



---

Architecture and Music Reunited: A New Reading of Dufay's "Nuper Rosarum Flores" and the Cathedral of Florence

Author(s): Marvin Trachtenberg

Source: *Renaissance Quarterly*, Vol. 54, No. 3 (Autumn, 2001), pp. 740-775

Published by: [The University of Chicago Press](#) on behalf of the [Renaissance Society of America](#)

Stable URL: <http://www.jstor.org/stable/1261923>

Accessed: 03/11/2014 00:42

---

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



The University of Chicago Press and Renaissance Society of America are collaborating with JSTOR to digitize, preserve and extend access to *Renaissance Quarterly*.

<http://www.jstor.org>

# *Architecture and Music Reunited: A New Reading of Dufay's Nuper Rosarum Flores and the Cathedral of Florence.*

by MARVIN TRACHTENBERG

*The proportions of the voices are harmonies for the ears; those of the measurements are harmonies for the eyes. Such harmonies usually please very much, without anyone knowing why, excepting the student of the causality of things.*

—Palladio (1567)

*The chiasmatic themes of architecture as frozen music and music as singing the architecture of the world run as leitmotifs through the histories of philosophy, music, and architecture. Rarely, however, can historical intersections of these practices be identified. This study proposes a transient nexus of architecture, sacred music, and theology in early modern Florence.*

*Nuper rosarum flores* has long been known to musicologists and historians of Florence as the brilliant isorhythmic motet commissioned from Guillaume Dufay for the dedication of the new Cathedral of S. Maria del Fiore on March 25, 1436 (fig. 1).<sup>1</sup> But only in 1973 did the piece acquire its current renown, as the result of the seeming discovery by Charles Warren of a strong connection between its musical structure and the dimensions and proportions of the new Cathedral (92-105). The composition now became an icon of music history, a work that seemed deeply embedded in an architectural context framed by ascendant Renaissance humanism, and its reinterpretation was regarded among many musicologists as a model of interdisciplinary scholarly practice. Recently, however, Warren's reading has been sharply undermined, in particular by Craig Wright, who in 1993-1994 showed that while Warren's analysis of the musical structure was essentially correct, his reading of the architecture was so deeply flawed as to be invalid.<sup>2</sup>

<sup>1</sup>Not to be confused with the separate dedication of the Cupola, which was not completed until August (Saalman, 1980, 133-34). This article is a revised version of a paper for the conference "Music and Art in the Renaissance," held 1 March 1996 at the Institute for Advanced Study in Princeton; for a report on the conference, see Clark. Alexander Blachly, who participated in the conference, has subsequently issued an exceptional recording of the motet by his group, Pomerium (Deutsche Grammophon Archiv 447 773-2, 1997). I thank Craig Wright, who also was present, for his generous support of my thesis and his critical reading of this paper. For the Palladio quote, see Wittkower, 113.

<sup>2</sup>Wright first presented his thesis in 1993 at the meeting of the American Musicological Society in Montreal. Although Wright took his cue directly from a passage in Von Simson, concerning the proportions of the Temple (37-38), Warren's article had been previously chal-

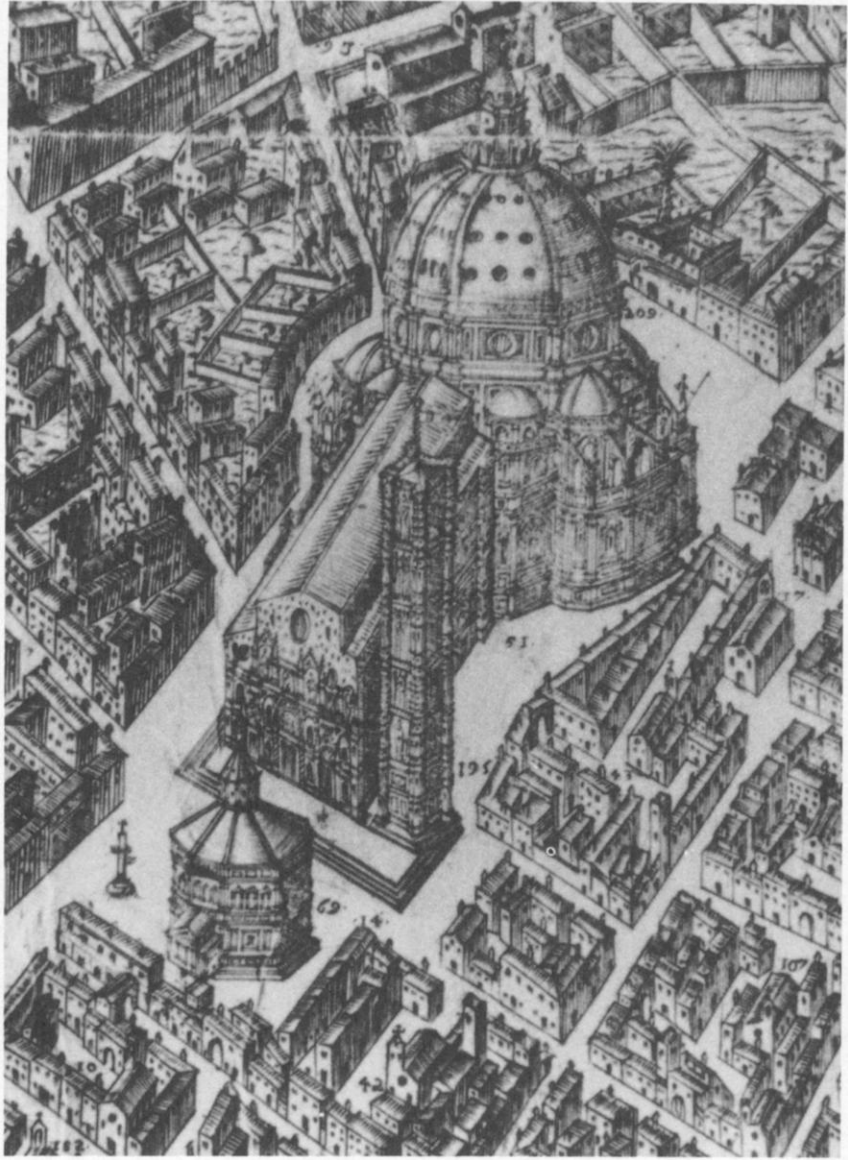


FIGURE 1. Florence Cathedral (Bonsignori plan of city, 1584).

In Wright's view, Dufay's score was informed not by the design of S. Maria del Fiore but instead by a numerological and symbolic nexus sited in biblical and exegetical descriptions of Solomon's Temple and in Marian lore. The referentiality of the music was not to the real architecture of the Cathedral, with which it had nothing to do specifically, but to the imaginary Solomonic architecture (and related numerological sets) that was the universal model for all church construction. This is where matters currently stand.

It is difficult to find fault with Wright's critique, whether regarding his refinement of Warren's musical reading, his own presentation of the textual, Solomonic-Marian syndrome, or his refutation of Warren's architectural analysis. Nevertheless, it is possible that Wright made one important tactical error, a fault not of commission but omission: having invalidated Warren's reading of S. Maria del Fiore, he walked away from the building without looking back, and this may have been a mistake (albeit one virtually unavoidable for anyone not a specialist in Italian architecture of the period). Wright tacitly excludes the following intriguing possibility: Warren's architectural analysis may have been wrong, but a different reading of the architecture — different from both Warren and Wright (and also all other published readings) — might yield grounds for reestablishing Warren's idea of a connection between music and the built Cathedral.

It is this possibility that I want to explore.<sup>3</sup> In doing so my intent is not to undermine Wright's reading but to overlay it with another, quite compatible interpretation, in which *Nuper rosarum flores* references not only the imaginary Solomonic Temple but also the real S. Maria del Fiore. Indeed, I propose to go further, by arguing that what we may be dealing with here is not two independent binary relationships — music to building, and music to biblical/exegetical text — but a triadic nexus in which all three factors are densely interrelated: the Cathedral directly related, in its morphogenesis, to Wright's textual model, as well as retroactively to the motet, which itself refers to both text and (real and biblical) image. Rather than seeing building and/or

---

lenged (as noted by Wright, 401 n.18, 404 n.24) by Charles Brewer in "Defrosted Architecture: The Incommensurability of Dufay's 'Nuper Rosarum Flores' and Brunelleschi's Work for Santa Maria del Fiore," a paper read at the Annual Meeting of the American Musicological Society, Austin, 1989; by Smith, 94; and by Arjan R. de Koomen, "Dufay's Nuper Rosarum Flores and Santa Maria del Fiore: A Case of Misinterpretation" (unpublished). Wright also notes that his Solomonic reading (see text below) was made independently by Ryschawy and Stoll, 47 (400 n.14).

<sup>3</sup>At the Princeton conference, Blachly suggested that the symmetry of proportional-symbolic structure of the motet may reflect the cathedral dome. See Clark, 166 n.4, who also reports that Vivian Ramalingam delivered two papers in 1996 evidently asserting a connection between the cathedral and the motet.

text as “causal” models for the music in the manner of Wright and Warren, I suggest instead that a more complex, bidirectional circulation of referentiality may have been at work, producing a complex cultural entity that we might call “word/image/music.” It would comprehend the ubiquitous “word/image” modality of art and architecture, the “music/word” combination of vocal and choral music, and more. I shall proceed by first briefly reviewing Warren’s and Wright’s arguments, and then offer my own analysis.

