Borromini's S. Ivo alla Sapienza: the spiral

Borromini's S. Ivo alla Sapienza is not exactly an under-interpreted building. Almost from the beginning, perhaps with a malicious nudge from Borromini himself, the plan was interpreted as an image of the Barberini bee. The star of Solomon entered the picture with a print of 1720 and soon made itself indispensable: it is invoked in a broad range of modern interpretations that revolve around the concept of the Domus Sapientiae. The sapiential literature of the Old Testament, especially the verses from Proverbs 9 inscribed on Borromini's presentation drawing, have been used to shed light on the design, but so has Ripa's Iconologia, Prudentius's Psychomachia, Fluid's pansophistic writings, and the orations of Roman seminarians delivered on the feast of S. Ivo (though in another church).

But it is the exotic lantern and spiral (Figs. 42, 44 and 57), the feature that the architect insisted on calling the "tempietto sopra al tempio della Sapienza", that has called down on itself much summer lightning. To some it seems to have a tower of Babel, inspired by Heemskerk's prints or by a spiral-shaped auto-maton, or more appropriately in this context an anti-Babel, converted and redeemed to serve a Christian university. Others have seen an image resembling Ripa's Philosophy, or the pillar of the Church, or the papal tiara (spiralled for easy maintenance), or Mount Purgatory in a particularly dynamic baroque form. Since the spiral clearly culminates in flames, explanations which include incandescence have an edge over all others. A guidebook of 1690 saw the flaming spiral as the Pharaohs of Alexandria, and several modern scholars have arrived independently at the same notion. Others have seen in the flames the column of fire that guided the Israelites in the desert by night, or Ripa's "Intellect", or the flames of the charity of the generous, fee-spurning medieval saint, St Yves Hélory de Kermartin, who took the church on consignment, so to speak.

Some scholars, put off by the number and inconsistency of the interpretations, have proposed that the spiral means nothing at all, or is merely a virtuosic demonstration of the mathematical culture of the times. Finally, the presence of seashells in Borromini's personal collection has seemed to open a path towards an interpretation in the light of contemporary theories about nature, seen either through an allegorical Tridentine lens, best represented by the Jesuits Kircher, Bartoli and Buonanni, or through what Krzysztof Pomian has called the 'culture of curiosity'.

The interpretation of the spiral which follows is based on several new presuppositions. First, it tries to retrieve meaning from the specific context of the Roman Sapienza, not ignoring the general decline of the institution in the period under discussion or the challenges posed by rivals. More generalities about Christian education are not sufficient for a close reading of the image. Secondly, it rejects the notion that an architectural image can mean something only because it looks like something else — such as an emblem, a cryptic diagram or an image of some previous building. At S. Ivo, I would like to propose that the spiral can be read like a sentence, with each element being a word and the whole construction designed to enunciate a meaning that was relevant and new. It was not simply a picture, and it was important that it could be climbed, since out of a possible lived experience for a few it offered a symbol of vicarious experience for many.

Finally, it is important to remember the dynamics of the commission. The spiral was the creation of Innocent X Pamphilj (1644–55), the second of the three popes who built S. Ivo. I will argue that it was not yet present in the design approved by Urban VIII Barberini (1623–44), the pope who began the building. Furthermore, like the church of S. Agnese, it was an idea of the end of Innocent X’s pontificate, not of the beginning. But, unlike S. Agnese, the spiral of S. Ivo cost very little. Urban VIII had spent about twelve thousand scudi on the bare structure of the church and cupola, and Alexander VII Chigi (1655–67), the pope who finished S. Ivo and added the Biblioteca Alessandrina, would spend over twenty-five thousand. Innocent X’s ‘tempietto’ cost only 1,600 scudi, including both structure and decoration, less than the amount that Alexander VII would later spend on the marble

* I am especially grateful to Elisabeth Kieren, Henry Millon, John Pinto and John Belton Scott, to Lucio Lami, Donato Tambò and Aldo Mastroianni of the Archives di Stato di Roma, to Richard Bosel and Veronika Birke of the Albertina in Vienna; and to my fellow climbers, Peter Riebenhofer and Christoph Frommel. Research was supported in 1986–87 by the Guggenheim Foundation and the American Academy in Rome, in 1994–95 by the National Endowment for the Humanities, and throughout by Columbia University, all of whom I thank.

† Rome, Archivio di Stato, Fondo Università, vol. 113, fol. 57r (hereafter citations from this source are abbreviated in the following format: ASR U 113.57r). "L’antiomelia (cioè la visione del Cattalino) che è la sommità della cima, cioè il tetto spiovente, che sorge sopra alla cupola coperta di palude" (ASR U 169.19v). In November 1655 Borromini began a full-sized wooden model for a large new lantern on S. Agnese, which he also called a 'tempietto' (G. Sermonti di S. Agnese in Naavna, Stockholm 1970–71, II, pp. 411–12).

‡ For a partial list of interpretations of the spiral, see Appendix B, below.

§ For a partial list of interpretations of the spiral, see Appendix B, below.


floor. And yet it is the spiral that allows the small cupola to make a mark on the Roman skyline.

