



THE
GEORGIAN
GROUP

Russell Taylor, 'Solomonic columns in
England: the origins and influence of the porch
of St Mary the Virgin, Oxford', *The Georgian
Group Journal*, Vol. XXIV, 2000, pp. 1-12

SOLOMONIC COLUMNS IN ENGLAND: THE ORIGINS AND INFLUENCE OF THE PORCH OF ST MARY THE VIRGIN, OXFORD

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Barley-twist columns – sometimes called Solomonian columns because of their supposed origin in Solomon’s Temple in Jerusalem – are a characteristic feature of Baroque architecture in the great Continental churches of the Counter-Reformation. It is strange therefore that one of the earliest uses of such columns was in Protestant England – the porch to the church of St Mary the Virgin in Oxford (Fig. 1). How did this occur, who was the designer, and was the significance of the form known to him? And where did he learn how to set out the difficult geometry to successfully make the writhing forms?

The most famous Solomonian (or Salomonian) columns are surely the four mighty bronze columns supporting Bernini’s baldacchino over the high altar in St Peter’s in Rome. Beneath the altar is the tomb of St Peter, in the same position since the building of the original basilica by Constantine the Great (326 AD). Bernini’s use of Solomonian columns perpetuated an arrangement established in the original construction. There, the tomb had been surrounded by six elaborate twisted columns, each a single block of marble some 14.8ft tall, of the composite order (or, it could be said, a highly decorated form of Ionic). The shafts divided into four compartments: two of spiral fluting alternating with two of carved vine leaves. The columns were carved about 200 AD and their pagan significance was Dionysiac.¹ Similar vine-clad columns survive elsewhere, as Asiatic elaborations of more regular



Fig. 1. The porch of St Mary the Virgin, Oxford (1637).
(Photo: Silvia Maiorino, 2015)



Fig. 2. Raphael, *The Healing of the Lame Man* (1515). Raphael's columns are closely based on those around St Peter's tomb in Constantine's Basilica. (Victoria & Albert Museum)

Classical forms.² Somehow the legend was attached to the columns that they had come from King Solomon's Temple in Jerusalem, perhaps for no better reason than their eastern origin. This is odd because nothing that could be interpreted as twisted columns appears in the descriptions of the Temple given in the Bible (I Kings 6 and II Chronicles 3).

The ancient original six columns were supplemented by a further six in a remodelling made in the reign of Gregory III (731–741).³ When the foundation stone of the new St Peter's was laid in 1506, Bramante was instructed to erect a temporary stone structure for the protection of the tomb, and the columns remained in place at least until the completion of the dome in 1593. However they were too small for the giant scale of the new basilica and were eventually relegated to the high level loggias in

the four crossing piers. Bernini's baldacchino with its four huge Solomonic columns, erected 1624–33, solved the problem of scale and provided a sort of continuity with Constantine's basilica.⁴

Until the rebuilding of St Peter's the distinctive form of Solomonic columns caused little interest or imitation. Perhaps the spirals of Cosmati paschal candlestands were a conscious evocation? Occasionally Solomonic columns are found in paintings or other two-dimensional media such as tapestries; of these the most influential were Raphael's cartoons for tapestries in the Sistine Chapel, (1515) which include, in the 'Healing of the Lame Man', a depiction of the Temple in Jerusalem.⁵ (Fig. 2) The columns are clearly those from Constantine's basilica: of the composite order, with two compartments of spiral fluting alternating with

two of carved foliage. Paolo Veronese may be cited as another example, notably in his murals (c.1560) in Palladio's Villa Barbaro at Maser.

