condition of each skeleton was scored on a scale of 1 to 3. The categories were as follows,-

1 The surface of the bone was in good condition with no peeling or erosion and, although in many cases fragmented to some extent, most osteological information, both metric and non-metric, could be obtained from the remains.

2. The bone itself was in moderate to good condition but most of the long bone ends were missing, limiting the amount of metrical information available.

3. The bone was in poor condition often with the surface missing, the long bone ends absent and highly fragmented generally, severely limiting the amount of retrievable information.

Using the above grading nearly half of the remains, 41.9%, fell into the first category providing the bulk of the information that could be derived from a skeleton, including an estimate of the stature of the living individual. The remaining 58.1% of the skeletal remains were in class 2, yielding a reasonable amount of osteological information in a more detailed analysis. None were in Class 3, the worst condition of preservation.

Methodology

Bone was recorded on the MoLAS Oracle database. The condition of preservation of individual bones as a consequence of burial practices was noted and efficiency of recovery calculated by comparing the number of bones recovered with that expected from the total number of burials.

The age of any immature individuals was estimated using dental development and state of epiphyseal fusion (Bass 1995, 13–15; Brothwell 1981, 64–7) and diaphyseal lengths (Sundick 1978, Hoffman 1979, Ferembach, Schwidetzky & Stloukal 1980, Ubelaker 1984, 46–53, Powers 1988) and of adults, tooth wear stages (Brothwell 1981, 71–2), state of fusion of cranial sutures (Meindl and Lovejoy 1985) and morphology of the pubic symphysis (Brooks and Suchey 1990). Sex was estimated using skull and pelvic dimorphism (Phenice 1967, Ferembach *et al* 1980; Brothwell 1981, 59-63) and tooth crown dimensions (Rösing 1983). Complementary data for sex estimation was sought metrically (Bass 1995, see below) but priority was given to the results of examination of the pelvis because this was regarded as the most reliable of the available techniques.

Conventional cranial and post-cranial measurements were taken (Bass 1995, 68–81, Brothwell 1981, 79–87) and long-bone lengths were employed in the estimation of stature using the regression equations established by Trotter and Gleser (1952, 1958). Non-metric traits were recorded (Berry and Berry 1967, Finnegan 1978) and where appropriate tested in the elucidation of family relationship.

The jaws were examined for non-metric traits, dental hygiene and pathology (Berry 1978, Hillson 1986). Information on general pathology was recorded (Ortner and Putschar 1985), as was the evidence for infectious disease (Rogers and Waldron 1989), joint disease (Rogers and Waldron 1995) and epidemiology (Waldron 1994).

Dating

Some of the inhumations may date from the extremely important early-mid Saxon period, which is not well represented in the London area. . Stratigraphy and attempted phasing of the cemetery concerned may give some clues as to which of the individuals fall into the earliest phase. However, as these inhumations are Christian no associated grave goods that would assist the dating were found. Radiocarbon dating of the skeletons themselves would allow the assignment of some of the burials to a very early date.

Two different methods of dating by radiocarbon analysis are routinely available at present. The ‘Accelerator’ method is capable of utilising very small samples of bone, viz. about 2g (leaving a hole in the bone about the size of a 10p coin) but is not very accurate, involving a range of 200 years around the true date. The ‘High Precision’ technique requires very large

samples (200 to 400g, depending on soil conditions) and this could mean the complete destruction of a long bone such as a femur. However, as the name implies, the method is more accurate for dating bone and may bring the date range down to a mere 100 years (Miss Alex Bayliss, Ancient Monuments Laboratory, English Heritage, pers comm.). The latter method raises the exciting prospect of being able to date burials in the part of the churchyard excavated to a particular century rather than the default case of AD 700 to 1400, say.

Miss Bayliss recommends providing a total of five 400g samples from the 29 burials under consideration for high precision dating. The Laboratories involved include that at Queen's University Belfast but there are equally reputable facilities at the universities of Heidelberg and Gröningen. Based upon the availabity of long bones from these truncated burials the following recommendations are made. For the early period contexts [222], [227] and [237] ought to be evaluated, and from the latter period of cemetery usage, [210] and [252]. [Note: this was done subsequent to this assessment: see main text above and results in Table 7].

Methods

HUMAN VARIATION

Sex

Context [147] proved to be the remains of three people, a man, a woman and a young child. They were included in the analysis.There were 7 males and possible males (22.6% of the sample), 12 females and possible females (38.7% of sample). For 12 individuals (38.3%) sex could not be determined, owing to truncation of the skeleton.

Age

There were only two children in the sample and no adolescents. Of the 29 adults 18 could not have an age assigned with any accuracy. Females outnumbered males in all the age categories (Table 14).

Age group(years)	Sex					Total number
	male	?male	unknown	?female	female	
Neonate			1			1
1-6			1			1
7-12						0
13-16						0
17-25	1		1	1	2	5
26-45	1				3	4
45+					1	1
unknown	2	2	11	1	3	19
Total	4	2	14	2	9	31

Table 14 Sex and age analysis

METRIC VARIATION

Stature

Stature estimates are usually more reliable using the bones of the leg, rather than of the arm, in using the appropriate regression equations (Trotter and Gleser 1952, 1958). Choosing the femur as the bone to be used in height calculations, stature could be estimated for one man and one woman from the site who had intact femora. These were 170.4cm (5ft 7in) and 165.5cm (5ft 5in) respectively.

Physique

None of the skulls was sufficiently intact for craniometry. This was unfortunate because consideration of cranial size and shape theoreticvally ought to have aided the sorting of Saxon skeletons from later burials.