Four Borromini drawings of 1651–52 allow a reconstruction of the design at the time when the spiral was still in formation; then four prints or drawings of 1653–55 show us what the cupola looked like at the end of Innocent X's pontificate. Alexander VII did not touch the spiral but he did change almost everything standing beneath it, from the exterior of the drum and the prospect on Piazza S. Eustachio to the interior walls and the decorations of the dome. But

Costs can be only imperfectly gauged from the occasional estimated summary or mandaglie preserved in the documents. A summary of 1661 says that the ampianti cost 1606 scudi, plus related expenses of 195.57 scudi for the north portico and 154.79 scudi for the 'fianmento del tetto' (i.e., the attic over the courtyard extra), which we know from other sources were all incurred under Innocent X (U 198.58r). The same document implies that 11,983.90 scudi were spent on construction up to but not including the ampianti, which would mean the rustic shell of Urban VIII and the lead roof. A summary in U 108.134r estimates costs up to 1636, that is, under Urban VIII and Innocent X, as 14,066.50 scudi. Another summary in U 115.47v totals 17,693.67 scudi, including the lantern. Another in U 115.406r says that the estimated costs of the east façade, the library and the completion of the stuccoes inside and outside the church came to 18,923.76 scudi; the stuccoes alone were contracted at 3700 scudi. The highest estimate for costs incurred under Alexander VII is 25,349.12 scudi, given in Rome, Biblioteca Apostolica Vaticana (hereafter abbreviated as BAV), Chigi H.11.62, fol.205v, though Carlo Cartari reported in 1664 that Alexander VII said that to date he had given 20,000 scudi to the Sapienza (ASR, Cartari-Fefei, vol.80, fol.85r).
although heraldry and even much of the basic structure changed under this pope, the ‘iconographic sentence’ of the spiral was put into a context that largely echoed and reinforced its meaning.

The Church under Urban VIII (1642–44)

In the terrible, war-torn years at the end of the Barberini pontificate the basic structure of S. Ivo was finished in rustic brickwork. On 9th September 1642 a contract was agreed with the masons, and scarpeletti were signed on in June 1643. The basic structure took a year to build and reached up to the level of the drum. On 23rd July 1644, when Urban VIII lay on his deathbed, the rector of the university thought it prudent to buy locks and chains. The pope died on 29th July 1644. On 12th September, while the difficult conclave was still in session, the masons signed a contract to finish the vault. Three days later the election of Innocent X was announced. The vault was finally finished in October, during Innocent X’s pontificate but not on his initiative.6

What the church looked like at this point can be seen in a crude print of 1652 (Fig 43).7 There are some inaccuracies: the cupola never had columns between the windows or a scalloped cornice. But from the beginning it did have six powerful apses, as the print shows, which bulged out ‘like the six petals of a rose’.8 These are Borromini’s homage to the temple of Minerva Medica and its late-antique progeny. The print accurately shows one steeped vault divided into separate gores, each rising to a central platform. But it is important to note what is still missing, aside from the lantern and spiral: the ‘contraforti arbolesciti’ (six buttresses that curl down from the lantern like ski slopes), and the ‘porticellè’ (six arched counterweights with balls on top, often compared to the merlons on Michelangelo’s Porta Pia).

Documents tell us that this vault, ‘of extraordinary workmanship, with many separate curves, requiring an expensive centre of a most unusual type’, had to be torn down and rebuilt several times to please the architect. Although there are no sketches of the interior at this early stage, it is possible to say something about its appearance by working back from the changes introduced by Alexander VII. In general it was more perforated and open than it is now. There were originally twelve niches in the upper levels of the walls corresponding to those on the lower level; the upper niches were later immured. There were large portals at ground level affording direct entrance from the two side corridors; Alexander VII walled them up to make the present tortuous entrance routes through the sacristies. Over the doors there were large windows that offered a view into the church from the piano nobile.9 The two choir balconies flanking the high altar were not yet there; behind blank stretches of convex wall (‘petto’) in this area there were hollow shafts that were meant eventually to contain spiral staircases.10 Finally the high-altar chapel looked rather different. It had doors or windows communicating with the flanking hexagonal rooms on both levels, or at least on the south, since the rooms on the north were not yet built. There was an arch above the entrance to the chapel; Alexander VII later introduced a flat lintel and some spectacular lighting effects over the altar, none of which remain today.11

The Church under Innocent X (1652–53)

The raw shell that Urban VIII left to his successor must have looked like a ruin from Hadrian’s Villa. In his haste to call the Barberini to account for their maladministration of state funds during the War of Castro, Innocent X became embroiled in a larger political conflict with the Barberini’s new-found protector, Cardinal Mazarin of France. In these years there was very little incentive for the new pope to take over the patronage of a church with strong Barberini associations and, although he hoisted a painting of the Pamphilj

6 ASR U 198.87f: M. DEL PIANZI: Raggiagli borrominiani, Rome [1968], pp.132ff, and 233f.
9 Alexander VII closed these frescoes (ASR U 115.356v) but left small windows 5½ palmi wide which are still visible on the plan drawn in 1721 by Johann Conrad Schlaun, now in Münster, specifically the ‘Planta superieure’ of the set mentioned by KÖNNEN (ibid. cit. at note 9 above, p.234, note 163, with earlier bibliography). Later the 5½ palmi windows were sealed entirely, but vestiges of them can still be seen today in the two cloisters which are entered from the balcony-bridge at piano-nobile level.
10 The shafts were 7 or 7½ palmi in diameter and rose 4½ palmi from the piano nobile level up to the vigilia scoperta. Alexander VII carved away the ‘petto’ of wall in front of each shaft to make two cortei, matching the coretto over the main entrance, in 1656–60. But the upper reaches of these shafts still survive at the level of the vigilia scoperta, where they are used as storage chambers. One is 3 palmi in diameter and the other 7½; both are shown on modern plans for electrical wiring.
11 These changes were first discovered by E. GRIFFEL and A. MAREC: Il complesso della Sapienza: lettura critica dei documenti d’archivio e loro ripartizione sul manufatto ad fini della conservazione, unpublished硕er of Later, Università degli Studi di Roma, Facoltà di Architettura, 2 vols, 1981-82 (copy in Bibliotheca Hertziana, Rome); the thesis is summarized in ad. et: ‘Il complesso della Sapienza: le fasi del cantiere, gli interventi successivi al Borromini, le manutenzioni’, Ricerche di Storia dell’Arte, XX [1983], pp.59-64. In Appendix A, below and elsewhere, I have always transcribed the documents from the originals in the ASR, Bando Università, ELEZIATAI KREYOS, in a perceptional analysis of the changes (op. cit. at note 10 above, pp.65ff.), compares the original appearance of the interior to the façade of S. Maria dei Sette Dolori.
arms over the university door in October 1644, he made no moves to continue the building. On the contrary, he weakened the financial base of the Sapienza by abolishing the Capitoline office of Riformatori dello Studio, and also by ordering the Capitoline authorities to finish the third palace on the Campidoglio, an expensive undertaking that would last his pontificate and consume their slender resources.

