

St Paul's Cathedral: archaeological recording of installation of new lift and external cleaning, 2006–11



Sitecode: PUF06

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August 2011

Cover: Cherub keystone above the window in bay NC3, north elevation of the choir, when cleaned

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Please note: all the photographs in this report have been reduced to small files for inclusion. All the MOLA photographs are high quality digital files. Some images here have been scanned from contact cards, not from the original files, so vary somewhat in colour. These blemishes are not in the originals. Other uncredited photographs are by J Schofield.

1 Introduction

1.1 Circumstances of archaeological coverage



Fig 1 The south side of St Paul's Cathedral, looking east, in May 2010, after the completion of the external cleaning project on the south side (A Chopping, MOLA). The newly laid out facsimile of the medieval cloister and chapter house undercroft can be seen south of the nave; the reproduced east cloister walk leads to the main door for disabled access into the cathedral, at the corner of the transept and nave. The new lift was installed in the shaft of the existing lift within the core of the stair shown by the vertical line of windows above the door

The recording at St Paul's Cathedral reported here was for two projects of 2006–10:

- (i) the replacement of the existing lift within the main stair at the junction of the south transept and the nave with a larger one suitable for disabled people (Section 2 and Appendix);
- (ii) cleaning of the external nave and choir elevations, which enabled photographs to be taken of some of the swags or festoons of carved foliage above the windows, and of the carved panels below the windows, all but one by Grinling Gibbons (Fig 1) (Sections 3–6).

The records for these two projects (SP170 and SP203/209) in the Surveyor's records, which will come to SPFA) are brought together under the Museum of London sitecode PUF06. Apart from a small group of architectural fragments from the excavation of masonry for the lift, there are no finds. The records are almost all photographs. Copies of the photographs (all digital) are held by SPFA and by Museum of London Archaeology.

2 The replacement of the lift and work on the great stair

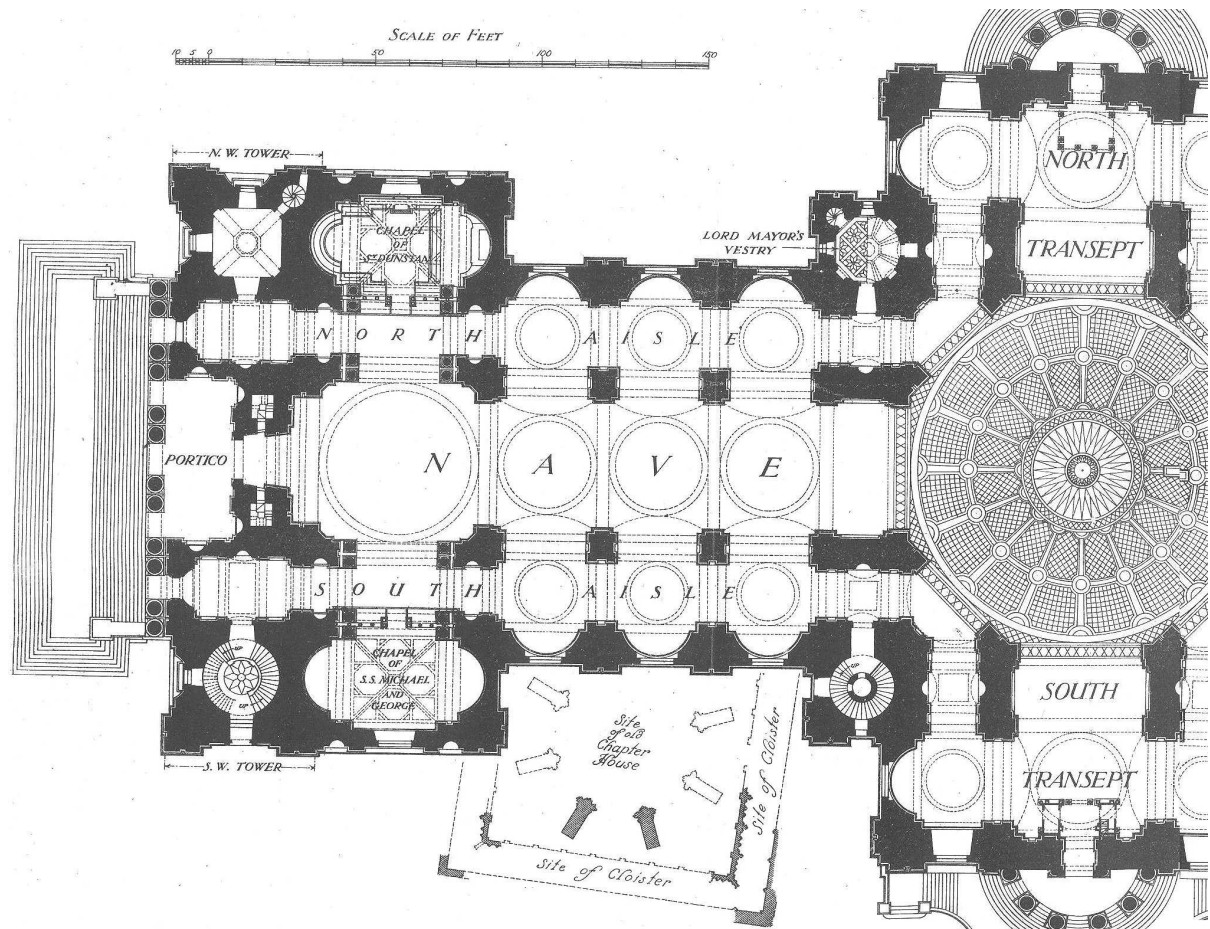


Fig 2 St Paul's main stair and lift: the site of the works is the main stair at the corner of the nave and south transept. Next to it are the three bays of the south wall of the nave where the decorations above the windows have been recorded before and after cleaning in 2006–7. This is an extract from the plan published by RCHME in 1929; compare now Fig 1

The replacement of the existing lift within the main stair at St Paul's with a larger one suitable for disabled people (e.g. large enough for a turning circle for a wheelchair) took place over a two-year period in 2006–8. At the same time, the lower section of the steps of the main stair which rises from churchyard level to the Whispering Gallery, that is those from the churchyard level door to the church floor, were inspected for possible renewal.

The archaeological considerations, as they developed in response to the project, were:

- (i) recording of parts of the fabric to be affected, and features revealed
- (ii) observation of any renewal of the stair treads

- (iii) monitoring of the construction of a new duct running east–west in the crypt at the north end of the widened passage to the lift at crypt level
- (iv) retention of carved or moulded stones from the pre-Fire cathedral, if they were produced by contractors’ excavations within the existing lift shaft or widening of the passage to the lift at crypt level.

As preparation for the project, a detailed set of plans and sections of the whole stair and the passage to the lift at crypt level, which was to be widened, was drawn up by Purcell Miller Tritton architects in 2004 and 2005. The plans in this report are adaptations of some of those drawings. The PMT job number is SP170, and the drawings most used in the archaeological coverage are numbers 5162, 5164, 5168, 5177–8, 5180–1 and 5187–9.

In November 2006 one of the treads was sampled geologically, and found to be Kentish ragstone, as indicated in the building accounts (detailed further below). At about the same time, the Surveyor decided to replace the treads of all the steps from churchyard level to church floor level. This was later modified to local repairs.

At the same time the cleaning of the exterior of the south nave elevation was in progress. An opportunity was taken to photograph the swags of carved stone decoration above the nave windows, both before and after cleaning. This forms a fifth part of this report. The site code is PUF06. The records of the monitoring, including the photographs which form the majority of the record, are held at the Museum of London; the moulded stones are kept at the cathedral.

2.1 Documentary history of the main stair and surrounding masonry, 1676–1709

The foundations for the south transept terminal wall and the south-west bastion or pier in which the stair was to be built date from 1676 to 1678; in preparation for this at least part, presumably the north part, of the 14th-century cloister’s east walk was removed (WS XIII, 77–80). Joshua Marshall was paid for the foundations of the south portico in September 1677 (WS XIII, 96–7). Marshall died in April 1678, and his contract was replaced by new contracts which included Edward Pierce or Pearce for the south transept (WS XVI, 14–16).

The ‘great round Staires in the South West leg of the Duomo’ appear in the accounts in October 1677, when carpenters were putting up centres presumably for the spiralling vault above the stair (WS XIII, 97). This is the general date for the construction of the foundations of walls in the south transept crypt. The ‘doreway of the great round Staires’ is mentioned in March 1678 (WS XIII, 101); presumably this was the external doorway to the churchyard.

Geological sampling has shown that the steps of the stair from churchyard level to church floor level are of Kentish ragstone. ‘Kent steps’ appear in the accounts in February 1677 (WS XIII, 85). The carpenters were paid several times for ‘caseing the steps of the great round staires’ (e.g. WS XIII, 103, May and June 1678) but this was

probably a temporary measure, as they did this for mouldings, cornices and capitals elsewhere. In September 1678 the executors of Marshall were paid for the section of stairs he had erected, along with surrounding work on the walls. This included the fitting of 61 steps of ‘Kentish step’ (WS XIII, 108). If we assume this is the first payment for the stair steps, and count from churchyard level, then 61 steps is 40 steps above church floor level. There is no dividing line today perceptible in the fabric to show where Marshall’s work stopped. His executors were also paid for Reigate vaulting over the stairs; although this has not been confirmed by geological sampling, it seems likely that the vaulting over the stair is Reigate stone, but it is painted and has not been examined. The construction of the stair and the bastion was taken over by Thomas Wise. An account of his work in January 1681 mentions that the vaulting of the round stairs contained rubble (WS XIII, 145).

In December 1678 an unspecified number of two types of stone were delivered, ‘flat Kentish steps’ at 14d per foot and ‘Neuell do’ (i.e. newel steps of the same) at 6d per foot, but not for any specified location (WS XIII, 114). More were delivered in October 1680 (WS XIII, 135). What these two types looked like or comprised is suggested in the analysis below.

Kentish steps were used in other stairs besides the main stair. Seventeen ‘Circular Kentish steps’ were used in the two round stairs of the vestries (ie within the north-east and south-east bastions) in September 1678 (WS XIII, 108). Kentish steps were supplied in November 1679 for the work of Edward Pearce, then employed on the south transept and south-east bastion (WS XIII, 124, 142–3). In August 1681 Jasper Latham was paid for setting 29 steps of Kentish rag in his work on the north side of the cathedral (WS XIII, 153).

In January 1681 Wise was paid for setting 45 Kentish steps in the round stairs, i.e. the main stair which is the subject of this report. Mention in the next section of accounts of the setting of 24 further steps by Wise is probably also to the stair (WS XIII, 146). A further stage with the stair was reached after an interval in the middle of 1684. Then the stair comprised 110 steps, and Wise was paid to add a further ten, though the type of stone is not mentioned (WS XIII, 184). Wise was dead by September 1686, and his place was taken by Thomas Wise junior and Thomas Hill. In December 1687 they were paid for more work on the bastion including 22 steps of Kentish stone (WS XIV, 38). Payment for a further ten steps followed in February 1691 (WS XIV, 82), and there may have been other stages not recorded. In September 1696 Thomas Wise junior and Thomas Hill were paid for fitting and setting 19 Kentish steps ‘from the top of the 204th step’ (WS XV, 23). There are today 234 steps from church floor level to Whispering Gallery level. Wise and Hill went on to build the south-west quarter of the peristyle and dome between 1698 and 1707 (WS XV, xiv).

The final element in the refurbishment of stair and lift project concerns the black and white marble floor, which is laid from the south aisle of the cathedral nave through the passage to the stair. The choir had been paved by 1697 when the cathedral celebrated its opening. The nave and west end were paved only in 1705–9 (WS XV, xxvii, 166–7, 176). Levelling up was employed by Samuel Fulkes at the west end in 1709, where he had to insert ‘gallets and tyles’ under the marble tiles in the ‘half pace’, which may be the landing on the west end stairs, or some other place within the west end (WS XV, 180). This local levelling with ‘gallets and tyles’ is what has been

recorded where the marble slabs of the passage meet the main stair landing, as detailed below. The nearest reference in the accounts which might be or the laying of the marble paving inside the passage to the round stair is probably one to work by Fulkes in September 1709, when he was paid for paving the body of the church from the dome to the west end (WS XV, 179). For the present purpose however the paving in the passage is dated to 1705–9.