The customary measurements were made upon the antero-posterior and medio-lateral diameters of the proximal shaft of both femora. The aim , as usual was to look for evidence of antero-posterior flattening of this part of the bone, possibly caused by adaptation to mechanical forces on the appropriate muscles as the result of manual work or other environmental effects (Wells 1964, 132). The platymeric index (the ratio of the antero-posterior to the medio-lateral diameter X 100) is an expression of the degree of shaft flattening, as above; a value of 84.9 or less showing platymeria, a value of 85.0 or greater showing a greater tendency to roundness of the shaft (eurymeria).

Very few limbs were suffiently intact for the requisite measurements to be made. For two women the means for the right and left femora were 80.0 and 79.5, respectively, and for two men the means were 79.2 and 77.0. Therefore there was little difference between men and women from the site, each showing a tendency to a flattening of the femur shaft. With both sexes affected equally it is difficult to see an occupational reason for such an observation. However, it is interesting that the men and women from the site were platymeric because all the large series of post-medieval skeletons examined have been eurymeric. The St Paul's skeletons are comparable to medieval sites in the London area, which are also borderline platymeric.

A related matter is the tendency to antero-posterior flattening of the bone shaft in the morphology of the tibia. Thus, for three women the means for cnemic index (the ratio of antero- posterior to medio-lateral diameter X 100) for right and left tibiae, were 75.4 and 75.2, respectively. Similarly for 27 men from the site the means were 73.7 and 75.6, respectively. These results correspond to a 'normal' population, there being no tendency toward antero-posterior flattening (platycnemic Index <62.9).

NON-METRIC VARIATION

Where skulls were sufficiently undamaged they were examined superficially and their features assigned to subjective categories as defined in the MoLSS Procedures Manual (in preparation). Discontinuous or non-metric variation in the human skeleton has an heritable element and has been used in attempts to deduce the presence of family groups in a

cemetery. The skeletons were examined for 36 cranial and 34 post-cranial traits and of these evidence was found for 34 epigenetic traits. Some of the traits were very rare, *viz*. a single manifestation in the entire population. Moreover, some traits found at other sites were entirely lacking. Thus, there were no variations in the presentation of the upper margin of the scapula, which invariably showed a suprascapular notch, rather than the other two alternative traits; the distal humerus never revealed a septal aperture (although there was a single example among the pre-Fire group).

The non-metric traits found are as summarised in Table 15.

CRANIAL TRAIT	No observed	No available	Prevalence (%)
Metopism	1	12	8.3
Lambdoid bone	0	12	0
Bregmatic bone	0	12	0
Coronal ossicles	0	12	0
Sagittal ossicles	0	12	0
R lambdoid ossicle	0	12	0
L lambdoid ossicle	0	12	0
Torus maxillaris	0	12	0
Torus palatinus	0	12	0
Torus mandibularis	1	12	8.3
Third-molar absence	6	26	23.1
Second-premolar absence	0		0

Table 15 Prevalences of cranial non-metric traits (unpaired and bilateral)

Thus of the few cranial traits of note the metopic suture had a prevalence of 8.3%, falling into the normal range. Congenital absence of the third molar, however, was rather high, at 23.1%. The only post-cranial trait of any importance was the presence of a perforate septum on the left humerus of one individual, [211]. This represented a prevalence of 10.0% of possible cases.

General Pathology

Osteoarthritis

As is usual for an attrition cemetery, as opposed to a hospital cemetery, the most frequently encountered expression of pathology was osteoarthritis of the joints and the spine. The vertebral column and the joints were affected almost to an equal degree. All parts of the spine were equally involved, there was no evidence for 'wear and tear' of a particular section. Joints affected included the shoulder and knee, the latter tending to be the more greatly affected.

Other conditions of the vertebral column

'DISH'

Diffuse idiopathic skeletal hyperostosis ('DISH') is a disease that affects predominantly males, over the age of 50, who are obese and living on a calorie-rich diet, and may be linked to late-onset diabetes (Waldron 1985, Resnick and Niwayama 1988). The clinical appearance is of bony proliferation in the skeleton, typified by growth of bone on the vertebral bodies leading eventually to the ankylosis of some or all of the vertebrae. In the latter stages the spine is fused into a rigid condition and the overall appearance is of 'dripping wax' .There was a single case observed among the St Pauls churchyard sample [222], possibly because this group appeared 'young', only one of them being demonstrably over the age of 45. This has been observed in other cathedral churchyards (Lichfield, St Albans, Wells) and in other monastic graveyards (Waldron 1985).

Schmorl's Nodes

Schmorl's nodes are depressions in the vertebral body caused by prolapse of the intervertebral disc, thought to be cause by stress or strain during adolescence or early adult life. It is more common in males than in females. At St Paul's it was found in but one individual [255], in whom six thoracic vertebrae were affected.

Spina bifida

Spina bifida occulta is a symptomless condition caused by the failure of one or more of the arches in the neural canal of the sacrum to fuse. It may be congenital in origin.
None of the skeletons from the site had all five arches open There were examples of partial spina bifida occulta , with one to three arches open, but the overall prevalence of the complete condition obviously was much lower than at the present day (5 to 10%).

Fractures

Healed fractures were seen chiefly in the upper part of the body. a single, healed rib fracture [222].The overall rib fracture rate was 1/62 or 1.6%. There was a well-healed mid-shaft fracture of a left humerus [340], representing a prevalence of 10.0% of possible cases. Trauma therefore had a low prevalence.

