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Florence Cathedral: The Design Stage*

Franklin K. B. Toker

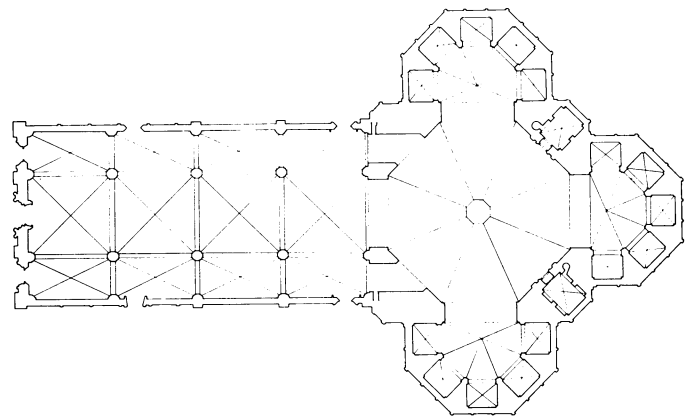
No list of the outstanding Gothic monuments of Europe could fail to include the Cathedral of Florence, yet its place in medieval architecture remains anomalous. Anomalous above all is its unprecedented design, which integrates a rib-vaulted basilica, a domed octagon, and a triconch of fifteen extruded chapels. What other building in Europe combines so many vocabularies (Early Christian, Byzantine, Romanesque, Gothic) and national traits (Italian, French, German) before the nineteenth century? Hardly less anomalous are the numerous construction scars still visible on the surface: vaults without buttresses and buttresses without vaults; fake windows inside and blocked windows outside; doors off-axis; violent jumps in scale; and a roof ridge that pokes out the west eye of the cupola drum (Figs. 1–3).¹ Parallel to the disjointed state of the physical fabric is the disarray of the archives, especially the loss of detailed building records from the ground-breaking in 1293 until 1353.² A further complication in writing an architectural history of S. Maria del Fiore is the shadowy record of its founding architect, Arnolfo di Cambio. An undated plaque at the southwest corner of the Duomo names Arnolfo as the cathedral builder at the time the cornerstone was laid in 1296: a government document of 1300 confirms this



1 Florence Cathedral from the south (photo: Alinari)



2 South exterior aisle wall (photo: author)



3 Plan of Florence Cathedral (photo: Opera del Duomo, revised S. G.)

* An outline of this study was presented in Florence at the Harvard University Center for Italian Renaissance Studies, May 30, 1974. Acknowledgment is gratefully extended to F. Gordon Morrill, Angiola Maria Romanini, Howard Saalman, Marvin Trachtenberg, Gert Kreytenberg, and Peter Galdi for stimulating though not necessarily acquiescent discussions on this material; and to my draftsmen Vito Stanco, Fred Schmitt, Robert Skydell, and Sheldon Goettel.

¹ An appended bibliography lists the most important studies on S. Maria del Fiore, particularly since 1964. Research up to 1950 was discussed in W. and E. Paatz, "S. Maria del Fiore," *Die Kirchen von Florenz*, III, Frankfurt a/M, 1952, 320–612; later research was evaluated in H. Saalman, "Santa Maria del Fiore: 1294–1418," *Art Bulletin*, XLVI, 1964, 471–500.

² G. Guasti, *Santa Maria del Fiore: La costruzione della chiesa e del campanile*, Florence, 1887, contains no internal documents from 1293 to 1353; all were gleaned from outside sources as a substitute for building-committee records now presumed lost. The documents after 1353 are, however, also less than complete. Guasti, lxxv, noted that the minutes of 1358–1362 has been used by C. F. von Rumohr for his *Italienische Forschungen*, Berlin and Stettin, 1827, 1831 (repr. Frankfurt a/M, 1920), but that they were missing by 1850. The profusion of French, English, and Siense building documents of the 12th and 13th centuries that have been published by Mortet and Deschamps, Du Colombier, Salzmann and Milanesi indicates that much earlier documents would have existed for Florence Cathedral.

status.³ A third and final document connects Arnolfo to the cathedral works on the day of his death, March 8, but fails to specify the year: historians place it between 1301 and 1310, inclusive.⁴ Such scanty documentation renders the “Arnolfo problem” three-fold: the length of his tenure as master-builder might have been anything between seventeen years (1293–1310) and five years (1296–1301); Arnolfo was a sculptor, and he is not documented as the architect of any other building save Florence Cathedral itself; and finally there is no documentary evidence of what his plan for the Duomo looked like, or how far he carried this plan into construction, or that he had actually devised a plan at all. Certainly the design stage of Florence Cathedral is a thin reed on which to pile a building history, yet Arnolfo must have produced an early design, for on April 1, 1300, the communal council of Florence declared itself well pleased with the “magnifico et visibili principio” of the Cathedral that Arnolfo had already manifested.⁵ This paper will attempt to reconstruct the nature of that “magnificent and visible beginning.”

I “Arnolfo’s Project”: Claims and Evidence

Archival research on Arnolfo’s participation in planning and building the Duomo is sharply limited by the scarcity of surviving documents. Only the three records of 1296, 1300, and 1301–1310, cited above, name Arnolfo personally. The minutes of communal council deliberations show only that the decade 1293–1303 was well-funded, and that by 1300 some unspecified work was taking place at the east end of the building site that required the partial demolition of the church of S. Michele Visdomini.⁶ More informative than the documents are a fresco view of Florence of 1342, which shows a marble façade on the Duomo, and a careful drawing of the

same incrustation by Bernardino Poccetti in 1587, the year of its demolition (Figs. 4, 5).⁷ Most recent studies attribute this marble façade to Arnolfo on the basis of a comparison of its sculptural decoration (now in part in the Cathedral museum) and its portal aediculae with Arnolfo’s two signed ciboria in Rome.⁸ Stylistic attribution is much less helpful in searching out Arnolfo’s contribution to the plan of the Duomo because the existing plan was adopted only in 1368 and the walls of the crossing and triconch were not erected until late in the fourteenth century.⁹ Whether the plan adopted in 1368 replicated an original Arnolfo design is hazardous to guess, because all of the comparative buildings that scholars have advanced (S. Croce, the Badia of Florence, and others) are merely attributed rather than documented to Arnolfo. There are, nevertheless, numerous claims for Arnolfo’s authorship of a supposed “original design” of the Duomo.

The oldest, most expansive, and most persistent of the claims on behalf of Arnolfo is that contained in Vasari’s *Vite* of 1568, which specified that Arnolfo designed the Duomo, that he left behind a wood model which Simone Martini depicted in the chapter house of S. Maria Novella, and that Arnolfo actually built the Duomo, up to the vaulting of the three apses and the drum of the cupola, which alone was left for completion a century later by Brunelleschi.¹⁰ Hindsight and nineteenth-century research permit us to demolish these claims with ease. The S. Maria Novella fresco (Fig. 6) was painted not in the early trecento by Simone Martini, but in 1366–68 by Andrea Bonaiuti. It could not literally represent a model by Arnolfo because its articulation is in the stylish mid-century idiom of Francesco Talenti and Andrea Orcagna, although the ring of gabled chapels around the triconch does hark back to the much earlier design of the apse of S. Croce,

³ The plaque naming Arnolfo (“istud ab Arnulfo templum fuit edificatum”) may date from 1368 (Guasti, Docs. 15, 201). Commune of Florence lifetime tax exemption, April 1, 1300: “. . . Quod idem magister Arnolphus est capudmagister laborerii et operis ecclesie Beate Reparte maioris ecclesie Florentine, et quod ipse est famosior magister et magis expertus in hedificationibus ecclesiarum aliquo alio qui in vicinis partibus cognoscatur, et quod per ipsius industriam experientiam et ingenium comune et populus Florentie ex magnifico et visibili principio dicti operis ecclesie iamdicte inchoacti per ipsum magistrum Arnolphum” . . . (Guasti, Doc. 24).

⁴ *Ibid.*: Doc. 25, xxxvi–xxxix. The death day but not the year was recorded in the cathedral register. The next decrease on that day was inscribed in 1311 (modern style). Full discussion in G. Vasari, *Le vite de’ piu eccellenti pittori scultori ed architettori*, ed. C. Frey, 1, Munich, 1911, 559.

⁵ See note 3 above.

⁶ On the financing of the Duomo during its first two decades see Grote, 38–42, and Guasti, Docs. 1–30. On the demolition of S. Michele Visdomini, *ibid.*, Doc. 168, May 31, 1367, citing the original act of November 26, 1300, now lost. The context of the note of 1367 suggests that the complete demolition of S. Michele was envisaged in 1300, although only part of the church was destroyed at that moment. The location of S. Michele is uncertain. My placement of it in Figure 15 is based on R. Piattoli, *Le carte della canonica della cattedrale di Firenze*, Rome, 1938, Doc. 130, and a reference found by F. J. Carmody, “Florence: Project for a Map, 1250–1296,” *Speculum*, XIX, 1944, 46, suggesting that S. Michele stood by the superseded city wall in 1275. In all likelihood S. Michele Visdomini stood by the Visdomini gate in an analogous position to four other high medieval churches in Florence (G. Vanini, “La formazione della topografia urbana di Firenze medievale [Le origine],” thesis, University of Florence, 1974, 149, 160). Consequently it stood approximately at the present crossing of the Duomo.

⁷ A late trecento or early quattrocento view of the Duomo façade in a fresco of the school of Giovanni del Biondo, formerly in the cloister of S. Croce (Morozzi-Toker, 85 and fig. 68), represents essentially the same façade with arbitrary transformations and possibly the Four Evangelist statues commissioned in 1408–09

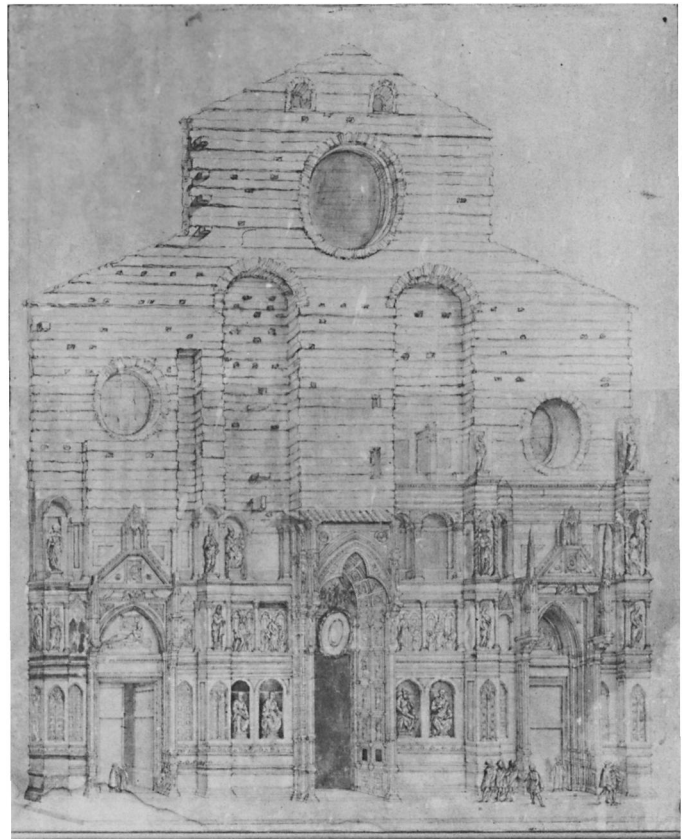
⁸ The older literature on the façade is summarized in Metz, 1938; L. Becherucci, “Una lettura arnolfiana,” *Studi in onore de Valerio Mariani*, Naples, 1971, 67–80, attributes the façade in the Poccetti drawing to Arnolfo, as do Romanini, Trachtenberg, and Kreytenberg. White, 321, speaks of this façade as “a jumble of incoherent detail” decidedly not by Arnolfo. M. Weinberger similarly denies this façade to Arnolfo in “The First Façade of the Cathedral of Florence,” *Journal of the Warburg and Courtauld Institutes*, IV, 1940, 76, n. 3. Weinberger was the first to notice the eagles of the Calimala guild over both side doors in Poccetti’s rendering, but he misidentified them with the wool guild. Hitherto unnoticed is the elongated six-pointed star of the Giudici e Notai, higher up over the north door. Since these were two of the seven major guilds that rotated administration of the Duomo until the wool guild took exclusive control in 1331, I believe that the façade must antedate that year. This would buttress the already substantial case for Arnolfo or his followers.