Architectural examples of Solomonic columns preceding Bernini's baldacchino are fairly rare. Giulio Romano, Raphael's pupil and artistic executor, used them in Mantua, as yet another rich ingredient in the confections assembled for the Gonzaga family. In the Pavilion known as La Rustica (1538–39) – part of the Cortile della Cavallerizza at the Palazzo Ducale – he went beyond more or less copying the columns from Constantine's basilica and made Doric twisted columns with only spiral fluting.⁶ But his work was not influential; where Solomonic columns were accepted into the canon of sixteenth-century Classical architecture it was the type from Constantine's basilica that was used in both two and three dimensions.⁷

It was Bernini's baldacchino which seems to have made Solomonic columns acceptable. Here at the very heart of the Catholic faith was an order of architecture, a type of column, that was supposedly Biblical in origin: founded in the Old Testament and long associated with St Peter. Solomonic columns became a staple of church architecture, often in imitation of St Peter's, and used in association with an altar, either supporting a baldacchino or even more commonly framing an image. Initially the Constantinian form used by Bernini was followed, with compartments of spiral fluting alternating with compartments of carved foliage. It is an exotic ensemble and in its over-decoration it must have been difficult to combine with more traditional Classical elements such as entablatures and pediments. As the development of Baroque architecture moved towards an emphasis upon mass and space, the surface decoration was often omitted, leaving the shaft as a smooth barley-twist. In this form Solomonic columns are found from Sicily to Prague, and from Spain and Portugal to South America.

THE PORCH OF ST MARY THE VIRGIN

Built in 1637, the porch of St Mary the Virgin is an exceptionally precocious use of Solomonic columns, just four years after the completion of Bernini's baldacchino. It was built on the orders of Dr Morgan Owen (d.1645) a former chaplain to Archbishop William Laud, and was clearly part of Laud's attempt to introduce features and forms of worship that emphasised the Catholic origins of Anglicanism. The broken segmental pediment enshrines an image of the Virgin and Child, alluding to the dedication of the church but so deeply offensive to Puritans, that it was cited at the trial that led to Laud's execution.⁸ St Mary's is the University church, and was used for degree ceremonies until the Sheldonian Theatre was built (1663–69), so it may not be too fanciful to say that the use of Solomonic columns refers to the wisdom that may be gained from a university education.

The porch is a Classical addition to a Gothic structure. At the time of its construction Inigo Jones was adding his huge Corinthian portico to old St Paul's in London (1633–42), another medieval building. The 'brief' for St Mary's was a more difficult one, since it required iconographic symbolism of a type more usually found in painting than in architecture. And it was painting and a painter who provided the design source.

Peter Paul Rubens's paintings for the ceiling of the Banqueting House in Whitehall were being painted from 1632 to 1634. In one of the central panels ('The Reign of Solomon: The Golden Age of James I') the King is shown as Solomon dispensing wisdom for the benefit of his realm. He sits in an aedicule formed of Solomonic columns capped by a broken pediment. The overall shape and form is reminiscent of St Mary's porch.⁹ Rubens's gifts and interests extended beyond painting into architectural design, as shown by his *Palazzi di Genova* (1622) and the design for his own house in Antwerp, remodelled and enlarged in 1610–15. Another of his architectural designs has particular relevance for the St Mary's



Fig. 3. Sir Peter Paul Rubens, design for the altar of the Jesuit Church, Antwerp (1620).
(*Albertina, Vienna*)

portal: the altar of the Jesuit Church in Antwerp (1620), now St Charles Borromeo (Fig. 3). The altar was not built, but the similarities between Rubens's drawing and the St Mary's porch are remarkable. It seems to have been the principal design source.

The design of the Antwerp altar features

Solomonic columns, but they are not the most architecturally advanced feature, as Anthony Blunt noted:

'[Rubens] not only used Salomonic (sic) columns and a broken pediment, but the curved elements of the pediment form S-curves, a device hinted at in the attic windows of the Porta Pia [in Rome] but not generally used till it was popularized by Andrea Pozzo in the late seventeenth century. In fact Rubens did to Michelangelo what no Italian architect did before Borromini: he absorbed the most revolutionary features of his late works and transformed them into something new and highly personal.'¹⁰

Both Rubens's drawing and the St Mary's porch have Solomonic columns. Both have modillion cornices combined with pulvinated friezes, and both have S-shaped, curved, broken pediments supporting angels who engage with the central image. The very forms which Blunt found to be ahead of their time can be seen here on an English church. The conclusion that the designer of the portal had seen Rubens's design is inescapable.