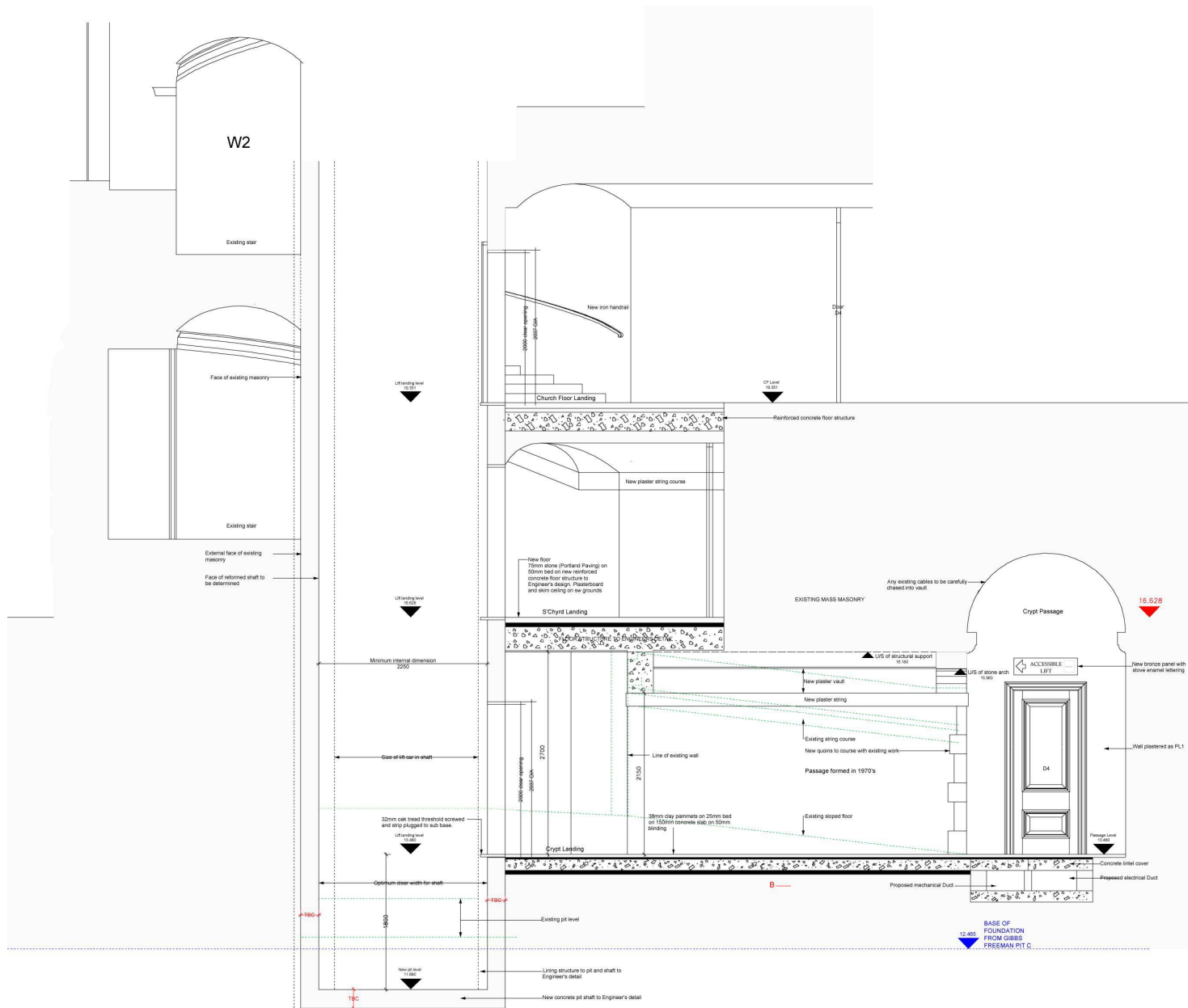
2.2 The stair repair scheme of 2006–8, basic levels and the deepening of the lift shaft

Some basic levels for key parts of the scheme were established on the PMT survey drawings of 2004–5 listed above. Three are partly reproduced here to show the details of the scheme and the setting for the archaeological recording. Fig 3 is an extract from PMT drawing SP170 5177 showing a section through the lower stages of the main stair, the lower part of the lift shaft, and the two passages, at crypt level and at church floor level. The section looks west. Fig 4 and Fig 5 are plans of the main stair, lift shaft and adjacent passages at churchyard level and church floor level respectively, showing the majority of the works intended. There are also several other drawings of the existing fabric before the works in the Surveyor's archive, but not reproduced here: a section of the whole stair up to Whispering Gallery level (SP170 5162), detailed internal sections and external elevations (SP 170 5181), a detailed section ('A-A') of the lower part of the lift shaft, the passage to the lift from the crypt, and church floor above looking west (SP 170 5187), the plan of existing fabric of the stair, lift and passage at church floor level (SP 170 5188), and a section ('D-D') looking north (SP170 5189).

The present landing on the stair which marks the passage into the nave of the cathedral, i.e. church floor, is at 19.35m OD. This is the same level as the passage leading to the main church floor, paved with black and white marble. One floor below, the churchyard entry landing level is at 16.6m OD (and is level with the outside paving, or was until the landscaping in the south churchyard of 2006–7). One further storey down, the crypt floor is at 13.48m OD. Prior to 2006 the existing passage to the foot of the lift, cut in the 1970s, rose to the south as it approached the lift shaft, to reach 14.08m OD which was the threshold of the door into the lift at its lowest entry point. As part of the refurbishment, the lift pit was to be deepened to a new depth, including any foundation matter, of about 11.4m OD. This would be a very complicated engineering exercise. As previous excavations suggested that Roman strata went down to about 12.2m OD in this area, and the existing pit bottom lay at about 12.4m OD, it was decided on safety grounds to monitor this excavation only, and not take an active part.

Next page:

Fig 3 Section of the main stair, lift shaft and passages, looking west, before the works, showing the main intentions (PMT SP170 5177)



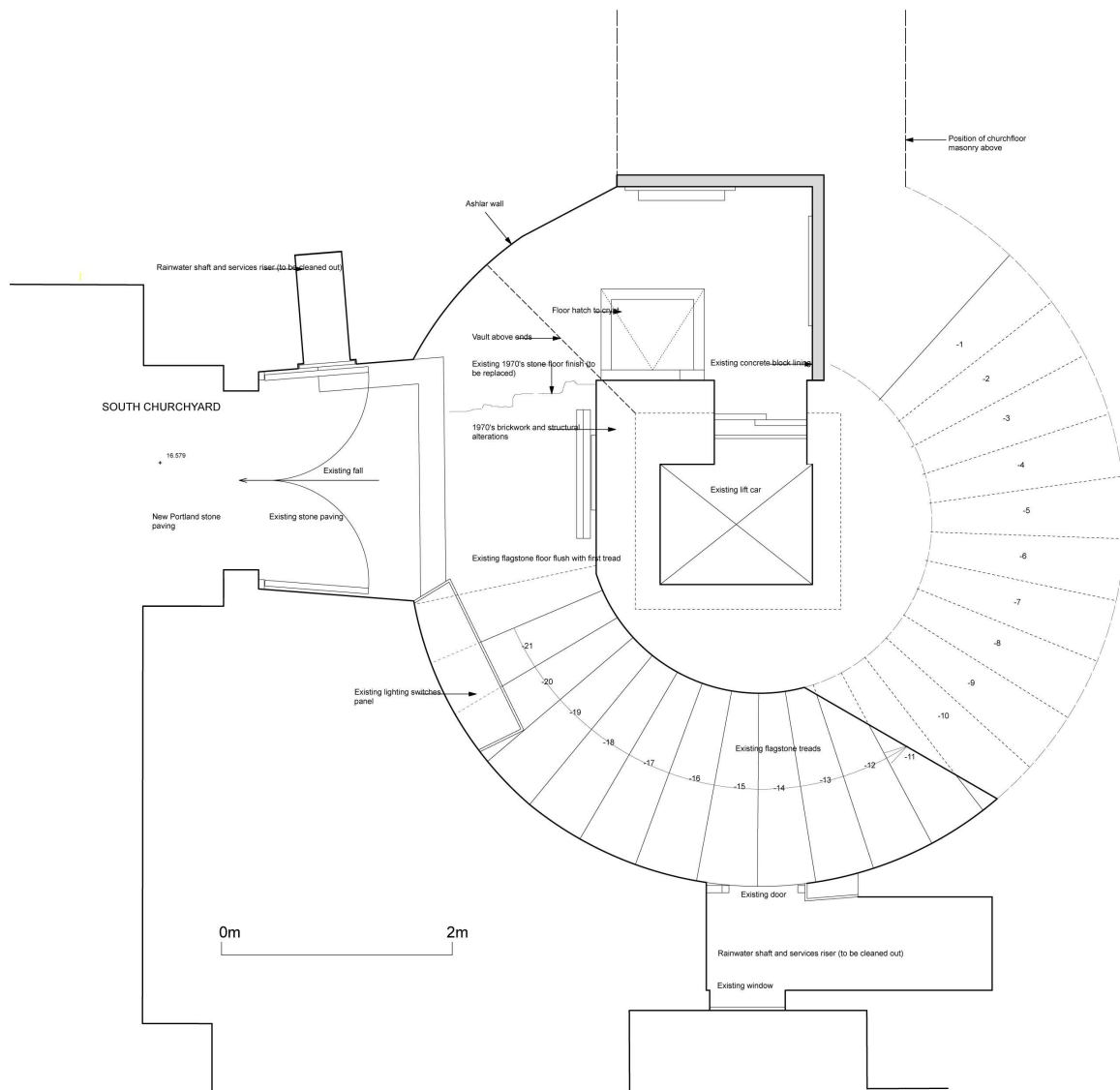


Fig 4 Plan of the main stair and lift at churchyard level showing most of the intended works (some small details removed for clarity), from PMT drawing SP170 5164

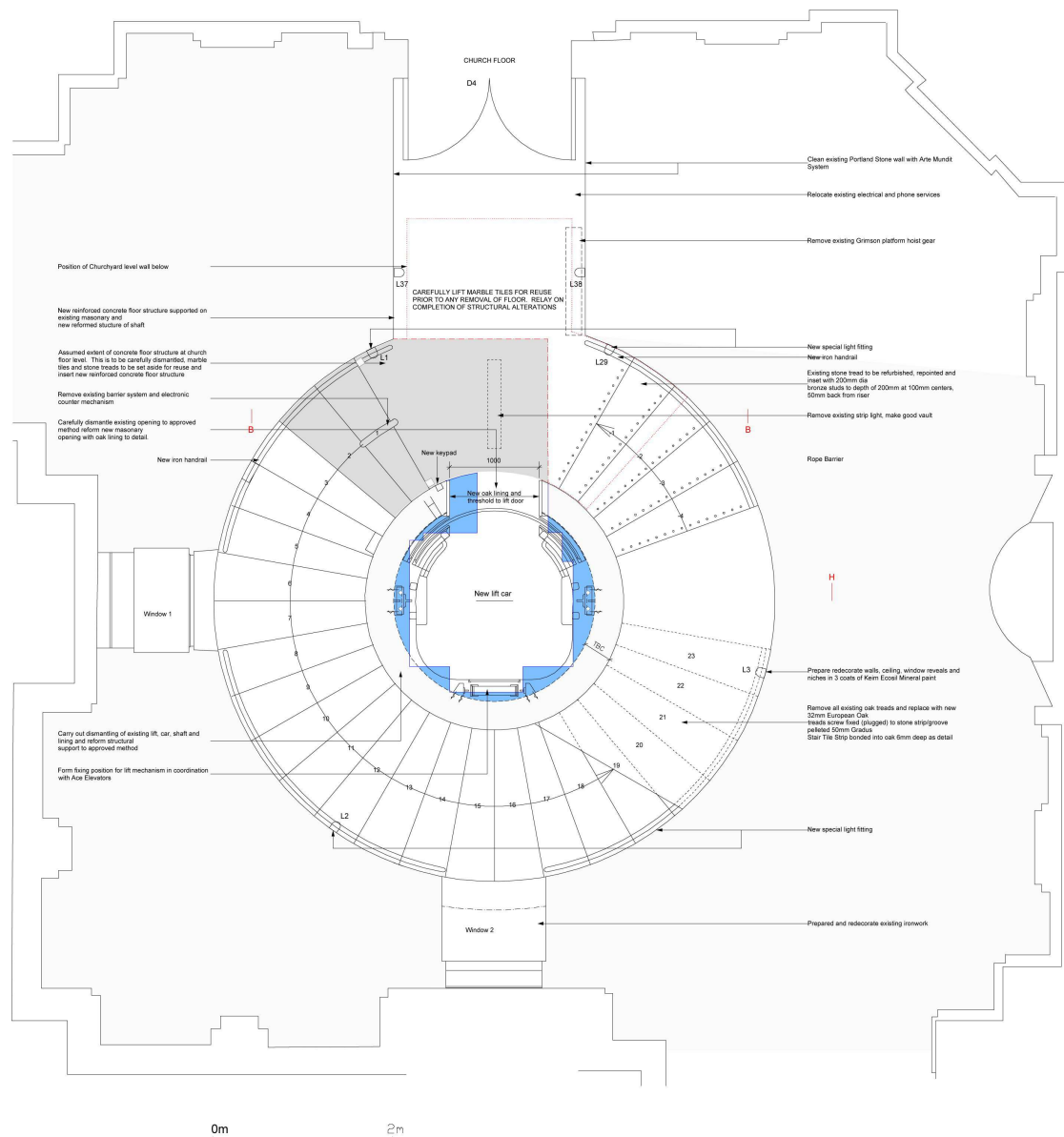


Fig 5 Plan of the main stair and lift at church floor level, showing most of the intended works (some details removed for clarity), from PMT drawing SP170 5168

The masonry was excavated by electric drills, and recording took place by drawing and photography (Fig 6).



Fig 6 MOLA photographer Maggie Cox photographing the masonry of Section 1

(1) The removal of the landing and excavation beneath the passage into the church at church floor level: Section 1

The landing between the two flights of steps, at church floor level, was work of the 1970s when the lift was put in. This was removed, along with the floor of the adjacent passage to church floor level, for a distance of about 1m northwards into the passage (the intentions shown in Fig 5). The first two steps leading down to crypt level (marked -1 and -2 on the plan, Fig 5) were also removed. These also contained recent repairs (Fig 7).