⁹ Saalman, “Santa Maria del Fiore,” 491–92.

¹⁰ G. Vasari, *Le vite*, ed. G. Milanesi, 1, Florence, 1878, 291–92: “E perchè lasciò non pure fondata Santa Maria del Fiore, ma voltate, con sua molta gloria, le tre principali tribune di quella, che sono sotto la cupola. . . ed il ritratto della chiesa di Santa Maria del Fiore, cioè del di fuori, con la cupola, si vede di mano di Simon Sanese nel Capitolo di Santa Maria Novella, ricavato dal proprio di legname che fece Arnolfo.”



4 Fresco view of Florence, 1342. Florence, Bigallo (photo: U. Falughi)



5 Bernardino Poccetti, view of the Cathedral façade in 1587 (photo: Opera del Duomo)



6 Andrea Bonaiuti, *The Church Militant and Triumphant*, 1366–68. Florence, S. Maria Novella, chapter house (photo: Brogi)

ca. 1295 (Fig. 8). Seizing on this anachronism, a majority of modern scholars (Boito, Guasti, Salvini, Sanpaulesi, Paatz, Frankl, Gioseffi, White, Romanini) have accepted Arnolfo as the main generator of the Duomo plan, although they believe it to have been very much enlarged and modified around 1368 (Figs. 7, 9, 10).¹¹ A smaller group of scholars (Metz, Kiesow, Trachtenberg, Kreytenberg) have attributed to Arnolfo a very different project: a wooden roofed church with a transept, akin to S. Croce (Fig. 11).¹² Werner Gross and Howard Saalman advanced the narrowest claim for Arnolfo as designer of the façade only, and warned against attributing any other part of the plan to Arnolfo without further documentation.¹³ Without such documentation, we cannot know whether the exceptional features of the definitive 1368 design were original or reiterations of a supposed Arnolfo plan.¹⁴ Until both the 1368 and Arnolfo plans are clarified, any attribution based on style alone is meaningless.

II. Excavation Below the Cathedral

A mass of new information on the design stage of S. Maria del Fiore has now emerged from the archaeological campaign of 1965–1974, which excavated two and a half bays of the Duomo, plus the piazza to its west.¹⁵ The object of the excavation was the sixth-century church of S. Reparata, which stood for seventy years while the Duomo was built about it (Figs. 12–14). S. Reparata was sixteen meters narrower than the Duomo, but it had two Romanesque side chapels: the south chapel wall was exactly coterminous with the Duomo wall, whereas the north chapel was partly sliced off by it. The old church had extended some fourteen meters west of the Duomo façade toward the Baptistery, with which it was parallel and axially aligned (Fig. 15).¹⁶ Curiously, the Duomo which replaced S. Reparata is neither parallel nor axial with the Baptistery.¹⁷ The first objective of site design was to open

up the narrow piazza between S. Reparata and the Baptistery, in order to permit circulation to the north suburbs through the Via degli Spadai (today Via Martelli and Via Cavour), a route which was laid out in 1285. To the south, the Via Calzaiuoli led to the future site of the Palazzo Vecchio, which was under construction by 1298. It was thus necessary to cut away the porch, façade, and two bays of the nave of S. Reparata at the start of work, probably in 1293–94. Consequently the façade of the Duomo had to be erected immediately to protect the old church (Fig. 16), a peculiarity of construction that Florence shares with a half-dozen other Gothic cathedrals, such as Amiens. Although the inhabitants of an entire city ward were forced out by the placement of the Duomo, the goodwill of only one small group would have been crucial to Arnolfo: the cathedral canons. The cloisters, private houses, and cells of the canons were packed alongside, behind, and on top of S. Reparata, even as they still perch today over the transept of Volterra Cathedral. Arnolfo seems to have appeased critics in this powerful body in two ways. First, he began building simultaneously at the façade and far to the east, where the church of S. Michele Visdomini stood, leaving the canonry behind and on both sides of the church untouched. Second, he aligned the new Duomo not with the axis of the nave of S. Reparata but with the deviant axis of the south chapel wall, and opened his first side door precisely above the old south chapel door. This was the key door of S. Reparata, for the canons had used it for centuries in their procession from the cloister to the main altar (Fig. 17).¹⁸ The canonry problem in Florence was exactly analogous to conditions at Reims Cathedral, which resulted there in the precocious north transept door.¹⁹ The Duomo side door minimized disruption of the canons' customs at a cost of an almost invisible distortion between the Duomo and the Baptistery.

The substitution of one door for another is indicative of the

¹¹ On the historiography of the Duomo, see Romanini, *Arnolfo*, nn. 121, 122, pp. 133, 134.

¹² Metz, 140; Kiesow, 20; Trachtenberg, 1963, 42–43; Kreytenberg, 53, 73–74.

¹³ W. Gross, *Die abendländische Architektur um 1300*, Stuttgart, 1948, 308, n. 92; Saalman, 473.

¹⁴ On the tortuous and largely anonymous evolution of the 1368 plan, see Saalman, 483–491.

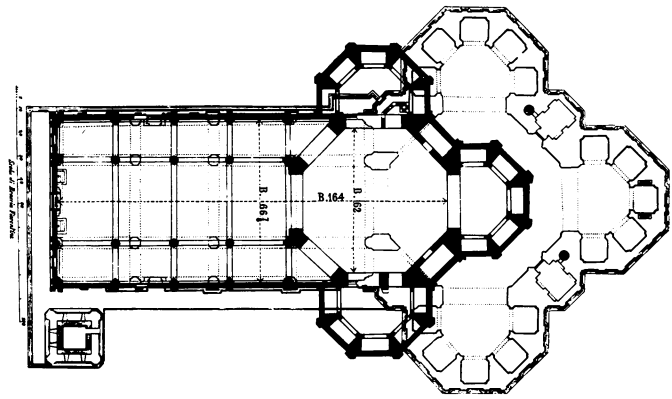
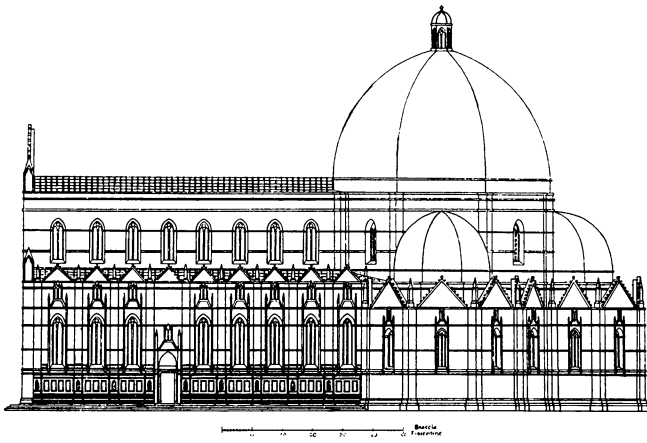
¹⁵ The excavation was initiated by Soprintendente ai Monumenti Guido Morozzi and concluded by his successor, Nello Bemporad. My position as archeological director from 1969 to 1974 was supported by the Committee to Rescue Italian Art (CRIA), to which I express my deep gratitude. F. Toker, "Excavations Below the Cathedral of Florence, 1965–1975," *Gesta*, XIV, 1975, 17–36, summarized details of the site from Roman times to the 13th century.

¹⁶ The relationship between the Baptistery and S. Reparata was discussed in F. Toker, "A Baptistery Below the Baptistery of Florence," *Art Bulletin*, LVIII, 1976, 157–167. Figure 15 is based primarily on excavation and on deeds of 1081 and 1088 in Piattoli, *Le carte*, Docs. 105, 130, and on documentary references in Carmody, *Speculum*, XIX; Vanini, "La formazione"; and F. Sznura, *L'Espansione urbana di Firenze nel dugento*, Florence, 1975, 54–64.

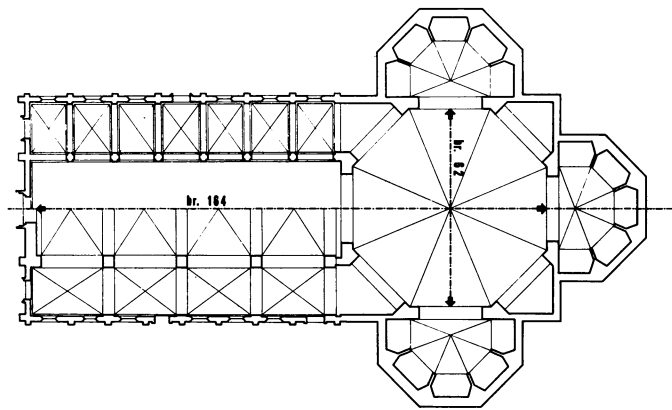
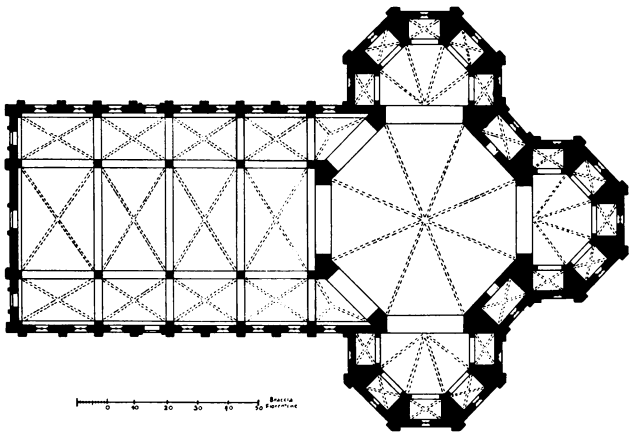
¹⁷ Kreytenberg, 69 and fig. 30, proposed that Arnolfo calculated the placement of the Duomo façade by sighting two equal sides of an isosceles triangle from the two nearest diagonal faces of the Baptistery. This seems correct in principle, although the triangle is in fact distorted.

¹⁸ Demolition of the Florence *canonica* was not ordered until 1339, a half-century after construction began, and the canons were still resisting pressure to move in 1357 (Guasti, Docs. 56, 58, 71). A brief history of the canonry was sketched by R. Davidsohn, *Forschungen zur älteren Geschichte von Florenz*, I, Berlin, 1898, 149; the direct correspondence from the church to the cloister is documented in the late 12th-century "Ritus in Ecclesia Servandi," Florence, Biblioteca Riccardiana, MS 3005, fol. 49v. Throughout the 14th century the lay company of S. Reparata grouped in the cloister before walking to the high altar, following the old route of the canons despite the Duomo construction (plaque of 1310 opposite the campanile and ASF, Conv. Sopr. Z.I., 2176, No. 12, fol. 2, 1326). Even in 1394 the first south Duomo door was still described as "porta che va nel Chiostrò" (*ibid.*, 2170, No. 4, fol. 76v). The bench that flanks the exterior south wall of S. Maria del Fiore from the campanile to the second door is, I believe, a relic of the cloister and marks its approximate position.

¹⁹ R. Branner, "The North Transept and the First West Façade of Reims Cathedral," *Zeitschrift für Kunstgeschichte*, XXIV, 1961, 224–30 and 238, n. 7.