The only person to whom payments were recorded at St Mary's was John Jackson (*c.*1602–1663), who had recently worked on the Canterbury Quadrangle at St John's College, Oxford (1634–1636).¹¹ There he was directed by Adam Browne, who provided 'the drafts of the fronts', but, as Howard Colvin noted, the design, or rather the individual designs, are likely to have come from Hubert Le Sueur (before 1585– after 1658), Balthazar Gerbier (1592–1663), Nicholas Stone (*c.*1587–1647), or someone else from within the royal circle.¹² Later in his career, Jackson was the mason for the chapel and cloister at Brasenose College (begun 1656), but here the Classical elements are less coherent than either the Canterbury Quad or the St Mary's porch; the Gothic plaster fan vault of the chapel is the most accomplished feature. Significantly, this the only part for which he received payment for supplying a design.¹³

The porch at St Mary's was attributed to Nicholas Stone in a list of his works compiled after

his death by his nephew, Charles Stoakes. He wrote: ‘The Noble Frontispiece with Twisted Collums hee desind & built at Stt Mary’s Church att Oxford.’ The porch, however, was not mentioned in Stone’s own notebook or in his account-book for the years 1631–42. But these are not definitive; for example, they do not mention designs for the first Goldsmith’s Hall, mentioned by Stoakes and supported by documentary evidence.¹⁴ Stone may indeed have edited his own record for political reasons; the porch was a product of the Royalist and Laudian circle, and by 1641 or 1642, when the notebooks were compiled, it may have been safer to omit to mention such work.

The design combines both Classical and Gothic elements. Behind the arch, between the porch itself and the wall of the old church, there is a fan vault: something also found in the Canterbury Quad and at Brasenose. This led Colvin to propose Jackson as the possible designer of the porch. But his contribution to the overall design may have been limited to the vault. For the frontispiece to the High Street someone was needed who was both in touch with Continental Classicism and technically proficient. Like Jackson, Nicholas Stone was both a contracting mason and a designer, but at a far higher level than Jackson. He built the Tulip Staircase in Inigo Jones’ Queen’s House in Greenwich (1630–35), the first stone cantilevered staircase in England. Here he introduced a device which made all subsequent stone cantilevered stairs possible – a rebated joint across the bottom of the riser which connects one step to another. It works by ensuring the individual stone steps do not cantilever, for if they did they would snap in two. There is no reason not to credit Stone with the invention of the riser rebate.¹⁵

Stone also excelled artistically, as seen in his memorials to John Donne in St Paul’s and to Francis Holles (d.1622) in Westminster Abbey; the latter has Holles seated in Roman armour in a pose clearly based on Michaelangelo’s Medici tombs.¹⁶ It is possible that he would have seen Rubens’s drawing for the Antwerp altar. He was apprenticed to Henrick

de Keyser and was in the Netherlands from 1606 to 1613, where he may have met Rubens. Later he was the mason at Inigo Jones’s Banqueting House, and any acquaintance could have been refreshed when the ceiling was being painted and installed.¹⁷ Both his technical brilliance and his connections with the artistic *avant garde* of the 1630s make it likely that he was the designer for St Mary’s porch.

THE DESIGN AND CONSTRUCTION OF ST MARY’S PORTAL

If we accept Rubens’s design for the Jesuit Church as the inspiration for St Mary’s porch it presents two difficulties. First, it features an arch (and internally a vault) with the considerable additional load of the figure of the Virgin Mary in her aedicule, whereas Rubens shows just a straight lintel. The thrust of the arch must be buttressed and the second line of Solomonic columns shown in Rubens’s drawing would be insufficient. Second, Rubens’s outer line of Solomonic columns have three quarters of their width showing from behind those in front. In three dimensions this does not work satisfactorily; the hollows of the columns will meet in a way that looks uncomfortably unresolved. These difficulties are neatly overcome at St Mary’s by projecting the wall plane of the arch beyond the corner (easily understood as such because it carries a section of impost moulding) to which are attached pilaster strips: those at the front directly behind the Solomonic columns; and those at the sides, which project further, evolving lower down into compressed volute scrolls standing on extended pedestal bases (Fig. 4). It looks right and obvious but it is a clever solution, a solution that is part of the Baroque language. If it had been left to John Jackson, a mason more used to the Gothic tradition, it would probably have looked very different.