Infections

Periostitis, unassociated with syphilis (see below) was present in the lower legs of three men and three women (Mays 1998, 123-5).

Osteomyelitis affected only one person [218]. The area infected was the marrow of the upper shaft of the left humerus.

Tuberculosis potentially was a disease of overcrowding and/or poverty during the latter part of the period concerned (Manchester 1992). However, no instances of tuberculosis were observed in the spines or joints of these people.

Dietary and developmental conditions

Pitting seen in the upper part of the eye sockets may be caused by a diet that is deficient in iron, possibly made worse by internal parasites. This was to not be seen in individuals from the site.

There was no evidence of rickets (caused by a deficiency of vitamin D in the diet). Likewise there was no sign of scurvy (caused by vitamin C deficiency).

Neoplasms

There was no evidence for tumours, whether benign nor malignant.

Dental disease

Dental calculus accumulation on the teeth of the population was rather light, suggesting that there was some form of regular tooth-cleaning habit.

Periodontal disease was rare but the customary pattern of dental caries infection, abscess formation and premature shedding of the permanent teeth appears to have been breached in that there was no case of dental abscess. Dental caries infection was rather moderate at about 6.5% overall, similar to the prevalence in Anglo-Saxon and early medieval England (White 1988).

Conclusions

The group of skeletons is too small to provide a statistically significant set of results. However, they constitute an important sample because of the prestigious site of burial and because they are the first articulated skeletons to have been excavated from around the cathedral in modern times. Although a general discussion about the bones is marred by the current inability to phase the burials into smaller groups the sample as a whole is of a healthy nature. There is a dearth of pathology, the population do not appeared to have suffered from dietary deficiences (indeed the occurrence of ‘DISH’ implies the opposite) and dental health likewise was very good. However, as a fairly large proportion have resisted precise ageing there is little evidence for these people being long-lived.

List of archive records and indexes

Areas and Sections

This section lists and explains the archive records and provides indexes; the records are held at LAARC. As stated above, the original records for Area E, the trench along the N corridor (called Site D in Schofield 2011), are almost all missing. An incomplete set of context sheets has been compiled.

Areas A–D were in the south-west part of the crypt, that is a bay at the west end of the crypt, in line with the south aisle of the crypt (now the south end of the café installation) (Area A); the passage south of this, running west from the open area of the crypt and then turning south into the domed chamber beneath the south-west tower of the cathedral (Area B); the room refurbished after the excavation as the Wren Suite (Area C); and a tunnel excavated by drills through the Wren walling between the main chamber and the domed chamber (Area D) (see Fig 2 of report above).

Area E was the trench dug by contractors along the corridor leading from the north-west corner of the north transept at crypt level to the works department (for location see Fig 6 and Fig 7). The trench was only in the east–west arm, not the north–south arm; a drain was only required in the former stretch.

The following sections form part of the archive:
Section 1: Area C, N side facing S
Section 2: [number not used]
Section 3: Area C, E side facing W
Section 4: Area C, S side facing N

Context register

SPU96 Context register			
Context number	Type	Plan y/n	Plan number
1	MASO	Y	1 33
2	DEPO	Y	2
3	DEPO	N	
4	DEPO	Y	4
5	DEPO	N	
6	DEPO	Y	6
7	DEPO	Y	7
8	TIMB	Y	8
9	DEPO	Y	9
10	DEPO	Y	10
11	DEPO	Y	11
12	CUT	Y	12
13	DEPO	Y	13
14	CUT	Y	14
15	DEPO	Y	15
16	CUT	Y	16
17	CUT	Y	17
18	DEPO	Y	16
19	CUT	Y	16
20	CUT	Y	16
21	CUT	Y	16
22	CUT	Y	16
23	CUT	Y	16
24	CUT	Y	16
25	CUT	Y	16
26	CUT	Y	16

27	CUT	Y	16
28	CUT	Y	16
29	CUT	Y	16
30	CUT	Y	30
31	CUT	Y	30
32	CUT	Y	30
33	CUT	Y	1 33
34	DEPO	Y	33
35	CUT	Y	33
36	DEPO	Y	33
37	CUT	Y	33
38	DEPO	Y	33
39	CUT	Y	33
40	MASO	Y	33
41	DEPO	Y	33
42	MASO	Y	42
43	MASO	Y	43
44	MASO	Y	42
45	DEPO	Y	45
46	DEPO	Y	46
47	DEPO	Y	47
48	DEPO	Y	48
49	DEPO	N	
50	DEPO	N	
51	DEPO	N	
52	DEPO	N	
53	DEPO	N	
54	DEPO	N	
55	DEPO	N	
56	DEPO	Y	58
57	DEPO	N	
58	CUT	Y	58
59	DEPO	N	
60	DEPO	N	
61	DEPO	N	
62	DEPO	N	
63	DEPO	N	
64	CUT	Y	64
65	DEPO	Y	65
66	DEPO	N	
67	CUT	Y	67
68	DEPO	Y	68
69	DEPO	N	
70	CUT	Y	70
71			
72	DEPO	N	
73	DEPO	Y	73
74	MASO	Y	74
75	CUT	Y	75
76	DEPO	Y	76
77	DEPO	Y	77
78	MASO	Y	78
79	DEPO	N	
80	DEPO	Y	80
81	DEPO	Y	81
82	DEPO	Y	82
83	CUT	Y	83
84	DEPO	N	
85	DEPO	N	
86	DEPO	N	
87	DEPO	N	
88	DEPO	N	
89	DEPO	N	
90	MASO	N	
91	DEPO	N	
92	DEPO	N	
93	DEPO	N	
94	DEPO	N	
95	DEPO	N	
96	MASO	Y	96
97	CUT	N	
98	DEPO	N	
99	DEPO	N	
100	DEPO	N	
101	DEPO	N	
102	MASO	Y	102
103	TIMB	N	
104	DEPO	N	
105	DEPO	N	
106	DEPO	N	
107	DEPO	N	
108	TIMB	N	
109	MASO	Y	109
110	CUT	Y	110
111	NATURAL	Y	111
112	DEPO	N	
113	DEPO	N	
114	CUT	Y	70
115	DEPO	N	
116	DEPO	N	
117	DEPO	N	
118	DEPO	Y	119
119	CUT	Y	119
120	DEPO	Y	
121	DEPO	Y	122
122	CUT	Y	122
123	DEPO	N	
124	TIMB	N	