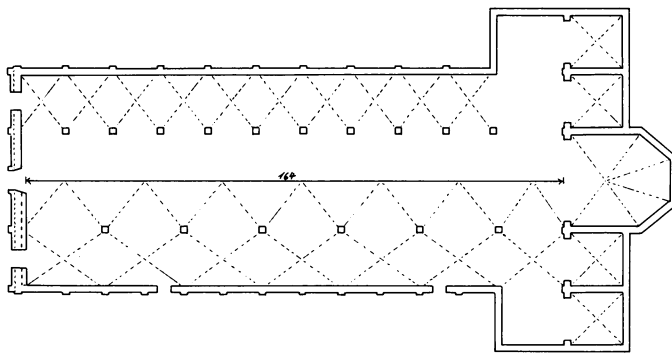


9 C. Boito, 1865 reconstruction of the Arnolfo project, superimposed on the final plan



10 D. Gioseffi, 1963 reconstruction of the Arnolfo project (above), and a revision of the 1330's (below)

7 W. Paatz, 1937 reconstruction of the Arnolfo project for Florence Cathedral

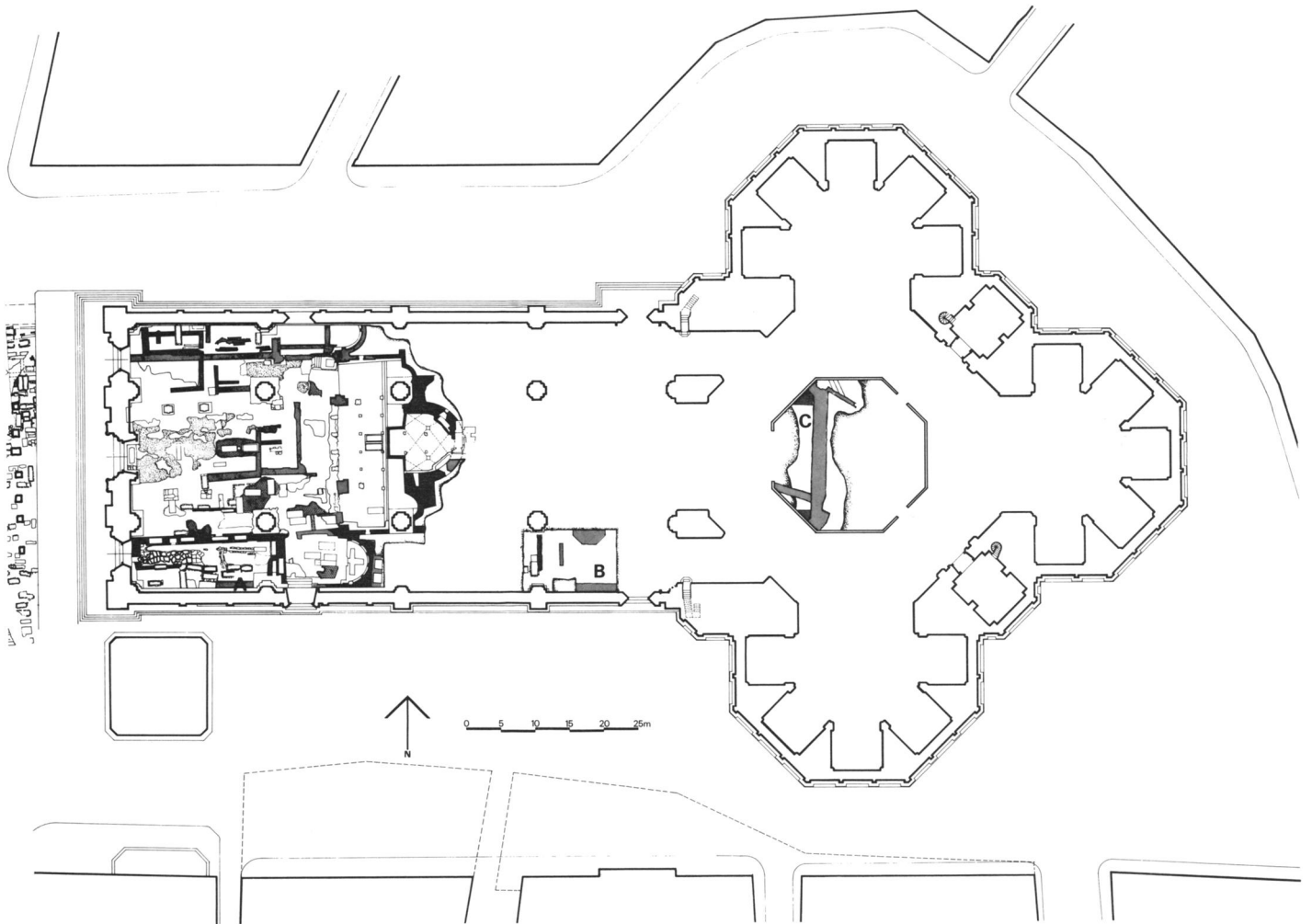


11 G. Kreytenberg, 1974 reconstruction of the Arnolfo project (above), and a revision of the 1330's (below)

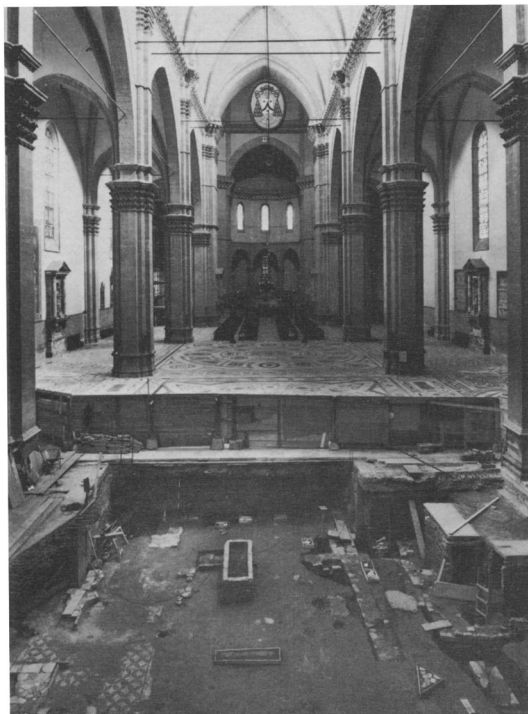


8 S. Croce, Florence, from the west (photo: Soprintendenza ai Monumenti, Florence)

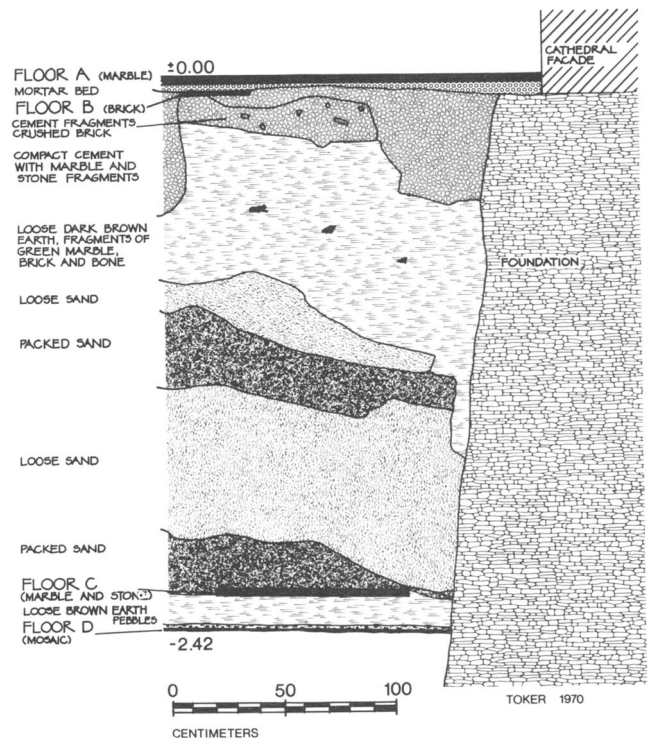
meticulous preparation and speed of construction by which the new cathedral was laid out around the old. Being an ancient church, S. Reparata lay about a meter below the street level of central Florence. South of the church lay an eleventh-century cemetery about a meter above street level. The cemetery grade was chosen as the floor line of S. Maria del Fiore, which in effect elevated it on a pedestal one hundred and fifty years before Alberti made the practice fashionable. As huge trenches were dug for the Duomo foundation, the earth was carted inside S. Reparata and then covered with a herringbone brick pavement, which served as the temporary Duomo floor for seventy years. It still bears the gouges incised by scaffolding supports and by falling stones. The brick



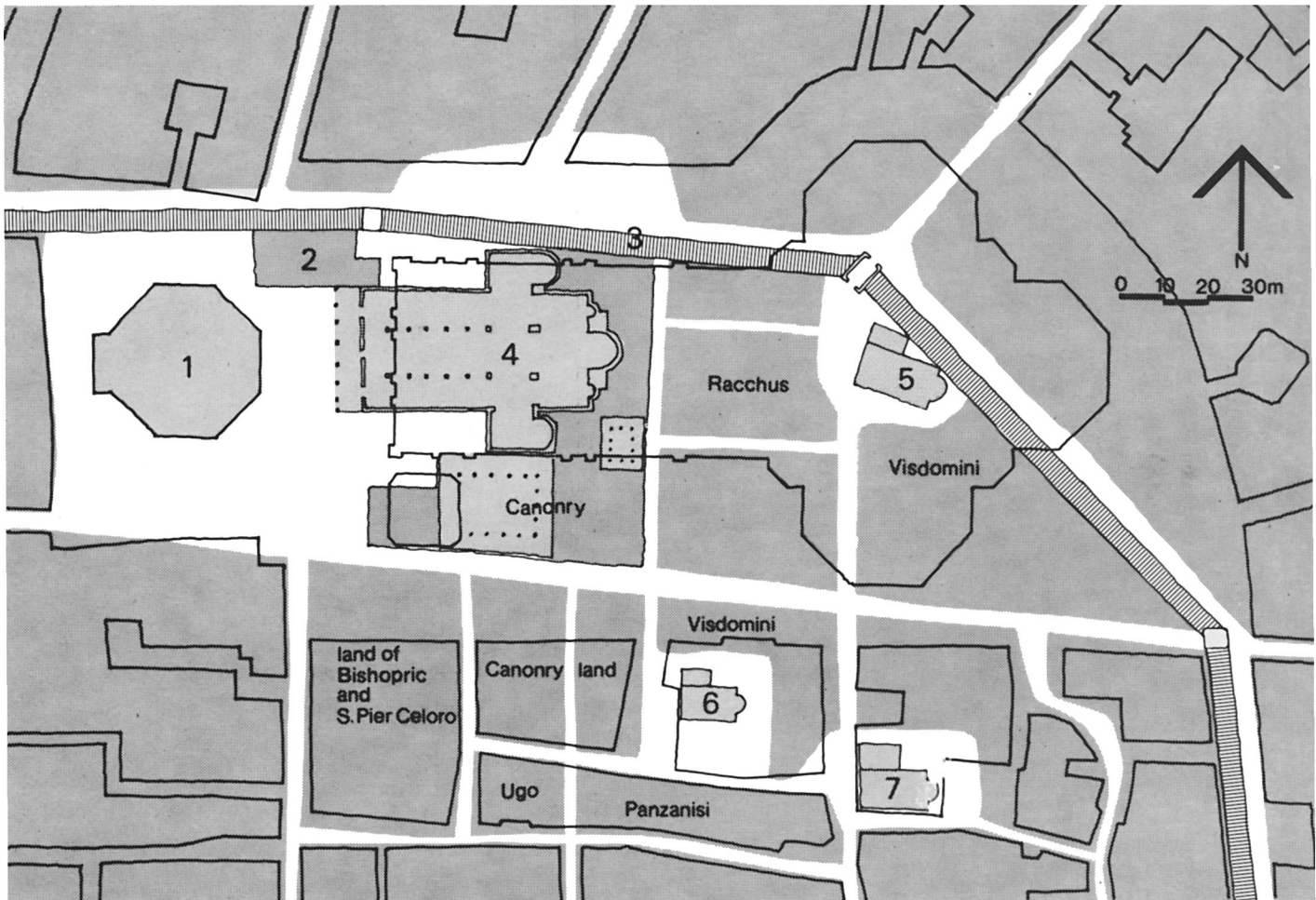
12 Excavation zones within and outside the Cathedral, 1965–1974 (drawing F. G. Morrill and author, redrawn V. S.)