#### WARREN AND WRIGHT

Charles Warren’s “Brunelleschi’s Dome and Dufay’s Motet,” published in the *Musical Quarterly* in 1973, was the first attempt to establish a meaningful connection between the music and the building. In the article the author identifies the underlying mathematical structure of the score, which involves two sets of numbers: a primary proportional series 6:4:2:3 (the overall isometric scheme), which is virtually unique in music of the period; and secondarily, an exceptional emphasis on the number seven in both score and text, in conjunction with the factors two and four. Warren directly relates this singular musical structure to an elaborate dimensional analysis of the building involving several sets of planning modules, rotational figuration, and other features, down to correspondences with the form, measurements, and even structural details of the Cupola. The fact that Warren gives the entire cathedral to Brunelleschi, who entered its construction more than a century after it was begun and was only involved with the Cupola, or the way his modular systems invert and contradict the design history of the Cathedral, should perhaps have alerted attentive readers to the questionable methods of his dimensional analysis. But the enthusiasm for the article was great, for (to the architecturally uncritical and misinformed reader) Warren seemed to have imaginatively linked the frozen music of Brunelleschi, the father of Renaissance architecture, with the sonic, liquid architecture of the prestigious Dufay, considered the greatest early Renaissance composer, in a way that seemed to illuminate both figures and to vindicate modern critical methodologies.

Craig Wright’s reappraisal — which appeared in the 1994 *Journal of the American Musicological Society* as “Dufay’s *Nuper rosarum flores*, Solomon’s Temple, and the Veneration of the Virgin” — although not the first critique of Warren, was the most radical and complete.<sup>4</sup> Wright begins by calling Warren’s piece a “classic in the field” — and then proceeds to demolish it. Wright’s quarrel is not with Warren’s numerological analysis of the motet, which he ba-

<sup>4</sup>See n.2.

sically accepts and indeed further refines.<sup>5</sup> Rather he demonstrates that the architectural analysis is cooked, attempting to force proportional and modular schemes on a building that they do not fit without blatant fudging. For example, in order to get his primary dimensional module to fit the actual nave of the building, Warren must extend it about 30 feet into the crossing, far beyond the tolerances allowed such proportional analysis. Wright's blistering critique leads him inexorably to the statement, "The unique ratio 6:4:2:3, which governs Dufay's motet, is in no way immanent, or even superficially apparent, in the design of the cathedral of Florence" (404).

Having broken, as he puts it, the "causal link between related media of artistic expression," Wright is left with the problem of explaining the evidently unique musical structure of the motet, of somehow finding a way to

<sup>5</sup>Wright, 396-400, provides the following technical analysis: "As is known to every student of the history of music, *Nuper rosarum flores* possesses a systematic, indeed, architectonic design. It comprises four sections of music and a short concluding 'Amen.' Section one commences with a duet for the two higher voices (superius and contratenor altus) lasting twenty-eight breves (transcribed as twenty-eight measures in the modern standard edition); the lower two voices (tenor I and tenor II) then enter and support the upper voices for a period of time equal to the opening duet (twenty-eight measures). Sections two, three, and four unfold in precisely the same way: an opening duet is followed by four-voice polyphony of the same duration. Each time the lower voices enter, they present the same notes in approximately the same rhythm as in the previous section — hence the designation 'isorhythmic' motet. The upper two voices proceed more or less freely, ungoverned by strict melodic or rhythmic repetition. What creates the distinctive form of *Nuper rosarum flores* is the use of mensuration signs applied to the two lower voices; the meter of each of the four sections is determined by its own sign (O, C, C, Φ respectively). These signs change the relative length of the notes and rests, and thus a different overall duration results for each section, according to whether the breve is perfect or imperfect, and whether it is measured in terms of *integer valor* or *diminutio* . . . [Thus] the structure of the motet, as reduced to its most basic expression, is governed by a proportional relationship with the values 6:4:2:3. The proportion 6:4:2:3 is not found elsewhere in Dufay's isorhythmic motets nor does it appear in those of any other composer. *Nuper rosarum flores* is also noteworthy for the fact that a second set of numbers is prominent here: 4 x 7 and 2 x 7. . . . There are four sections to the work, each consisting of twice twenty-eight (4 x 7) breves. Moreover, the composer has chosen as a cantus firmus the first four words and the first fourteen notes of the Introit of the Mass of the Dedication of a Church, *Terribilis est locus iste*, which he disposes in quasi-canonic fashion in the two lower voices in two groups of seven notes.

"While the lower voices proclaim this ancient chant, the two upper parts sing a newly created Latin poem, likely penned by Dufay himself. It is arranged in four stanzas, each with seven (normally) seven-syllable lines . . . . Unbroken runs of seven-syllable lines are exceedingly rare in classical Latin poetry and equally scarce in late medieval Latin verse. The poet . . . has striven to produce successions of seven-syllable lines, even if an unconventional verse form is the final product. Thus the prominence given the numbers four and seven here is not the result of mere happenstance, but of careful cogitation, likely with the aim of expressing a symbolic meaning."



tie it in with the dedication of the cathedral for which it was composed. Perhaps because Warren's analysis of the Duomo turned out to be so embarrassingly inept, Wright turns away from the real architecture of the Duomo and explores models in another direction — the textual realm of imaginary, legendary buildings and traditions of biblical exegesis and numerological symbolism, which certainly were important in the religious and artistic discourse of the period.

Wright explains that the motet is essentially a “spiritual vehicle with a symbolic message,” and that the main theme of this message, plainly evident in the verbal text, is the divine unity of the legendary Temple of Solomon and the Virgin Mary, to whom, of course, Florence Cathedral — as S. Maria del Fiore — was dedicated (406ff). The exegetical identity of the Virgin and the Temple is densely framed. Just as Solomon prefigured Christ, so his Temple was the precursor and symbol of the Universal Church, and every sanctuary drew spiritual authority from it. Similarly, Mary and her womb were the maternal temple, the *templum maternale* in which Christ was nurtured: Mary is the Temple of Christ, Mary is Solomon's Temple, which conversely signifies Mary, who is the Seat of Wisdom, and so on.

It is in this syncretistic, circular identity of the Virgin and the Solomonic Temple that Wright finds the key to the motet's proportions. If virtually unique in musical history, these proportions are ubiquitous, in certain respects fundamental, in the Solomonic and Marian realm. The proportional sequence 6:4:2:3 that underlies the motet corresponds to the proportional set organizing the primary biblical description of the Temple, whose principal dimensions are all multiples (by ten) of 6, 4, 3, and 2. Overall, the plan of the main body of the Temple (Wright excludes the vestibule) measures 60 by 20 cubits; it is subdivided into a nave 40 cubits long and 30 cubits high and a cubic sanctuary of 20 by 20 by 20 cubits. Although not presented in quite the same order as the motet sequence, the four numbers — 6, 4, 3, 2 — are all there, and only those four.<sup>6</sup> As to the secondary number set 2 x 7 and 4 x 7, or 2, 4, and 7 of the motet (densely shaping text as well as music), the Temple

<sup>6</sup>1 Kings 6:1-20. In concentrating on the two main areas of the Temple, Wright disregards its secondary spaces: the 10 cubit deep vestibule and the side chambers around the nave and sanctuary (406). Although it might be argued that the omission of the vestibule is potentially a singular weakness of his interpretation (although the biblical text does treat this porch as supplementary to the 60 by 20 main body of the Temple), it would not affect my reading in which the numbers 6.4.3.2 are employed as multiplication factors, with a product that obviously would not be affected by the additional factor of 1 (see text below). Moreover, in Krautheimer's understanding of numerical architectural modelling in the period (1-33), both the selective use of the prototype's dimensions and the reshuffling of their order are standard practice (see n.31); extending Krautheimerian theory from the visual to the musical representation of architecture would fully legitimize Wright's omission of the 10-cubit Solomonic ves-

with its four cornerstones and seven Pillars of Wisdom was begun in the fourth year of Solomon's reign; it took seven years to complete and was dedicated in the seventh month with a service of dedication that lasted  $2 \times 7$  days. The 2.4.7 set is also Marian, especially the seven — the seven sorrows of the Virgin, her seven joys, her seven acts of mercy, virginal companions, years of exile in Egypt, feasts, and so on, as Wright explains at length. The upshot of his analysis is that the proportional structure of the motet reproduces a numerological set that signifies the union of the Virgin and the Solomonic Temple. This biblical/exegetical numerological structure would have served as Dufay's model for the musically unique proportions of his motet.

Insofar as it goes, Wright's interpretation, which is nuanced far beyond my summary, is in every respect exemplary. But is it really as comprehensive as he makes it seem? Wright's emphasis is on the universalism of the Motet. "Dufay's intent," he writes, "was to honor not merely the cathedral of Florence, but all Christian sanctuaries. . . . the Virgin and the Universal Church are worthy of honor, not merely Santa Maria del Fiore and the Cathedral of Florence" (439). Effectively, in Wright's reading the motet could have been used with equal significance for the dedication of just about any church, at least any Marian church — which would include most of the major cathedrals of Tuscany, not to mention many in other regions in and beyond Italy. To my mind, the question — to invert Wright's summation — is whether Dufay's intent was to honor not merely all Christian sanctuaries, but also specifically the Cathedral of Florence.

#### RECONSTRUCTING THE PROPORTIONS OF THE DUOMO

S. Maria del Fiore, of course, was not just any church, nor was Florence just another city. It was, as we know, one of the largest, most dynamic, self-confident, and creative urban centers in Europe. In the course of the fourteenth century Florence had created an extraordinary set of huge civic monuments to its ambition, pride, and power — among them the Palazzo Vecchio, the Campanile, and Orsanmichele. The dedication of the Duomo, begun in 1296, was the culmination of nearly a century and a half of planning and building on a scale unprecedented in medieval Italy. No city was more self-assertive about its identity, honor, and civic mythology as realized in public buildings.<sup>7</sup> I find it difficult not to speculate that the Florentine regime

---

tribune, as well as his reordering of the number sequence, not to mention my own analogous interpretations below. For extensive analyses of the several biblical descriptions of the Temple, see the references in Wright, 406 nn. 29, 31.