125	DEPO	N	
126	DEPO	N	
127	CUT	Y	127
128	DEPO	Y	128
129	DEPO	N	
130	DEPO	N	
131	DEPO	N	
132	DEPO	N	
133	DEPO	N	
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142	MASO	N	
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157	CUT	N	
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175	CUT	N	
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177	DEPO	N	
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179	DEPO	N	
180	CUT	N	
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186	DEPO	N	
187	MASO	N	
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216	CUT	N	
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218	DEPO	N	
219	CUT	N	
220	DEPO	N	
221	DEPO	N	
222	SKEL	N	
223	CUT	N	

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252	SKEL	N	
255	SKEL	N	
257	DEPO	N	
258	DEPO	N	
259	CUT	N	
261	DEPO	N	
262	CUT	N	
263	SKEL?	N	
283	CUT	N	
284	DEPO	N	
285	CUT	N	
291	DEPO	N	
292	SKEL	N	
293	DEPO	N	
294	DEPO	N	

295	DEPO	N	
296	DEPO	N	
297	DEPO	N	
298	DEPO	N	
299	CUT	N	
300	DEPO	N	
301	DEPO	N	
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337	DEPO	N	
338	DEPO	N	
340	SKEL	N	
341	DEPO	N	
342	DEPO	N	
350	DEPO	N	
351	DEPO	N	
358	DEPO	N	

Images Register

Contact card No	B/W Neg No	Col Slide Nos [the slides were given the numbers of their black and white counterparts by photographic staff]	Description / direction / context no.	Date	Photographer	Copyright
1	303/96/1	303/96/1	stone <72> in situ in E window reveal of Area C chamber looking E	2/07/96	M Cox	MoLAS
2	345/96/1	345/96/1	opening of tunnel into SW tower looking W	17/7/96	E Baker	MoLAS
3	365/96/1	365/96/1	excavation of tunnel (Area D) in progress	1/8/96	E Baker	MoLAS
4	365/96/2	365/96/2	excavation of tunnel (Area D) in progress	1/8/96	E Baker	MoLAS
5	384/96/1	384/96/1	Area C: Section 1 showing cut [58], looking NE	19/8/96	M Cox	MoLAS
6	384/96/2	384/96/2	view of excavations in Area C looking SE	19/8/96	M Cox	MoLAS
7	384/96/3	384/96/3	N-S passage between crypt under SW tower and room to N, looking N, Area B	19/8/96	M Cox	MoLAS
8	384/96/4	384/96/4	N-S passage between crypt under SW tower and room to N, looking S, Area B	19/8/96	M Cox	MoLAS
9	384/96/5	384/96/5	Area A in excavation looking S	19/8/96	M Cox	MoLAS
10	384/96/6	384/96/6	Area A: Group * postholes, looking W	19/8/96	M Cox	MoLAS
11	393/96/1	393/96/1	finished excavation for tunnel [33], looking W into SW tower from Area C	28/8/96	E Baker	MoLAS
12	393/96/2	393/96/2	finished excavation for tunnel [33], looking E from SW tower into Area C	28/8/96	E Baker	MoLAS
13	393/96/3	393/96/3	stone <70> in situ at SE corner of passage, in wall [1]	28/8/96	E Baker	MoLAS

14	393/96/4	393/96/4	stone <71> in situ at NE corner of passage, in wall [1]	28/8/96	E Baker	MoLAS
15	393/96/5	393/96/5	Wren drain [78] and ?base for shoring [74] in Area B, looking E	28/8/96	E Baker	MoLAS
16			card missing			
17	393/96/8	393/96/8	Wren drain [78] running along Area B, looking W	28/8/96	E Baker	MoLAS
18	413/96/1	413/96/1	Wren drain [78] and ?base for shoring [74] in Area B, looking E (closer than 15)	28/8/96	E Baker	MoLAS
19	413/96/2	413/96/2	W end of Area B, Wren drain [78] runnig under foundation of W front, looking W	9/9/96	M Cox	MoLAS
20	413/96/2	413/96/2	Area C looking E, nature of trenches	9/9/96	M Cox	MoLAS
21	415/96/3	415/96/3	Area C looking E, nature of trenches; also shows Section 1	11/9/96	M Cox	MoLAS
22	415/96/4	415/96/4	Area C looking NE, nature of trenches	11/9/96	M Cox	MoLAS
23	413/96/5	413/96/5	Area C looking E, nature of trenches	11/9/96	M Cox	MoLAS
24	393/96/7	393/96/7	Detail of foundation [74] and top of Wren drain [78]	28/8/96	E Baker	MoLAS
25	415/96/1	415/96/1	temporary Wren period drain [109], Area A	11/9/96	M Cox	MoLAS
26	415/96/2	415/96/2	Area A section 3, detail of mortar surface [104] with plank impressions	11/9/96	M Cox	MoLAS
27	1/97/5	1/97/5	card missing			
28	1/97/4	1/97/4	Area E looking E, nature of excavation	Jan 1997	M Cox or A Chopping	MoLAS
29	1/97/1	1/97/1	Area E, skeleton [147]	Jan 1997	M Cox or A Chopping	MoLAS
30	1/97/2	1/97/2	Area E, skeleton [146]	Jan 1997	M Cox or A Chopping	MoLAS