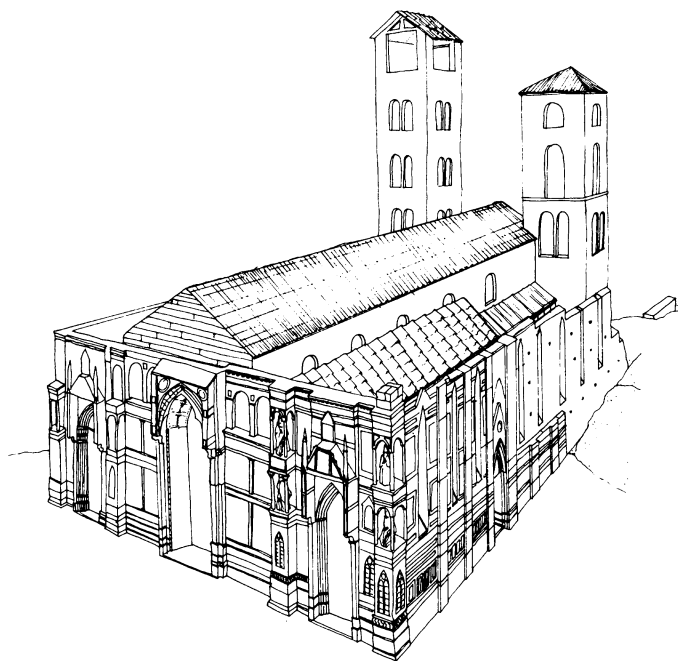
13 Excavation in the nave of the cathedral, 1971 (photo: Soprintendenza ai Monumenti)



14 Floor levels below Florence Cathedral (author): (A) Existing 16th-century floor, replacing a late trecento floor; (B) Brick pavement in use ca. 1302–1375; (C) Romanesque floor of S. Reparata; (D) Early Christian floor



15 Cathedral district in the 12th century (drawing author, redrawn F. S.): (1) S. Giovanni Battista (standing); (2) Hospital of S. Giovanni Evangelista, destroyed 1296 (reconstruction); (3) Carolingian city wall, superseded 1172, later destroyed (reconstruction); (4) S. Reparata, destroyed 1293–ca. 1375 (excavated); (5) S. Michele Visdomini, destroyed 1300 and 1368 (reconstruction); (6) S. Pier Celoro (standing); (7) S. Benedetto (standing)



16 Construction of S. Maria del Fiore around S. Reparata, mid-14th century: integration of the views of 1342 and 1587 with the archaeological evidence (drawing A. Bigazzi, revised F. T., redrawn R. S.)



17 Florence Cathedral, first south side door ("porta del campanile") during excavation, showing temporary pavement and steps in use ca. 1302–1375 (photo: Soprintendenza ai Monumenti)

pavement was first laid inside S. Reparata, but later the south aisle wall and the west wall of the south chapel were demolished, and the floor was extended with only a minimal seam over the stumps of these walls (Fig. 18 and A on Fig. 19). The *terminus ante quem* of this extension is 1302, the year in which the dated tombstone of Canon Iacopo Cavalcanti was cut into the preexisting floor.²⁰ The herringbone floor was not laid in the corresponding zone north of S. Reparata, nor at any point east of the transept. Since the south aisle wall of S. Reparata was gone by 1302, but its piers and roof were documented as standing until 1358, one must surmise that the south Duomo wall had been erected from the façade to the first south door by 1302, and that a shed roof extended from the Duomo wall to the surviving clerestory of the old church (Fig. 16). Certainly the elaborate tomb slabs that lay between the two churches would not have been placed there without overhead protection. The north aisle wall was, on the contrary, not torn down until 1358: workers entered the construction site through breaches in the Duomo and S. Reparata walls (Fig. 19, point C), so that the north chapel was not disturbed by traffic.

From these findings, one sees that the old church was operational although progressively decimated until about 1375. Worshippers would have entered it by the three doors in the new Duomo façade or by the south wall door. The herringbone pavement acted as a ramp, which descended 0.90m from the Duomo façade threshold to the S. Reparata transept so that the congregation could pass below the raised presbytery into the crypt.²¹ The fresco view of 1342, on which Figure 16 is based, proves to be accurate. The parts of the old church that then remained standing were the rest of the roof (after the facade and two bays were shorn off in ca. 1293), the north aisle wall, the apses of the two side chapels, and the entire east end with its three apses and two square towers. By 1362 the piers,

clerestory, roof, north aisle walls, and the towers had all been demolished, but the five apses and the chancel walls survived until ca. 1380, when the remnant was cut down and paved over with a new brick floor. This second floor is also gone today, replaced by the present marble pavement of the cinquecento.²² In the middle of the third bay was an open *confessio*, or sunken chapel, which exposed the semicircle of the old apse of S. Reparata until 1439 (Fig. 20).²³

III. Early Work on the Façade and Nave

The rapidity with which old S. Reparata was cut away, filled up, bricked over, and then patched by new Duomo walls on both the west and the south suggests that work progressed faster during the lifetime of Arnolfo than anyone but Vasari has hitherto claimed. Archaeological evidence demonstrates that the façade and at least thirty-six meters of the Duomo south side wall were standing and in use (though much lower than their present height) by 1302. When Francesco Talenti erected pilasters in 1357 to support his rib vaults, he sank rubble masonry into pits hollowed out in the earth next to Arnolfo's foundation (Fig. 21). In excavating the whole of the first two bays and a substantial portion of the third and fourth bays, only one pre-Talenti pier (discussed below) and no pre-Talenti pilasters at all came to light. This finding confirms what some scholars had suspected: that Arnolfo did not intend the Duomo to be vaulted, for he neglected to bind pilasters into his foundation walls. We should think of Arnolfo's projected nave and aisles as wood-roofed, as in the Cathedral of Orvieto, or wood-roofed with transverse arches springing over the aisles from consoles high up on the wall, as in S. Croce. The excavation also confounds the theory of Gioseffi and Kreytenberg that the façade was thickened internally in the 1330's in order to sustain the thrust of a new system of vaulting. This supposition had its origin in data on the façade

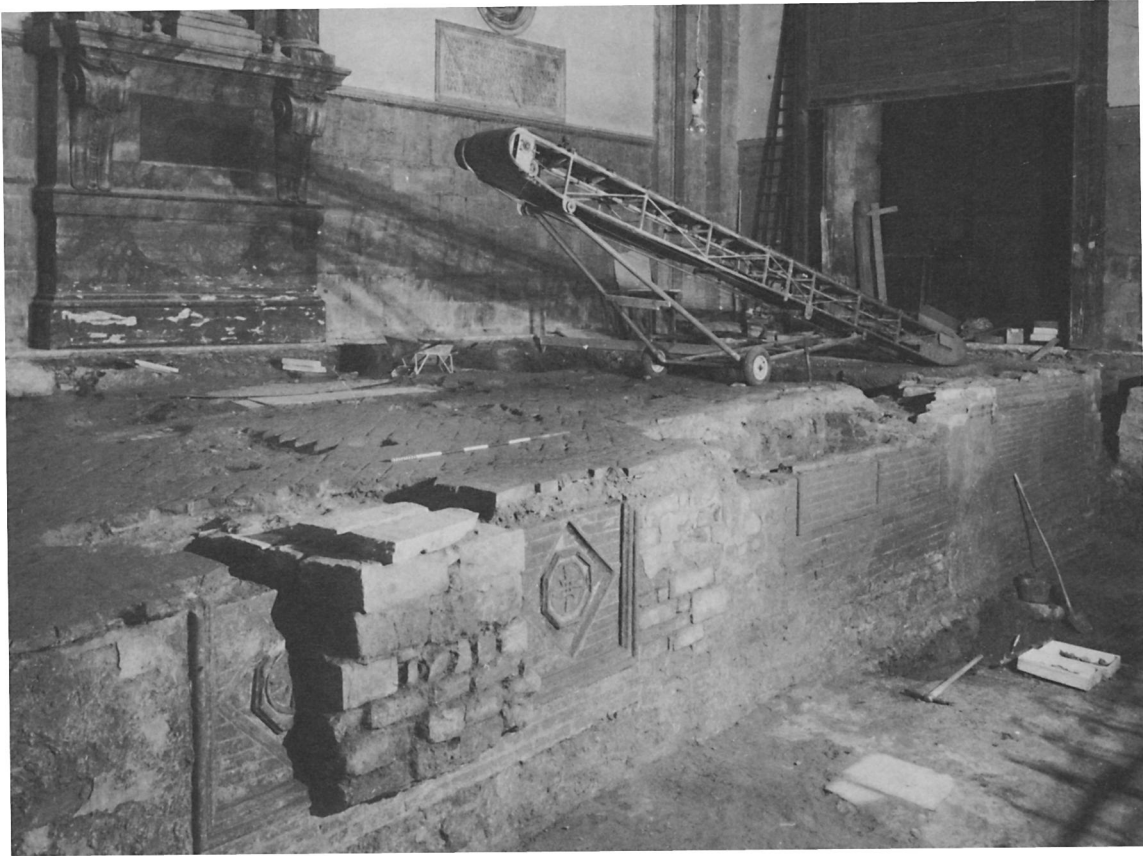
²⁰ The date of this tombstone appears secure. It corresponds to a notice in the "Necrologio della Metropolitana" (ASF, MS 615, fol. 29v) and the tombstone is cut in the low frontal relief characteristic of the early trecento (ill. in P. Bargellini *et al.*, *Santa Reparata*, Florence, 1970, 65). The fourteen dated tombstones in Figure 19 were inserted between 1302 and 1363; however, the tomb to the left of point B postdates 1374, according to the twenty-three coins found inside, and the tomb slab of Filippo Brunelleschi (point B) was inserted through a cut in a higher pavement in 1447.

²¹ The presbytery of S. Reparata would have resembled that of S. Miniato near Florence or S. Zeno at Verona. Its destruction is not documented; however, it was standing in 1359 and gone by 1364 (ASF, Conv. Sopr., Z.I., 2170, No. 12, fols. 12, 13). The entire church would have been usable on Sundays until scaffolding filled the nave. Several hundred men met in the "parlamento del popolo" at S. Reparata in 1343 (R. Davidsohn, *Storia di Firenze*, v, Florence, 1964, 108).

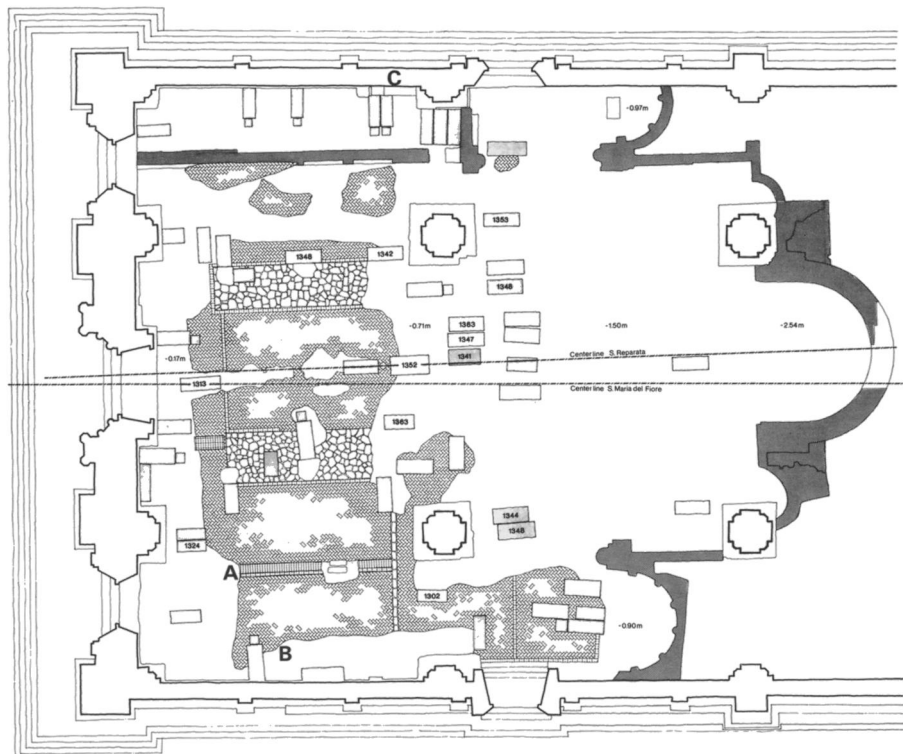
²² Samples of the late trecento brick floor were preserved under the two

wooden tabernacles of Bartolomeo Ammannati in the side aisles of the first bay. Preserved there too was a stone block one meter wide and three meters long (Fig. 19, right of point B; at extreme left in Fig. 18), which served as the base of a flight of steps about four and a half meters high which led to a small door in the Duomo wall and thence by a bridge to the Campanile (Trachtenberg, 1971, 69).