The Consistorial Advocates, the elite corporation of lawyers who controlled the all-important legal faculty at the Sapienza, made several moves to finish the church in the later 1640s, and to prevent damage from water infiltration they covered the cupola with lead between December 1648 and January 1649. Carlo Cartari, the lawyer whose entire career would be bound up with the Sapienza, commissioned some sort of perspective drawing of the Sapienza from a certain Cavaliere Falucci. We have no idea of what it looked like, but perhaps it briefly charmed the pope, since he issued a chirograph in April 1649 allowing the corporation to borrow eight thousand scudi to finish the church. But still nothing happened.

Innocent X turned to S. Ivo only in 1652, after two-thirds of his pontificate had already passed. This anticipates by a year or so his final reconciliation with the Barberini in June and July 1653, which included the marriage of his great-niece, Olimpia Giustinian, to Maffeo Barberini, the promotion of Carlo Barberini to the Sacred College, and finally the return of Antonio Barberini from Paris. The lantern and the spiral were begun in March 1652 and quickly finished; the iron superstructure was in place and gilded by the end of October 1652. Immediately the dome began to suffer, and it became urgent to buttress it from both sides. This meant that the loggia running along the north side of the chapel, which was still not even begun, had to be undertaken as quickly as possible. Foundations were dug in July 1653 but progress was slow, and two years later the loggia was still not finished. In 1655 Borromini, exasperated at the pace of work, drafted a legal guarantee making himself and his heirs responsible for the safety of the cupola for fifteen years, but only if the north loggia were promptly finished.

The most revealing documents from this phase of the construction are not those of the masons but those of the smiths. They too tell of cracks and perils. In May 1652 Borromini had to design a huge iron chain weighing 949 pounds to contain the hoop thrusts created at the base of the dome by the great weight of the lantern. The bands of the chain had to fit perfectly around the six apses of the drum, and the smiths had to refashion them again and again, "according to the caprice of the architect, with great waste of time and charcoal." The chain was not hidden and can still be seen at the level of the pilaster bases. Borromini was an expert on the use of hidden chains which could make the most perilous-seeming vaults safe. All this leads us to suppose that if he had foreseen the great weight of the lantern from the outset, he would surely have found a way to bury the chain inside the masonry of the drum at the time of its construction. One has the impression that the architect was improvising, trying to prevent the Barberini dome from coming apart under the weight of Pamphilj ambitions.

The smith's accounts also afford a glimpse of the workman's life under a perfectionist architect. The iron circle that holds together the separate travertine blocks which make up the flaming crown at the summit had to be forged and reforged in the August heat, and then because it was not to the liking of the architect it had to be reheated over a great circular fire lit in the courtyard. The six iron stanchions that support the globe, each thirty palmi long, were put into the fire again and again by four men working in the rain until they matched the template perfectly. The stanchions, globe, dome and cross were gilded in situ, all taking days of work at dizzying heights. The smith in the end did his work well. But even so, and even though he was the son of the smith who had started work on the church under the Barberini, seven years later he was still complaining that Borromini bore him a grudge and that he had not been paid.

The lantern was completely finished under Innocent X, interior and exterior, including the final touches of colour.

44. The lantern and spiral of S. Ivo alla Sapienza, Rome, by Francesco Borromini.

45. ‘1644. X.S: eight scudi spendit a M. Riffi Tomassini, indumento e pittura per facer fatta un arco del 1° immenso to per portare sopra la porta della Sapienza’ [ASR U 112/37].
47. K. GÜTHERZ, Der Palazzo Nuovo des Kapitols, Beiträge zur Kunstgeschichte, XXI [1983], pp.119ff.
48. Ibid., p.149. A. PETRUCCE: Carlo Cartari, Dizionario Biografico degli Italiani, XX [1977], pp.783-86. Louise Rice, who has read the extensive entries in Carlo Cartari’s Latin diary (ASR, Cartari-Féret, vols. 73-80), kindly informs me that on 8th April 1645 (vol.73, fol.257) Cartari estimated that the ‘capotino’ of the church, as it was then envisaged, would cost 500 scudi to finish, less than a third of what the lantern and spiral eventually cost in 1652.

49. Istituto di chirografia all’Umanità X per il locazione di essere un debito di 8000 dell’Accademia delle scienze, quala di poco non ebbe effetto; the estimate of 7000 scudi (then 8000 scudi) was for lead to cover the cupola and stuccoes on the interior (ASR U 178, table of contents at fol.75ff).
51. Dal Pozzo, op. cit. at note 3 above, p.151.
52. E. R. BORROMINI: Opera, Rome [1720-25], II, ch. xx, written in 1647 and referring to chains in the vaults of the new Via Giulia wing of Palazzo Farnesino.
53. Dal Pozzo, op. cit. at note 8 above, pp.147-48 and 230-37, see also Appendix A below.
and decoration. The jewels and pearls must have gone onto the spiral as the scaffolding came down, since they are shown on the earliest views of 1653–55. There was a pentecostal image on the inside of the vault, with the Holy Spirit descending from a blue sky amidst a golden glory with fifteen tongues of flame. The dove was not plastered onto the surface of the vault but placed on the end of an iron rod 2¼ palmi long, so that it looked as though it were really flying. The rod fell in the early nineteenth century and has never been replaced, but the hole it fitted into is still visible. The swift-moving Paraclete was placed slightly off-centre so that the clouds would look as though they were trailing behind Him. It was a dazzling theatrical effect, the kind of thing one might have found in a Sacro Monte, and it was not lost on visitors.\textsuperscript{23}