31	1/97/3	1/97/3	Area E, skeleton [255]	Jan 1997	M Cox or A Chopping	MoLAS
32	9/97/1	9/97/1	Area E, skeletons [206, 208]	Jan 1997	M Cox or A Chopping	MoLAS
33	9/97/2	9/97/2	Area E, skeleton [204]	Jan 1997	M Cox or A Chopping	MoLAS
34	9/97/3	9/97/3	Area E, skeleton [225]	Jan 1997	M Cox or A Chopping	MoLAS
35	537/96/1	537/96/1	Area E, foundation [142]	Jan 1997	M Cox or A Chopping	MoLAS
36	537/96/2	537/96/2	Area E, foundation [142]	Jan 1997	M Cox or A Chopping	MoLAS
37–40			cards apparently missing or not numbered			
41	427/96/1	427/96/1	stone <1>	19/20 Sept 1996	M Cox	MoLAS
42	427/96/2	427/96/2	stones <2-11>	19/20 Sept 1996	M Cox	MoLAS
43	427/96/3	427/96/3	stones <12-15>	19/20 Sept 1996	M Cox	MoLAS
44	427/96/4B	427/96/4B	stone <16> capital fragment from Jones portico	19/20 Sept 1996	M Cox	MoLAS
45	427/96/4A	427/96/4A	stone <16>	19/20 Sept 1996	M Cox	MoLAS
46	427/96/5	427/96/5	stones <17-18>	19/20 Sept 1996	M Cox	MoLAS
47	427/96/6	427/96/6	stone <19>	19/20 Sept 1996	M Cox	MoLAS
48	427/96/7	427/96/7	stone <20>	19/20 Sept 1996	M Cox	MoLAS
49	427/96/8	427/96/8	stone <20>	19/20 Sept 1996	M Cox	MoLAS

50	427/96/9	427/96/9	stone <21> fluting	19/20 Sept 1996	M Cox	MoLAS
51	427/96/10	427/96/10	stone <22>	19/20 Sept 1996	M Cox	MoLAS
52	427/96/11	427/96/11	stone <23>	19/20 Sept 1996	M Cox	MoLAS
53	427/96/12	427/96/12	stone 24>	19/20 Sept 1996	M Cox	MoLAS
54	427/96/13	427/96/13	stone <25>	19/20 Sept 1996	M Cox	MoLAS
55	427/96/14	427/96/14	stone <26>	19/20 Sept 1996	M Cox	MoLAS
56	427/96/15	427/96/15	stone <26>	19/20 Sept 1996	M Cox	MoLAS
57	427/96/16	427/96/16	stone <27>	19/20 Sept 1996	M Cox	MoLAS
58	427/96/17	427/96/17	stone <28> lower part of column	19/20 Sept 1996	M Cox	MoLAS
59	427/96/18	427/96/18	stone <29>	19/20 Sept 1996	M Cox	MoLAS
60	427/96/19	427/96/19	stone <30>	19/20 Sept 1996	M Cox	MoLAS
61	427/96/20	427/96/20	stone <31>	19/20 Sept 1996	M Cox	MoLAS
62	427/96/21	427/96/21	stone <32>	19/20 Sept 1996	M Cox	MoLAS
63	427/96/22	427/96/22	stone <33>	19/20 Sept 1996	M Cox	MoLAS
64	427/96/23	427/96/23	stone <34>	19/20 Sept 1996	M Cox	MoLAS

65	427/96/24	427/96/24	stone <35>	19/20 Sept 1996	M Cox	MoLAS
66	427/96/25	427/96/25	stone <36>	19/20 Sept 1996	M Cox	MoLAS
67	427/96/26	427/96/26	stone <37>	19/20 Sept 1996	M Cox	MoLAS
68	427/96/27	427/96/27	stone <38> fluting	19/20 Sept 1996	M Cox	MoLAS
69	427/96/28	427/96/28	stones <39, 41>	19/20 Sept 1996	M Cox	MoLAS
70	427/96/29	427/96/29	stone <40>	19/20 Sept 1996	M Cox	MoLAS
72	427/96/31	427/96/31	stone <42-44>	19/20 Sept 1996	M Cox	MoLAS
72	427/96/32	427/96/32	stone <45>	19/20 Sept 1996	M Cox	MoLAS
73	427/96/33	427/96/33	stone <46-47>	19/20 Sept 1996	M Cox	MoLAS
74	427/96/34	427/96/34	stone <48-49>	19/20 Sept 1996	M Cox	MoLAS
75	427/96/35	427/96/35	stone <50>	19/20 Sept 1996	M Cox	MoLAS
76	427/96/36	427/96/36	stone <51-55>	19/20 Sept 1996	M Cox	MoLAS
77	427/96/37	427/96/37	stone <56-61>	19/20 Sept 1996	M Cox	MoLAS
78	427/96/38	427/96/38	stone <62>	19/20 Sept 1996	M Cox	MoLAS
79	427/96/39	427/96/39	stone <63>	19/20 Sept 1996	M Cox	MoLAS