The ultimate origin of volute buttresses is the Renaissance desire to link a high nave with lower



Fig. 4. The porch of St Mary the Virgin, Oxford (1637), showing the buttresses – the upper part is partly obscured by a protected tree. (*Silvia Maiorino*, 2015)

side aisles in a Classically composed church façade, as at S. Maria Novella, Florence, by Alberti (1456–70). These visual links gradually evolved into more canonic volute scrolls – for example *Il Gesù* in Rome as completed by Giacomo della Porta (1584) – and they were even used by Inigo Jones in his refronting of St Paul’s (1633–42). But it was an inspired adaptation at St Mary’s to bring them down to street level. And then, rather than leaving them as separate, isolated elements they were organically united with the arrangement of pilaster strips – an advanced Baroque motif used by Carlo Maderno at

S. Susanna, Rome (1597–1603) and on an epic scale by Baldassare Longhena at S. Maria della Salute, Venice (1631–82).

Other parts of the porch work less well. It is a design to be attached to an existing building and the details of how it was to be done were never worked out and integrated into the design. There are three zones: the porch itself with Solomonic columns, scrolled pediment, volute buttresses, etc; the original church wall containing the door into the church; and the masonry between. The masonry between tells an interesting story. To reconcile the scale of the large



Fig. 5. St Mary the Virgin, the fan vault within the porch.

Note: the adjustments to accommodate a perfect fan vault, rather than the vault being adapted to fit the space. (*Silvia Maiorino*, 2015)

arched porch with the much smaller original doorway the builder splayed the side walls inwards from just behind the arch pilasters to the door surround. By encasing this in new masonry, the Gothic stepped buttresses which divide the bays of the side of the church were hidden. All this was very reasonable, but the fan vault inside the porch posed a problem (Fig. 5). To work properly the long side (with the door) had to be exactly twice the length of the two splayed sides, but it was not, and the builder was forced to make an adjustment by moving the springing of the vault inwards from the internal

corner. He could have adjusted the geometry of the vault to fit the space but he chose not to, presumably because a perfect fan vault mattered more to him than a vault perfectly related to the space below it.

THE GEOMETRY OF SOLOMONIC COLUMNS

Rubens's drawing provides a source for the composition but not for the smooth barley-twist column shafts. The source for these was Vignola's

treatise, *Regola delli Cinque Ordini d'Architettura*, first published in 1562 (2nd edition 1572). Plate 31 shows the setting-out geometry for the underlying form of a Solomonic column, before the spiral fluting and floral decoration is added (Fig. 6), and also gives two methods for setting out entasis. According to the instructions engraved on the plate:

'If one wanted to make columns straight but twisted, similar to those in the church of St. Peter in Rome, it would be necessary to start from the horizontal plan as shown in the drawing. The small circle in the middle determines how much the column is to twist. Once it has been divided into 8 parts and the 4 lines parallel to the central axis of the column have been drawn, the entire column is to be divided into 48 parts. Thus one should form the central spiral from which the thickness of the column has to be measured, line by line, as shown. Since the laying out must start in the

centre, one should be warned that points 1,2,3,4 indicated in the plan should be used between the bottom of the column and the first crest. Further up one should follow the small circle except that, in order to determine the last half cycle of ascent, one should use the 4 points as at the bottom.'¹⁸

The result is six 'crests' or swellings on each side: six, because the 48 vertical divisions divided by the eight points on the setting-out circle equals six. There were only five in Old St Peter's,¹⁹ four in Rubens's design for the Jesuit Church in Antwerp (their profile is more a wavy line than firm geometry), and three or four in Giulio Romano's building at Mantua. But there are six in the columns of St Mary's porch, and most of the designers of the smooth barley-twist shafts in the Baroque churches of Europe also followed Vignola's method.

The first English edition of Vignola was published by Joseph Moxon in 1655, long after the construction of St Mary's porch. Setting-out instructions were not therefore available in English. But other languages were: polyglot editions of the *Regola* in Italian, Dutch, French and German had been published in Amsterdam in 1617 and in Arnhem in 1620.²⁰ It is unlikely that John Jackson was fluent in any languages other than English, but Nicholas Stone, having lived in the Netherlands from 1606–13, must have been reasonably fluent in Dutch and was therefore capable of following the setting-out instructions.