The imagery of Pentecost may just possibly, also, be an allusion to S. Ivo, the saintly Breton lawyer who died on Pentecost (19th May 1303).\textsuperscript{24} The cult of S. Ivo was officially moved to the church only in 1661, and it was a very long time before it displaced the older dedications, especially that to Sts Leo and Fortunatus. But S. Ivo was definitely the lawyers’ saint and it could be that Innocent X, himself a former Consistorial Advocate, was already preparing for his entry into the church. In any case, the imagery of S. Ivo had long been moving away from the good works of the ‘advocate of the poor’ towards a typically baroque hagiography, one that emphasised miracles of illumination: Yves was the star in the Gallic firmament, his was the fiery tongue, to him came the vision of a dove all aglow, lighting up the whole cathedral by night.\textsuperscript{25}

The drawings

Four or possibly five drawings from the period just before construction began in March 1652 show Borromini’s superstructure in its formative stages. The earliest of them is in the Albertina, Vienna (Fig. 45; see Appendix C, no. 1), which I date to the second half of 1651. It shows a large sketch plan that clearly combines two structures, one on top of the other. Both are climbable, though neither is anything like the final spiral. The lantern proper has a scalloped cornice, Baalbek-like, and triple clusters of columns on each pier, ideas that are refined in the three sketches along the right edge of the sheet. Two of the lantern piers are hollow and have tiny spiral staircases inside; one of the sketches (top right) seems to have iron rungs in this hollow instead of a spiral. In either case this would be a tight climb. But on top of the lantern there is drawn what looks like a second lantern, slightly smaller, with

\textsuperscript{23} Vc. Del Frate: S. Maria del Monte sotto Varese, Varese [1938], pl. LXVII. The idea was imitated by Guarini in the SS. Sindoni in Turin.


a generous spiral staircase encased inside it. What all this led to we do not know, but clearly the idea of ascent was paramount.

By the next drawing (Fig.46; see Appendix C, no.2) the famous spiral has already arrived. A working plan, black and smudged, it is not a pretty sight, but it would have been of considerable use to the masons who had to build this strange object. It is not a true spiral, such as a geometer might have drawn, but a false one constructed out of arcs of circles. The curves of the top half of the drawing are semicircles generated from the real centre, while those of the bottom half are semicircles generated from a centre that has been moved about 1½ palmi up and to the left. The inscriptions both on this drawing and the one that follows show Borromini's concern not for Cartesian geometry but for optical illusion, l'inganno dell'occhio: they deal with the problem of how to make each turn of the spiral appear to rise by an equal amount.

One of Borromini’s most famous and elaborate drawings (Fig.48; Appendix C, no.3), shows the spiral on the brink of construction, an organism in rapid growth. It began as a section but has one strange feature. A true section that cuts through the windows should show a pier on the inside of the lantern, while this drawing shows a full window frame in that position; possibly this departure from convention was meant to make the sheet more useful as a presentation drawing. In any case the upper reaches show a spiral wound around a fluted column which is topped by a flaming laurel wreath and an iron crown. Tailor Borromini nudged the wreath upwards two or three times in the course of his revisions. The iron ribs of the crown were then stretched into the tall onion-shaped cage that lifts the ball, dove and cross to the very top of the sheet. The ball, for example, was redrawn five times. At this stage the fever was upon Borromini, and the creative assault on the drawing was very strong. He drew over the neat section in heavy pencil lines to show the full rising curve of the spiral. It is these final touches that give the drawing its strange transparent quality, like an X-radiograph.

*At this early stage it resembled the crown Borromini designed for the belltower of St Peter's in the summer of 1645; see H. Tiele, *70 disegni di Francesco Borromini dalle collezioni dell'Albertina di Vienna*, exh. cat., Gabinetto Nazionale delle Stampe, Rome [1958], p.19, no. 35, pl. V. Antedating both of these was the brightly painted crown on top of the belltower of the Westerkerk in Amsterdam, representing the ‘Keyserlieke Staats-wapen-kroon’, published by N. de Keyser: *Architectura moderna*, Amsterdam [1631], pp.16–17, with engraving.* Cartari, in a diary entry of 1632 (ASR, Cartari-Febei, vol. 76, fol.17, which I know thanks to Louise Rice) says that the ‘cap-palma’ was begun and that the masons say that it will be 60 palmi high (‘in horno seminato Ercole vice susci studii Urbis, incepta fist fabrice [at urbe] del cappellano, qui, ut desinuit fabre murario, erit altissima palmarum 60. Borrominius Architectus quodamque assistit’). But by the time Fig 48 was drawn the masonry parts of the cupola and spiral had reached a height of 62 palmi, not counting the iron superstructure.
The next drawing (Fig. 47; Appendix C, no. 4) shows some other features of the superstructure besides the lantern and spiral. The Pamphilj dove and gigli confirm the date under Innocent X. The drawing is primarily a study of the porticelle, 'little gates', which stand along the rim of the vault and act as counterweights against thrusts from the lantern. These thrusts still seem to be conveyed along normal convex ribs, according to the sketch at the lower left of the sheet; the 'ski-slope' buttresses have yet to make their appearance. They would be Borromini's last brilliant touch under Innocent X, one that gives the whole superstructure a dynamic unity.