Fig 7 The steps leading down from church floor level, showing the recent patchings of the upper treads (steps -1 and -2), and the landing which along with the uppermost two treads was removed as part of the works; looking west

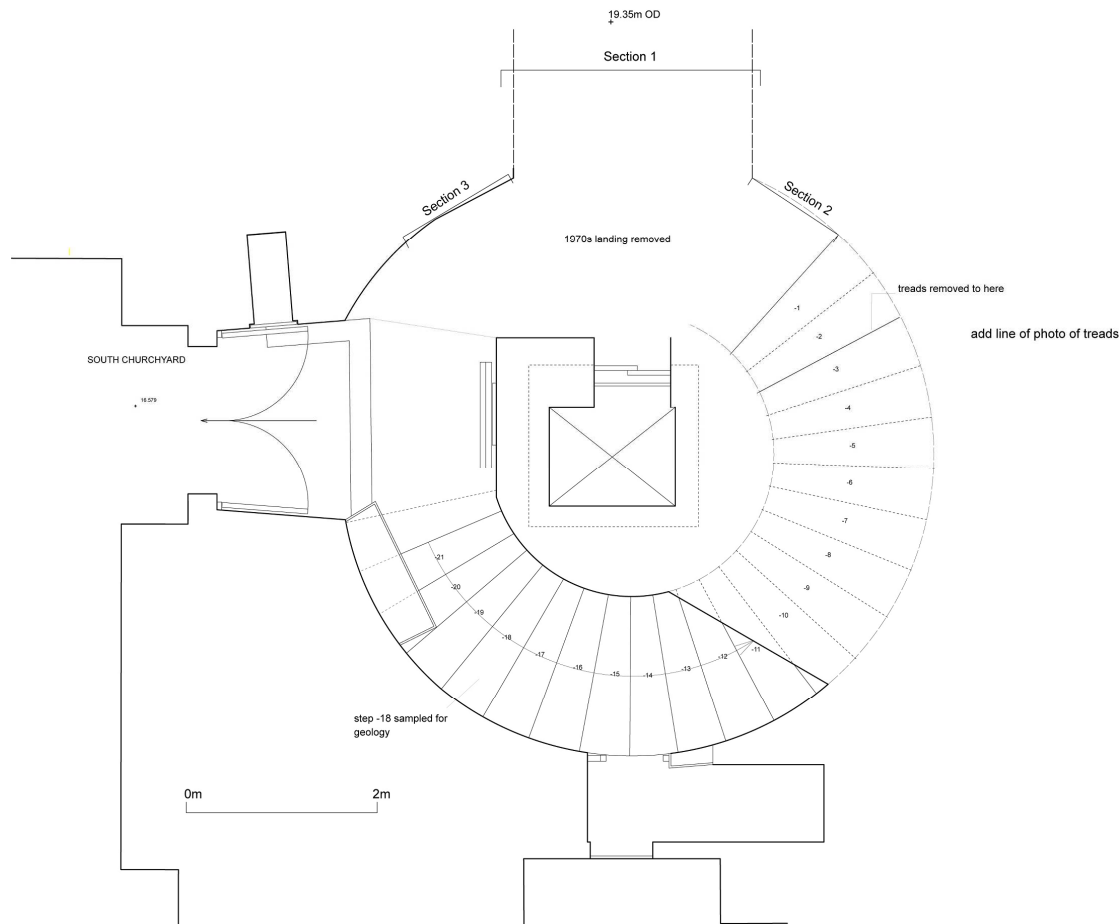


Fig 8 Plan showing position of Sections 1–3 and line of step treads shown in Fig 12

The removal of the landing and excavation of the core of the south wall of the nave beneath the passage into the church floor revealed the courses of the core itself. The north elevation of exposed masonry, the limit of excavation beneath the passage, is called Section 1, and is shown in photographs Fig 9 and Fig 10. The masonry exposed (in effect an east–west cut through the middle of the Wren nave wall, at church floor level and below) was just over 3m in height and about 1.8m wide from west to east. At the top of the section were the edges of marble tiles of that part of the passage which was to remain; beneath them was a layer of either flat roof tiles or perhaps thin floor tiles, with occasional pieces of thin brick, in a pink mortar with charcoal flecks. The core of the wall below was of rubble of several kinds of stone with occasional brick (Reigate stone; Caen, flint) in rough courses, in a similar pink mortar with charcoal flecks. 330mm below the tiles was an

identifiable course of squared stones within the foundation; no special structural purpose is attached to these, and they may only have been a course within the foundation. They did not appear in the north or south sides of the excavated area (see Fig 11).



Fig 9 Section 1, cut through the masonry below the passage at church floor level, looking north (for explanation see Fig 10) (MoLAS neg 12407002)

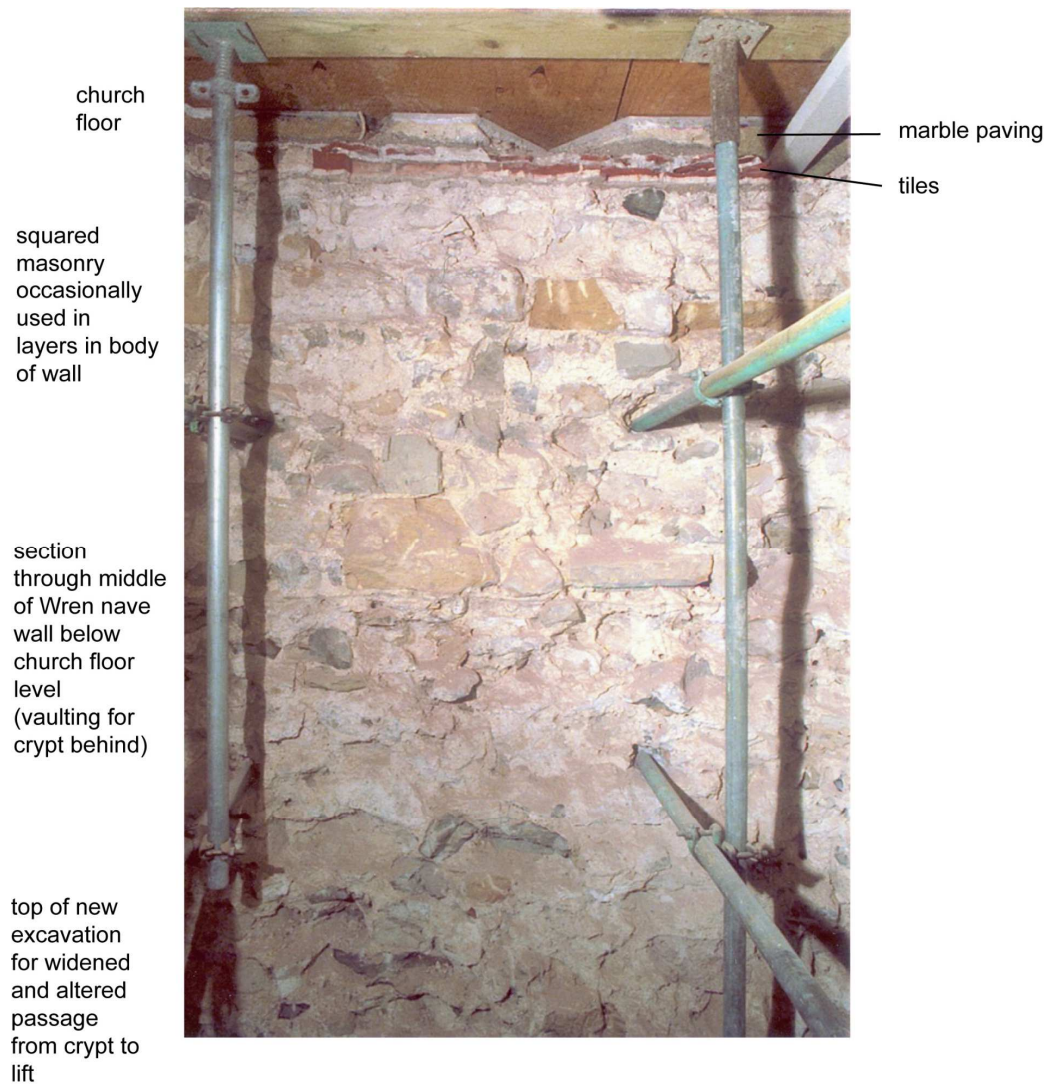


Fig 10 Annotated version of Fig 9



Fig 11 Section 1 viewed from the south-east, at church floor level with the boards above removed, showing the paving of 1705–9 in the passage

(2): excavation beneath the stair from churchyard level to church floor level: Section 2

Masonry was also removed for a short distance to the east of the landing at church floor level, approximating to the first two steps down to the crypt, numbered -1 and -2 by PMT Architects; these two steps were removed. This excavation disclosed two things: four rows of ashlar masonry continuing down the present outer wall of the stair, and evidently going with that, the line of several former steps marked as dirty soil (Fig 12 to Fig 15). The line indicated three steps before disappearing into the masonry as a horizontal stretch.

Above this line was a layer or dump of fine gray mortar including chips of chalk and brick, with charcoal flecks. This infill was approximately 0.6m thick where seen at the south end (the right hand side of Fig 12) and 0.57m thick below what had been step -1, the first step down from the landing.

The dark line was clearly the trace of a former or first phase stair. The sharp corners of the three outlines of risers indicates that steps were formerly in place, but were later removed. It is possible that these were timber steps, but equally likely that they were stone.



Fig 12 Evidence of first phase stair line showing in the masonry beneath the stair (for explanation see Fig 13) (MoLAS neg 19807016)



Fig 13 Annotated version of Fig 12



Fig 14 Section 2 of masonry, looking north-east (for explanation see Fig 15)

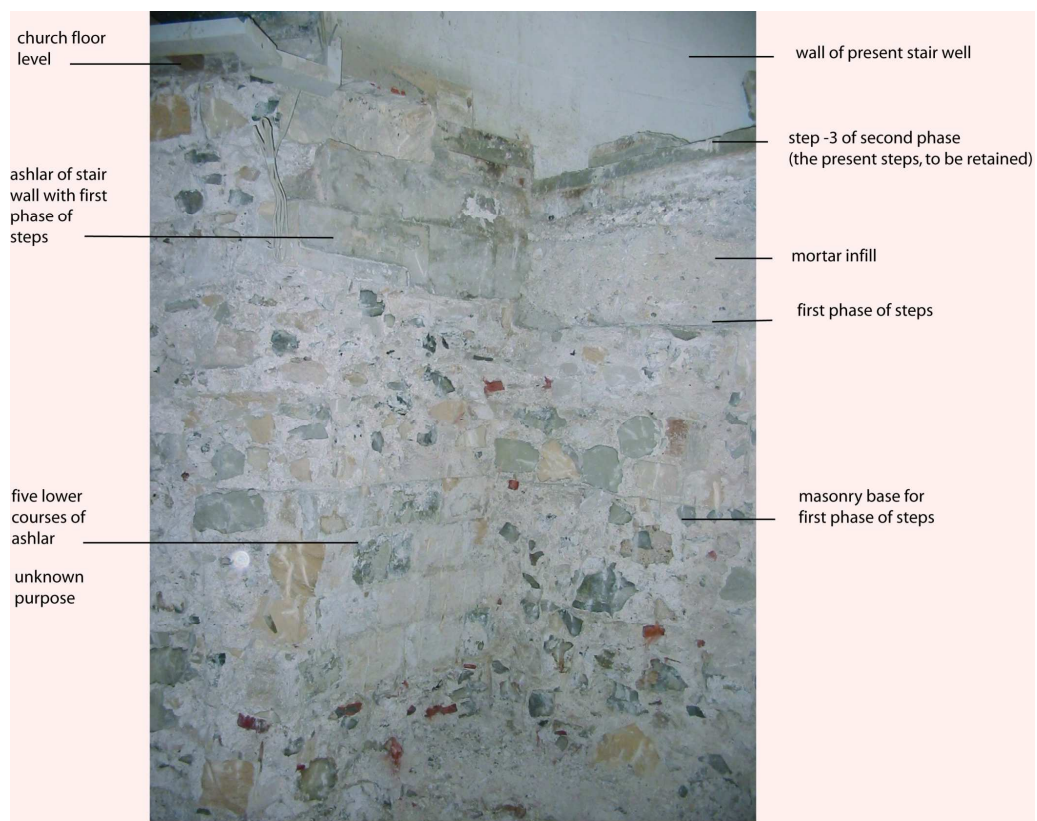


Fig 15 Annotated version of Fig 14

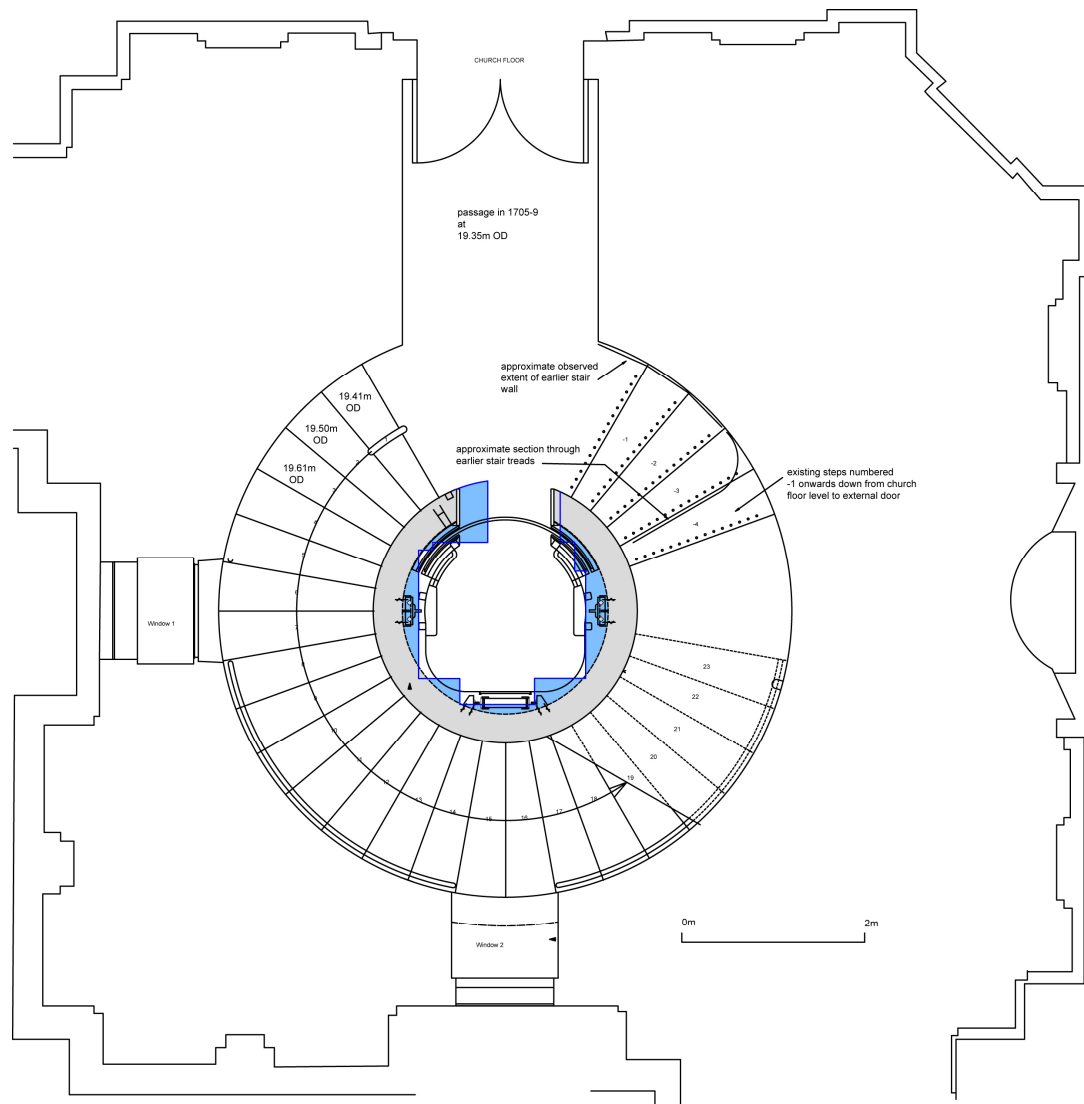


Fig 16 Plan of the stair at church floor level, showing the lines of the ashlar wall found below, and the approximate line of the observed section through the first-phase stair (adapted from PMT drawing SP170 5168)

There is clearly a slight ‘error’ in that the first step after the landing, now, is only 60mm (6cm) high. But it seems to be original, and so is the height of the passage at 19.35m OD, which is at the same level as the church floor. The levels of the first three steps after the present landing are shown on Fig 16.