It should be noted, though, that the adherence of the Solomonic columns in St Mary's to Vignola's setting-out geometry has been obscured by subsequent restoration; on the evidence of a comparison of old and recent photographs it appears that the original form of the Solomonic columns has not been accurately reproduced. Old photographs show equal dimensions between the crests, as must occur when following Vignola. But now the dimensions vary with the distance between crests noticeably greater at the bottom of the shaft than those at the top (Fig. 7).

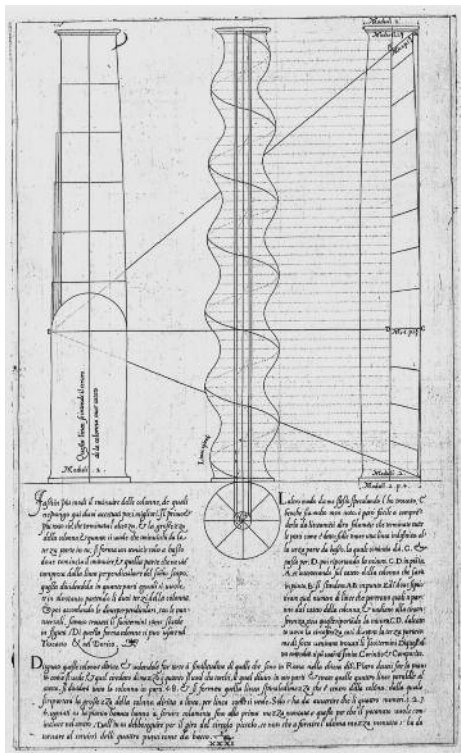


Fig. 6. Plate XXXI of Vignola's *Regola delli Cinque Ordini d'Architettura* (2nd ed. 1572).



Fig. 7. The right hand Solomonic column in St Mary's a photograph of 2014 compared with one c.1960. The old image clearly shows equal dimensions between the crests (in adherence to Vignola's method) in the modern image the dimensions are markedly greater lower down the shaft than they are at the top.

LATER HISTORY IN ENGLAND

It is possible that the first use of Solomonic columns in England was not at St Mary's but at Aldermaston Court, Berkshire. The house was burned down in 1843, but it was illustrated and described in J. P. Neale's *Views of the Seats of Noblemen and Gentlemen* (1828):

'In 1636 Sir Humphrey Forster Bart Built the magnificent family mansion now remaining in its original state, as appears by the inscription still existing over the door-ways of the principal front ... It is a large brick mansion with a bold blocked cornice, having two doors in the principal front, adorned with twisted columns.'

Neale's engraved plate shows twisted columns surrounding the porch, though they may be conventional columns with applied mouldings spiralling up them, and the pediment is perfectly ordinary, unlike the broken segmental pediment at St Mary's church.²¹

Exactly contemporary (1637) with the porch at St Mary's is a fireplace surround in Ham House designed by Francis Cleyn. This has a Constantinian compartmented shaft, but with the proportions grossly adjusted to suit the space and, interestingly, Ionic capitals. The Solomonic columns in Cleyn's design are pilasters but are hardly used

architecturally, for they do not carry an entablature, only floral decoration.

The next significant use was after the Restoration, in the Royal Chapel at Windsor (1680–84) (now destroyed), a collaboration between the architect Hugh May and the painter Antonio Verrio. Real Solomonic columns stood on each side of the altar, and matching columns painted in *trompe l'oeil* continued around the other three walls to create the illusion of a chapel ringed by a Solomonic colonnade.²² Was this a deliberate act of provocative symbolism by a monarch sympathetic to Catholicism? Solomonic columns also feature in the reredos of Hawksmoor's St Mary Woolnoth (1716–27) in the City of London; here the design was clearly based on Bernini's baldacchino, with a scallop-edged and tasselled valance replacing the entablature.²³ They were also used occasionally as a novelty in secular buildings, as in the entrance to

Clifton House, Kings Lynn (c.1708), perhaps by the local architect Henry Bell (Fig.8).²⁴