The whole system is fully worked out on a brilliant plan, albeit one that is very difficult to date (Fig. 49; Appendix C, no. 5). It shows the lantern in its final form, complete with a tiny well for climbing up through one of the piers. The stepped vault is made up of arcs of circles, each of which is correlated with its own centre by a number code. The ribs shown between the gorges of the vault are presumably the ski-slope buttresses. But while some elements on the drawing seem Pamphilj, others seem Chigi in date. The porticelle are placed too far out over the edge, as though Borromini were still experimenting with their exact location and planning to thicken the pilasters that articulate the drum; this would put the date around 1652. But on the other hand these pilasters are arranged in triple clusters, an innovation of Alexander VII in 1659–60, as explained below. Certainly the two concave wings sketched in dark pencil, the 'mezzi lana' that frames the cupola in the view from Piazza S. Eustachio, are of Chigi date, though they give every appearance of having been drawn later. For the moment the dating of the sheet must remain uncertain.

With the possible exception of the last, these are all preparatory drawings. After the spiral was built it is shown in four further images that can all be dated to the period

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49. Plan of the cupola of S. Ivo, by Francesco Borromini. 1651–52 or 1659–60. Pencil, 35.5 by 29.5 cm. (Albertina, Vienna).

50. Elevation and section of the cupola of S. Ivo, by Francesco Righi. 1653–55. Pencil, 70 by 46.1 cm. (Albertina, Vienna).

1633–55. The first of these is by Borromini’s assistant, Francesco Righi. Righi drew two large elevations of the exedra and the superstructure (Figs. 50 and 51; Appendix C, no. 6), which can be joined together to form a single grand elevation over a metre high. The spiral is shown as a plain parapet without jewels, though at a later moment two pearls were added along the left edge, a token of the rich encrustation to come.

A striking drawing in Berlin (Fig. 52; Appendix C, no. 7) shows the cupola in exaggerated perspective, typical of a veduta. It is more likely to be by Borromini’s printmaker, Domenico Barrière, than by Borromini himself, though details such as the dove added in pencil at the summit of the cupola may be autograph and thus testify to a certain amount of collaboration. In any case, the perspective of the drawing is identical to the series of views of S. Ivo done by Barrière in 1658–60, working with material supplied directly by Borromini.

52. View of the cupola of S. Ivo, attributed to Domenico Barrière. 1653–55. Pen and light brown wash over pencil, 31.5 by 18.6 cm. (Kunsthistorisches Museum, Vienna).


(Fig. 53). In the Berlin drawing Barrière shows the spiral in all its glory, with jewels, torches, and fantastic metal finial. But it is the bottom half of the sheet that is of greatest importance, since it shows the Barberini drum before the many changes wrought upon it by Alexander VII. Unhappy with the heavy, Minerva-Medica look of the drum, wanting something more refined and ‘regal’, Alexander VII had Borromini transform the double pilasters into triple pilaster clusters, while taking away the frames on the surface of the apses and adding a pair of lite pilasters around each window. All this showed Alexander VII’s daintier taste; the heavy, powerful asples the Barberini had built were simply not to his liking.

There is one small detail that shows these changes in a nutshell. It is to be found at the base of each pilaster of the much-doctored drum. Here we can still see the original sturdy pilaster of the first construction campaign, a citation from late antiquity. It was covered over by the chain of 1652, inserted when the Barberini dome began to split under the weight of the Pamphilj lantern. Finally the chain itself was covered over by Alexander VII’s slender pilaster, when the drum was subjected to Chigi refinements in 1659–60. These seemingly random superpositions show something of the curse, but also the stimulus, that every concave posed for the architect.28
Aside from the Berlin drawing, there are two other images that show the drum before Alexander VII’s changes. Barrière’s first known print after any Borromini building is a small allegorical frontispiece published in 1653 with an oration in honour of S. Ivo produced by a young protégé of Cardinal Marzio Ginetti (Fig.55; Appendix C, no.8). According to the allegory, the student is supposed to pass through the Temple of Merit to get to the Temple of Honour. The former is a conventional little shrine, but the latter is S. Ivo, with the spiral shown in reverse. It gives every appearance of having been added at the last minute to a nearly finished copperplate. The drum is still pre-Chigi, just as on the Berlin drawing.

The last image we have before Alexander VII’s changes is a strange drawing done in 1656 by the Swedish military architect, Erik Dahlberg, who added the cryptic and probably unflattering inscription, ‘Sapienza Babylon’ (Fig.54; Appendix C, no.9).

The Ascent

The spiral of S. Ivo was in former times one of the great climbs of Rome. The roof of the Pantheon and the copper ball on top of the lantern of St Peter’s, neither much visited now, were on the established routes for adventurous visitors to the city.29 The lantern on Giacomo Del Duca’s dome of S. Maria di Loreto, built in 1573–77, is not a lantern at all but a belvedere; it was designed for the view, and has no connexion whatsoever to the dark internal lantern hidden between the two shells of the cupola.30 As soon as S. Ivo was finished it joined the ranks of such buildings. The first two descriptions of the spiral in guidebooks are unequivocal about the possibilities of ascent. In 1660–63 Fioravante Martinelli described the lantern as follows:

un tempietto, à torre, cinta di loggia incoronata à chiociolina, et in essa una commoda scala per salire sin alla Croce, la quale viene nascosta agli occhi di reguardanti dall’ornamento che à guisa di corona, cinge detta loggia per tutta la chiociolina.31

And an anonymous but well-informed French guidebook of 1677 calls it:

cette piramide autour de laquelle est une couronne tournée en vis qui menace jusqu’au sommet forme un escalier qui semble conuire ceux qui se rendent illustres par les lettres d’y monter pour les conduire jusqu’au sommet de la gloire dont tout ce dôme est un symbole.32

This is not simply metaphorical ascent. The earliest veduta of S. Ivo, drawn by Lievin Cruyl in 1664, shows two little men standing at the base of the lantern and one who is halfway up the spiral (Fig.56).33