<sup>7</sup>Trachtenberg, 1993.



would have expected that the dedication motet be in some way more site-specific than in Wright's interpretation. Surely it is not unreasonable to hypothesize that the Florentines (the "devoted populace of Florence" in the motet's text) might have wanted that their city and its proud, shining new cathedral (the motet's "most enormous Temple . . . the Temple of the grandest structure dedicated to . . . [the] Virgin") be somehow identifiably and significantly present not only in the text but in the music of its dedication motet.<sup>8</sup> At the very least it may be contemplated that Dufay might have intuited that such referentiality would be well-received by his audience, in particular the "intellectual and spiritual elite" that Wright sees as the auditors of the "number allegory."<sup>9</sup> He well may also simply have been intrigued by the challenge to his virtuosity of creating such a musical "portrait" of the great building, a notion that would have found stimulus and support in the Florentine cultural atmosphere of exceptional inter-media fluidity (of which Brunelleschi himself, never far from the Duomo, was an extreme participant as goldsmith, sculptor, painter, geometer, architect, and urban planner).<sup>10</sup>

Wright's reading, as already explained, is basically a binary construct — the motet on one side, biblical exegesis and numerology on the other — bypassing the cathedral, leaving it virtually excluded, at best only nominally present. My hypothesis of a triadic, or rather triangular structure of meaning, is one that retains Wright's two components but reintroduces Warren's idea that the motet's musical structure is directly and specifically related to the actual physical cathedral — only in a different way than Warren himself proposed. In this triangular structure all three components — motet, building, and biblical text — would participate in a common numerological and ideological structure, albeit in different ways and degrees. The music would reflect not only the distant biblical Temple, but more immediately the building being dedicated, although as I emphasize, the interrelationship is one of mutual triangulation.

This hypothesis involves a reinterpretation of the dimensional and proportional basis of S. Maria del Fiore (and also other critical factors, regarding architectural iconography, discussed later). To follow my reading of the Duomo, however, one must first gain a more accurate notion than is usually held of how the proportioning of monumental buildings worked in

<sup>8</sup>For Dufay's complete score and for the text in original and translation, see Wright, 399.

<sup>9</sup>Wright, 439. This extraordinary elite probably would have included Brunelleschi, Ghiberti, Donatello, and other artists; Alberti (in Florence at the time in the Papal court), Leonardo Bruni, Poggio Bracciolini, Niccolò Niccoli, and other humanists; the Pope and his entourage of Cardinals and high prelates; and, of course, Cosimo de' Medici, family, and adherents.

<sup>10</sup>Trachtenberg, 1997, 185-223; this holds for the early fifteenth century as well as the Trecento.

late medieval Florence.<sup>11</sup> Although the Renaissance bias toward this period has taught us to overlook, undervalue, or otherwise misconstrue pre-Renaissance design, it was in fact at once strategically rather simple, yet highly nuanced and effective in practice. Buildings were structured by net-like chains of proportionally related dimensions, whose generation variously employed both geometric and arithmetic techniques — that is, dimensions produced by geometric figures (principally squares and triangles) as well as simple “musical” ratios (1:1, 1:2, 2:3, etc.).<sup>12</sup> These chains, which interlinked all important elements of plan and elevation, were often combined without methodological consistency, just as it was also possible to combine measurements taken between pier/wall centers with others made between internal and/or external surfaces of elements. In this procedure, which combined proportional idealism with a canny, opportunistic pragmatism, what counted most was not any absolute consistency of technique (all concerned seem to have understood the resistance of monumental buildings to any such consistency) but simplicity, exactitude, and lucidity of the final numerical relationships — that is, accountability and readability — together with the continuity and comprehensiveness of the proportional chain.<sup>13</sup> Such chains, moreover, rather than arising from a single design moment, were often produced over time in an openended, transgenerational process, a process that might comprehend more than one building at a single site, as well as many design moments, and whose primary goal was to maintain proportional norms even as the project evolved, as was usually the case in the typically large and slow-moving projects of the time.<sup>14</sup> It is in studying this dynamic, volatile process (as opposed to simply the final product, as is usually attempted) that we generally can best observe the proportional thinking of the planners (who practically never tell us explicitly in words what that thinking was). This means that we should study the building, not as a timeless abstraction, but rather in its long forward development through time.

One of Warren’s most egregious errors was to read the *Duomo* backward, as if it had been designed and built from the huge octagonal base of the Cupola westward into the nave, an error that led to a hopeless muddle of

<sup>11</sup>Although far from exhaustive or definitive, the considerable literature on Florentine Trecento architectural proportions includes Gori-Montanelli, Friedman, and Trachtenberg, 1997.

<sup>12</sup>Although framed in somewhat negative terms, the most insightful account of this method (which does not touch directly on Florence, however) is Ackerman.

<sup>13</sup>The dialogical process combining idealism with pragmatism is also seen in the urban planning of Trecento Florence (Trachtenberg, 1997, 21-22 and *passim*).

<sup>14</sup>In a forthcoming book I deal systematically with this dynamic design process, which was fundamental to the age.

proportional misreadings. Reading the building “forward” — i.e., eastward — means, of course, starting at the beginning, which in this case takes us back to the period before the commencement of the new cathedral, back to the preexisting site conditions, which were a powerful factor in determining the dimensions and proportions of the new project. Among these determinants, the most important was not the old cathedral of S. Reparata that was replaced by S. Maria del Fiore beginning in 1296, but what must be considered the “root” building of the Cathedral group, the Romanesque Baptistery (fig. 1).<sup>15</sup> It is the Baptistery’s dimensions from which those of both the new Duomo and “Giotto’s” Campanile, begun in 1334, derive. That is, the Baptistery was the first link in a single proportional chain that eventually came to structure all three buildings of the cathedral group.<sup>16</sup>

The Baptistery embodies two discrete sets of major proportions, in both cases 1:1. Like its model the Pantheon, its diameter (56 braccia externally) corresponds to its height (to the vault extrados). Of direct consequence for the “chain,” however, is the other set. Here it is not the building’s actual diameter that is used, but what might be called its virtual, circumferential diameter: this dimension is derived from a basic module of the building, the facets of the octagonal plan, each of which measures externally circa 24 braccia. Three of these facets — which circuitously “span” the 56 braccia “real” diameter — measure together 72 braccia, which corresponds to the full height of the building through the lantern (including the cross and orb, shown in Trecento views of the building).

What is telling in the present context is how these two dimensions were taken up in the Trecento as “small” (24 braccia) and “large” (72 braccia) modules in the development of the cathedral group. The Campanile adopted the small module as the sides of its square plan, while its final height came to 144 braccia, that is, the large module doubled. The development of the Duomo, while far more complex, remained equally “chained” to the Baptistery system, as well as adherent to its proportional idealism. Although, as we shall see, this chain was finally extended through the entire building only with some difficulty, it began unproblematically. The dimensions of Arnolfo di Cambio’s new facade represented a direct projection of the three-dimensional Baptistery (using its “virtual” diameter) onto a plane measuring 72 braccia in both width and height (fig. 2).<sup>17</sup> Behind the facade, Arnolfo’s side

<sup>15</sup>On the history of the buildings of the cathedral group, see Paatz and Paatz, entries “S. Giovanni” and “S. Maria del Fiore”; Saalman; Toker, 1978, 1983; Trachtenberg, 1971, 1979.

<sup>16</sup>On the evolution of this proportional chain, see Trachtenberg, 1997, 43-55, 118-21, 160-63.

<sup>17</sup>Trachtenberg, 1997, 55-59.

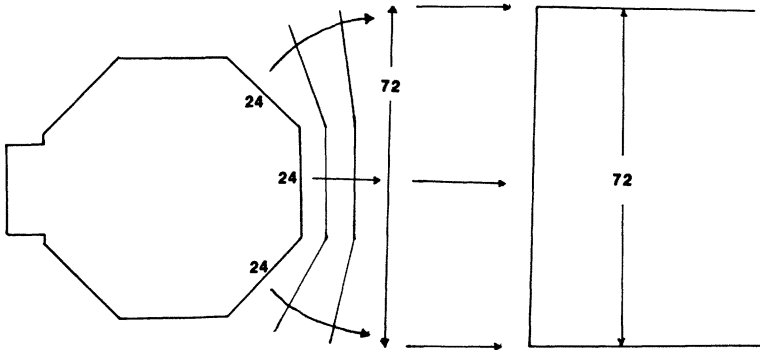


FIGURE 2. Projection/unfolding of Baptistery walls to form Duomo facade.

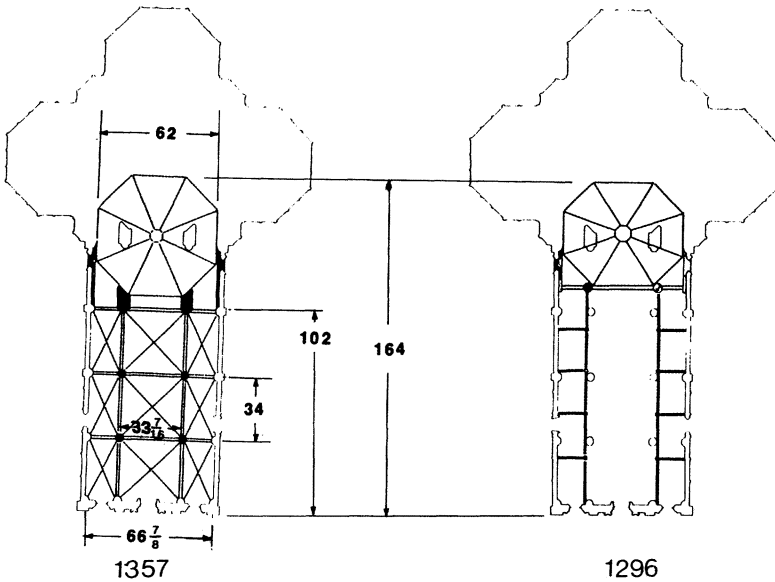


FIGURE 3. Reconstruction of 1296 Duomo project of Arnolfo di Cambio and Francesco Talenti's 1357 revision (after Franklin Toker).

walls of his new nave correspondingly spanned 72 braccia externally.<sup>18</sup> When, after a long lapse in construction, the Duomo project was taken up again in the 1350s under the leadership of the architect Francesco Talenti, Arnolfo's facade and side walls were retained, but most everything else of the project was radically changed. The definitive project did not emerge immediately,

<sup>18</sup> The nave width is 71 braccia measured to the exterior faces of the side walls; together with the buttresses the dimension comes to circa 72 braccia. The  $66 \frac{7}{8}$  braccia internal measurement recorded 19 June 1357 (Guasti, 94) has consistently misled scholars about the nave proportions. This dimension served only for the *internal* subdivision of the space into main

but in two phases: Talenti's (re)design of 1353-1358, and the modification of that design by a committee of architects, painters, and sculptors in 1366-1367.<sup>19</sup> What is most significant for us about this complicated, often recounted, yet incompletely understood mid-Trecento story is that the second (final) phase was prompted not by structural problems or any known changes in taste, financing, or personnel but essentially by a serious proportional flaw: Talenti's revised project of 1353-1358 had interrupted and discontinued the proportional chain, and it needed to be restored.