There is therefore evidence of five pieces of construction:

1. The masonry of the nave wall, together with similar masonry beneath the stair. Within this masonry is the lower section of apparent ashlar walling seen in Section 2 (Fig 14 and Fig 15). The function of these five courses of ashlar cannot be suggested.

2. Above this masonry was the trace of three steps, showing as a dark line. It is possible that there were stone treads, later removed. This is called the 'first phase' stair.
3. The upper zone of ashlar seen in Section 2 seems to have related to the first phase stair; the traces of two of the first phase steps survived as scars along the bottom edge of the patch of ashlar.
4. Sealing the traces of the first phase stair was a layer of grey mortar and then the present steps leading down from church floor level to the entrance from the churchyard.
5. The black and white paving in the passage was part of the laying of the main church floor; it was laid on a thin layer of tile and brick fragments.

There seem to be two ways of explaining these construction 'events':

1. The first phase stair, of 1677–81, continued round below the future landing, to meet the existing steps which start after the landing. This possibility is shown in Fig 16; it would be possible to have six steps of the normal depth of 120mm between the first phase step at 18.65m OD and the first step after the present landing, at 19.41m OD. But this can only be a rough estimate; in fact the height of 18.65m OD on the first phase step is of the dark soil scar left by it, not by its top surface, which cannot be reconstructed. The difference in height between 18.65m OD and 19.41m OD is 0.76m. If the original step below step -1 was also, like the eventual steps, about 120mm deep or high, then there might have been five steps to bring it up to the first step after the landing.

This interpretation, with no original landing in 1677, would mean that the passage from church floor level, from 1677 to 1705–9, ended by butting against the edges of several steps. Then, in 1705–9, the landing was created when the marble paving of the passage was laid; and this required the steps from church floor down to churchyard level to be modified. But it would mean all the steps from church floor to churchyard level would have to be modified, since they now have uniform amounts of rising. This interpretation therefore seems extremely unlikely. I have been through the published building accounts for 1705–9 several times, and cannot find any reference in those years to rebuilding or relaying of the steps from church floor level to churchyard level.

2. The second interpretation suggests that the first phase stair was a transitory arrangement during the construction of the steps from churchyard level up to church floor level, in 1677–81, and that it was quickly overtaken by the existing stair from churchyard level to church floor level, in the same years. When the cathedral was paved in 1705–9, the passage was paved, and here as elsewhere some small adjustments were needed to level up the paving. These presumably carried on to the existing landing, thus slightly obscuring the first step after the landing (which is now only 60mm high). This is clearly a preferable interpretation.

2.3 Renewal of the stair treads

The steps leading down from church floor level to the external door were much decayed and some renewal was proposed. After investigation and discussion, the solution in late 2007 was to replace some of the most decayed examples with pieces taken from near the top of the stair near the Whispering Gallery.

The existing state of steps, and their construction, is shown in Fig 17. Most steps seemed to be of the construction shown: probably wedge-shaped pieces at the rear, but a front edge of rectangular slabs, of varying lengths. They were not keyed into the outer wall; whether they keyed into the inner wall of the stair could not be identified.



Fig 17 The steps leading down from church floor level to churchyard level, showing their condition and how the steps were constructed, before works started

The British Geological Survey was engaged to sample one of the stair treads. The step which was sampled was fourth up from churchyard level, numbered ‘-18’ on the architect’s plan (i.e. 18 steps below church floor level). The sample was declared to be ‘pale greenish-grey, sandy, glauconitic limestone, i.e. Kentish ragstone (report for BGS by Dr Graham Lott, 28 November 2006). This stone was then also partly removed (Fig 18).



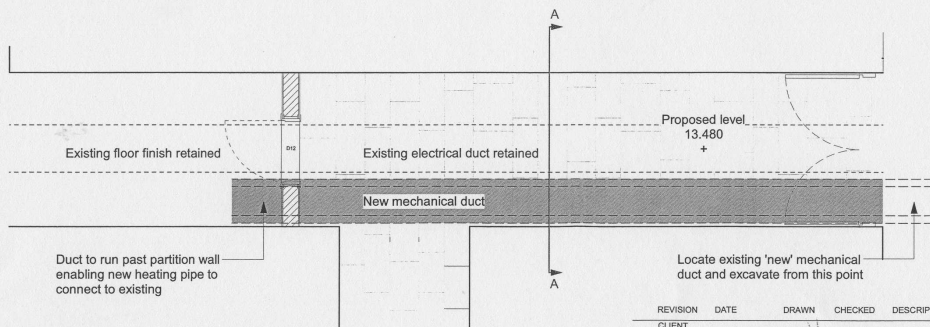
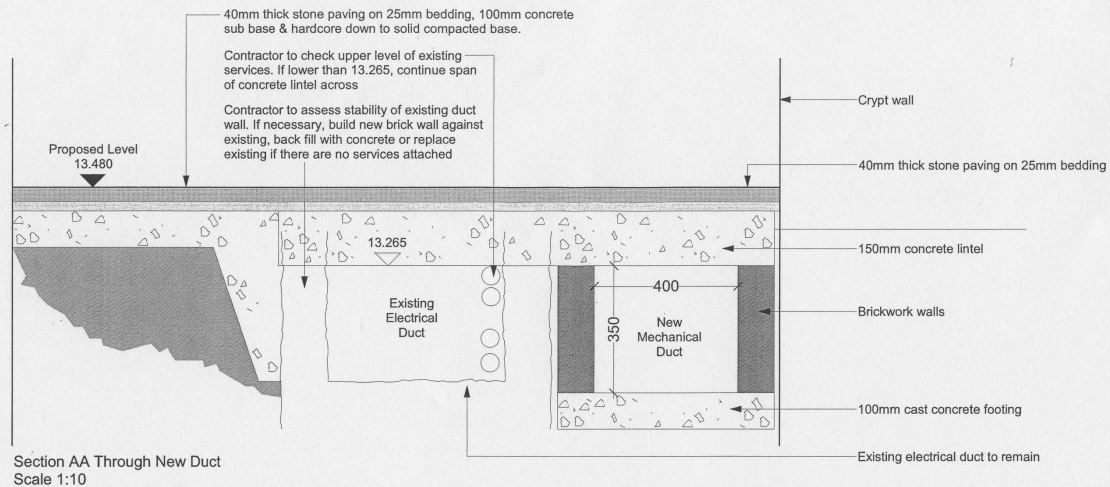
Fig 18 Tread 18 and the steps around it after half of the tread had been removed (0.5m scale) (MoLAS neg 00107005)

2.4 A new duct in the crypt

The works included the refurbishment of an existing duct in the crypt at the north end of the passage to the lift, running east–west along the south aisle of the crypt, and although this work was monitored, it did not result in any new intrusion into archaeological strata or the fabric.

Next page:

Fig 19 Section and plan of the intended new duct in the crypt at the north end of the passage to the lift (PMT drawing SP170 5308)



CONSTRUCTION

REVISION	DATE	DRAWN	CHECKED	DESCRIPTION	SCALE	DATE
CLIENT		Dean & Chapter of St Paul's Cathedral			1:50 / 1:10 @ A3	June 2007
PROJECT		Main Stair and Lift			DRAWN CV	CHECKED
DRAWING TITLE		Crypt Passage - New Mechanical Services Duct			JOB NUMBER SP170	DRAWING NO. 5308
					REVISION	

29 MARYGATE, YORK, YO30 7WH, TEL 01904 644001, FAX 01904 623462

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DO NOT SCALE FROM DRAWING
CHECK DIMENSIONS ON SITE

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2.5 Moulded stones from the lift shaft and foundations

A small number of architectural fragments or moulded stones were recovered from the work on the lift shaft, whether widening it slightly or its increased foundations. These came from the Wren fabric, as is always found when that fabric is pierced for modern works. These fragments are therefore without archaeological context except that they were reused by Wren, in this case in the period 1675–90.

A report on the fragments by Mark Samuel was written in 2010 and is included here as the Appendix. He reports on 19 fragments, all of which have been retained and remain at the cathedral (with the sitecode PUF06). They are of the various known medieval stone types, i.e. Taynton, Reigate and Caen stones.

New findings from this small group include a possibly late 11th- or 12th-century column drum fragment <4> in Reigate stone and a small piece of moulding <18> from a 14th-century monument.

These fragments join the larger groups excavated from the Wren crypt walls in 1994–6, and will be catalogued in due course as part of the wider collection of moulded stones.

2.6 Conclusions: the lift and great stair recording

The replacement of the 1970s lift in the core of the circular stair on the south side of St Paul's therefore produced a small amount of evidence for adjustments in the stair's construction, and a small group of medieval architectural fragments reused in Wren's walls, as is now found on all sites where Wren's walls are dug through.

These findings will be incorporated into future studies of the Wren building and of the reused medieval architectural fragments.

3 Cleaning of the south nave elevation

3.1 Introduction and documentary note

The cleaning of the exterior of the nave was taking place at the same time as the works in the south churchyard and on the lift, in 2006–7, and continued until June 2011.

The first phase of recording, of the south nave elevation, is described in this section. Then there is description of recording of the north choir elevation, with one bay of the north transept (Section 4). These descriptions are of the swags and cherubs' heads above and around the tops of the windows, that is in the lower half of the cathedral facades. Then in Section 5 there is recording of those panels below the windows on the north transept and north nave, part of the work of Gibbons, which had so far not been cleaned. Discussion of the swags ('festoons' in the accounts) and Gibbons panels is then brought together in a final section (6).

Thus the recording reported in Sections 3–6 of this report is of parts of the external cleaning project. It has resolved into two related exercises or recording exercises:

- (i) some of the swags and cherub's heads above the windows, on the south nave and north choir bays, along with one bay of the north transept, before and after cleaning;
- (ii) most of the Gibbons panels below the windows of the north transept and the north nave, before and after cleaning.

Although documentary accounts for the construction of the Wren building are voluminous, there is very little in the accounts about either the swags and decoration above the windows, or the Gibbons panels. Both topics will be the subject of wider research, and only some few facts will be reported here. This section now turns to the first part of the reporting on the external cleaning, the swags and cherubs' heads above the windows.

The construction in 1675–90 of the parts of the upper walls on which the swags are located is summarised in Fig 20, which is based on the Wren accounts. Although the master masons and the extent of their responsibilities are clearly known, we do not know who carved any of the details. The master masons such as Edward Strong had up to 60+ masons working for each of them at this period, the 1690s.

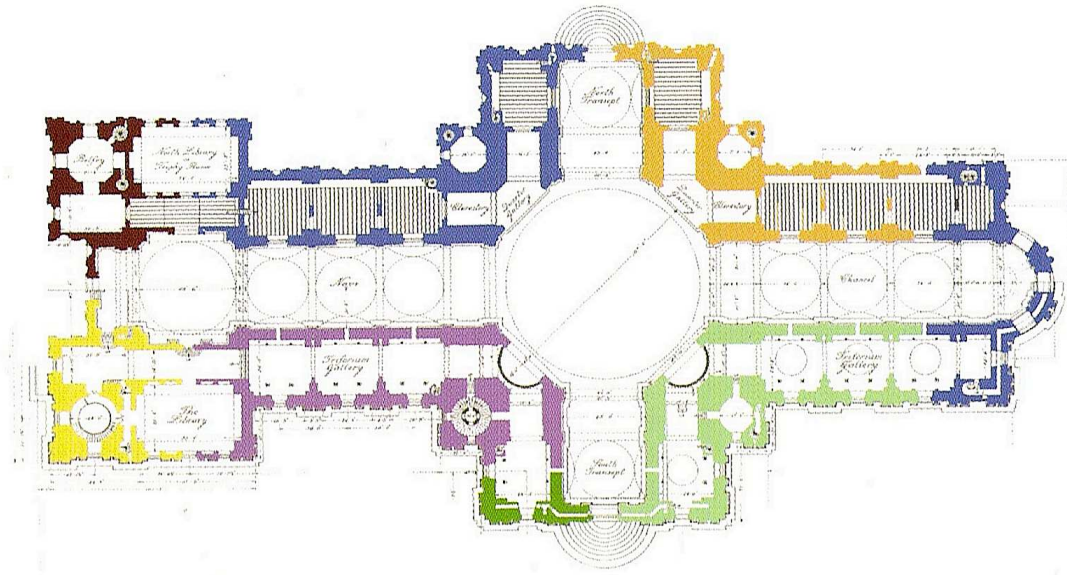


Fig 20 Division of responsibility between the master masons in the period 1687–99 (Campbell 2007, pl 7, after the Wren accounts). Blue: Edward Strong senior; green, Edward Pearce until 1690, then C Kempster and E Beauchamp; orange, Jasper Latham until 1690, then Nathaniel Rawlins; purple, Thomas Wise junior and Thomas Hill. The masons working on the west towers (not covered in this report) were Samuel Fulkes (brown) and John Tompson (yellow)

3.2 Recording

For the purposes of management and recording, Emma Hardisty of PMT Architects had devised a scheme of numbering the external bays of the cathedral (Fig 21). This is used when referring to the comprehensive photogrammetric records of each bay, and now for the photographs taken in the present project.