80	427/96/40	427/96/40	stone <64-66>	19/20 Sept 1996	M Cox	MoLAS
81	427/96/41	427/96/41	stone <67-69>	19/20 Sept 1996	M Cox	MoLAS
82	427/96/42	427/96/42	stone <73> (? un-numbered in shot)	19/20 Sept 1996	M Cox	MoLAS
83	427/96/43	427/96/43	stone <74>	19/20 Sept 1996	M Cox	MoLAS
84	427/96/44	427/96/44	stone <75-76>	19/20 Sept 1996	M Cox	MoLAS
85	427/96/45	427/96/45	stone <77>	19/20 Sept 1996	M Cox	MoLAS
86	427/96/46	427/96/46	stone <78>	19/20 Sept 1996	M Cox	MoLAS
87	427/96/47	427/96/47	stone <79A> [to differentiate it from following]	19/20 Sept 1996	M Cox	MoLAS
88	51/97/1	51/97/1	stone <79>	26/2/97	M Cox	MoLAS
89	51/97/2	51/97/2	stone <80>	26/2/97	M Cox	MoLAS
90	51/97/3	51/97/3	stone <81>	26/2/97	M Cox	MoLAS
91	51/97/4	51/97/4	stone <82>	26/2/97	M Cox	MoLAS
92	51/97/5	51/97/5	stone <83, 87>	26/2/97	M Cox	MoLAS
93	51/97/6	51/97/6	stone <84>	26/2/97	M Cox	MoLAS
94	51/97/7	51/97/7	stone <85>	26/2/97	M Cox	MoLAS
95	51/97/8	51/97/8	stone <86>	26/2/97	M Cox	MoLAS
96	51/97/9	51/97/9	stone <88>	26/2/97	M Cox	MoLAS
97	51/97/10	51/97/10	stone <89>	26/2/97	M Cox	MoLAS

98	51/97/11	51/97/11	stone <90>	26/2/97	M Cox	MoLAS
99	51/97/12	51/97/12	stone <91>	26/2/97	M Cox	MoLAS
100	51/97/13	51/97/13	stone <92> from Jones door spandrel (2 pieces)	26/2/97	M Cox	MoLAS
101	51/97/14	51/97/14	stone <93> from Jones door spandrel (3 pieces)	26/2/97	M Cox	MoLAS
102	51/97/15	51/97/15	stone <94>	26/2/97	M Cox	MoLAS
103	51/97/16	51/97/16	stone <96>	26/2/97	M Cox	MoLAS
104	51/97/17	51/97/17	stones <97, 105>	26/2/97	M Cox	MoLAS
105	51/97/18	51/97/18	stone <98>	26/2/97	M Cox	MoLAS
106	51/97/19	51/97/19	stones <96, 99, 112>	26/2/97	M Cox	MoLAS
107	51/97/20	51/97/20	stones <100, 111>	26/2/97	M Cox	MoLAS
108	51/97/21	51/97/21	stone <101>	26/2/97	M Cox	MoLAS
109	51/97/22	51/97/22	stone <102>	26/2/97	M Cox	MoLAS
110	51/97/23	51/97/23	stones <103, 104>	26/2/97	M Cox	MoLAS
111	51/97/24	51/97/24	stones <106, 107, 113>	26/2/97	M Cox	MoLAS
112	51/97/25	51/97/25	stone <108> paint traces	26/2/97	M Cox	MoLAS
113	51/97/26	51/97/26	stone <109>	26/2/97	M Cox	MoLAS
114	51/97/27	51/97/27	stone <110>	26/2/97	M Cox	MoLAS
115	51/97/28	51/97/28	stone <114>	26/2/97	M Cox	MoLAS
116	51/97/29	51/97/29	stone <116>	26/2/97	M Cox	MoLAS
117	51/97/30	51/97/30	stone <117>	26/2/97	M Cox	MoLAS

118	51/97/31	51/97/31	stone <118>	26/2/97	M Cox	MoLAS
119	51/97/32	51/97/32	stone <119>	26/2/97	M Cox	MoLAS
120	51/97/33	51/97/33	stone <120>	26/2/97	M Cox	MoLAS
121	51/97/34	51/97/34	stone <121>	26/2/97	M Cox	MoLAS
122	51/97/35	51/97/35	stone <122>	26/2/97	M Cox	MoLAS
123	51/97/36	51/97/36	stone <123>	26/2/97	M Cox	MoLAS
124	51/97/37	51/97/37	stone <124>	26/2/97	M Cox	MoLAS
125	51/97/38	51/97/38	stone <125>	26/2/97	M Cox	MoLAS
126	51/97/39	51/97/39	stone <126> Jones ashlar	26/2/97	M Cox	MoLAS
127	51/97/40	51/97/40	stone <127> Jones ashlar	26/2/97	M Cox	MoLAS
128	51/97/41	51/97/41	stone <128>	26/2/97	M Cox	MoLAS
129	51/97/42	51/97/42	stone <129>	26/2/97	M Cox	MoLAS
130	51/97/43	51/97/43	stone <130>	26/2/97	M Cox	MoLAS
131	51/97/44	51/97/44	stone <131>	26/2/97	M Cox	MoLAS
132	51/97/45	51/97/45	stone <132>	26/2/97	M Cox	MoLAS
133	51/97/46	51/97/46	stone <133>	26/2/97	M Cox	MoLAS

Area E stratigraphic relationships and interpretation of strata

The following is a table drawn up to study the incomplete information of the Area E trench and the skeletons found there. It may be of use in the future. For contexts [137] to [358], it lists a 'General period' (R=Roman, S=Anglo-Saxon, M=medieval, W=Wren), the stratigraphic relationship of each context ('Under' and 'Over') and the interpretation of the context.