Talenti had inherited from Arnolfo, in addition to the incomplete facade and side walls, quite possibly also the partial foundations of an ambitious east end comprising a large cupola and some manner of attending chapels. Talenti's major task evidently was one of fitting, as best he could, his new design into the confines of this uncompleted fabric (or at least into the site limitations determined by it).<sup>20</sup> In place of the timber-roofed nave with five or more short bays, planned by Arnolfo, Talenti set out, in 1357, a vaulted structure of three huge bays (fig. 3).<sup>21</sup> In plan, each central unit measured 34 braccia in length and 33 7/16 braccia in width (between pier centers), or half the 66 7/8 braccia *internal* width of the nave; while the vaults were to rise to 72 braccia, corresponding to the *external* width of the building.<sup>22</sup> This 102 braccia-long nave project was to be combined with a cupola scheme of indeterminate authorship — Arnolfo and/or Talenti — but of a specified diameter of 62 braccia.

The interruption of the proportional chain of the cathedral group by Talenti's revision involved not the individual bays — whose plan and height were proportionally directly scaled respectively to the internal and

---

and side aisles, whereas the *external* 72 braccia dimension played a dominant role in the dimensioning/proportioning of the nave as a whole, as well as of the east end, as observed below.

<sup>19</sup>For this history, see n.15.

<sup>20</sup>The question of what possible "Arnolfian" model and completed fabric Talenti inherited remains controversial, in particular regarding the east end or cupola area of the project. Although Waldman has recently demonstrated that the often cited 1334 document referring to a completed "choir" does not refer to the cathedral at all, Toker's archaeological findings do possibly indicate considerable construction of the foundations of the Arnolfian choir (1978), which would seem to have imposed tight limits on Talenti's redesign. In the 1366-1367 phase, the limitations of Arnolfo's fabric were overridden as the project was expanded eastward.

<sup>21</sup>Guasti, 94; Saalman's is the best published reading of this key document (38-41). Most of the following dimensions are recorded in the document, although a few are taken from the building directly. Serving as illustrations here are Franklin Toker's reconstructions (with my measurements added) of the Arnolfo and Talenti projects, which are more plausible than most such attempts (Toker, 1978, 214-31).

<sup>22</sup>See n.18.

external width of the nave — but the largest units of the project: the 102 braccia-long nave as a whole and the 62 braccia cupola diameter. These figures clearly were in absolute proportional discord with the width and height of the nave and were incompatible with the chain as a whole. Thus it was these figures that came under the common criticism of the several review and (re)planning committees of 1366-1367.<sup>23</sup> Most tellingly, it was these dimensions that were altered and “corrected” in the final project of 1367 (figs. 4, 5). Proportionally, the overall basis of this revised project was self-evidently the 72 braccia module that had determined the overall width and height of the nave (of which two bays had been completed in 1366). On this basis, the cupola was brought into full conformity by simply expanding its projected (internal) diameter from 62 to 72 braccia, and setting its (internal) height at 144 braccia. (The internal height of the vault was made 55 braccia from base to intrados, identical to the internal height of the Baptistery.)<sup>24</sup>

This left the problem of the nave length. From the outset of the 1366-1367 replanning, the proportional necessity of adding a fourth bay to Talenti's three had been openly stated.<sup>25</sup> This was now done, bringing the total nave length (as Wright noticed)<sup>26</sup> to 136 braccia (4 x 34) — still eight braccia shy of a normative 144. These missing braccia, however, were provided in a decision of 1367 to make the inner face of the huge piers supporting the Cupola on the nave side — where they could be seen as “extensions” of the fourth pair of nave piers, hence conceptually part of the nave — exactly

<sup>23</sup>On this phase of replanning see Saalman, 45. The critical report of the review committee of goldsmiths and artists of 13 July 1366 is quite specific about the inadequate number of bays with respect to the proportional problem (see n.25); other aspects of the critique can be directly inferred from the changes made to the Talenti project in the 1366-1367 process.

<sup>24</sup>Braunfels, 31-32, argues that the height of the Cupola was determined by the so-called Fibonacci series, in which each number is the sum of the previous two numbers (1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, etc.); i.e., the Cupola itself is 55 braccia high, its substructure 89, the total being 144. However, as we have seen, its diameter and total height of 72 and 144 braccia is directly derived from the nave dimensions; the 55 braccia vault height is produced directly by its stated “quinto acuto” curvature (a method using a radius of  $\frac{4}{5}$  the diameter), leaving the 89 braccia difference. The appearance here of the Fibonacci numbers may well be a simple coincidence; or this may be one of those “redundant” convergences of diverse planning methods seen elsewhere in Florentine planning (Trachtenberg, 1997, 62; 1980). In this case the “quinto acuto” curvature, the interior Baptistery height, and the Fibonacci series all produce the identical 55 braccia Cupola dimension, as well as the 144 dimension. Friedman mentions the Fibonacci series among the standard planning techniques of the period (121).

<sup>25</sup>The 1366 review committee recommends: “E che inanzi che la cominci, si facciano quatro valichi, e ponghasi la croce non uscendo la chiesa di sua ragione di lunghezza ne di larghezza ne d'altezza” (Guasti, 167 doc. 141).

<sup>26</sup>Wright, 402.



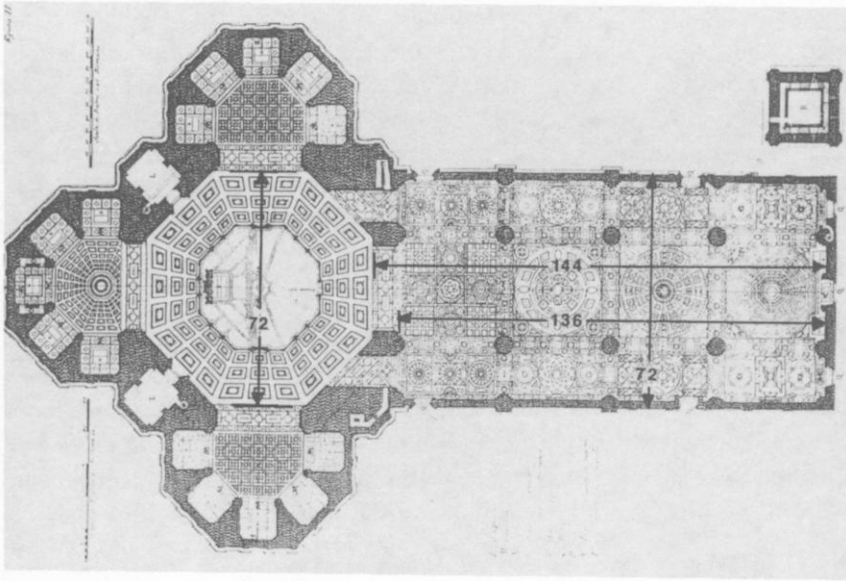


FIGURE 4. Main dimensions of Cathedral plan.

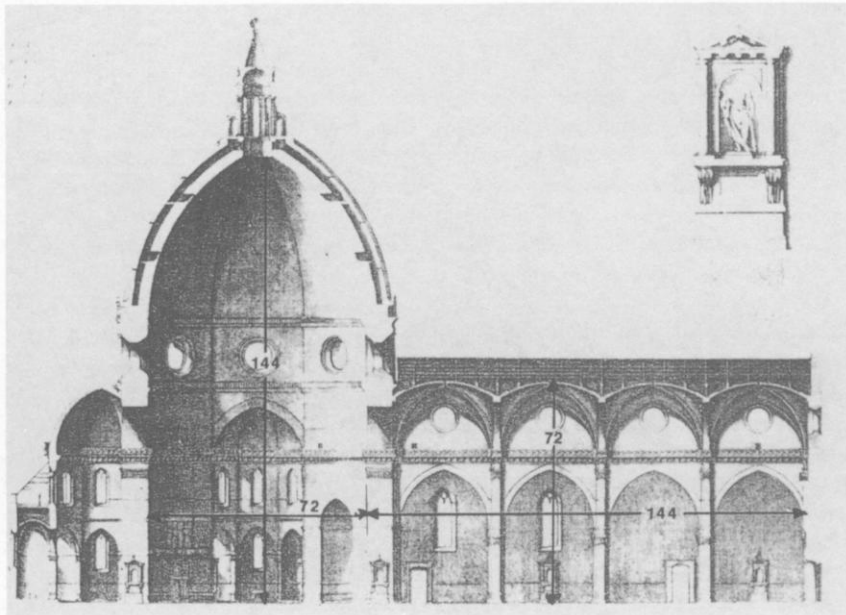


FIGURE 5. Main dimensions of Cathedral in length and height.

eight braccia deep.<sup>27</sup> Thereby at exactly 144 braccia from the facade, the nave came to the edge of the 72 braccia octagonal spatial base of the Cupola. All was now well in the planners' eyes — architectural dissonance having been fully resolved into consonance — and remained so: the project of 1367 was followed without formal or dimensional change down to the dedication of the Cupola in 1436 (for which Brunelleschi provided only the structure, not the shape or dimensions) — bringing us back to the question of Dufay's motet and its numerological referentiality.<sup>28</sup>

#### NUMERICAL CORRESPONDENCES BETWEEN MOTET AND CATHEDRAL

Having now reconstituted accurately the basic dimensional and proportional structure of the cathedral as historically composed, let us explore the possible referentiality of the motet to it.<sup>29</sup> First we find the basic musical number set — 6.4.2.3 — present in the Duomo in a rather straightforward way. In this potential relationship, however, I allow one modification, that

<sup>27</sup>On 9 August 1367 it is specified that the Cupola measure 72 braccia in diameter, and that the last pier measure (in length) 12 braccia on one side and 8 braccia on the other; the latter is clearly the primary, inner face, part of the center aisle of the nave (Guasti, 178). This is another detail of the planning whose significance appears to have eluded all commentators.