Palladianism and the Classical styles that followed had no use for Solomonic columns, except when the use was limited to barley-twist shafts, as balusters or chair-legs, not columns. There could have been a return to the use of Solomonic columns during the Edwardian Baroque revival of the twentieth century, but the projects were civic and capitalist rather than religious and it never happened. The last significant use of Solomonic columns in England was for the baldacchino of St Paul's Cathedral, 1950, a new design by Stephen Dykes-Bower (with, it is said, some assistance by W. Godfrey Allen) replacing G. F. Bodley's war-damaged reredos, an assured and utterly convincing neo-Baroque design that underlines how good an architect Dykes-Bower was.²⁵

Fig. 8. The street entrance to Clifton House, Kings Lynn (c.1708). The drawing accurately shows both Solomonic columns spiralling up in the same direction, anti-clockwise, a deviation from the almost universal practice of symmetrical arrangement on opposite hands. (*Architectural Press*, 1927)



CONCLUSION

Dr. Morgan Owen would not have precisely identified design sources in his commission for St Mary's porch. It is unlikely that John Jackson knew of Rubens's design for the Jesuit Church in Antwerp, and he may not have had access to a copy of Vignola's treatise in any language. Nor is he known to have designed anything himself in a Classical or Baroque idiom at this stage of his career.²⁶ On the other hand, everything points to Nicholas Stone's authorship for the design. There is the near-contemporary attribution to him in Stoakes' list of works. He is likely to have had contact with Rubens and access to Rubens's design for the Jesuit Church. He was in the artistic avant-garde and moved in the right circles. He understood construction and the need to buttress the thrust of the arch in an appropriate, Baroque manner. The setting-out instructions for the columns were available in Dutch, a language he understood. If he had also been the contracting mason, and not Jackson, the finished work might have been more directly and powerfully Baroque. But it turned out as a hybrid of Gothic and Classical; that is what people remember and comment on, and consequently it is not taken all that seriously. To many it looks as if the Baroque motifs are poorly understood or arrived at by accident but, they are not. The designer was aware of the Baroque developments in Italy and the Netherlands. Unfortunately, John Jackson, the man actually making it, was less in tune with the Baroque spirit. Completed in the right way and at a more favourable time in history St Mary's porch could have been an influential design, but it was not to be, and it remains a compelling curiosity.

ENDNOTES

1. W. Tronzo (ed.), *St Peter's in the Vatican* (Cambridge, 2005) chapter: *Spolia* by Dale Kinney, pp. 30–37; also J. Lees-Milne, *St Peter's – The Story of Saint Peter's Basilica in Rome* (London, 1967), pp. 79–80.
2. One of the most similar may be the column with carved vine decoration from the Temple of Hadrian at Cyzicus (117–168AD) now in the museum at Erdek, Turkey. Spiral fluting on otherwise conventional columns can be seen at the Synagogue in Sardis (second or third century AD) and the temple of Aphrodite in Aphrodisias (first century BC) both in Turkey. An example of a decorated and carved shaft is the acanthus column from Delphi (third century BC)
3. It seems extraordinary that after four centuries a reasonably similar further six were found: Tronzo, *op. cit.*, pp. 30–37. They were a present from the Exarch of Ravenna: Lees-Milne, *op. cit.*, p. 96.
4. Lees-Milne, *op. cit.*, pp. 95–97 & 251–253
5. The cartoon is now in the V&A. The Solomonic columns appear to be in ranks of four supporting an external colonnade around an external courtyard. Having decided that Solomonic columns originated in the Temple, Renaissance artists were faced with the problem of how they were used there. 'The Circumcision' by the studio of Raphael (Louvre) shows ranks of closely spaced Solomonic columns supporting a vast ceiling to create a hilariously wobbly space. 'The Purification of the Temple' by Marcello Venusti (after 1550, National Gallery) shows Solomonic columns supporting a dome and pendentives, abandoning any attempt to recreate archaic architecture.
6. A. Belluzzi & K. W. Forster in M. Tafuri (ed.) (translated by F. Barry), *Giulio Romano* (Cambridge, 1998), pp. 200–1 and Fig. 243
7. Other three dimensional examples may be known but the only ones known to the author are a fountain in the gardens of the Villa d'Este at Tivoli, 1573, by Pirro Ligorio (d.1583) and smaller, mediaval copies of those in St Peters, a pair in S. Carlo, Cave (outskirts of Rome) and a pair, now destroyed, in S. Chiara, Naples: Tronzo, *op. cit.*, pp 125–130.
8. H. M. Colvin, *The Canterbury Quadrangle* (Oxford, 1988), p. 119.
9. For a discussion of the iconography of the ceiling, and the Banqueting House in general, see R. Strong, *Britannia Triumphans Inigo Jones, Rubens and Whitehall Palace* (London, 1980).