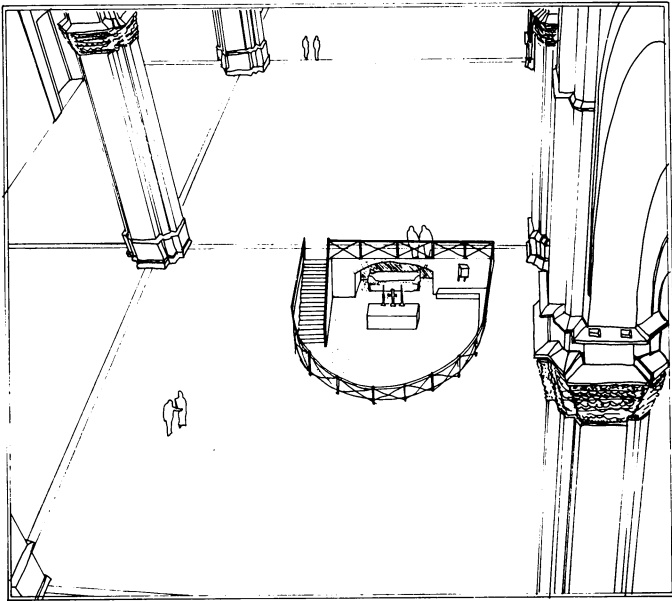
²³ The *confessio* exhibited the casket of the founder-bishop of Florence, Saint Zenobius. After the relic was transferred to Ghiberti's bronze casket, the apse was vaulted over by assistants of Brunelleschi, although it was thereafter accessible by a marble trapdoor. Documentation on the *confessio* is abundant: Guasti, Docs. 299, 333, 346; G. Poggi, *Il Duomo di Firenze*, 1, Berlin, 1909, Docs. 887, 891, 892, 895, 934, 941; *idem*, II (unpublished proofs in the Kunsthistorisches Institut, Florence), Doc. 2093. Only the steps are arbitrarily restored in Figure 20. G. Richa, *Notizie storiche delle chiese fiorentine*, VI, Florence, 1757, 132–34, identified steps that were no longer in place in 1965.



18 South aisle wall of S. Reparata visible below brick floor of ca. 1302 in the southwest corner of Cathedral (photo: Soprintendenza ai Monumenti)



19 Remains of S. Reparata within S. Maria del Fiore in the mid-thirteenth century (drawing author, redrawn F. S.)



20 Apse of S. Reparata transformed into a *confessio* below the Cathedral floor, ca. 1375–1439 (drawing F. G. Morrill)



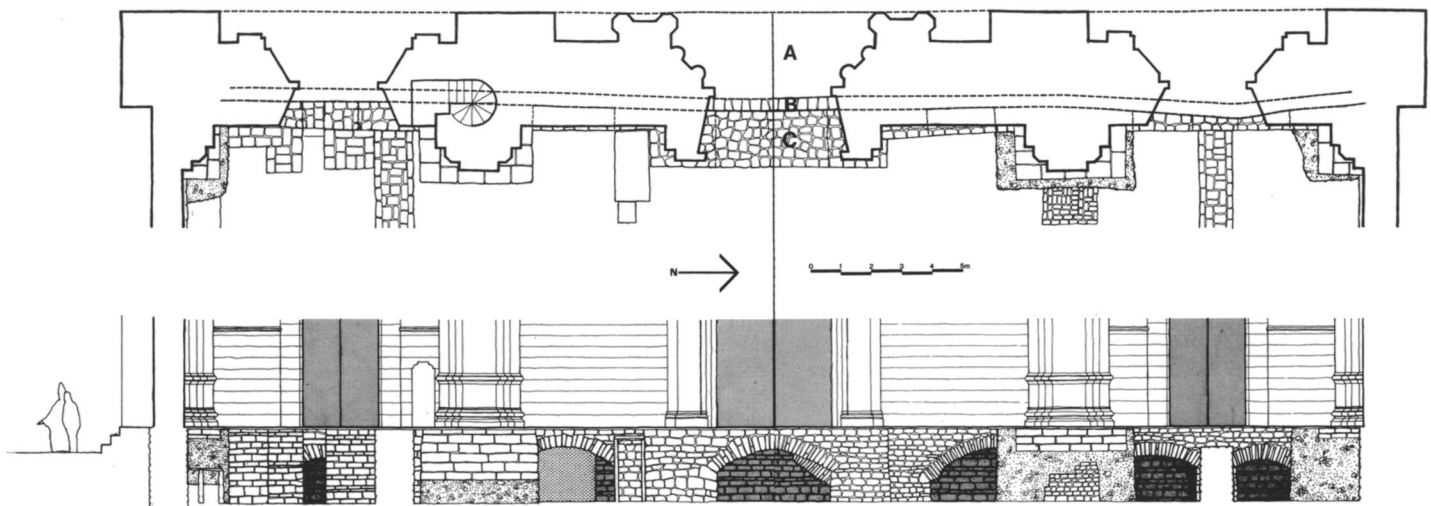
21 Southwest corner pilaster inserted ca. 1357 against Arnolfian foundation (photo: Soprintendenza ai Monumenti)



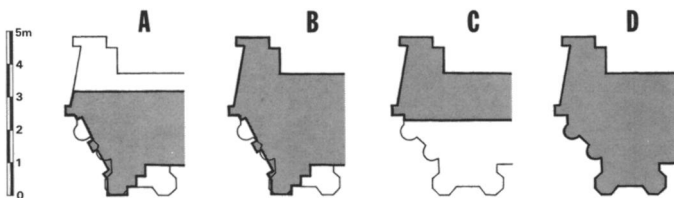
22 Interior façade with exposed foundation layer "C" (photo: Soprintendenza ai Monumenti)

supplied a century ago by the architect of the new façade, Emilio de Fabris.²⁴ Excavation of the inside façade foundation indicated the presence of three separate foundation layers (Figs. 22–24). The basic layer is the outermost (wall A on Fig. 23), which was built to support the Duomo façade wall and its marble incrustation on its three-meter base (by comparison, the side walls are 1.10m thick and their bases about 1.30m). East of wall A on Figure 23 is wall B, only 0.30m, or one stone thick, which does not begin many meters underground in the manner of A, but starts only at the level of the old floor of S. Reparata. This wall hangs like a modern curtain wall on A, and is too shallow and thin to be of structural value. Its function, I believe, was infill, to insure that the side walls of S. Reparata adhered without any gaps to the new Duomo façade. The retrofaçade of the Duomo that one sees today does not rest on either walls A or B but on C, the innermost layer. This is not a true foundation but only a base of 1.40m maximum

²⁴ Emilio de Fabris directed soundings in the façade foundation in 1871, before erecting the modern layer of incrustation. His *Rapporto alla deputazione . . . del Duomo*, Florence, 1871, was integrally reproduced in C. J. Cavalluci, *S. Maria del Fiore*, Florence, 1881, Appendix 1, 1–15. De Fabris spoke confusedly of an inner foundation that projected 1.40m to the east of the retrofaçade wall; a middle layer that he did not measure; and an outer foundation that projected 2.28m to the west of the outside façade wall (which in 1871 stopped at the first jamb of the center door: see state C on Fig. 24). De Fabris interpreted the inner layer as Arnolfo's façade; he believed that the middle "ringrosso" layer was added for structural stability and that the outer layer was a later base for the marble veneer. The royal inspector of excavations and monuments, Emilio Marcucci, challenged these interpretations in a counter-report which identified the inner layer as the old façade of S. Reparata, the middle and outer layers as Arnolfian (B. Gallina et al., "Emilio Marcucci," *Dilettante in Architettura*, " *Antichità viva*, XII, 1973, 43–44). Gottfried Kiesow, 16, linked the De Fabris statement of a thickened façade to his own observation that the first side-wall window is axially balanced on the outside but 0.90m too close to the inside façade. Gioseffi, 129, and Kreytenberg, 50, n. 230, interpreted the façade thickening as a consequence of a complicated new post-Arnolfian scheme of vaulting, probably of the 1330's (Figs. 10, 11). Saalman, 498, nn. 107, 108, rejected the notion of a thickened façade.



23 Plan and elevation of façade and foundations (drawing author, redrawn F. S.)



24 Cathedral façade (drawing author, redrawn F. S.) (A) As projected ca. 1293; (B) As executed ca. 1300; (C) After incrustation removed, 1587; (D) After incrustation replaced, 1871–1887

width, resting on six arches (Figs. 22, 23). These arches were constructed quickly and cheaply, by using the earth that had already been piled up inside S. Reparata as centering. In consequence, one might regard the erection of wall C as an afterthought, to support the enframing around the central door, to embellish the middle of the retrofaçade with cut stone (the sides were only stuccoed), and to add the blind arcade which is so decisive to the design. This thickening also had the unfortunate result of jamming the side windows 0.90m too close to the west wall, as Kiesow has pointed out. The motive for thickening the wall was consequently not structural but decorative, and its date would not be in the 1330's, as Gioseffi and Kreytenberg suggested, but a generation earlier. This is persuasively argued by the stylistic rapport of the mosaics over the central door with the 1296 apse mosaic of S. Miniato; by the early trecento profile of the capitals in the arcade; and by a *terminus ante quem* of the year 1321 for a tomb embedded in the

retrofaçade itself (Fig. 22).²⁵ Dating the blind gallery early in the trecento affords another clue to the original design for the Duomo. One notes that Talenti's façade pilasters overlap the blind gallery by about 0.75m. Hence the project for the original nave would have been 1.50 to 2m wider than the nave today (19.83m on center), in a ratio to the aisle width of greater than 2:1.