<sup>28</sup>In addition to this arithmetic proportioning of the building, the forms and dimensions of the entire east end — cupola and surrounding tribunes and chapels — were precisely generated by the systematic and inspired deployment of the geometric rotational technique of “quadrature” (Trachtenberg, 1997, 118-22). This also produced the 42 braccia depth of the tribunes, in itself an insignificant number that falls outside the arithmetical proportional chain (24, 72, 144), yet ultimately linked to it through the way the 72 braccia octagon is the point of departure of the east-end quadrature series. Because of its arithmetical non-presence, the 42-braccia dimension, i.e., the depth of the tribunes, does not itself enter the numerological symbolism of the Duomo, although the form of the triconch is important for the Duomo iconography, as explained below. Warren's attempt to read the building in terms of the quadrature method is even more flawed than in the critique of Wright.

<sup>29</sup>Smith refuses Warren's argument on the grounds that Renaissance descriptions of the Duomo by Manetti, Goro Dati, and Albertini see its dimensions in simple (and somewhat inaccurate) measurements of total length, width, and height — for example in Manetti's case, respectively 266, 66, and 70 “paces” — that have nothing in common with Dufay's proportions. It is not true, however, that such numbers indicate fully how the cathedral's “measurements were perceived in the quattrocento” — but only how certain Florentines who were neither architects nor polyphonic composers saw them. Assuredly, Brunelleschi would have understood them in authentic Trecento terms; and Dufay, given the extraordinary intricacy of numerological relationships in his music, not only would have been capable of such comprehension, but most likely would have been intrigued by the Duomo scheme, especially if it was explained to him by the architect (and also considering his figuration of the Solomonian-Marian proportional nexus in his music). It is also possible that Brunelleschi played some further role in the genesis of the motet.

is, I switch 2 and 3, much in the way Wright himself legitimately rearranges the order in which the dimensions of the Temple appear (sometimes repeatedly) in biblical description.<sup>30</sup> I also introduce a second operation that is entirely in keeping with the spirit and methods of medieval numerological practice.<sup>31</sup> In the Temple and the music, 6.4.3.2 are present directly as structural proportions, whereas in the Cathedral they serve instead as factors in multiplications whose products correspond to the major dimensions of the building (much as division analogously attends Wright's Temple connection, with its dimensions 60, 40, 30, and 20 all requiring the divisor 10 to directly connect with the musical series). In this manner we arrive at the following simple arithmetic. First, we have  $6 \times 4 = 24$ , yielding the basic "small" module of the cathedral group (the Baptistery sides, the Campanile breadth, also the facets of the Cathedral tribunes). Next appears the operation  $6 \times 4 \times 3 = 72$ , producing the "intermediate" module of the nave width and height, and the Cupola diameter. Finally we provide multiplication of the full set,  $6 \times 4 \times 3 \times 2 = 144$ , or the length of the entire nave and the height of the Cupola. The numerical set 6.4.3.2, in other words, contains in the most condensed form possible the entire cathedral (indeed, the entire cathedral group of buildings, including the 144 braccia Campanile), whose virtual completion was marked by the 1436 consecration.

Although in a much less clear-cut and comprehensive way, it is possible also to see the secondary level of numerical structure of the motet —  $2 \times 7$  and  $4 \times 7$  — in the building. This possibility requires that again we take our cue from Wright's reading, which uses these numbers for the most part not as multiplication factors but simply as the integers 2, 4, and 7. Four is present throughout the cathedral in two powerful modes: as the four gigantic nave bays, and as the four tremendous piers supporting the Cupola

<sup>30</sup>Compare the biblical text as quoted by Wright, 406 n.31. On the reshuffling, see my discussion of Krautheimerian theory in n.6.

<sup>31</sup>On medieval numerology, see Hopper and Meyer. That modern interpretations of medieval numerological practices can be far more speculative than my reading is apparent in the suggestion by one of the anonymous readers of my manuscript that I relate the Duomo numbers to Christian cabalistic methodologies (which began in the thirteenth century), according to which the total length of the cathedral,  $144 + 72 + 42$  (the tribune depth, see n.28) = 258, would be the number of Hiram in Hebrew (Cheth 8, Yod 10, Resh 200, Mem 40 = 258). King Hiram of Tyre provided the materials for the Temple, while Hiram the bronzemonger was responsible for its iconographic program; all of this (and much, much more in the way of such cabalistic cipher combinations) serves as evidence of the Florentine New Jerusalem Duomo program. On the other hand, the proportional systems of Renaissance architecture seem at times not unrelated to the multiplication chains proposed here; an example is the way Alberti split up compound proportions into the smallest harmonic ratios, e.g.,  $1:2 = 2:3 + 3:4 = 2:3:4$ , and so forth; cf Wittkower, 115.

(analogous to the four cornerstones of the Temple). Although I would not insist on the following conjunction, seven and two easily become 72, which multiplied by two becomes — again — 144.

FROM NUMEROLOGY TO ICONOGRAPHY:

THE DUOMO AS TEMPLE, AND OTHER ANCIENT AND IDEAL MODELS

It would seem possible, then, that despite his own flawed analysis, Warren's idea of a numerological linkage of music and cathedral may indeed have had a certain validity. The question is, although the numerical interrelationships discussed in the preceding paragraphs are seemingly quite positive for the most part, what might be their significance? Does the parallelism entail referentiality, and if indeed the music does allude to the building, is this building targeted simply as a proportional abstraction, or as something more, perhaps itself Solomonic or embodying other meaningful traits, which would reinforce the numerical allusion?

Medieval-Renaissance numerology, as we know, tends hermeneutically to be notoriously difficult given the highly polyvalent character of individual numbers, as, for example, the way "seven" could refer to the deadly sins or the circles of Hell, as well as the Virgin's Joys, Sorrows, Acts of Mercy, etc. In and of themselves, numbers — symbols — were highly unstable signifiers, whose signifieds generally took on definition only as parts of a particular semantic field produced by a specific combination of numbers and/or by the context in which the numbers appeared (and even then the numbers typically produced multiple meanings). While it is possible to see such a semantic field in the intricate numerical set of the cathedral dimensions alone, the numerological cross-referencing of music and cathedral would acquire more positivity and resonance if a symbolic context were present, that is, if it could be established that the building itself, apart from proportions, participated independently in the Solomonic-Marian realm of meanings beyond its rather commonplace dedication to the Virgin.

This possibility requires that the Duomo be understood not merely in terms of formal abstraction but as a representational entity, in other words, that we see the building much in the way that Richard Krautheimer showed medieval architecture to behave in general, in his fundamental article of 1942 on architectural iconography.<sup>32</sup> Like many buildings of the middle ages — and especially those of Florence — the Duomo invites comprehension as more than the abstract architectural composition that it is generally taken for in modern scholarship, which often finds a satisfaction in formalism alien to the medieval period itself. As I have recently argued, S. Maria

<sup>32</sup>Krautheimer; see also Crossley.

del Fiore appears to comprise a complex, overlapping collage of forms, that is, of architectural images referential to real and imaginary architectural models.<sup>33</sup> Whereas most of Krautheimer's iconographic allusions (which are for the most part early medieval) tend to be rather minimalist and abstract (as well as, to the modern eye, often somewhat arcane and even surreal), Trecento Florence tends to be more visually explicit in its referencing. It moves toward the "realistic" mode that Krautheimer attributed mainly to the post-medieval period (raising again the issue of the true position of the Trecento in architectural history). But eventually we will also find that the Duomo quite possibly participated as well in Krautheimer's "minimalist" numerological mode (in which, for example, a building with more than four sides was considered "round").

To comprehend the iconographic modeling of the Duomo, however, we need first to understand something of the ideological foundation of the architectural iconography of Trecento Florence. The iconography of its principal monuments centered in various ways on the protean concept now known as the "Myth of Florence," whereby the city, in its primary ideological metaphor of civic status and identity, saw itself as both a new Rome and a new Jerusalem.<sup>34</sup> Rooted in the factual ancient origins of Florence, the "Roman" notion — which was already immanent in the extreme classicism of the Pantheon-like Baptistery — first appears explicitly in chronicles around 1200, and it continues strongly in expanded form in the fourteenth-century "new" histories of the Villani. Yet Florence identified itself not only with pagan Rome but also with the early Church Fathers' concept of a New Christian Rome. It was this latter entity, according to the Florentine chronicles, that provided the model for the rebuilding of Florence after its destruction by the barbarians, in the way the dedications and locations of Florentine churches were made parallel to those in Rome. This visionary urbanistic reading tied the Roman myth with the myth of Jerusalem, which came to most intensely embody the moral and spiritual aspirations of the city. In this myth, Florence is explicitly destined to be both a reborn Christian Rome and a veritable New Jerusalem of Christian virtue.<sup>35</sup>

This multilayered civic mythology, and especially the New Jerusalem component — an idea closely associated with the Temple in Jerusalem, that is, ultimately with the Solomonic Temple as well as with the Heavenly Jerusalem — appears to underlie the complex architectural iconography of the

<sup>33</sup>Trachtenberg, 1993.