	Gen period	Under	Over	Interpretation
137	W	+	144 150 196 139	Concrete slab
138	W	137	185	Wren make-up =139
139	W	137	185	Wren make-up =138
140	M	143	147	cemetery soil =146
141	M	150 196	142	chalk wall foundation with 142-3
142	M	141	143	chalk wall foundation
143	M	142	144 140	chalk wall foundation
144	M	137	145	cemetery soil
145	S	144	not exc	cemetery soil with skeleton
146	S	143	147	cemetery soil with skeleton =140
147	S	153	152	skeleton in grave
148	S	155	154	grave, but no bones recovered
149	S	156	157	skeleton in grave
150	S	137	141	
151	R	157	166 159 161 179	gravel horizon
152	S	147	155	grave cut
153	S	140	147	fill of grave
154	S	148	156	grave cut
155	S	152	148	fill of grave
156	S	154	149	fill of grave
157	S	149	151	grave cut
158	R			
159	R	151	160	
160	R	159	165	slot
161	R	151	162	
162	R	161	165	
163	R	151	164	
164	R	163	171	hearth
165	R	160 162	167	gravel 13.02m OD
166	R	151	167	
167	R	166	165	posthole
168	R	151	169	fill of posthole 169
169	R	168	170	posthole
170	R	167 169	171	?plaster
171	R	170	172	occupation debris
172	R	171	173	floor
173	R	172	174	floor make-up
174	R	173	175	floor
175	R	174	176	cut
176	R	175	177	brickearth slab
177	R	176	178	deposit

178	R	177	not exc	gravel deposit
179	R	157	151	
180	R			
181	R	157	182	
182	R	181	183	demolition dump
183	R	182	184	demolition dump
184	R	183	151	demolition dump
185	W	139	186	linear Wren lead drain
186	W	186	165	linear Wren lead drain
187	W	186	not exc	Wren foundation
188	W	139	193	Wren foundation
189	W	139	193	Wren foundation
190	W	139	193	Wren foundation
191	W	139	193	Wren foundation
192	W	139	193	Wren foundation
193	M	190 191	194	dump
194	R	193	not exc	sill
195	W	139	193	Wren foundation
196	M	137	141	
197	S	144	198	robbed grave (?fill)
198	S	197	204	robbed grave (?cut)
199	S	144	200	robbed grave (?fill)
200	S	201	199	robbed grave (?cut)
201	S	200	202	pillow grave (?fill)
202	S	201	203	pillow grave skeleton
203	S	202	204	grave cut
204	S	203	205	skeleton in grave
205	S	204	206	grave cut
206	S	205	207	deposit with skeleton
207	S	206	208	15% skeleton in fill of pillow grave
208	S	207	209	skeleton in grave
209	S	208	212	grave cut
210	S	220	211 233	skeleton in grave
211	S	210	214	skeleton in grave
212	S	209	213	silt-gravel deposit
213	S	212	222	
214	S	211	215	robbed grave (?cut)
215	S	214	216	skeleton in grave
216	S	215	217	grave cut
217	S	216	218	grave fill
218	S	217	219	skeleton in grave
219	S	218	212	
220	S	239	210 246 248	
221	S	233	231	grave fill
222	S	213	223	skeleton in grave
223	S	222	224	grave cut
224	S	223	225	? burial
225	S	224	259	skeleton in grave
226	S	259	227	grave fill
227	S	226	228	skeleton in grave
228	S	227	not exc	grave cut
229	S			
230	S	232	235	deposit
231	S	221	232	skeleton in grave
232	S	231	230	grave cut
233	S	210	221	grave cut
234	S			
235	S			

236	W	219	237 262	fill of cut 262, possibly Macartney
237	S	212	238	skeleton in grave
238	S	262	257	
239	S	240	220	
240	W	+	239	
241	S	244	242	grave fill
242	S	241	243	skeleton in grave
243	S	242	257	grave cut
244	S	245	241 252	pit
245	M	220	244	robber cut
246	M	220	247	? pit fill
247	M	246	250	pit cut
248	M	220	249	posthole/pit fill
249	M	248	258	pit cut
250	S	247	251	skeleton in grave
251	S	250	258	grave cut
252	S	244	253?	skeleton in grave
253	S	252?	254?	
254	S	253?	255?	
255	S	254?	256?	skeleton in grave
256	S	?255	257	
257	S	238	not exc	deposit/fill
258	S	251 249	314	robber cut
259	S	225	226	recut burial
260	S	212	263	grave fill
261	S	263	unexc	
262	W	237	238	cut – possibly by Macartney 1909
263	S	260	261	burial – grave but no skeleton
267	S			10% skeleton
276	S			50% skeleton
287	S			30% skeleton
292	S			10% skeleton
293	R			
294	R			
295	R			
296	R			
297	R			
298	R			
299	R			
300	R			
301	R			
302	R			
303	R			
304	R			
305	R			
306	R			
307	R			
308	R			
309	R			
310	R			
311	R			
312	R			
313	R			
314	S	258	329 315	recut burial
315	S	314	316	skeleton in grave
316	R	315	317	
317	R	316	318 322	deposit
318	R	317	319	slot (?fill)

319	R	318	320	slot
320	R	319	321	posthole fill
321	R	320	326	posthole
322	R	317	323	slot fill
323	R	322	324	slot
324	R	323	325	posthole fill
325	R	324	326	posthole
326	R	325	unexc	gravel
329	S	314	330	skeleton in grave
330	S	329	331	grave cut
331	R	317		
335	R			
336	R			
337	R			
338	R			
340	S			skeleton in grave; note a piece of Chinese porcelain is also marked as from this context, which must be an error
341	R			
342	R			
350	R			
351	R			
358	R			

Finds Inventory

A finds inventory for the site was produced by MoLSS in 2009 (file spu96finv.xls). It is appended to this paper copy of the report, after the Radiocarbon Date Certificates. It is a separate file in the digital archive.