10. A. Blunt (ed.), *Baroque & Rococo Architecture & Decoration* (London, 1978), p. 147
11. H. M. Colvin, *A Biographical Dictionary of British Architects, 1600–1840* (New Haven and London, 2008) pp. 561, 991.
12. Colvin, *Canterbury Quadrangle*, pp. 44–52.
13. E. W. Allfrey, *The Architectural History of the College* (Brasenose Quatercentenary Monographs, III, Oxford 1909), pp. 25–28.
14. W. L. Spiers, *The Note-Book and Account-Book of Nicholas Stone* (Walpole Society, VII, Oxford, 1919) p. 137; confirmation for the construction of Goldsmiths' Hall is given on p.10.
15. R. Taylor, 'Revealing Masons' Mysteries', *The Architects' Journal*, 26 Sept 1989. It should be noted that, as with St Mary's porch, the attribution for the Tulip Staircase relies on Stoakes's list (Spiers, *op. cit.*, p. 136). Stone was appointed Master Mason in the King's Works in 1619, with Inigo Jones as Surveyor General.
16. For an assessment, see M. Whinney (Revised J. Physick), *Sculpture in Britain 1530–1830* (Harmondsworth, 1988), pp. 67–80.
17. Spiers, *op. cit.*, pp. 2–3 & 9–10.
18. Translation from B. Mitrović, *Giacomo Borozzi da Vignola: Canon of the Five Orders of Architecture* (New York 1995). In his commentary, Mitrović notes that the setting out for the transitions at the top and bottom of the column (the small circle and points 1, 2, 3 and 4) is not shown correctly. 1 should be $\frac{1}{4}$ along the radius; 2, $\frac{1}{2}$ way; 3, $\frac{3}{4}$ along; and 4 (as shown) on the circumference. In practice, once the principles are understood this error would be easily overcome.
19. In his introduction (plate 2 of the *Regola*) Vignola says that he based his treatise on a study of the antiquities of Rome. For Solomonic columns, though, he seems to have deviated from the example of those in St Peter's geometrical analysis (based on just a visual inspection, not a geometrical analysis) His adherence to the precedents of antiquity was far from slavish; for example, his second method for entasis is, he admits, entirely his own invention. It gives a slight diminution towards the base – a form unknown in antiquity.
20. A reasonably complete list of all editions in all languages is given (in French) on the website www.architectura.cesr.univ-tours.fr.
21. On the basis of the use of Solomonic columns, both T. Mowl & B. Earnshaw (*Architecture without Kings*, Manchester, 1995) and Giles Worsley (*Inigo Jones and the European Classicist Tradition*, New Haven and London, 2007) attribute both St Mary's porch and Aldermaston Court to John Jackson.
22. The Chapel was illustrated in W. H. Pyne *Royal Residences*. The original watercolour (by C. Wild) and a short description are reproduced in D. Watkin, *The Royal Interiors of Regency England* (London, 1984), pp. 30–31.
23. See V. Hart, *Nicholas Hawksmoor – Rebuilding Ancient Wonders* (New Haven and London, 2002), pp. 93–94. Hart suggests that Hawksmoor was inspired by prints of St Peter's in his possession.
24. A measured drawing of this doorway appears in *The Practical Exemplar of Architecture*, a series of loose-leaf portfolios published by the Architectural Press, Fourth Series (of seven) Plates 7–8 (1927).
25. A. Symondson, *Stephen Dykes Bower* (London, 2011) pp. 24–31.
26. His later *oeuvre* includes a design for Welford Park, Berkshire, commissioned by Richard Jones after 1652: Colvin, *Dictionary*, p. 561; G. Tyack, S. Bradley and N. Pevsner, *The Buildings of England: Berkshire* (New Haven and London 2010).