<sup>34</sup>Ibid., with further literature.

<sup>35</sup>Davis.

Cathedral.<sup>36</sup> In its analysis of pictorial representations of the Duomo, scholarship has in one case come close to recognizing this referential nexus. It has often been noted that in the 1430s panel in the Philadelphia Museum depicting “Christ Healing the Demoniac” — an event that occurred in the Temple (Matthew 17: 14-18, Mark 9: 17-27) — the “biblical Temple in Jerusalem,” in Wright’s words, “is transmogrified into the cathedral of Florence” with its four bays and dome (416, 429). But whereas Wright and others see the painting only as an *ex post facto* reinterpretation of the Duomo, in which, in Wright’s words, it “is made to represent the Temple of Solomon and, by extension, to symbolize the ideal of the Universal Church” (417), I find evidence indicating that the Florentines instead saw their new Cathedral in such symbolic or biblical terms from the beginning. A striking example is the way in which the 1366-1367 Duomo project serves to represent the universal Church in the contemporary Spanish Chapel frescoes at S. Maria Novella by Andrea da Firenze, himself a member of the planning committee.<sup>37</sup> Yet the issue is not one merely of the Florentines’ always having “seen” their Duomo in such terms regardless of its actual form, in the way so many medieval buildings were willfully “seen” as the Temple, etc., important as that projected perceptual desire was to the representational process; rather, the Florentines appear to have shaped its forms to specifically mirror the Solomonic-Jerusalemic set of models.<sup>38</sup>

To follow my iconographic analysis of the Duomo, however, another digression is needed, in this case to grasp certain further peculiarities of the representational process in question and the problematics of our access to it. Models such as “The Temple,” “Jerusalem,” and “The Heavenly Jerusalem,” far from being fixed images, tended to be extremely fluid, unstable, and even mutual or self-contradictory presences in the imaginary.<sup>39</sup> Although this volatility and irrationality complicates our interpretation, it augmented the freedom of the architect in the process of transmogrification, that is, in designing visible referentiality into the form of an actual building, with all of its historical and physical contingencies of typology, structure, function, and local taste and tradition. Architectural representation, like representation in general, was never a passive mirroring but a complex process involving the transformation of one or more real or imag-

<sup>36</sup>On these associations, see Sauer, 109; Sedlmayr; von Simson, 8ff, 38-39, 95ff; Stookey, 35-41.

<sup>37</sup>Meiss, 97-100.

<sup>38</sup>For this modeling process, in addition to Krautheimer see Krinsky; Sinding-Larsen, 203ff, 220ff.

<sup>39</sup>This instability is apparent in Krinsky’s discussion.



inary models into a new form, an act of reinterpretation of the historical and the imaginary into the present and the real, and nowhere was this truer than in Trecento Florence. There the architectural representation of the fluid complex of “models” in question, which I earlier characterized simply as comparatively “realistic” (in terms of Krautheimer’s spectrum) was on closer examination actually highly variable in modality, ranging from the rather direct and concrete to the vaguely suggestive, speculative, and freely interpretative, all complicated by the contingent factors just alluded to. Unlike much of Renaissance architecture, where we easily recognize a representation of the Corinthian order, triumphal arch, temple front, or tholos, and in contrast to certain Tuscan Romanesque buildings such as the Baptisteries of Florence and Pisa, respectively modeled directly on the Pantheon and Holy Sepulchre, the Florentine Trecento developed in its major buildings an extremely sophisticated and poetic art of allusion, collaging, and concatenation of representational forms. Difficult as it sometimes is to decipher the iconographies involved, the effort is necessary and justified, unless we are willing to accept the huge, extravagant, expensive, and structurally challenging works simply as oversized and overcomplicated abstract forms. What finally makes possible here a potentially valid iconographic reading is the very factor that, in my view, made these forms representationally effective in the first place: each building, rather than repeating or developing established typologies or assemblages of features, instead comprises a unique and highly individuated formal entity, a singular design inexplicable in terms of utilitarian function, structural exigency, stylistic evolution, or criteria of sensuous “beauty” — of what was seductive and pleasing to the eye. Indeed, regarding the last mentioned factor, much of Trecento architecture — and most particularly the visually disjunctive, overcomplicated, ponderous, sometimes even coarse Duomo — refrains from significant participation in such a discourse of the “beautiful” (notwithstanding its incorporation of ideal proportional schemes). I would argue that any valid understanding of the Duomo and other major Trecento monuments must be predicated on the premise that the key to their design resides in their iconography; that is, we must seek to understand them in semiotic terms, as *architecture parlante*, as complex three-dimensional signifiers that participated in the larger semantic field centered on Florentine civic mythology.<sup>40</sup>

When we enter the nave of the Duomo, what we behold, for all its proportional coherence, is certainly not sensuously “beautiful” in any normative

<sup>40</sup>This process is more extensively studied in Trachtenberg, 1993; see also Trachtenberg, 1991, for the eclectic design modality of the practice and also its sociological basis.



FIGURE 6. Cathedral nave.

sense (fig. 6). That Trecento Florentines were fully capable of producing elegant and serene church interiors when they so desired is quite clear, for example, in the nave of S. Maria Novella. At the Duomo, other criteria seem to be at work, and, as I have indicated above, those criteria appear to center on the iconographic. In part, the interior may be understood as a collage of the major local church interiors of the period: the nave incorporates the pier type of Orsanmichele (whose ground story loggia was then being transformed into a closed oratory), the clerestory oculus and vaulted format of S. Maria Novella, and the ballatoio of S. Croce.<sup>41</sup> Thereby the interior becomes identifiably “Florentine,” something uniquely and broadly referential to the city itself.

Yet our eyes tell us there is more to the nave than this easily identifiable syncretism of contemporary monuments; in its immense scale, weight, and detailing, the nave seems inhabited by an alien presence. Compared to virtually all church interiors of the period, in Florence and elsewhere, the Duomo nave, in its extraordinary massiveness and overt classicism of form and space, is infused with the presence of antiquity. Its piers, faced with classicizing pilasters on all sides, form towering, double-storied masses that, at this level of perception, obliterate the reference to the small Orsanmichele models. The double-ported ballatoio, unlike the spartan version of S. Croce, is as massively and lavishly classicizing as the trabeation of many an ancient triumphal arch or basilica. The huge spatial units (some 20 meters square, over 40 meters high), like the piers, dwarf those of any contemporary building. Perceived against the architectural horizon of expectations of its day, the nave

<sup>41</sup>The cathedral pilasters possibly also alluded to the old nave of S. Reparata, whose principal tectonic features were piers of rectangular plan with a single pilaster articulation.

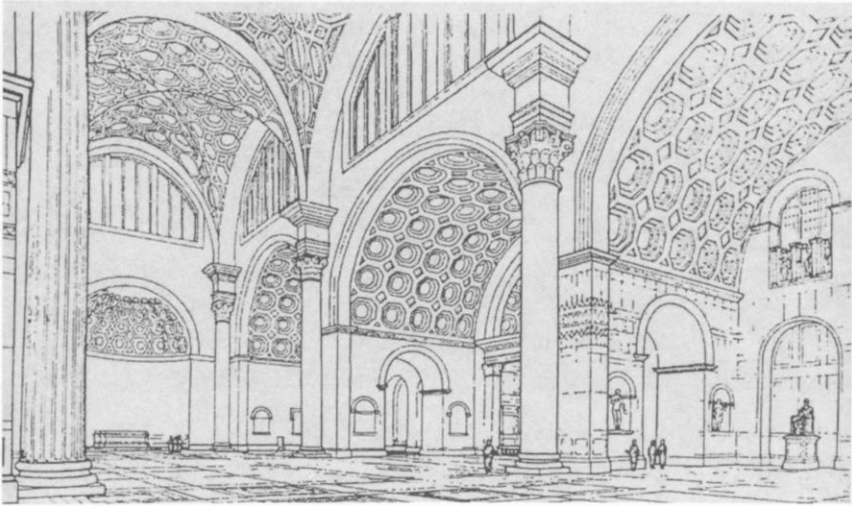


FIGURE 7. Reconstruction of Basilica of Maxentius (“Pacis”), Rome.

seems less allied to “medieval,” that is, contemporary interiors than to the vast spatial and massive physical forms of ancient Roman architecture.

It is possible to carry this reading a step further. I suggest that the referentiality may have been more specific, that, in other words, the Florentines may have had a particular ancient building in mind as model. Especially in the original plan of the 1350s of only three bays, the nave may have specifically referred to the huge three-bayed “*Templum Pacis*,” as the Basilica of Maxentius in the Forum Romanum was known at the time (fig. 7). What might have made such an allusion resonant and given it motivation beyond the desire merely to make the nave “Roman,” was that the *Templum Pacis* iconography contained a meaning relevant to the main theme of this paper, for it was believed to have been the repository of the spoils taken by the Romans from the destroyed Temple in Jerusalem (which, of course, had actually been displayed in the real *Templum Pacis* in the Forum of Vespasian).<sup>42</sup> Through the agency of metonymy, the nave might have thus acquired an ideological “resemblance” to the Temple in the Florentine mind, thereby speaking simultaneously to both sides of Florentine civic mythology, to Florence as both a New Rome and a New Jerusalem. This reading would be strengthened by the way in which, first, the Duomo scheme is virtually copied by the Loggia dei Lanzi, the huge three-bayed

<sup>42</sup>On the way the Basilica of Maxentius acquired the identity of the *Templum Pacis*, see Whitehead, 2-3; Scherer, 78. It is, however, not known exactly at what point between the thirteenth and the mid-fifteenth century the building acquired this mistaken identity (having earlier been known as the “*templum urbis Romae*” and the Temple of Romulus).

civic loggia in the Piazza della Signoria built 1374-1382; and second, later in the Sasseti Chapel frescoes Ghirlandaio pairs the Loggia with the *Templum Pacis* itself, completing the circle of reference.<sup>43</sup>

In the cathedral nave such Temple/Rome modelling as may have obtained was limited and diluted by the dependence of the interior on the standard three-aisled, rib-vaulted, basilican church typology, which the references in question would have overlaid. Few such compromises appear to have affected the immense east end of the Duomo, which constituted a radically free and virtually comprehensive departure from contemporary typologies (sharing with Tuscan prototypes only the basilica-*cum*-cupola idea), presenting instead a complex collaging of multiple references to “Rome” and “Jerusalem,” the Temple and the Virgin.