ST. PAUL'S CATHEDRAL,
LONDON.
PLAN OF CHURCH FLOOR.

SCALE OF FEET.

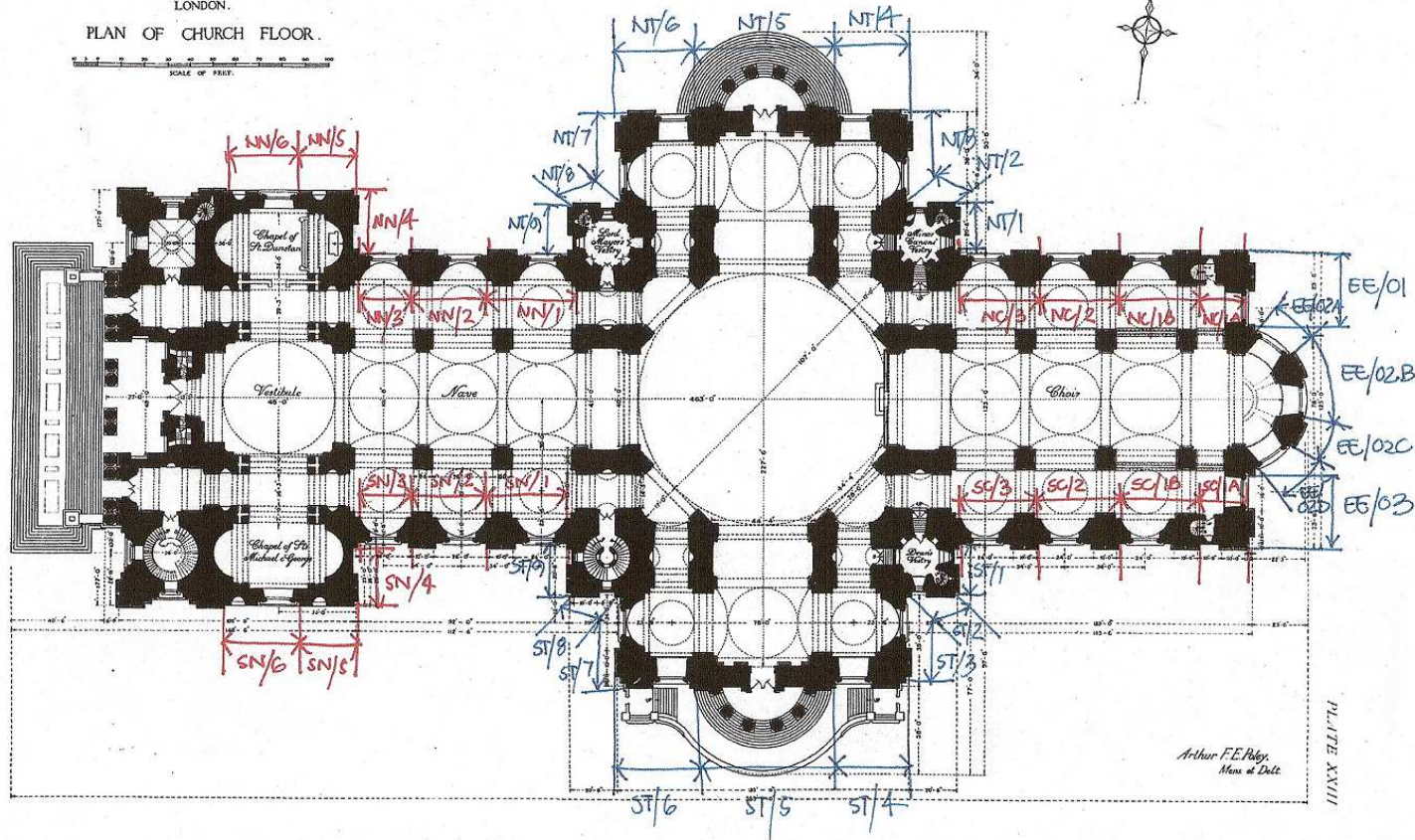


Fig 21 Bay references for external cleaning and repair projects, excluding the west front (Emma Hardisty, July 2008). A further bay, NN7, has been added during the present recording, for the bay immediately W of bay NN6 at the NW (to match bay NN5)

BAY REFERENCES FOR EXTERNAL CLEANING + REPAIR PROJECTS EX. W. FRONT

EH/08 JULY 08

To show the setting of the windows in general, and the three bays of the south nave elevation in particular, they are shown after cleaning in Fig 22 to Fig 24.



Fig 22 Bay SN3 after cleaning



Fig 23 Bay SN2 after cleaning



Fig 24 Bay SN1 after cleaning

Only a few details of the decorations before cleaning were photographed (Fig 25 to Fig 28). The swags were photographed in January 2007, before cleaning (the official picture, Fig 26, by MOLA photographer Maggie Cox; the other details for information by JS); and after cleaning, which required two visits from Maggie Cox, in October and November 2007 (Fig 29).



Fig 25 Decoration above window 3, looking east, before cleaning



Fig 26 Cherub's head above window SN1, before cleaning, January 2007 (MoLAS neg 00107006)



Fig 27 Decoration above window in bay SN1, looking west, before cleaning





Fig 28 Details of the swags before cleaning, January 2007(JS photos)

Fig 29 [following] Details of the cleaned swags around the tops of the nave windows, photographed in October and November 2007. The MoLAS negative number is placed beneath each picture for reference



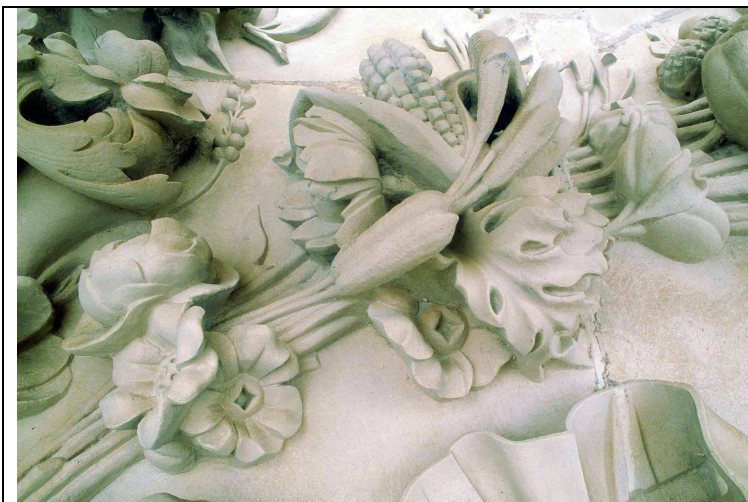
MoLAS neg 39307001



MoLAS neg 39307002



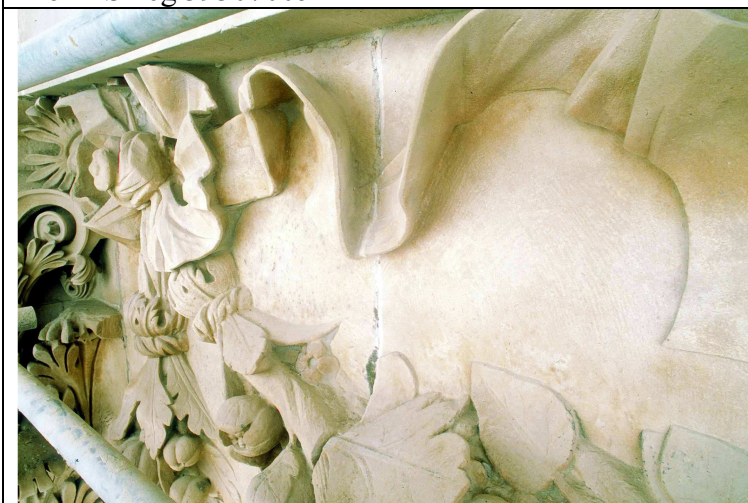
MoLAS neg 39307003



MoLAS neg 39307004



MoLAS neg 39307005



MoLAS neg 39307006



MoLAS neg 39307007



MoLAS neg 39307008



MoLAS neg 45007001



MoLAS neg 45007002



MoLAS neg 45007003



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MoLAS neg 45007008



MoLAS neg 45007009



MoLAS neg 45007010

4 Cleaning of the north choir elevation

4.1 Introduction and documentary note



Fig 30 The north choir elevation in December 2008, as the scaffolding and plastic covering was being removed in stages

In May 2008 work began on cleaning the north elevation of the choir (for a general view, Fig 30). Two sets of photographs were taken, each of 15 shots; of the same details before cleaning, in May 2008, and after cleaning, in November 2008. In contrast to the cleaned photographs on the south nave taken previously, both these sets were taken while the plastic Monarflex tarpaulin was on the outside of the scaffold; so that there is little contrast and no direct sunlight on the carving.

In this part of the project, therefore, each detail is recorded in both its dirty and clean state. The photographs were taken in a sequence from east to west. Though for convenience this part of the project is called the North Choir Elevation, it includes photography of one swag in the first bay of the east elevation of the north transept, i.e. bay NT1 (Fig 47).

A brief documentary note on the building sequence of the upper walls of the cathedral is placed at the beginning of Section 3 above. There it will be seen that the masons for the choir elevation were two 'groups': (1) Edward Strong senior, who built the first bay of the choir from the east (as part of his work on the east end), that is bay NC1A and the east half of bay NC1B; (2) Jasper Latham until 1690, then Nathaniel Rawlins, from the middle of bay NC1B for the remainder of the choir elevation and the first bay of the north transept (bay NT3). Any differences between the work of the two masons, in the middle of bay NC1B, could not be readily perceived at the assumed join (Fig 33 to Fig 35).

4.2 Recording



MOLA photo 42108001



MOLA photo 42508001

Fig 31 Bull's eye window and swag in bay NC1A before and after cleaning (all north nave elevation photographs are looking south)