IV. The Original Design of the Octagonal Crossing

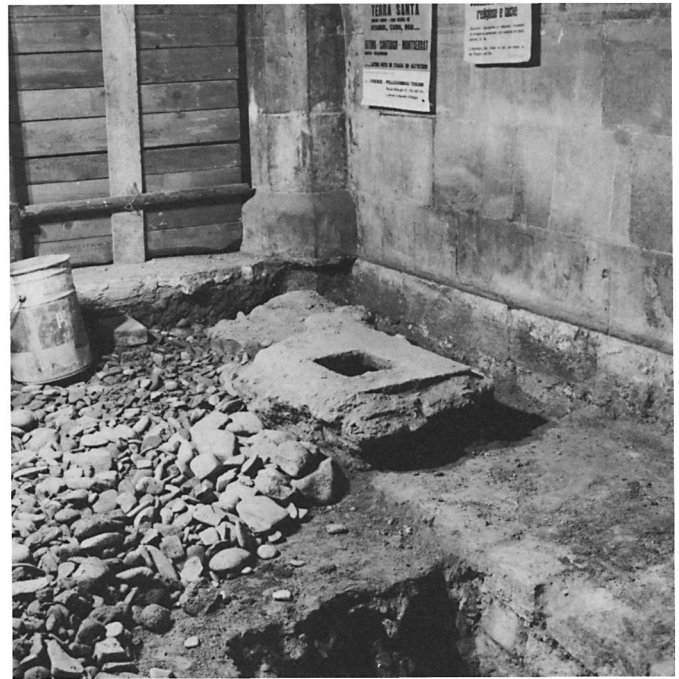
The official S. Reparata excavation stopped in the third Duomo bay, but in 1973–74 I took advantage of floor repairs in the fourth south aisle bay and at the crossing to conduct a separate investigation. Excavation in the aisle at point B on Figure 12 revealed the remains of several thin walls of finished masonry belonging to pre-Duomo buildings, a late trecento brick tomb (datable by pottery inside) which was inserted during cathedral construction, and an octagonal base of rough foundation masonry (Fig. 25). The base lay directly under the Duomo floor: its diameter is 4.90m; each side measures 2.05m, and its east-west axis lies about 0.70m south of the axis of Duomo piers. Directly south of this base the foundation of the Duomo protruded 1.16m, or two *braccia* (1 *braccia* = 0.5836m), from the wall plane (Fig. 26). This thickened wall aligns with the 1.16m-projection of the aisle wall 10m farther east. Another group of walls was unearthed at point C on Figure 12 during renovations to the high altar in February 1973. The main structure was a cement-covered wall of hammer-dressed stone 2.05m thick, 17.38m long inside its inner corners, and about 20m long to its obscured outer

²⁵ The tomb of Bishop degli Orsi was fixed to the retrofaçade by Tino da Camaino before July 1321 between the north and central door; the inscription cut into the wall below it dates no later than 1322 or 1323 when Tino permanently left Florence (W. R. Valentiner, *Tino di Camaino*, Paris, 1935, 62–74). The tomb was removed soon after but not the inscription,

which Valentiner and Paatz, 1952, 396, n. 239, accepted as original. Kreytenberg, 89, n. 256, proposed the very problematic hypothesis that the blocks which bear the inscription were transferred from another place. On the style and derivation of the blind gallery see Paatz, 1952, 355, 369, 495, n. 240, and Paatz, 1937, 87, 98, 145; Romanini, 128.



25 Octagonal base in fourth side aisle bay (zone B in Fig. 12) (photo: Soprintendenza ai Monumenti)



26 Projecting wall foundation in fourth south aisle bay (photo: Soprintendenza ai Monumenti)



27 Foundation wall in the cathedral crossing, from the south (photo: Soprintendenza ai Monumenti)



28 Northwest inside corner of excavated walls at crossing, from the south (photo: Soprintendenza ai Monumenti)

corners, which angled at 135 degrees northwest and southwest (Figs. 27–30). Both inner corners were plugged with similar foundation masonry which had been added at a second stage. This wall is fractionally less than a perpendicular to the Duomo axis, which bisects it. One much thinner wall intercepted the large mass from the west, and cut-stone steps impacted against it from the northeast. Although separated by over thirty-five meters, the north-south wall at C and the octagonal base and exposed foundation at B correspond in orientation, axis, level, and masonry type. It was clear from their position that all three elements were constructed as part of the Duomo foundations in accordance with some outmoded plan. Completing these elements on paper yields an octagon formed by the east, northeast, and southeast walls found under the crossing, the north and south walls that exist in the Duomo today at the entrance to the crossing, and two octagonal bases on the west that would have held crossing piers.²⁶ In three respects this octagon would have differed from the present octagonal crossing: its center would have been about twenty-two meters west of the cupola center today; its cupola would have fit within the aisle walls and not ten *braccia* beyond; and, although its angles would have been equal, the projected cupola would have been “stretched” in Romanesque fashion (as in Romainmôtier, Speyer, Pisa, the Duomo Nuovo plan in Siena, etc.) with two long sides across the nave and six equal short sides. This stretching, apart from being a common form in the thirteenth century, would have reduced the cupola diameter for safety and would have joined the cupola to the nave more elegantly, without the need for the misshapen crossing piers there today.²⁷

The hypothesis that these are the remains of octagonal foundations for an aborted cupola could not and should not

convince us without documentary evidence. Fortunately such documents exist from the tenure of the seventh recorded *capomaestro*, Francesco Talenti (1351–1368).²⁸ Talenti's main task after the completion of the campanile in 1357 was to harmonize preexisting construction at the east and west ends of the church. At the west were the façade and at least half the present length of the side walls. To the east lay unspecified walls for which no original construction records exist but of which we have four descriptions: “the chapels in the rear” (1355); the “part of the chapels below where the cupola must come” (1357); “the large chapel” to the east (1366); and “near the cupola” (1368).²⁹ Whatever stood at the east end was considerable enough to force Talenti into the acrobatic vaulting compromise which is still evident in the discord between the interior and exterior.³⁰ The decision to link the two parts was made on June 19, 1357. Breaking completely with the bay lengths indicated even today on the exterior side walls, the *Opera* proposed to erect three virtually square bays 34 *braccia* long for a total nave length of 102 *braccia*, or 59.53m. Digging for the first pilaster base began the same evening, but not before the dimensions of the existing Duomo walls had been recorded: “They measured the church all together this day. It was: long 164 *braccia* exactly to [variant manuscript: *from*] the chapels. Wide 66 $\frac{7}{8}$ *braccia* net in the front part. In the part of the chapels below where the cupola must come, wide exactly from the chapels 62 *braccia*.”³¹ The first two bays of the Duomo were vaulted according to this plan between 1357 and 1366. In July 1366, as Talenti was on the point of erecting the third, oversized, set of piers, which would have supported the west side of the cupola, he was stopped by a special advisory committee of goldsmiths, which proposed to lengthen the nave 19.84m by building an additional fourth

²⁶ Two counter-reconstructions of these walls have been suggested: Ugo Procacci saw them as parts of a medieval defense tower (Vanini, 105, n. 1), whereas other observers at the site suggested a connection with the destroyed church of S. Michele Visdomini. Considerations of axis, level, size, and shape of these walls rule out associations with either building. Since the structure terminated on the west with piers rather than a continuous wall, it could not have been freestanding. The walls were fully recorded in photographs and in a detailed plan by F. Gordon Morrill (reproduced as Fig. 30), but discussion of them was foreclosed after only five days when they were ordered reburied.

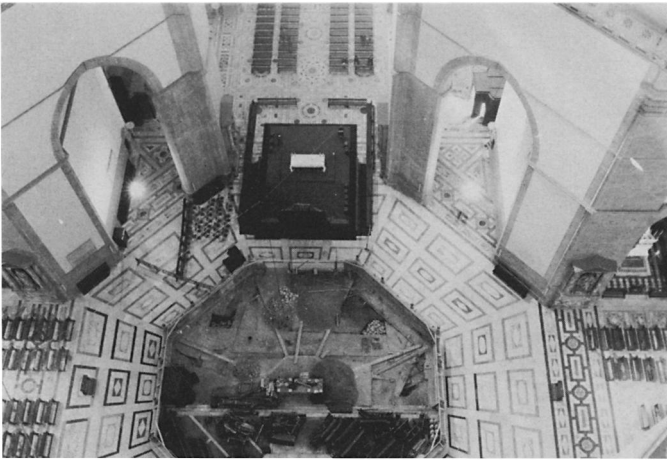
²⁷ The north-south diameter of the cupola would have been 36.60m, identical to the present narrowed nave and aisle width before the crossing. The east-west diameter would have been approximately 31.10m, depending on how the foundations were utilized to support rising masonry. On this form of stretched octagon in Romanesque architecture, see R. Chappuis, “Utilisation du tracé ovale dans l'architecture des églises romanes,” *Bulletin monumental*, CXXXIV, 1976, 7–36. The expressive potential of the stretched octagon was exploited in post-medieval buildings also: it was the fundamental motif of Louis Kahn's projected Mikveh Israel synagogue in Philadelphia, 1961–1970.

²⁸ The documented *capomaestri* of the Duomo before Talenti are Arnolfo di Cambio (1293, 1296, or 1300 to before 1311); Fino Tosi, Zenobio di Falco, and Vanni Cione in 1332 (R. Davidsohn, *Forschungen zur älteren Geschichte von Florenz*, IV, Berlin, 1908, 460); the painter Giotto in 1334–37 (Guasti, Docs. 44, 50), and the sculptor Andrea Pisano in 1340 (Guasti, Doc. 57).

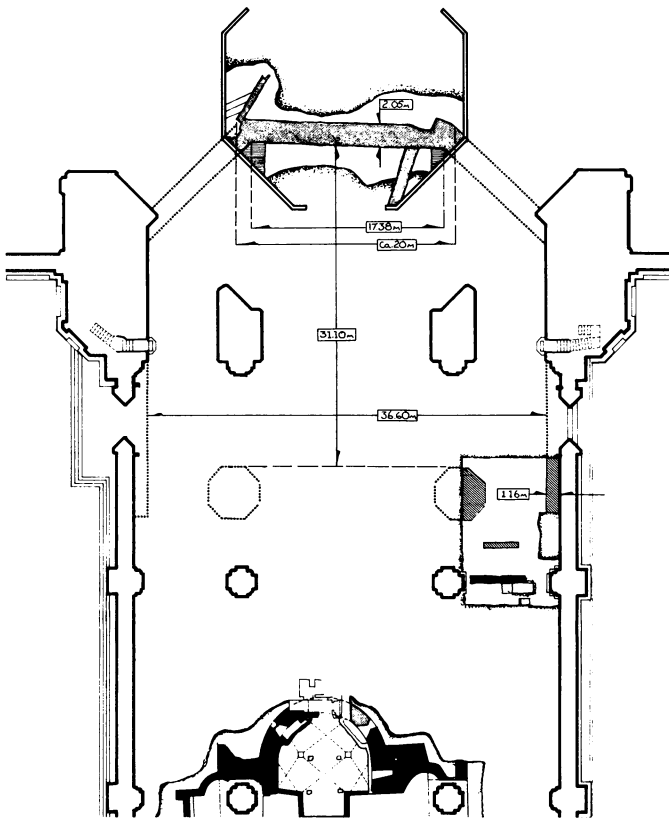
²⁹ Guasti, Doc. 70, p. 81, May 29, 1355; Doc. 72, pp. 94–95, June 19, 1357; Doc. 141, July 13, 1366; and Doc. 212, November 28, 1368.

³⁰ There is no agreement on what stood at the east end. Gioseffi, 129, argued for rising masonry, whereas Saalman, 499, proposed that walls were only projected to rise there, but were not yet built. There is an ambiguous document of work at the east end of the site in 1334. Davidsohn, *Forschungen*, IV, 460, and Piattoli, *Le carte*, Doc. 105, cited a 12th-century parchment copy in the chapter archives of S. Maria del Fiore (presently in *cartella* 44) of a lost deed of 1081 to land now covered by the Duomo. On the back of the parchment roll is a note of September 15, 1334 that “super qua terra [. . .] altare maius [superscript in same hand and ink: *sancte marie del fiore*] et chorus noue ecclesie siue canonice predictae hedif. . . .” Davidsohn and Piattoli completed the last five letters to read “hedificati sunt” and interpreted the document to mean that the choir of the Duomo had been built by 1334. Saalman, 473–74, n. 12, accepted the same reading but not the interpretation. My own reading of the letters “hedif. . . .” in the original indicates *hedificantur* (are being built), or, less probably, *hedificabuntur* (will be built). In this case the note of 1334 means only that the *chorus*—which might denote no more than choir stalls—had been marked out on a plan or on the ground but not necessarily constructed by that year.

³¹ Guasti, Doc. 70, p. 95: “Misurarono tutti insieme questo dì la chiesa. Fue: Lunga br. clxiiij netta dentro alle [variant manuscript: *da le*] chappelle. Largha br. lxxvij $\frac{7}{8}$ netta nella parte dinanzi. Nella parte delle chappelle sotto ove dee venire la chupola, largha netto delle chappelle br. sesantadue.” The word “misurarono” has caused controversy. C. Boito, “Il duomo di Firenze e Francesco Talenti,” *Architettura del Medio Evo in Italia*, Milan, 1880, 187, and Guasti, lix, affirmed that the preexisting masonry was literally measured. Saalman, 477–480, and White, 320, asserted that the dimensions were given on that day rather than taken from existing walls.