We can follow the route up the spiral with the aid of the construction documents, illuminated here and there by the sketches of Gilles-Marie Oppenord (1672–1742), who made


55. Allegory of the Temples of Merit and Honour, by Domenico Barrière. 1653. Etching, 10 by 12.5 cm. from A. BLANCARD: Itinéraire de la Villa Ostia à S. lorenzo Pastrovat Patrona Civitae, Rome [1653]. (Biblioteca Apostolica Vaticana, Rome).
the climb during his years in Rome in 1692–99. There were any number of staircases in the Barberini church to get to the level of the loggia scoperta but no provision for rising higher than that. It was Innocent X who provided the means of ascent to the uppermost reaches. At first he built some sort of spiral along the side of the drum but this was soon rebuilt in the form of two flying buttresses which also served as bridges from the side wings to the roof of the cupola. A sketch by Oppenord shows the bridge on the north; the one on the south is still visible on old photographs (Fig. 57). The stepped roof allowed ascent to the base of the lantern. Inside one of the piers of the lantern there is a tiny well, 3\(\frac{1}{2}\) palmi wide, with thirty-seven iron rungs. These got the visitor to a chamber, ten palmi high and ten palmi wide, hollowed out of the mass of the spiral. It was a room ‘where climbers can stop and rest before they go out to complete the walk’, and Oppenord shows a number of people doing just that (Fig. 58). Then came the time to summon up one’s courage and venture outside. The curving path led between ridges of the

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"Fol.37r of the sketchbook in the Cooper-Hewitt Museum, New York, illustrated in ibid., loc. cit. at note 34 above; p.325; E. HEMPEL, Francesco Borromini, Vienna 1924, pl. 71. Albertina 509 (Fig.49) shows still another project for stairs to the roof of the cupola, antedating the flying buttresses. When the flying buttresses were removed in the late nineteenth or early twentieth centuries, a ladder of iron rungs was attached to the north side of the drum to provide access the level of the roof; today this is the hardest part of the climb.

"The balustrade that Barrière shows running around the top of the drum (Fig.53) was never built. But it could be that Borromini intended climbers, after they crossed the buttress-bridge and reached the stepped vault, to walk along the balustrade one-quarter turn to the front of the cupola, and from there to mount up to the balustrade around the lantern; there is an opening in the lantern balustrade precisely at this point. If this was the intended route, then the name ‘porticelle’ for the ‘Porta Pia’ buttresses would make more sense, since visitors would pass through them.

"There are 37 rungs in place today, and I cannot account for the discrepancy with the ‘47 freti che fianco scalini per detta scala’ mentioned in ASR U 198 47’s.

"Berlin, Kupferstichkabinett, DZ 90, Hzd. 2405, 6d.84c."
crown, a twisting parapet studded with giant jewels and pearls. After three and a half turns one had to duck back inside the structure, into a manhole three palmi wide and about nine palmi high (Fig. 58). Standing in this well the hardy visitor could pull himself up into the fiery travertine crown at the top, a not uncomfortable perch, where splendid views awaited. Unlike many modern interpreters Oppenord saw not only the flames but what was burning, a wreath made up of laurel leaves and berries and wrapped in a ribbon; the lambent flames draw together in groups of three.

To put the experience into words, it was an ascent along a bejewelled path, one might say an ennobled path, to a laurel crown, which must be the laura or doctorate that was the culmination of a university education. In this case it was a flaming laura, and the triplet flames make one think of an inspiration that is numinous or divine.

The laura, and the battle over who had the right to confer it, is a key to the social history of the Sapienza in the seventeenth century. The Sapienza claimed the exclusive right to confer the degree in two fields, law and medicine, and the non-exclusive right to confer it in other fields, such as theology. The ius doctorandi rested on two foundations, the auctoritas transmitted from the pope at the time of the foundation of the university, and the universality of teaching at the Sapienza, which was, at least in theory, a studium generale in which all subjects were taught. The doctorate was especially important in legal education. Ever since the days of Sixtus V the lawyers controlled the Sapienza. The Consistorial Advocates had purchased the right to choose the rector in perpetuity from their own ranks, and they controlled nominations to the legal faculty. Most of the students aspired to careers in the papal bureaucracy and chose the legal curriculum. The laura was a guarantee of a safe career.

But it was also a source of income for the faculty. Conferal of the degree was an occasion of great ceremony, greater still when a rich candidate rose above the forma comune and chose the forma nobile or the forma principesca, degrees of pomp that have their analogy in the degrees of Roman citizenship so famously described by Montaigne. Above all the laura represented passage to a higher social plane. The medieval concept of the nobilitas doctorum, which had guaranteed exemption from certain taxes and immunity from the death penalty, had lost its historical base but still lent an aura to the whole corporation of doctors, raising them above the common level. Naturally such sudden changes in status did not come about without considerable outlay, both in fixed fees and in presents to one’s fellow doctors. For, like the cavaliere that it in so many ways resembles, the laura was stalked by venality and the general inflation of honours. Critics said that not five graduates in a hundred were worth their salt; the rest were iuris doctori et non Doctores.

The marketplace for degrees was more active in Rome than the Sapienza would have liked. Fraudulent degrees abounded, and the condemnation of the practice in 1618 was ineffective enough to have to be repeated in 1659 and 1673. Troublesome families such as the Sforza claimed the right to award a private laura, a feudal vestige of an auctoritas invested in their families in the distant past. This practice was prohibited in 1609, 1618 and 1627; but from a decree of 1691 we learn that a Sforza duke was still at it. The most serious threat, however, came from the Jesuits. Jesuit dominance of education was, of course, a Europe-wide phenomenon. Richelieu dwelt on it in his political testament, and even in Protestant England Francis Bacon could say, ‘consult the schools of the Jesuits, nothing in use is better . . . if only they were ours’. In 1551 the Jesuits had opened the Collegio Romano as a School of Grammar, Humanities and Christian Doctrine, Free. Within a few years it was a university where all subjects were taught. It was awarding doctorates as early as 1556; magnificent new quarters were built.