MOLA photo 42108002



MOLA photo 42508002

Fig 32 Swag in bay NC1B, east side of window



MOLA photo 42108003

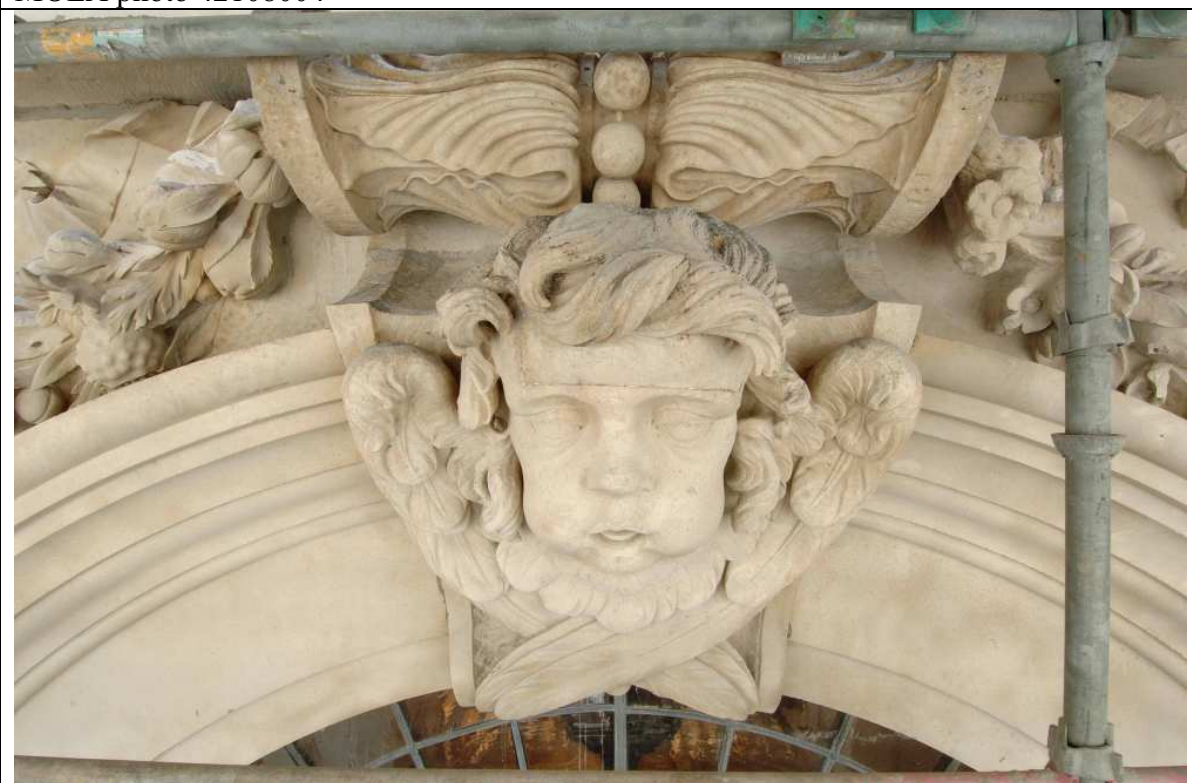


MOLA photo 42508003

Fig 33 Swag in bay NC1B, east side of window



MOLA photo 42108004



MOLA photo 42508004

Fig 34 Cherub keystone in bay NC1B



MOLA photo 42108005



MOLA photo 42508005

Fig 35 Swag in bay NC1B, west side of window



MOLA photo 42108006



MOLA photo 42508006

Fig 36 Swag in bay NC1B, west side of window



MOLA photo 42108007



MOLA photo 42508007

Fig 37 Swag in bay NC2, east side of window

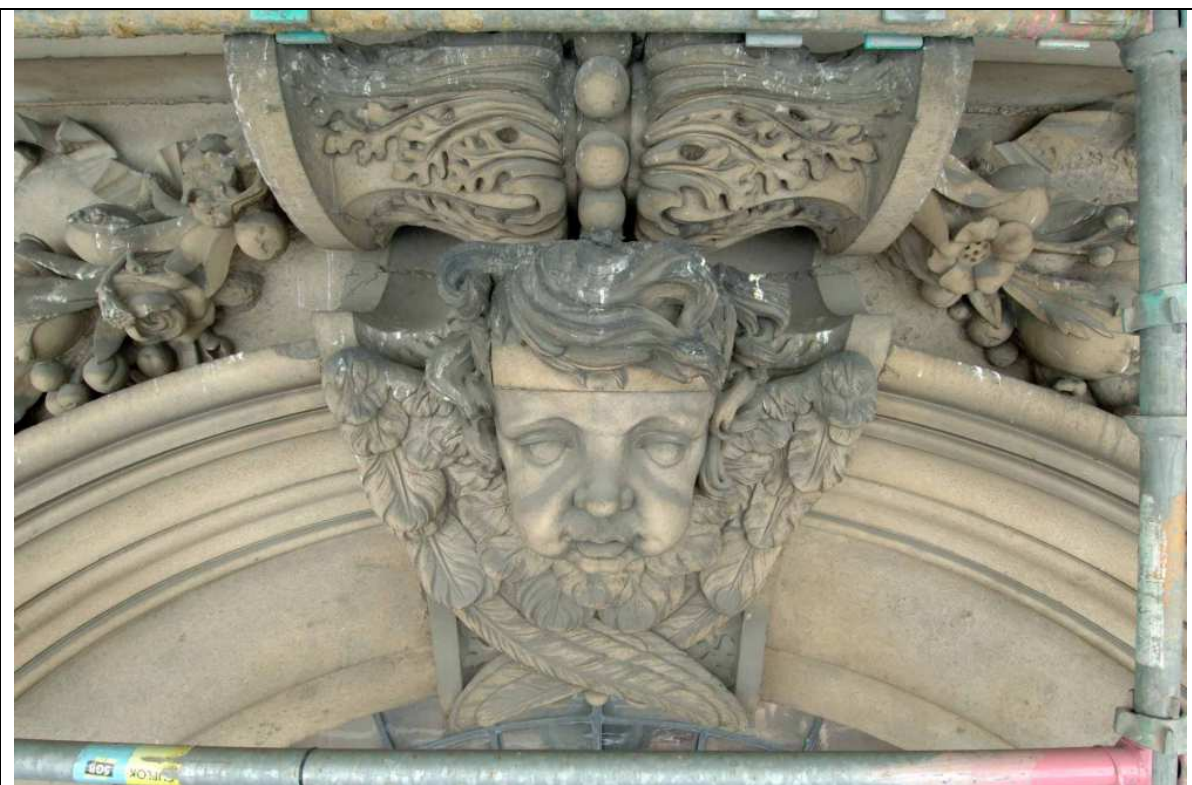


MOLA photo 42108008



MOLA photo 42508008

Fig 38 Swag in bay NC2, east of window



MoL:AS photo 42108009



MOLA photo 42508009

Fig 39 Cherub keystone in bay NC2



MOLA photo 42108010



MOLA photo 42508010

Fig 40 Swag in bay NC2, west side of window



MOLA photo 42108011



MOLA photo 42508011

Fig 41 Swag and drop in bay NC2, west side of window



MOLA photo 42108012



MOLA photo 42508012

Fig 42 Swag and drop in bay NC3, east side of window



MOLA photo 42108013



MOLA photo 42508013

Fig 43 Swag in bay NC3, east side of window



MOLA photo 42108014



MOLA photo 42508014

Fig 44 Cherub keystone in bay NC3



MOLA photo 42108015

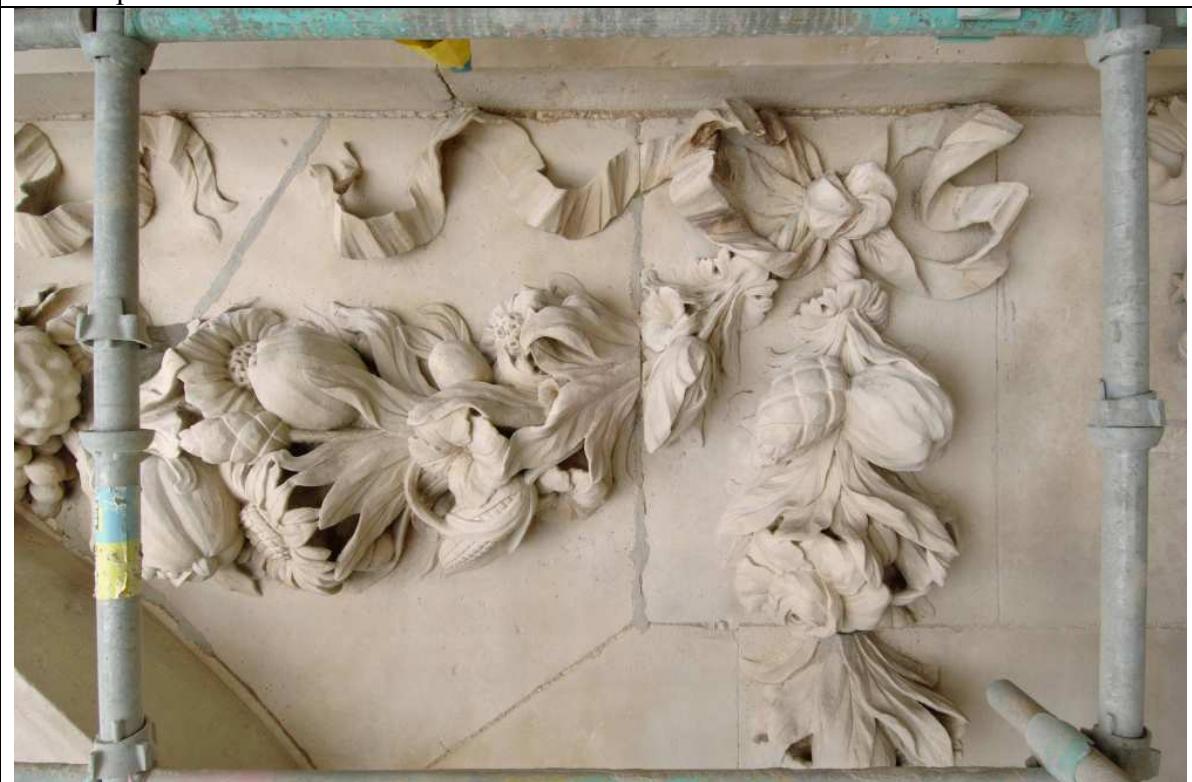


MOLA photo 42508015

Fig 45 Swag in bay NC3, west side of window



MOLA photo 42108016



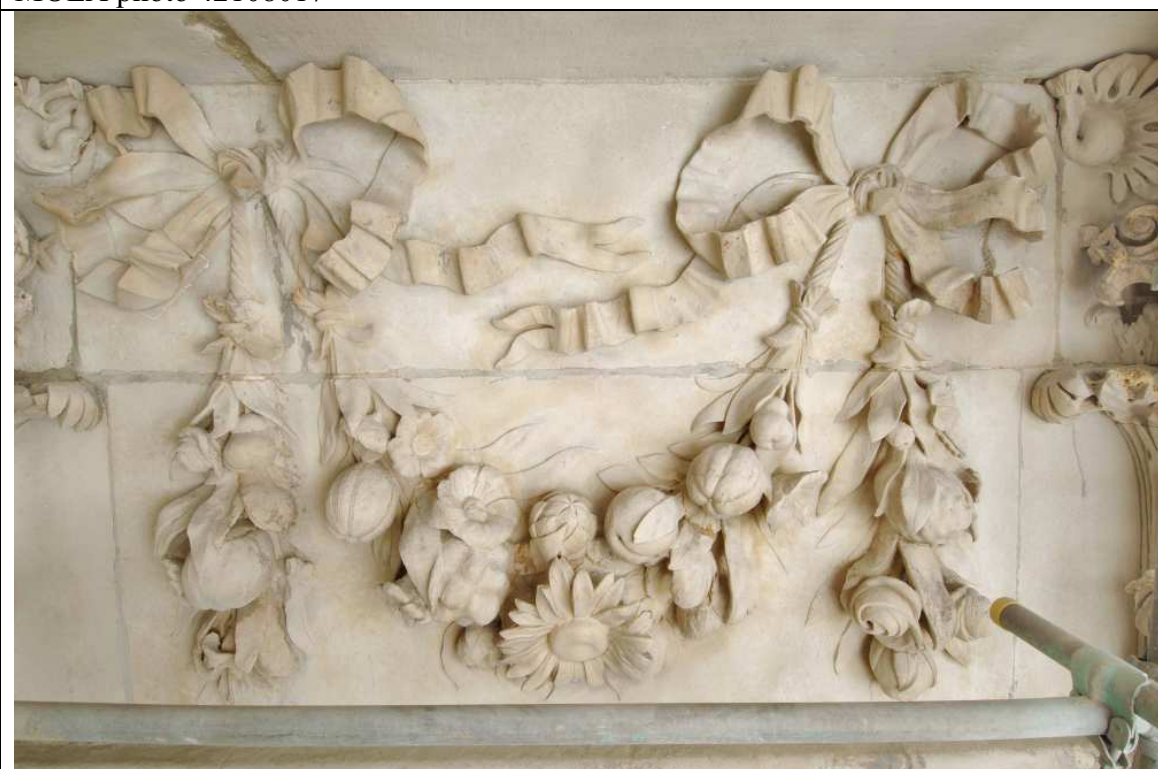
MOLA photo 42508016

Fig 46 Swag and drop in bay NC3, west side of window

This phase of recording included one bay on the north transept, the main and only bay of the transept (as opposed to the Minor Canons' Vestry), NT3. After this the photography of the decoration around the tops of the windows ceased.



MOLA photo 42108017



MOLA photo 42508017

Fig 47 Swag in bay NT3, E side of N transept

4.3 Later repairs

There are scattered instances of elements being held in with wires, which I think are later repairs (eg Fig 48). There is no evidence of any armatures, in the sense of metal rods originally placed within the flowers or vegetable forms.



Fig 48 An example of a wire ?repair to a leaf fragment, from one of the swags

First discussion of the recording is placed in Section 6 below.

5 The cleaning of the north transept and north nave elevations

5.1 Introduction and documentary note

No further photography of the swags around the upper parts of the windows took place in the North Transept part of the project, but attention turned to the panels below the windows, all by Grinling Gibbons. Separately, PMT Architects engaged another photographer, Sue Salton, to photograph the cleaning works on the north transept, but her brief was different from that given by the Archaeologist to Andy Chopping. Ms Salton's photographs are stored separately by SPFA.

The north transept was constructed between 1675 and 1699 (Campbell 2007, pl 7). The basement storey was by Thomas Strong, and the main parts by Jasper Latham (the east half) and Thomas Strong (to 1681) and Edward Strong (the west half). After 1690 Latham's half was taken over by Nathaniel Rawlins (Fig 49).



Fig 49 The north transept as the scaffolding was being erected around it, December 2008. The missing statue of St Philip at the east (left-hand) end of the pediment has since been restored to its position in a related project. The pediment bears the arms of William III

The royal arms of William III



Fig 50 Andy Chopping recording the royal arms in the pediment of the north transept, 18 August 2009

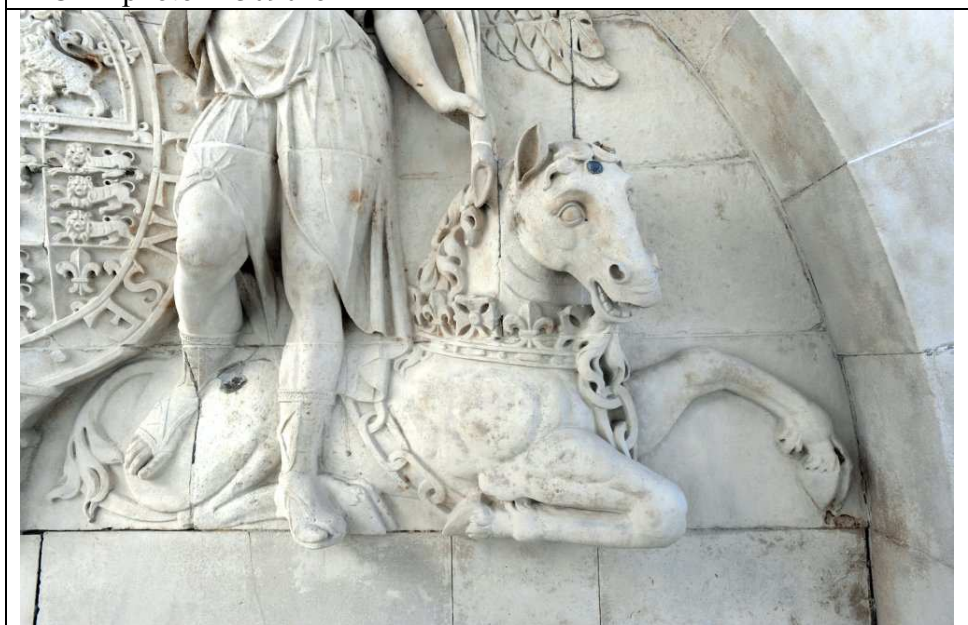
Photographs were taken of the royal arms in the pediment of the north transept, after cleaning (Fig 50; Fig 51, Fig 52). The arms of William were carved by Grinling Gibbons; in July-September 1698 he was paid £120 for ‘carving a bas-relieve on ye N pediment, being 18ft long and 9 ft high, with Two Angells, being 8 ft figures and 18 inches thick, with a Lyon and Unicorne and the King’s Arms and Crowne’ (WS XV, 45). The royal arms are a rare occurrence of the arms of William, since Mary died in 1694. He thereafter used his own arms, which were identical to those of William and Mary except that the escutcheon of Nassau was added in the middle, as here.