29 Excavation at the crossing, February 1973 (photo: author)



30 Plan of excavations at the crossing: dotted lines mark completion of ascertained foundations (drawing F. G. Morrill and F. T., redrawn V. S.)

³² Guasti, Doc. 141: "Che non si debba seguire più la chiesa cominciata, ma quivi si soprassedga, e chomincisi allavorare di dietro alla chapella maggiore . . . E che inanzi che la croce comenci, si facciano quatro valichi, e ponghasi la croce. . . ." There is no stated reason why the Duomo was lengthened at this time, but a comparison with the length of Siena Cathedral is illuminating. When S. Maria del Fiore was projected in 1293, the length of Siena Cathedral was about 89m. The minimum length of Florence Cathedral in 1357 was 95.71m. But in 1339 the Sienese Duomo Nuovo was designed about 116m long. The Florence plan of 1366 would have restored its cathedral to eminence, about 154m long.

³³ On the deliberations of 1366–67, Guasti, Docs. 150, 170, 178, 190, 193; Saalman, 483–491. Saalman, 493–94, discussed in detail the independent citation of a project of similar nature in the chronicle of Marchionne di Coppo Stefani.

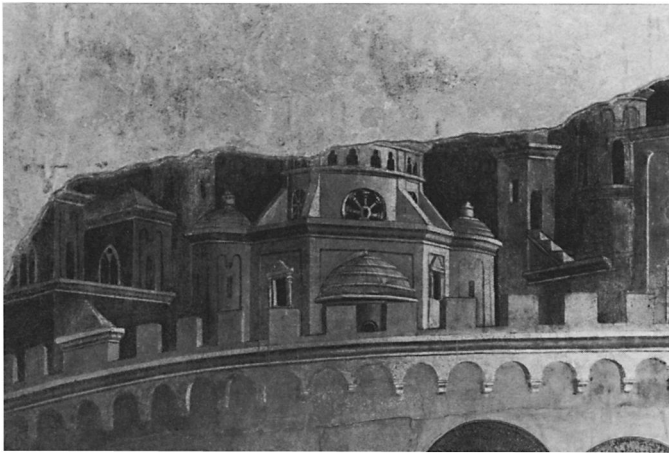
bay.³² In August 1367 the projected width of the cupola was increased from 62 to 72 *braccia*.³³ This plan, ratified in 1368, became the basis for work to the top of the drum until 1420.

The "cupola" measurements of 1357 may be verified by the wall fragments unearthed in 1973–74. The 1357 memo gave the cupola width as 62 *braccia* (36.18m). The north-south width of the excavated foundation is 36.60m, equal to the present width of the nave and aisles just before the crossing. This discrepancy of 0.42m or 6/8 *braccia* is unexceptional in the light of a half-*braccia* error between the measurement of the interior width in 1357 and 1974 (39.03m recorded in 1357; actual dimension 39.30m). There is a greater disparity of 9 *braccia* or 4m between the 1357 note, "long 164 *braccia* to the chapels" (or "from the chapels" in Guasti's variant), and the position of the north-south wall 99.85m or ca. 173 *braccia* from the retrofaçade. This discrepancy is inelegant but not disqualifying. Apart from an insignificant lapse of the scribe (clxiiij instead of clxxiiij), similar to others that Guasti recorded, one may regard this as a five percent error caused by taking measurements in several steps around the bulk of S. Reparata and the canonry. One thinks of the relief that Abbot Suger experienced when the east and west ends of St.-Denis aligned properly, but dozens of other medieval cathedrals do not align. The possibility exists also that the chapels alluded to stood not outside to the east of the cupola line but 9 *braccia* inside to the west, as in SS. Annunziata. Should Guasti's variant reading "from the chapels" be correct, the measurement may be understood as beginning 9 *braccia* inside the retrofaçade, where two chapels stood from the mid-threento until 1905.

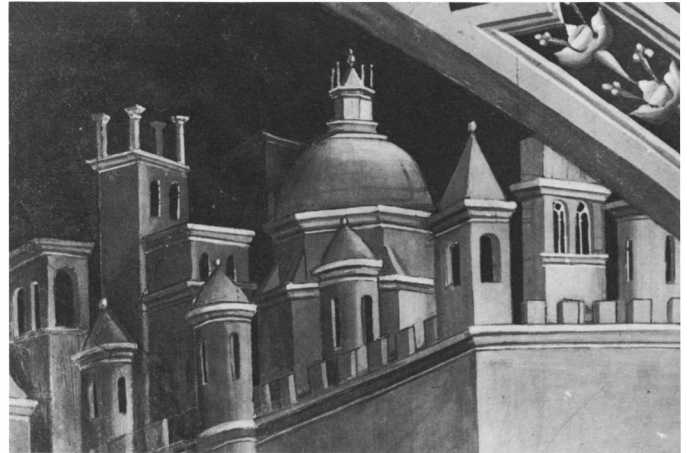
V. Reconstruction and Dating

It is possible to reconstruct and then to date the new octagon fragments beyond their schematic description in the *Opera* records of 1357. It has not been and may never be possible to excavate the entire crossing of S. Maria del Fiore to ascertain the complete form of the aborted project for the east end. It is unknown whether this project ever matured beyond the foundation stage, and the cement covering of the main wall suggests that the structure lay exposed a long while. The limited extent of excavation could not confirm that the octagon led into a triconch, such as one sees in the Bonaiuti fresco, but neither was anything found that in any way contradicted this hypothesis, particularly if the massive supports "plugged" as an afterthought into the southeast and northeast corners were intended as stabilizers and as sacristies.³⁴ Between 1328 and 1334, Taddeo Gaddi twice portrayed a domed and buttressed triconch in the Baroncelli Chapel of

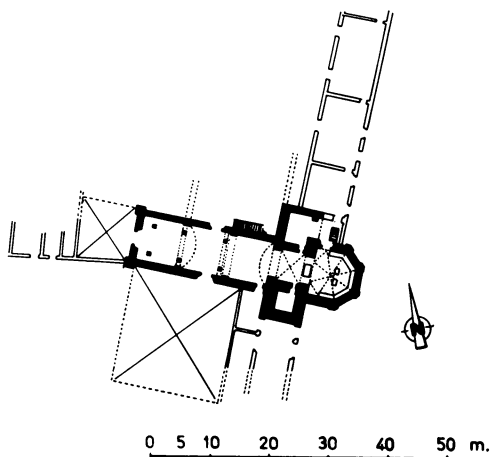
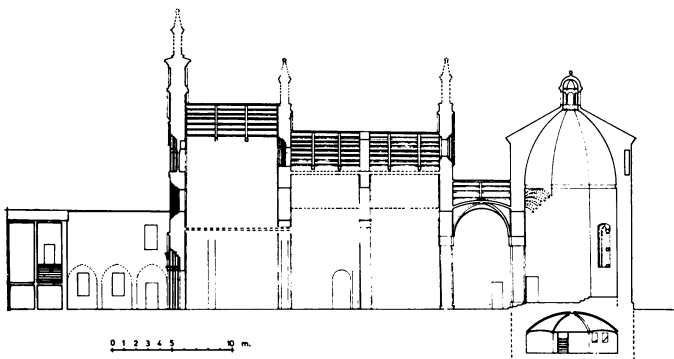
³⁴ The triconch hypothesis may at first seem incompatible with the fact that the east façade of the octagon is marked by a solid foundation wall rather than by two corner piers with an opening between them. E.-E. Viollet-le-Duc, "Fondation," *Dictionnaire raisonné de l'architecture française du XI^e au XVI^e siècle*, v, Paris, 1861, 525, observed, on the contrary, that medieval builders frequently placed hidden foundations to stabilize points of stress. The outer aisle piers of Milan Cathedral are joined below ground by a massive continuous stylobate, although the inner aisle piers are not (A. M. Romanini, *L'Architettura gotica in Lombardia*, Milan, 1964, pl. 166A). At S. Maria del Fiore a four-meter-thick foundation lies hidden between the Duomo and the Campanile (De Fabris report in Cavallucci, 11).



31 Taddeo Gaddi, detail from *The Meeting at the Golden Gate*. Florence, S. Croce, Baroncelli Chapel, ca. 1328–34 (photo: Soprintendenza alle Gallerie, Florence)



32 Taddeo Gaddi, detail from *The Annunciation and Visitation*. Florence, S. Croce, Baroncelli Chapel (photo: Soprintendenza alle Gallerie)



33 Plan and section of S. Gottardo, Milan, 1336, in part restored, after Romanini, "Nuove tracce per il rapporto Giotto-Arnolfo"

³⁵ These frescoes are now free of all later restoration (the old state shown in White, pl. 120). See the detailed study by J. Gardner, "The Decoration of the Baroncelli Chapel in Santa Croce," *Zeitschrift für Kunstgeschichte*, XXXIV, 1971, 105–05, 110. The first of these views was pointed out in Trachtenberg, 1963, 50. The depictions are regarded as unrealistic by Kreytenberg, 81, n. 127, but they convey the lines of a domed triconch earlier than any other trecento painting, and do not derive from the fantastic domed churches painted by Duccio, Giotto, or the Lorenzetti. Filippo Villani wrote in *De Origine Civitatis Florentiae et Eiusdem Famosis Civibus*, ca. 1381–1400: "Taddeo, again, painted buildings with such art that he seemed to be another Dinocrates or that Vitruvius who wrote 'The Art of Architecture'" (J. Lerner, *Culture and Society in Italy, 1290–1420*, New York, 1971, 379).

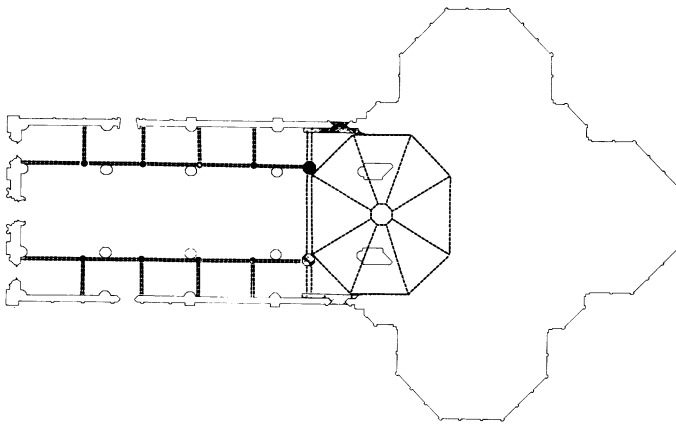
³⁶ See Romanini, *Arnolfo*, 121, and fig. XVII.