As the beholder moves from the nave into the vast eastern interior (fig. 8), she or he is struck by the way its lower parts resemble no building of the age, seeming instead to transpose into Tuscan architectural language the huge masses and voids of some great Roman ruins such as the baths or the imperial palace.<sup>44</sup> In any case, the Cupola that these “antique”-like masses support unquestionably was intended to rival the Pantheon, whose diameter it almost precisely equals and whose medieval dedication to the Virgin as “*Sancta Maria Rotunda*” it parallels. Indeed, so intent were the Florentines on again “copying” the Pantheon — this time in scale rather than more formally as at the Baptistery (which the Cupola also “copies”) — that the Cupola was planned at a moment when no architect seems to have known how a Pantheon-scaled vault might actually be built. Again, the symbolism is complex, alluding to Florence as the New Rome, but through the Marian traits also indirectly to the Jerusalem/Solomonic nexus.

Although the Cupola tends to dominate our attention at the Duomo because of its sheer scale and Brunelleschian glamour, the fantastic massing of which the Cupola was but the dominant part — that is, the prodigious, polymorphous east end as a whole — was compositionally and iconographically still more complex, indeed supercharged with referentiality (fig. 9). The evidence suggests that, considered as a whole, and particularly in its external form, the east end was not simply a “domed triconch” or other generic medieval type, as is usually imagined.<sup>45</sup> Rather it appears to have been explicitly modeled after the Trecento Florentine notion of the Temple in

<sup>43</sup>Borsook, 46-47.

<sup>44</sup>Paatz, 1937, 102-03, compares it with the “*Massenbau*” of Roman imperial architecture (seen here for the first time since antiquity), specifically with the Palace of Augustus on the Palatine.

<sup>45</sup>For example, by Wittkower, 11, as a “composite type” of nave plus cupola, as in Siena, Pisa, etc.

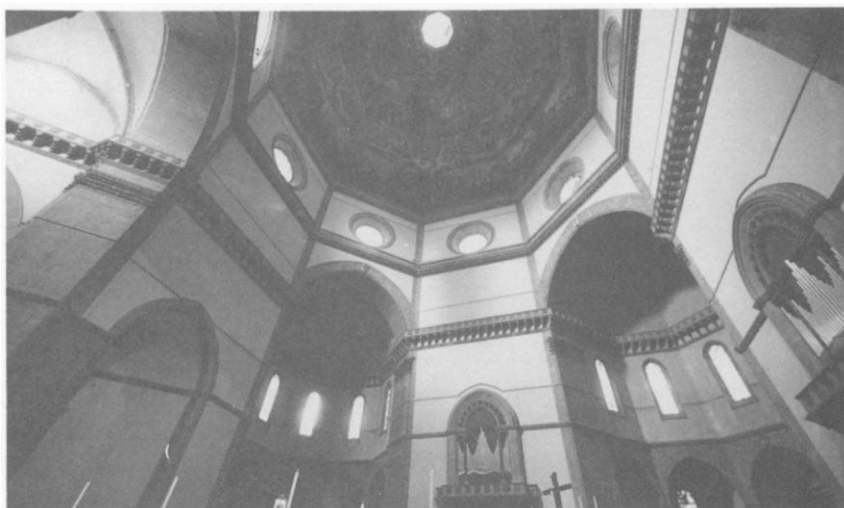


FIGURE 8. Cathedral east end, interior.



FIGURE 9. Cathedral east end, exterior.



Jerusalem, in conjunction with certain medieval images of the Heavenly Jerusalem, the two concepts overlapping in the medieval mind. The shape of the Temple in Jerusalem, insofar as it existed in the Florentine imaginary, appears to have had little to do either with the biblical description or the actual post-Solomonic Temple.<sup>46</sup> Its imagined form, which partly derives from the Islamic Dome of the Rock with which the Temple was often confused (notwithstanding the fact that the Herodian Temple was, of course, destroyed), is revealed in contemporary Florentine painting in a series of depictions of the Temple rising behind the walls of Jerusalem, all taking the form of a large domed octagon, often though not always surrounded by tribunes or smaller domes. While numerous examples postdate the Florentine Cathedral project, several predate it, including one of special importance (fig. 10). Taddeo Gaddi's Temple, painted in the Baroncelli chapel in S. Croce in the 1330s, I believe reflected the current Florentine notion of the Temple in Jerusalem on which the Cathedral itself was eventually modeled. That Taddeo Gaddi became a prominent member of the definitive Cathedral planning committees of the 1360s reinforces this line of argument.<sup>47</sup>

The probable association of the Duomo east end with the related image of the Heavenly Jerusalem is suggested by another work: the famous reliquary of the Holy Blood in S. Marco in Venice, which is the most elaborate preserved example of a widespread medieval type of representation of the Heavenly City (fig. 11).<sup>48</sup> To understand this connection one must first reconceptualize the Duomo east end according to the way it was originally planned and partly built. Although its three tribunes are usually seen as huge apsidial constructions, this is true only of their plan. Their high vaults were conceived as asymmetrical, pseudo-domical forms, and as can be seen in the Spanish Chapel fresco, each vault was meant to receive a lantern.<sup>49</sup> The effect on the exterior thus was to have been of a great lanterned dome surrounded on three sides by secondary lanterned pseudo-domes (the fourth side being, of course, occupied by the nave), much as in the Taddeo Gaddi Temple, as well as in the reliquary, as is suggested by my sketch in fig. 12.

To this restoration should probably be added another detail (seen in the sketch): Brunelleschi's highly classicizing semicircular exhedrae would have replaced an original project for presumably more "Gothic" corner accents, for such prominent corners resulting from the setting of an octagonal

<sup>46</sup>Following Krinsky's analysis, such deviation would have been characteristic of the Temple in the late medieval imaginary.

<sup>47</sup>Cf. Trachtenberg, 1993, 16-19.

<sup>48</sup>Gaborit-Chopin.

<sup>49</sup>Trachtenberg, 1983a.



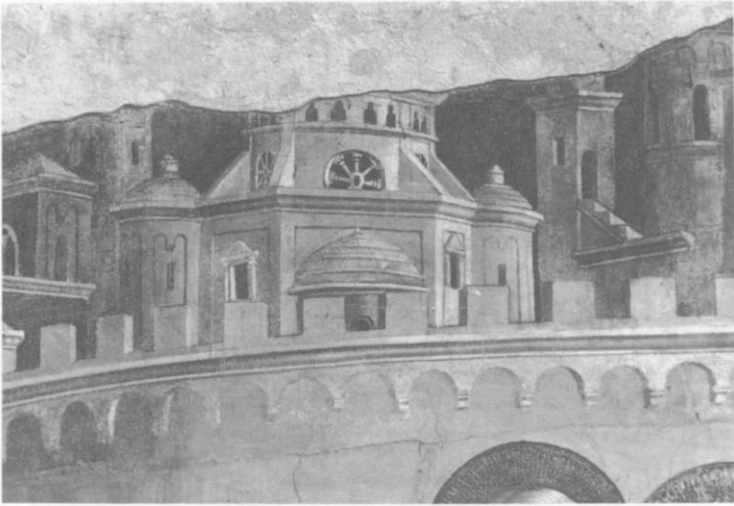


FIGURE 10. Taddeo Gaddi, *Meeting at the Golden Gate*, detail of Temple in Jerusalem, Baroncelli Chapel, S. Croce, 1332-1338.



FIGURE 11. Reliquary of the Holy Blood, S. Marco, Venice.

structure over a larger square base were rarely left bare in the Gothic period.<sup>50</sup> Giotto's Campanile project foresaw a huge central octagon surrounded by high pinnacles at the corners, an arrangement paralleled in the superstructure of Orcagna's Orsanmichele tabernacle, whose central ribbed cupola has in fact been seen to reflect or foreshadow the Duomo project (fig. 13). If in addition to the minor cupolas-cum-lanterns one thus restores to the Trecento Cathedral project a set of corner pinnacles (fig. 12), its resemblance to the S. Marco reliquary, with its subsidiary domes, lanterns, and pointed corner elements, is schematically complete.

#### ICONOGRAPHY AND NUMEROLOGY AT THE DUOMO

Far from having been iconographically innocent or facile, the Duomo thus appears to have incorporated two collage-like layers of deeply meaningful multiple images in its design. One layer referred to the contemporary physical city of Florence itself: its three major "modern" church interiors, S. Maria Novella, S. Croce, and Orsanmichele, were collaged into the nave; and the Baptistery, the architectural epicenter of Florentine civic identity, appeared in enlarged form as the Cupola and also was multiplied in the external forms of the three tribunes, which repeat the Baptistery dimensions, its triple-arched arcading, and (as originally projected) its lantern. At this level, the Duomo appears as a flamboyant, explosive, polymorphous celebration of the city as represented in its major preexisting ecclesiastical monuments.