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"In Simoni, loc. cit. at note 5 above, pp. 47–67.
"On the Consistorial Advocates, see il FASCICULO Trattato di tutte l’opere fari dell’alma città di Roma, Rome [1601], pp. 120–21; G. CANTARELLI, Advocate Santissima Scolastica, Rome [1656]; T. MORTENBEK and L.G. DE BEER, De Nobile ob Causa Consistoriali Avvocati Originis, ac Manni, Rome [1657], especially pp. 178 on the right of the College of Advocates to confer the laura Doctoris in utroque iure; G. MORONE, Dizionario di erudizione storico-ecclesiastica da S. Pietro sino ai nostri giorni, Rome and Venice [1840–79], III, pp. 13–15; P. SIMONI, loc. cit. at note 5 above, pp. 34–38. An important critique of their shrewdness on the Sapienza was drafted anonymously in c. 1625–26, in BAV, Vat. lat. 7400, fo. 26–43.
"P. SIMONI, loc. cit. at note 5 above, p. 37.
"ASR T 77, 29–25; U 4, 209; 4, 229.
"H. BERTRAM HILL, ed. The Political Testament of Cardinal Richelieu, Madison, WI [1961], pp. 17–19; Bacon is quoted in J. HELBIGN, Elements of Early Modern Physics, Berkeley and Los Angeles [1982], pp. 82.”
for it between 1581 and 1626. The dynamic pedagogy of the Jesuits emptied the classrooms of the other institutions of learning in Rome. The numbers tell their own story: there were two thousand students at the Collegio Romano in the period we are considering, while enrolment at the Sapienza varied between 100 and 140.

The Sapienza could never hope to compete in numbers of students, but it did try to preserve its monopoly over the laurea in law. The Consistorial Advocates repeatedly protested that the Jesuits had been conceded the right to confer the laurea only in theology. The conflict built up over time and came to a head at the end of the century when, in 1695, the Jesuits reinforced their claim to give the laurea in law by appointing a distinguished jurist to their faculty. The Consistorial Advo-

"Di Simone, loc. cit. at note 5 above, pp. 18-23 and 47-67; the case against the right of the Collegio Romano to consider itself a university is made in Di Galleria: Trattato de' ministeri e amministrazione, Rome [1675], pp. 102-04. The lawsuit of the medical faculty against the Collegio Romano is documented in ASR U.4.

"W. Böse: Jesuitenarchiv in Italien 1549-1773, Teil I: Die Bauschulen der nürnberger und der napoleontischen Ordensträger, Vienna [1985], pp. 199-89 and 280, fig. 138. The drawing with the obelisk is in BAV, Vat. lat. 11257, fol. 117v; with a copy by Borromini or his workshop in Vienna (Albertina, it. AX Rom 493). Strongly enough, in his critique of Grassi’s project, undated but c. 1651, Borromini not only does not mention the obelisk, but advises the Jesuits to accept a cupola without any lantern at all, like the Cappella del Tesoro in Naples.

"V. D’Onofrio: Giuseppe di Grassi, 2nd ed., Rome [1967], fig. 2.


THE SPIRAL OF S. IVO ALLA SAPIENZA

The flaming laurea was set up over the spiral of S. Ivo in the summer of 1652, and may have been designed as early as the second half of 1651. In 1650–51 the Jesuits were also experimenting with ideas for the cupula and lantern of their own college church, S. Ignazio. Drawings by Orazio Grassi show a new cupula with a single-shell dome sunk down into the drum. This was a typical Lombard tribine, and when Borromini saw the drawing he said it reminded him of S. Carloino and S. Ivo. One of Grassi’s projects shows an obelisk raised over the lantern and supporting the Jesuit symbol, an IHS in a sunburst (Fig. 59). The obelisk was fifty palm high, nearly twice as tall as the little obelisk of S. Macuto that stood right next to the façade of S. Ignazio.

Grassi seems to have borrowed this striking image from a print in a book by his fellow Jesuit, Christoph Scheiner, the other great anti-Gallilean of the Society. It appeared in Scheiner’s Rosa Ursina of 1626–30, a treatise on sunspots (Fig. 60). On the bottom the print shows two Jesuits observing an image of the sun cast on a sheet of paper by compositive refraction, the method Scheiner claimed to have used as early as 1612, when his rivalry with Galileo began. On the top it shows other means of observation: a helioscope to look directly at the sun, a telescope to look at it through clouds, and reflection of its image onto a plane surface. But the biggest instruments are a pair of monumental obelisks, one focusing the sun’s rays through a lens, the other through a hole in the top of the ball; this latter also carries the IHS in a sunburst. Solar imagery was much in vogue at this time among the Jesuits, and of course obelisks had been raised to the height of fashion by Athanasius Kircher, then riding the crest of his glory with the publication of his book on the Pamphili obelisk. But Grassi’s precise source still seems to be the print of his fellow-astronomer Scheiner.

For the successful pedagogues at the Collegio Romano, Grassi conjured up the image of solid Egyptian wisdom in the service of Jesuit glory. For the threatened lawyers and doctors at the Sapienza, Borromini raised the laurea high on the skyline, and showed how it could be reached along an emblazoned path. It does not seem possible to say who fired the first shot, only that the competition existed—at least on paper, since the Jesuits of course never managed to build the cupola of S. Ignazio. When Alexander VII finished S. Ivo many new themes were introduced into the imagery of the church, but
the laura did not disappear. Half of the angels sculpted on Alexander's vault are laurati. When the south portal was built on Piazza S. Eustachio in 1664-65, it featured a trio of emblems which, when deciphered, complements the meaning of the spiral (Figs. 61 and 62). The book, sword and scales at the left stand for Justice; the snake staring at its image in a mirror at the right stands for Prudence. The sentence reads, 'A winged laura (the emblem in the centre), in Justice Prudence (awaits the student who goes through this portal). The door faces, of course, in the direction of the College Romano.