Bibliography

Bass, W M, 1995 *Human Osteology, a laboratory and field manual*, (4th edn) Missouri Archaeological Society Special Paper No. 2

Brooks, S T, and Suchey, J M, 1990 Skeletal age determination based on the *os pubis*, comparison of the Acsàdi-Nemeskèri and Suchey-Brooks methods, *Human Evolution* 5**,** 227–38

Brothwell, D R, 1981 *Digging up Bones; the excavation, treatment and study of human skeletal remains,* (3rd edn), Oxford University Press

Ferembach D, Schwidetzky, I, and Stloukal, M, 1980 Recommendations for age and sex diagnosis of skeletons, *J Human Evolution* 9**,** 517–49

Heard 2002

Hoffman J, 1979 Age estimation from diaphyseal lengths, two months to twelve years, *J Forensic Science* 24, 461–9

Keily 2002

Macartney, M, 1913 'Some investigations into the soil in and around St Paul's Cathedral, and comparison with data in *Parentalia*', *Proc Soc Antiq London* ser 2 26, 218–28

Meindl, R S, and Lovejoy C O, 1985 Ectocranial suture closure, a revised method for the determination of age based upon the lateral anterior sutures, *Amer J Physical Anthropol* 68, 57–66

Ortner, D J, and Putschar W G J, 1981 *Identification of Pathological Conditions in Human Skeletal Remains* , Smithsonian Institute Press

Pearce 2002

Powers, R, 1988 A tool for coping with juvenile human bones from archaeological excavations, in White W J 1988 *Skeletal Remains from the Cemetery of St Nicholas Shambles* , London and Middlesex Archaeological Society Special Paper 9, 74–8

Price, J, and Cottam, S, 1998 *Romano-British glass vessels: a handbook*, CBA Practical Handbook in Archaeology 14, York

RCHM(E): Royal Commission on Historical Monuments (England), 1929: *London IV: The City*

Rogers, J, and Waldron, T, 1989 Infections in palaeopathology, the basis of classification according to most probable cause, *J Archaeological Science* 16, 611–25

Rogers, J, and Waldron, T, 1995 *A field guide to joint diseases in archaeology*, Wiley, Chichester

Rösing, F W, 1983 Sexing immature human skeletons, *J Human Evolution* 12, 149–55

Samuel, M, 1999 St Paul's Cathedral, excavations in the crypt 1994–6: archaeological post-excavation assessment of the architectural fragments, MoLSS

Schofield 1995 St Paul's Cathedral Crypt Phase II: an archaeological assessment, Report for Dean and Chapter

Schofield, J, 2011 *St Paul's Cathedral before Wren*, English Heritage

Schofield, J, in prep *The archaeology of St Paul's Cathedral* [the Wren building; possibly to be retitled *St Paul's Cathedral: a biography of the building*]

Sundick, R L, 1978 Human skeletal growth and age determination, *Homo* 29, 228–49

Thomas, T, 1995 West crypt, St Paul's Cathedral, EC4: an archaeological investigation, MoLAS

Trotter, M, and Gleser, G C, 1952 Estimation of stature from long bones of American whites and negroes, *Amer J Physical Anthropol* 10, 463–514

Trotter, M, and Gleser, G C, 1958 A re-evaluation of estimation of stature based on measurements of stature taken during life and long bones after death, *Amer J Physical Anthropol* 16, 79–123

Ubelaker, D H, 1984 *Human Skeletal Remains, excavation, analysis, interpretation* Smithsonian Institute Press

Waldron, T, 1985 DISH at Merton Priory, evidence for a 'new' occupational disease, *British Medical Journal* 291, 1762–4

Waldron, T, 1994 *Counting the Dead, the epidemiology of skeletal populations*, Wiley, Chichester

Walton-Rodgers, P, 1997 *Textile production at 16-22 Coppergate*, The Archaeology of York, Volume 17: The small finds, CBA for the York Archaeological Trust, York

White, W J, 1988 *Skeletal Remains from the Cemetery of St Nicholas Shambles, City of London*, London and Middlesex Archaeological Society Special Paper 9

White, B, 1997a *Human Bone from the Royal Opera House Site (ROP95)*, MoLAS archive report HUM/REP/07/97

White, B, 1997b Assessment of Human Skeletal Remains from 10 Bouverie Street (BOV95), MoLAS archival report HUM/ASS/12/97

White 2002 The human remains from St Paul's Cathedral (SPU96), MoLSS Environmental Archaeology Section report HUM/REP/03/00

White B in prep [in 2002] Human Bone from Guildhall Yard (GYE92), MoL; published as W White, 'Human bones', in Bowsher, D, Dyson, T, Holder, N and Howell, I, 2007 *The London Guildhall: an archaeological history of a neighbourhood from early medieval to modern times*, MoLAS Monogr 36, 498–505

WS: volumes of Wren Society, 1923–42