Fig 51 The royal arms in the pediment on the north transept, cleaned (MOLA photo 22309013)



MOLA photo 22309015



MOLA photo 22309014

Fig 52 The royal arms in the pediment of the north transept, details of supporters, left and right, cleaned

The Gibbons panels below the windows

There are 27 carved panels below the windows of the cathedral. Twenty-six, that is all but one, were carved by Grinling Gibbons between September 1694 and May 1695 (WS XIV, 138, 143, 148; XV, pl 30 for sketch plan). One further panel, that beneath the window of the Consistory Court at the south-west end of the building, was carved by Jonathan Maine in 1701 (WS XV, 72). There is no explanation of why this one is later. It contains the bishop's arms, presumably an allusion to the function of the Court.

From this point on in the archaeological project, only the panels below the windows, carved by Grinling Gibbons, were photographed before and after cleaning. The panels were photographed by Andy Chopping of MOLA on four occasions: 18 August 2009, 14 October 2009, 10 March 2010, and 23 May 2011.

The photographs are presented in order of the bays around the N and E sides of the transept and along the N nave, going W, from bay NT3, that is the N face of the transept, the bay E of the portico.



MOLA photo 22309009



MOLA photo 22309010

Fig 53 Bay NT3 (east side of N transept): panel below window before cleaning



MOLA photo 11110004

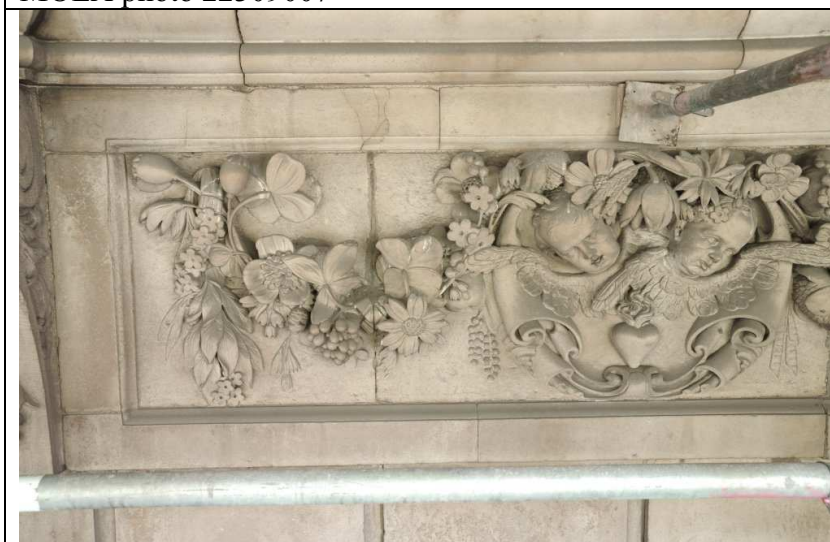


MOLA photo 11110005

Fig 54 Bay NT3 (east side of N transept); panel below window after cleaning



MOLA photo 22309007



MOLA photo 22309008

Fig 55 Bay NT4 (north side of north transept): panel below window before cleaning



MOLA photo 111100001



MOLA photo 11110002

Fig 56 Bay NT4 (north side of north transept): panel below window after cleaning



MOLA photo 22309005



MOLA photo 22309006

Fig 57 Bay NT6 (north side of north transept): panel below window before cleaning



MOLA photo 22309006



MOLA photo 22309005

Fig 58 Bay NT6 (N side of N transept): panel below window before cleaning



MOLA photo 11110006

? more*

Fig 59 Bay NT6 (N side of N transept): panel below window after cleaning



MOLA photo 22309003



MOLA photo 22309004

Fig 60 Bay NT7 (west side of north transept): panel below window before cleaning

There is also photo 22309011 which shows the whole panel.



MOLA photo 15111015

Fig 61 Bay NT7 (W side of N transept): panel below window after cleaning

North nave

The panels below the windows only were photographed here in an uncleaned state on 18 August 2009 and in a cleaned state on 23 May 2011.



MOLA photo 22309001



MOLA photo 22309002



MOLA photo 22309012

Fig 62 Bay NN1 (N side of nave): panel below window before cleaning



MOLA photo 15111013



MOLA photo 15111012



MOLA photo 15111014

Fig 63 Bay NN1 (N side of nave): panel below window after cleaning



MOLA photo 22311017

Fig 64 Bay NN2 (N side of nave): panel below window before cleaning



MOLA photo 15111010



MOLA photo 15111009



MOLA photo 15111011

Fig 65 Bay NN2 (N side of nave): panel below window after cleaning



MOLA photo 22309021

Fig 66 Bay NN3 (N side of nave): panel below window before cleaning



MOLA photo 15111008



MOLA photo 15111007

Fig 67 Bay NN3 (N side of nave): panel below window after cleaning

Due to oversights, bay NN4 was not photographed in either a dirty or a clean state.



MOLA photo 22309020

Fig 68 Bay NN5 (N side of nave): panel below window before cleaning



MOLA photo 15111005



MOLA photo 15111006

Fig 69 Bay NN5 (N side of nave): panel below window after cleaning



MOLA photo 22309019

Fig 70 Bay NN6 (N side of nave): panel below window before cleaning



MOLA photo 15111003



MOLA photo 15111002



MOLA photo 15111004

Fig 71 Bay NN6 (N side of nave): panel below window after cleaning



Fig 72 Bay NN7 (N side of nave): panel below window before cleaning



Fig 73 Bay NN7 (N side of nave): panel below window after cleaning

A first short discussion of the Gibbons panels is given in Section 6.

6 Discussion: the external carvings above and below the windows at St Paul's

6.1 The swags ('festoons') and cherubs' heads above the windows

Swags are not a feature of the earliest Renaissance buildings in the 15th century, but they do appear on prominent, palatial houses in Rome and Paris in the first half of the 16th century, such as the Louvre. The occurrence of swags on churches, almost all on the west front, is found from the 1560s in Vignola's proposed design for the Gesù in Rome. Swags are often an accompaniment to Corinthian and Composite capitals or pilasters (as at St Paul's), but there are also less commonly cases of swags with Ionic capitals.

In England swags were authorised by their inclusion between the windows of the upper story of Jones's Banqueting House (1622). They occur thereafter on Wren's Sheldonian Theatre (1662–3) and in the pediment of his Pembroke College Chapel, Cambridge (1663–5). They figure in Wren's 1666 pre-Fire proposal for a dome over the old recast medieval building, as sketchy details.

Summerson thought Wren's swags and drops in the interior of the pre-Fire proposal drawing were 'closely similar to some of the coarse Anglo-Flemish stuff which English plasterers were producing in London at the time' (1993, 185), but other models might be discussed. One possible influence on Wren may have been Palladio's design for the Palazzo Valmarana in Vicenza (1566), though the swags were only on the design, not on the finished building. Wren had a copy of Palladio's *Libri* in which this appeared (Fig 74). Swags also appeared on the chateaux which Wren would have seen in the Paris area in 1665.

Swags were a feature of grander buildings in the rebuilt City of London apart from the cathedral. Wren employed them as part of the grand temple-front design for the east end of St Lawrence Jewry, and Robert Hooke included them in both storeys of this main range for the College of Physicians in Warwick Lane, near the cathedral (1672–8) (Fig 75).

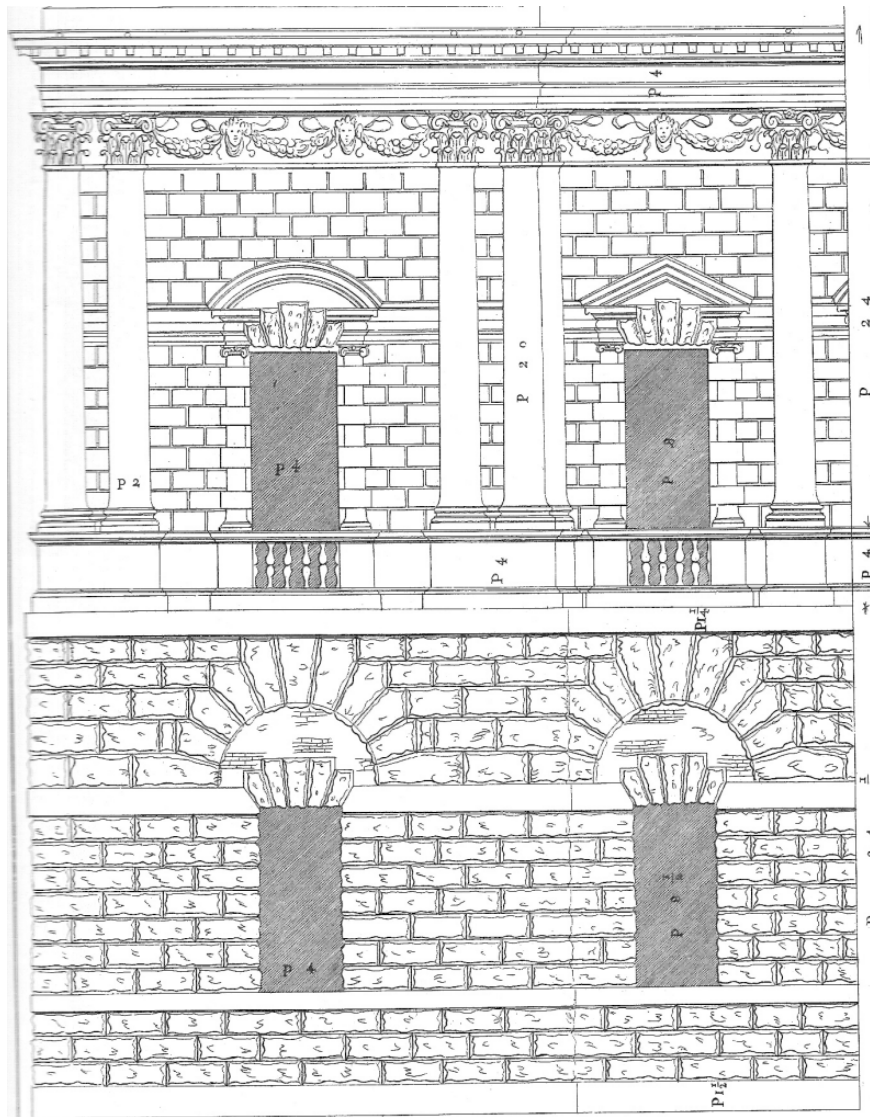


Fig 74 The Palazzo Valmarana, Vicenza, by Palladio (Book ii, Chap 4, pl 9; Dover edition 1965)



Fig 75 The College of Physicians, by Robert Hooke, showing use of swags (engraving by S Wale, late 18th century)

The use of swags above the windows of the ground or church floor storey was in contrast to the lack of them between the Composite pilasters of the upper storey (Fig 76, Fig 77), except at the east and west ends, where the swags were part of the embellishments of the upper storey, giving each end more formality.

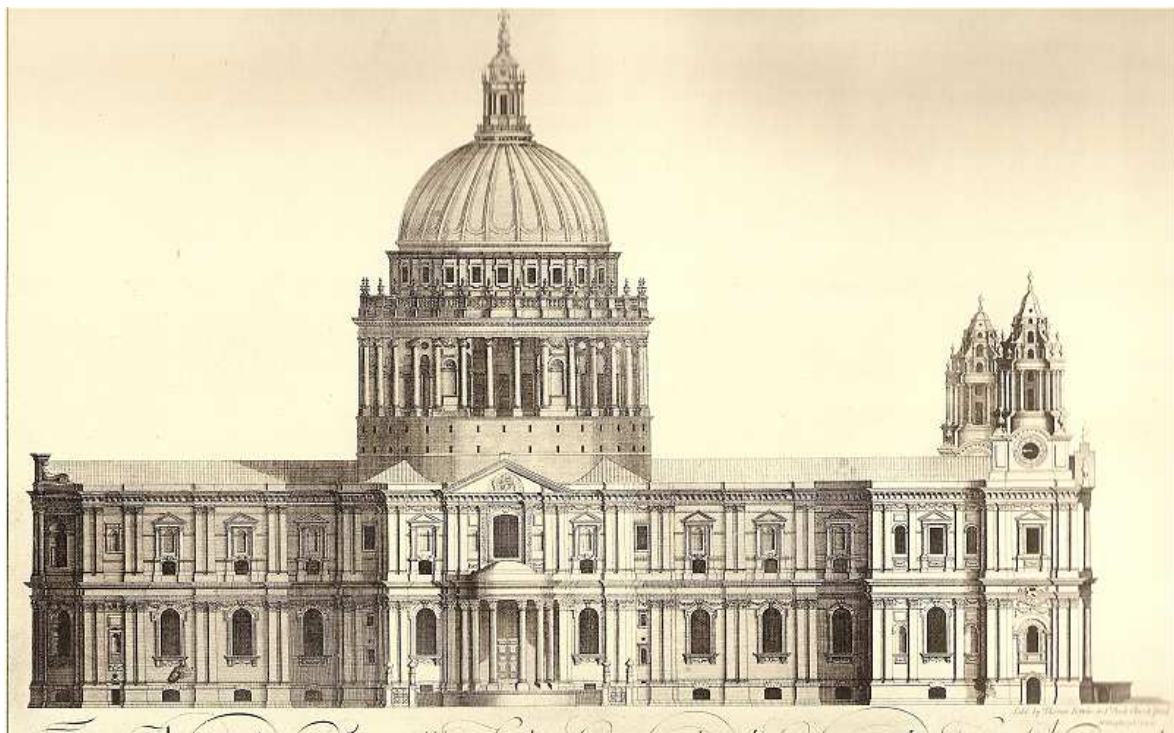


Fig 76 N facade of St Paul's in the early 18th century, by Hulsbergh (WS XIV, pl xxxix).