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Appendix

A. Documents relating to the construction of the lantern, spiral and southeast portal of S. Ivo alla Sapienza.

The abundant documentation for the construction of S. Ivo in the Fondo Università dell’Archivio di Stato di Roma has been sorted in the documentary thesis by G. Grelli and Marino, cited at note 13 above. The following transcriptions represent my own selection of documents relating to the lantern, spiral and southeast portal. They have been taken especially, from the two minutes e storie of the maker’s work in ASR, Fondo Università (here abbreviated as U), vol. 115 and 198 (the former being generally more complete), and the inscriptions in vol. 110. They have been rearranged to correspond to the order in which the objects described were built.

1. Vault (September to October 1644)

[U. 115, fol. 46v: 47r] Si dovrebbe crescere una certa quantità del muro della grossa volta in etto una più grossa di quello che è stato posto nella misura stretta da G. Domenico de Quaris. Nella presente misura non si è avuto riguardo alle straordinarie fature e mostrò diverse fette per detti lavori come anco alle cose finite più volte e poi bastate con gran prezzo di dolo e quantità di giornate di maestri che a questo ci si lascia pensare a chi sappia.

Among the minutes' long list of complaints about Borromini's low valuation of their work, 190, fol. 53r: Vieta la partita dell’armatura della volta sopra il tempio, quale si vede esser di fattura straordinariamente finita a molti corpi con fattura dell’armatura straordinaria e di molto sprolo (U. 115, fol. 31r: repeated in U 198, fol. 36v: 57r) 12 graditi che ogni di loro forma un

ASR U 108.115v: U 115.137r. Similar emblems for Justice and Prudence had already appeared on the frontispiece of J. Martellari: Rome ex ethica saevo, Rome [1633]; Albertina. Az Rom 527 is Borromini’s sketch for Prudence. All three

triangoli per amor della volta che è sotto... con sue legature per farli spanner e collegare acci si uniscano con la volta... Muro di tavoletta che si facesse detto al生意 gradito sino al vano del ceppo che dà luogo alla volta per spanner e far pianta al tempio sopra detta volta... con l’arco che fu fatto sopra dove fia poi spiccato per piantarne il tempio

2. Chain at the base of the vault (May 1652)

[Bernardo Pariani’s account for the iron chains weighing 499 pounds; U 190, fol. 42] A cerchio di no. 7 pezzi, è raggiunto due volte e rifatto a capriata di detto architetto, con gran perfezionamento di tempo, e carbone

[U 186, fol. 52r] Per la mettitura in opera della carota di ferro che gia attorno a detta di 7 pezzi con suoi palieti e sci sprangolati.

3. Stair for ascending from the loggia soppuretina to the roof of the cupola

[U. 115, fol. 375v] Per haver rifatto un pezzo di cornicione a detto tamburo dove fu tagliato per poggiarlo la volta che fu fatta per la scala per salire al padiglione che poi fu levato per le ragioni sopradette [the steps in question measured 8 by 28 by 3 palms]

[U. 115, fol. 332r] Seguì il cheri, e volte, et altro per fare la scala, che doveva salire alla scalinata del Padiglione al tempio sopra detta loggia scoperta in fianco la libreria e la penultima volta a mezzocircio, che poggiava da una banda sopra al cornicione, del fianco della libreria e andava a impostare nel fianco del tamburo della chiesa, e do[i?] poi un altra volcela fatta in penultima, che sopra detta volcela impostava, e andava a fine con un 4o di circolo alla cima del cornicione del tamburo dove andava messi i saldini per salire sopra la volta della chiesa, e sopra al tempio costruito sopra detta volta fuori murati quando si pensava, che la facciata verso la piazza di S. Eustachio avassil il cornicione tirato in piano d’un linea sola, ma inanzi che si allasse detta facciata si cominciò, che haverche levato la vista alli ferimentos della chiesa però fi risoluto di lasciare la faccia senza come stava prima, e alzare solo nella parte che copre la libreria però fi risoluto di levare.

[U. 115, fol. 358v] Segue l’archi, e volte fatti sopra il piano di detta loggia per fare la scala per salire alla scalinata del tempio... Muro di 2 archi che ficiar leggiornano la volta, che va sotto la scala di misura simile all’altra gia detto sei compagni in nostro rifacimento... Muro della volta di piazza [?] in mezzo a detto archi con fattura e misura simile alla detta sopra detta sua compagnia... Muro dell’augmento del l’imposti di trea simile all’altro... Muro della volta di prim’ordine della scala simile all’altra gia detto incontro sua compagnia... [U. 198, fol. 26v] Per haver tagliato il muro della fabbrica vecchia in fianco a detta loggia dove habita il S. Pallamolla [i.e., in the south wing] che era per gettar un arco tra la fabbrica vecchia e la nova per salire sopra al tamburo della volta della chiesa longo palmi 15 alto palmi 3 grosso palmi 1

4. Pecchette and curing butter

[U. 115, fol. 335r] Porticella dove sta posto il globulo.

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B. Partial bibliography of interpretations of the spiral of S. Ivo alla Sapienza.

The SPIRAL OF S. IVO TO THE SAPENZA

C. Drawings for the cupola and spiral of S. Ivo, and vedute before 1655.

1. Albertina, Vienna, At. AZ Rom 514 (Fig.47), by Francesco Borromini, 1652-65.

2. Getty Research Institute, Santa Monica CA (Fig.16), by Francesco Borromini, 1652-65.

3. Albertina, Vienna, At. AZ Rom 510 (Fig.48).