S. Croce, which leaves no doubt that such a form was known to the Florentines well before the 1360's (Figs. 31, 32).³⁵ There are also non-triconch designs that might have completed the octagonal foundation. The simplest, but least dramatic, would have incorporated the cupola in a square east end, as in the thirteenth-century cloister vault of S. Maria Maggiore at Lanciano, in the Abruzzi.³⁶ Alternatively the church may have terminated in an octagon without radiating chapels or apses, as in the ducal chapel of S. Gottardo (1336) at Milan (Fig. 33).³⁷

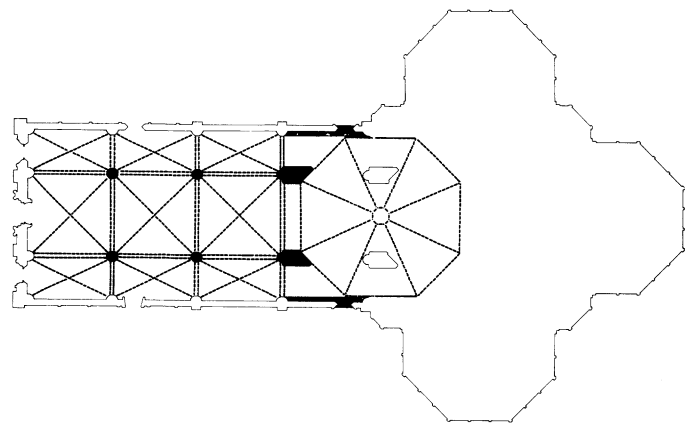
The position of the newly unearthed southwest crossing pier is the key to the reconstruction of the intended nave. The axis of this pier lies about 0.70m south of the axis of the present Duomo piers, which indicates that the proposed nave width was about 21.25m. This is the same approximate width implied by the blind gallery on the retrofaçade. A conjectural restoration would suppose a basilical, unvaulted church with the nave divided into bays by octagonal stone piers and perhaps also marked by transverse arches over the side aisles (Fig. 34). Since the pier lies 66.80m from the retrofaçade, one may calculate a nave length of five bays with an average but not identical width of 13.36m.³⁸ Such a bay size corresponds,

³⁷ Romanini, "Rapporto Giotto-Arnolfo," proposed that the plan of S. Gottardo reflected Giotto's transmission of Arnolfo's intentions for S. Maria del Fiore. Apart from a vast difference in scale, S. Gottardo and the octagon foundations are distinguished by the presence of corner buttresses in the former but not the latter. Corner buttresses would be unnecessary on an enclosed, self-supporting structure, however, and should they have been intended for visual emphasis at the Duomo they would not have been required in the foundation level.

³⁸ The reconstruction of bay lengths for a Florentine church of the trecento is necessarily hazardous and approximate. The first, second, and fourth bay divisions of the Duomo exterior side walls today are each dissimilar, and the layout of bays at S. Maria Novella is notoriously erratic. Rather than five nearly equal bays, the Duomo may have been planned with a short entry bay and four double bays (S. Stefano at Empoli was built on this rhythm in 1367). The reconstruction in Figure 34 is frankly influenced by S. Croce, which is just 0.80m narrower than the Duomo (38.50m and 39.30m), and has an average bay size just over 13m. The vaulted single aisle bays indicated by Kreytenberg (Fig. 11) seem improbably cramped for a metropolitan church of this size, nor are there any internal pilaster supports for vaulted aisles.



34 Reconstructed project of Arnolfo di Cambio: reflected ceiling plan of the nave and cupola, superimposed on the existing Duomo plan (see Fig. 3; author, redrawn by S.G.)



35 Reconstructed project of June 19, 1357: reflected ceiling plan of the nave and cupola, superimposed on the existing Duomo plan (author, redrawn by S.G.)

moreover, to two of the exterior bays on the side walls (average width on center 6.50 to 7m). Two exterior units would then correspond to one great unit of the clerestory and roofline above, in strict analogy with the east façade of the Badia (1285) and the transept of S. Croce (1295).³⁹

This reconstruction of the original design for Florence Cathedral contains many elements that point to an origin in the early trecento, and more specifically to Arnolfo di Cambio. The octagonal pier was popular in Florence between 1250 and 1300 (Bargello court and great hall, excluding vaulting; S. Croce; Camera dell'Arme in the Palazzo Vecchio; Chiostrò dei Morti at S. Maria Novella). After 1300, octagonal piers fell out of favor and they returned after mid-century only as secondary supports (Chiostrò Verde and refectory at S. Maria Novella; loggia of the Ospedale di S. Matteo).⁴⁰ The date of the octagonal pier base discovered below the south aisle would seemingly correspond to the placement of the first side door (pre-1302) and the blind gallery of the retrofaçade (in place by 1321, probably much earlier). The combination of a wood-roofed nave and a vaulted east end was highly characteristic of central Italy ca. 1250–1300 in mendicant-order churches and in such cathedrals as Orvieto. Florentine churches of the later trecento had either a wooden roof or vaulting, but not both. A Duomo with both a wooden roof and a cupola would have united the ascetic tradition of the mendicant orders—and of the many “ancient” churches of Florence, such as SS. Apostoli—with the more dynamic Gothic taste for a culminating altar space. That the

altar space should be centralized in a church dedicated to the Virgin was all the more appropriate.⁴¹

The foundations of the octagon which are here attributed to Arnolfo were evidently abandoned for lack of subsidies as Florence made war and not buildings during the 1320's and thirties. When construction resumed, it was primarily on the Campanile until 1357. We can imagine that the concept of a domed crossing had lost none of its appeal in the 1350's, but the particulars of Arnolfo's solution were unsatisfactory. Octagonal piers, wooden roofs, and small-scale wall articulation were now out of style for a cathedral. The three giant bays in the 1357 project modernized all that without destroying any existing masonry. The three new bays could be linked to the five foundation walls of the octagon by abandoning Arnolfo's crossing piers and redesigning the “stretched” octagon with eight equal sides. The west face of the octagon would then have shifted out about four meters to be carried by Talenti's new crossing piers. The nave that was projected in 1357 was thus essentially the nave one sees today, only shorter by one bay (Fig. 35). For nine years the Arnolfian foundations were retained, but the longer nave and wider cupola envisaged in the new project of 1366 ended their potential usefulness at last.⁴²

To summarize: the documents record that Arnolfo founded the Duomo and supervised construction of its cheapest and fastest phase for five to seventeen years.⁴³ In architectural style, the octagonal pier base, the façade, the retrofaçade, the

³⁹ At least one roof gable was actually constructed at the Duomo, as several documents and two quattrocento paintings testify (Saalman, 500, n. 111). Hitherto unnoticed is a side gable in the S. Croce fresco portrait of the Duomo (see note 7 above). One gable over each two bay fields would signify more accurately the internal support system, and also add much greater dignity to the design than the single-gable system in the reconstruction by Paatz (Fig. 7).

⁴⁰ H. Klotz, *Die Frühwerke Brunelleschis und die mittelalterliche Tradition*, Berlin, 1970, 15, 16; Paatz, *Werden*, 71.

⁴¹ See the very stimulating discussion of the meaning of the centralized crossing of Siena Cathedral in Middeldorf-Kosegarten, 78–80.

⁴² On February 27, 1375 the *Opera* paid Bruno Dini “pro destructione

brachiorum 115 veteris muri ecclesie Sancte Reparate” (Guasti, Doc. 237). Davidsohn, *Storia*, I, 1100, translated this as the destruction of 115 *braccia* “of the walls of old S. Reparata,” which is untenable in the Latin context. Kreytenberg, 47, translated the document correctly as 115 *braccia* “of old walls of S. Reparata,” which could mean the predecessor church or the Duomo itself (popularly called S. Reparata). In the latter case, the reference might be to the old octagon walls, though 115 cubic *braccia* is not a very large mass.

⁴³ See an excellent discussion by R. Branner on the interpretation of Gothic building chronology from financial records, “Historical Aspects of the Reconstruction of Reims Cathedral, 1210–1241,” *Speculum*, xxxvi, 1961, 24.

wooden roof, and the 2:1 rhythm of the inside and outside units testify to an origin in the early trecento. Ascribing these scattered parts of the fabric to Arnolfo integrates and explicates such isolated phenomena as the thickening of the façade, the placement of the side doors, the structural system, and the bay divisions throughout the nave length. Questions that are left open are the authorship of the side-wall decoration, the reason for the differing widths of the first, second, and fourth exterior bays, the extent of rising masonry (as opposed to foundations) at the east end built under Arnolfo and his successors, and the presence or absence of the triconch in the Arnolfian scheme. A triconch plan is made more plausible by the discovery of early trecento cupola foundations, but it is still conjectural.

The question of how much Arnolfo built at the Duomo serves to illustrate and perhaps to revise some concepts of medieval building. It reminds us of the careful planning and the deliberate laying-out of Gothic cathedrals, which might be constructed simultaneously at both the east and west ends (Cologne, St.-Denis) in order to race to completion (eight years for Canterbury choir; three and a half years for the choir of St.-Denis; nine years up to the vaults of the Duomo Nuovo of Siena; a quarter-century for all but the last details of Chartres and Salisbury). Even if the church walls were not erected immediately, the plan of the building was habitually fixed in advance by foundations, by wide trenches, or by multiple cornerstones.⁴⁴ Although the construction of both Florence and Milan Cathedrals was erratic, it would be false to assume that the Italian Gothic plan or model was of schematic value only. The use of models appears at every step of the Opera del Duomo deliberations, and after 1368 the new *capomaestri* had to take an oath not to deviate from the final

model.⁴⁵ The question of what models or plans Arnolfo might have left behind is particularly crucial because, as Pevsner has noted, medieval Tuscany was in the vanguard of the return of the architect to the intellectual position set out for him by Vitruvius. The chief distinction of the Gothic architect was the power of conception and designation, which he exercised through graphic records.⁴⁶ A generation after Arnolfo, the painter Giotto was appointed *gubernator* of the works of the Duomo, not from caprice or merely to share in the glory of an illustrious citizen, but because the power of conception of the architect so much predominated over the daily job supervision of the *capomaestro*. Thomas Aquinas wrote during the youth of Arnolfo: "We see the same with any governed system where power issues from an original principle to secondary principles, thus the execution of State policy descends by the sovereign's ordinance to subordinate administrators, and thus also in architecture the master-plan of the building descends from the architect to the workmen."⁴⁷

It now appears that Arnolfo's master-plan "descended" figuratively to his immediate workmen and also literally to four generations of *capomaestri*, in the concrete form of walls and foundations. It was what Arnolfo planned at S. Maria del Fiore, not what he built, that fed his posthumous fame. When the communal council of Florence expressed itself pleased with the "magnifico et visibili principio" of the Duomo in 1300, it undoubtedly referred to the vast quantity of façade, side walls, and octagon foundations that stood before their eyes; but at another level we may imagine that what surprised and gratified them was not only the raw masonry but the brilliance of the plan itself.

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⁴⁴ Laying an entire foundation years before walls might be erected on it is still a frequent practice in modern construction. The foundation of Washington Cathedral was completely poured by 1923, although the nave was not fully vaulted until 1976. Certain Duomo walls were in fact documented in 1353 in a ruinous state (Guasti, Doc. 70, p. 78). The toponymy of the streets of Florence accords exactly with the notion of bare foundations lying exposed for half a century. Vasari recorded that the street around the Duomo to the east was called "lungo i fondamenti" (*Le vite*, I, 287) after Arnolfo's abandoned walls. Similarly the prolongation of Via dei Tedaldi (now Via dello Studio), which once cut between the nave and the apse of the Duomo, was called Via del Transito.

⁴⁵ Grote, *Dombauamt*, 113–119, provided a detailed examination of the Duomo documents which referred to models and drawings. That graphic aids were used in the planning stage of the Duomo before construction began, as well as during construction, may be supposed from the example of three other famous Italian Gothic monuments. Parchment was provided

"causa designandi fontem" for the Fontana Maggiore of Perugia in 1277 and to Lando di Pietro in 1339 for designs of the proposed Duomo Nuovo in Siena. Antonio di Vincenzo recorded the plan and elevation of Milan Cathedral in 1390, when that church was just underway, and he constructed a model at 1:12 scale to demonstrate the design of his own project of S. Petronio in Bologna (White, 50, 168, 336, 354).

⁴⁶ N. Pevsner, "Terms of Architectural Planning in the Middle Ages," *Journal of the Warburg and Courtauld Institutes*, v, 1942, 232–37; *idem*, "The Term 'Architect' in the Middle Ages," *Speculum*, xvii, 1942, 557–59; L. Salzman, *Building in England down to 1540*, Oxford, 1967, 14–23; J. Harvey, *The Medieval Architect*, London, 1972, chaps. 2–4.

⁴⁷ Thomas Aquinas, *Summa Theologiae*, PS. Q. 93. Art 3, ed. T. Gilby, xxviii, New York, 1966, 59: "In artificialibus etiam ratio artificialium actuum derivatur ab architectore ad inferiores artifices, qui manu operantur." The same thought was expressed also in PP. Q. 1. Art 6.

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