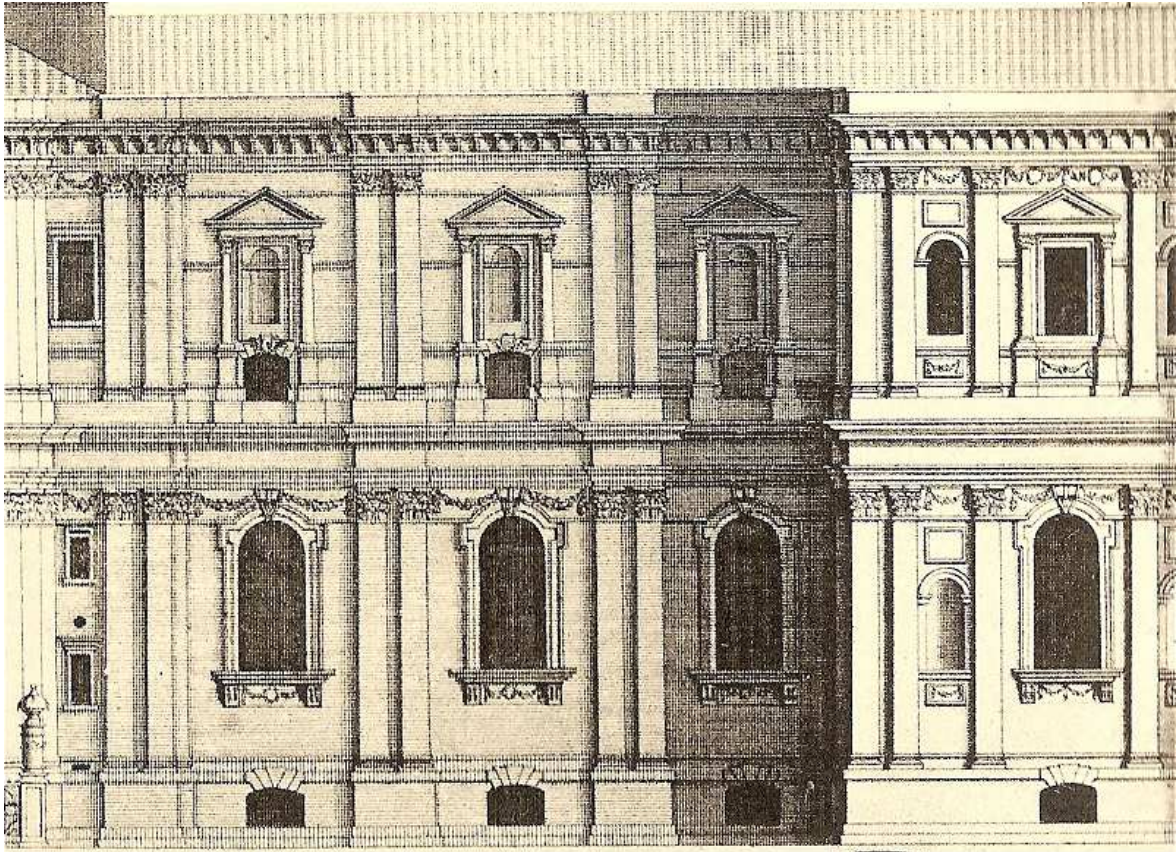


Fig 77 Extract from Hulsbergh's elevation of the N side, showing the difference in use of swags on the upper storey between the W chapels (right) and the nave

6.2 The panels below the windows by Gibbons

Gibbons carved 26 panels below the windows of the cathedral; eleven were recorded here.

The limewood carvings of Gibbons both at St Paul's and in many places elsewhere in Britain have been studied (eg by Esterly 1998), but there is very little research on his stone panels at St Paul's.

Further research will illuminate the Gibbons panels, which have only been partly recorded and reported here. Some of the others, such as those at the east end with carvings of doves (Fig 78), should be included in any discussion.

For the swags (festoons) and Gibbons panels, this exercise has been primarily to record a good sample in their state before and after cleaning.



Fig 78 Panel below the window at the E end of the N aisle, facing E (Bay EE01), cleaned state (August 2011)

7 Bibliography and abbreviations

Campbell, J W P, 2007 *Building St Paul's*

Esterly, D, 1998 *Grinling Gibbons and the art of carving*, Victoria and Albert Museum

Summerson, Sir J, 1993 *Architecture in Britain 1530–1830*, 9th ed

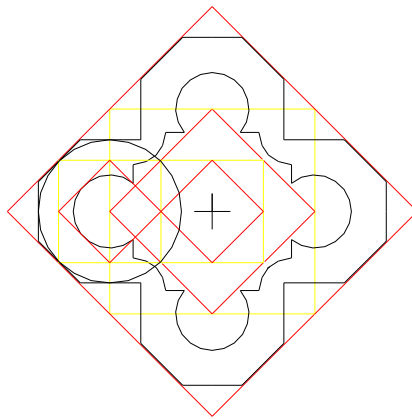
WS Wren Society volumes, 1923–43

8 Appendix: report on medieval architectural fragments

by Mark Samuel

St PAUL'S CATHEDRAL 2006 Intervention [PUF06]

***The Architectural Fragments:
A brief description and recommendations***



Architectural Archaeology

**For the Dean and Chapter of St. Paul's
April 2010**

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Introduction

An intervention in the fabric of St Paul's Cathedral in 2006 penetrated into the rubble core of Wren's church. This resulted in the discovery and removal of nineteen architectural fragments (AF). During December 2006, these were briefly recorded by Dr Schofield using the MoLA 'Worked Stone' recording sheet: they were then removed to storage below the West Front steps. Because a detailed analysis had already been made on AF recovered in similar circumstances in 1994-6, it was necessary to determine how much the 'new' assemblage incorporated unfamiliar material suitable for long-term retention. Conversely, less important items were noted as possible candidates for 'non-retention' (Note that 'non-retention' here includes the option of re-use for conservation, or some other constructive purpose.). The author inspected the stored fragments (28.7.09) and made additional notes on the sheets. The conclusions given in this report are provisional and may be subject to revision.

Circumstances of recovery and storage

The stones were all recorded from the same mass of wall core [1] and still had much mortar adhering to them. They seem to have been recovered without significant new damage. Current marking is 'minimalist' and needs to be enhanced. The stones are stored in stable if damp conditions that seem suitable in the short term, but this needs review by a conservationist. No conservation has been carried out.

The problem of physical storage of the stone and its relief was an important part of the assessment. The purpose of this exercise includes the recognition of 'repeats' and non-interpretable material which could be 'discarded' (see above).

The degree of ornateness of a stone is not the only criterion for retention or display: Paint finishes, graffiti and unusual building stone may also make a stone worthy of retention; at least on a temporary basis.

Each fragment was inspected and basic parameters set down on the pro forma sheets (see above) as a series of keywords, free text and (if necessary) sketches of moulding profiles. The author gave each moulding or element a date span based on art-historical criteria (normally the moulding) and/or tooling marks. Early Date is the earliest possible date. 'Importance' is rated **0-4**. Only items rated **3** or **4** are recommended for possible or certain retention (Table 1) and perhaps eventual display. Parity (if any) with earlier discoveries is also noted and references given.

Final marking should be carried out after cleaning and conservation is carried out.

19 items were inspected. The main conclusion is that 6 items can be disposed of without the need for further recording. 7 items need full recording and retention while another 6 need further inspection and perhaps some recording before reviewing the need for retention.

Conservation requirements are indicative only, as are geological identifications (given that neither subject is in the author's field of expertise). Some mention of these subjects is however inescapable. Geological identifications made by Dr Schofield and the author take into consideration Blow's findings (1998).

The Appraisal

Table 1: Items in numeric order

No.	Building stone (region)	Description	Comments	Frag? (%)	Early date	Late date	Importance
1	Taynton	Drum 370mm diam.	Equates to SPU96 <67>	100	1087	1190	3
2	Taynton	Drum 225mm diam.	First example	95	1087	1190	4
3	Taynton	Drum 310mm diam.	Equates to SPC94 <174>	90	1087	1190	3
4	Reigate	Quarter drum diam ?.	First example, recut 17Cy?	100?	1087	1190	3
5	Taynton	Quarter drum diam ?.	First example, recut 17Cy?	100?	1087	1190	3
6	Taynton	Ashlar	Recut 17Cy as stair well?	100?	1680	1700	2
7	Taynton	Ashlar	Recut	100?	1680	1700	2

			17Cy as stair well?				
8	Taynton	Quirk/roll/hollow voussoir, burnt	First example ?research	50	1087	1190	4
9	Taynton	Roll voussoir, burnt	First example ?nave aisle blind arcade	25	1087	1190	4
10	Taynton	Engaged colonnette drum	First example. Re-cut 17 Cy?	?	1087	1190	3
11	Reigate	Compound pier element?	First example.	25?	1087	1190	4
12	Caen	Ashlar	Re-cut 17 Cy?	?	1680	1700	1
13	Caen	Ashlar	Re-cut 17 Cy?	?	1680	1700	1
14	Caen	Compound pier?	First example	25?	1180	1220	4
15	Taynton	310mm diam drum	?Recut 17Cy	100?	1087	1190	3
16	Taynton	Ashlar	-	100	1150	1200	2
17	Caen	Label	First example: heavily weathered	75	1350	1540	2
18	Reigate	Subsidiary rib	First example: good parallel	75	1325	1350	4
19	Caen	Window jamb	First example: fresh	75	1150	1190	4

Some points about the retained assemblage

It is inevitable that the commonest elements in the medieval church are going to form the commonest survivals, and the PUF06 assemblage continues this pattern: the majority can be identified as drums from engaged shafts deriving from the initial Romanesque building campaign. This is no surprise, but few can be equated with drums recovered from the series of interventions in the 1990s (SPC94, SPU96 & SPV98). The ubiquitous 18" axial shafts from the nave piers (Samuel 1999, fig 7) are absent, suggesting the PUF06 drums derive from a different part of the Romanesque church. Some approximate the diameter of previously-encountered drums while apparently differing in the length of chord relative to the arc. Others have diameters not previously encountered or are cut to form quadrants. More research is required to determine if 17th-Century re-cutting is responsible for these peculiarities.

The 1990s excavation identified several possible blind arcade (nave aisle) and ?nave clerestory rerearch voussoirs (Samuel 1999, 26-7) . Further research is needed to see how these and the new discoveries <9> (blind arcade) <8> (rere arch) relate, but they show exactly the same evidence of intense heat damage seen in the earlier findings.

The PUF06 assemblage consists largely of the ubiquitous oolitic limestone identified by Blows and Worssam as deriving from the Taynton area of Oxfordshire. Limited evidence for the Romanesque-period exploitation of Upper Greensand ('Reigate stone') was identified in the 1990s (ibid, 44). The presence of two additional elements cut from this stone suggests that Reigate stone was more extensively used in this period than had been appreciated.

Apart from the poorly preserved label <17>, there is only one identifiable later medieval moulding which is however of real interest: a ribstone <18> derives from a small vault or a large monument. The moulding is closely paralleled by that used in the subsidiary ribs of the presbytery aisles at Ely which are documentarily dated to shortly after 1322 (Morris 1979, fig 14). This may indicate a connection between two major contemporary English projects and would support RK Morris' belief that the construction of the eastern arm '...dragged on well beyond the date of c.1280 implied by Dugdale' (1990, 89).

MWS 23.4.10

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Glossary

Ashlar

A rectilinear block used for wall facing

Axial termination

Term used to distinguish the two central (long-axis) 'points' of a mullion moulding (a rib moulding will have only one)

Label

A projecting moulding, polygonal or rectilinear in profile that surrounds the head of a window, door or other arched feature.

Moulding

A profile of infinite variability to which stones are cut where moulded ornament is required; usually at a point of change (i.e. the meeting of a wall faces with a window). The profile remains constant along its length. At the end, the moulding is either terminated with a stop, or made to 'die' into another moulding it meets, usually at ninety degrees. Dozens or even hundreds of identical moulded stones may be required in a single building campaign. Simple mouldings are usually created from combination of stereotyped sub-units such as the hollow chamfer, ogee and rebate. Fashion played an important role in their development and mouldings can occasionally be dated to a twenty-five year period; a fifty-year bracket is frequently attainable (see also type stone).

Oolitic limestone

A wide variety of English building stones are formed from the basic building block of the ooid or oolith. These spherical to sub spherical grains form around a nucleus such as a fossil fragment. The ooids can vary greatly in size, regularity and uniformity. Careful study of the ooids, fossils etc can allow the general area of a building stone to be determined

Rib stone

One of many identical moulded elements used to build up a rib. It is usually carefully curved and jointed to produce a regular effect. The size of the lost rib can usually therefore be approximately determined from a single loose rib stone

Roll

A continuous sub circular-sectioned projection within a moulding

Quoins

Dressed stones at the corners of buildings.

Type stone (see also moulding)

An entity used by the researcher only: The most complete or the first encountered example of a moulding. It may incorporate more than one moulding (i.e. the meeting of a window sill and jamb). It is not necessary for a moulding to be present, if there is some other reason for 'flagging' the stone (i.e. a structural element).

Voussoir

A single element or block of an arch.

Rickman's periods of English architecture

Norman 1066-1189

Early English 1189-1220

Decorated 1280-1377

Perpendicular 1377-1547

These modern coinings are still useful, but the precise cut-off dates are now not taken very seriously and the popular term 'Norman' has fallen out of academic favour, being replaced by 'Romanesque'. 'Perpendicular' is now usually subdivided with 'Tudor' for 1485-1547.