By contrast, in the second — but by no means secondary — iconographic layer, the referential thrust is instead to extra-Florentine, real and imaginary architecture bound up with civic mythology, indeed, with virtually the entire semantic field associated with the Myth of Florence. Allusions to Rome, both pagan and Christian, and to Jerusalem, both historical (the Temple) and Heavenly, permeate the nave, the Cupola, and the dominant east end as a whole of the church dedicated to and symbolizing the Florentine Virgin, S. Maria del Fiore. If the model for the nave (at this level) was the *Templum Pacis*, the huge interior was allusive to both Roman antiquity and the Temple, whose treasures the *Templum Pacis* had contained. Analogously, the Cupola, modelled in its huge dimensions on the Pantheon dedicated to S. Maria Rotonda, formed an iconographically Marian crown for the cathedral dedicated to S. Maria del Fiore. The colossal east end as a whole iconographically conflated the period's imaginary of the Temple in Jerusalem and the Heavenly Jerusalem, themselves closely associated concepts in the medieval mind, to produce the most stupendous of Solomonic references, capped by the Mariological Cupola.

<sup>50</sup>Cf. Trachtenberg, 1993, 29 n.30.

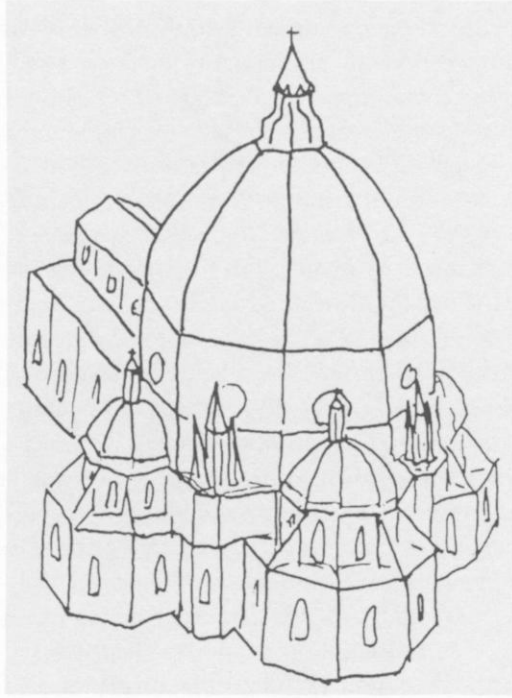


FIGURE 12. Reconstruction sketch of definitive 1367 project for Duomo.

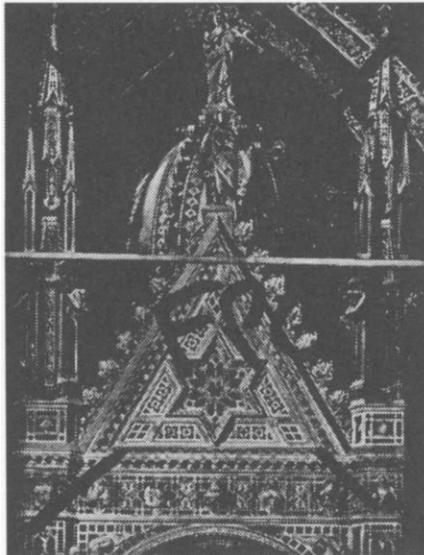


FIGURE 13. Andrea Orcagna, Tabernacle, Orsanmichele, detail of superstructure.

As we contemplate these multiple, overlapping allusions, the Duomo is transformed into a powerful, rich semantic field in which signifiers constantly shift and oscillate in their signifieds between iconographic nodes and layers, as, for example, in the way (in the nave) S. Croce and S. Maria Novella also become emblems of Florence as New Jerusalem in their embodiment of spiritual reform, or in the transmogrification of the Baptistry, originally a Roman Temple of Mars (as Trecento Florentines erroneously believed) in the form of the Christianized Pantheon, into the Duomo east end. To use Krautheimer's term for the highly-valued medieval cognitive experience of a simultaneity of numerological and iconographic symbolism, the Cathedral of Florence in its many parts and as a whole "vibrated" syncretistically with Marian, Solomonic, Jerusalemic, and associated references (not to mention Roman and contemporary Florentine allusion).<sup>51</sup>

That the Duomo was inhabited by this "reverberatory" biblical-exegetical nexus of architectural iconography and allusion enables us now to read with greater fluency the numerological character of the Duomo, where we find additional meaning in its dimensions. Given the rich iconography of the Duomo-as-Temple, we may legitimately speculate that the Temple model may also be embedded in its proportional structure — here the biblical description rather than the centralized format of Taddeo Gaddi's representation. If we reduce the Duomo plan, in its most basic aspect, to a schematic construct, it may be said to parallel the biblical Temple format and proportions (fig. 14). That is, in both cases the main part of the building is bipartite, comprising a nave and separate sanctuary; in plan, both naves are proportioned 2:1 in length and width, respectively 40 by 20 cubits and 144 by 72 braccia; and in both buildings the sanctuaries rise over centralized plans with diameters equal to the nave width, in one case a 20 cubit square, the other a 72 braccia octagon (leaving aside here the peripheral tribunes). At the fundamental Krautheimerian level of architectural representation, minimalist abstraction, the Duomo thus may be said to have proportionally "resembled" the biblical Temple (that also was the Virgin) so richly alluded to in more palpably visual terms.

Similarly, the Celestial Jerusalem — with which the Temple was also identified — may also be seen as numerologically present in the Duomo, in a basic and lucid way. The largest meaningful dimension of the Duomo is the 144 braccia of the nave length and Cupola height; that is, 144 braccia is the dimension of the major axis (respectively longitudinal and vertical) of the two basic units of the Duomo. Quite simply, the number in question corresponds to the description in *Revelation* of the New Jerusalem, whose

<sup>51</sup>Krautheimer, 122.

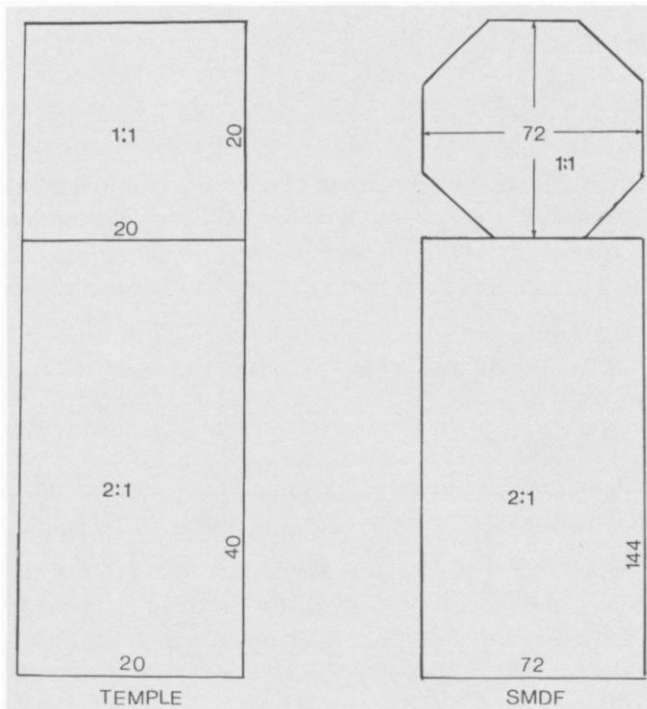


FIGURE 14. Schematic identity of Temple and Cathedral.

walls (of Jasper) measure 144 cubits in height (21:17) — a city to be populated with the 144,000 worthy members of the twelve tribes of Israel who alone “were redeemed from the earth” (14:3). That 144 braccia was also the height of the adjacent Campanile, as well as the “ideal” height of the Palazzo Vecchio design (stretched in execution to 160 braccia), would have extended this apocalyptic symbolism toward the city of Florence itself; that is, it would have returned the ideological chain of association to the Myth of Florence whereby the city is destined to be a New Jerusalem on earth, completing the iconographic-myth/text circle interlinking the civic and religious themes and iconography that we have been attempting to follow.

#### MOTET AND CATHEDRAL: *UT ARCHITECTURA MUSICA*

Let us now summarize the main evidence brought forward regarding the primary purpose of this paper, the revival of Warren’s idea of a linkage between Dufay and Florence Cathedral:

1) Dufay’s text repeatedly refers explicitly to the Cathedral as the Temple, an obvious but fundamental point considering the absolute bonding of music (score) and text in composition (as Wright emphasizes) and performance.

- 2) As Wright expansively shows, the structure of Dufay's motet — the primary 6.4.2.3 set as well as the numbers 2, 4, and 7 — alludes densely to the numerology of the symbolic nexus centered on the Solomonic Temple, the Virgin, and their unity.
- 3) The principal dimensions of the cathedral group of monuments are identical with or derived from the modules 24, 72, and 144, numbers which result from the progressive multiplication of the numbers 6, 4, 3, and 2. The 2.4.7 set may be seen as present at the Duomo in a less comprehensive way.
- 4) The complex form of the Duomo is understood here mainly, not as an abstraction, but in terms of iconography, allusion, and representation. It forms a complex collage of referentiality that includes the Temple, the Virgin, and the Heavenly Jerusalem.
- 5) The Duomo may also be seen as representing the Temple numerologically, in its schematized proportions (nave 2:1, chancel 1:1 in plan).
- 6) The Duomo's largest meaningful dimensions, of its 144 braccia long nave and 144 braccia high Cupola (as well as its Campanile), correspond to the height of the walls of the Celestial Jerusalem, with which the Temple was closely identified. (144, we recall, is the product of  $6 \times 4 \times 3 \times 2$ .)
- 7) Pictorial evidence that the Florentines saw their cathedral as the Temple is present in the Baroncelli chapel (before the mature Duomo project of the 1360s), the Spanish Chapel (during the Duomo planning), and the Philadelphia "Christ Healing the Demoniac" (afterwards).

Given these observations, it would seem fair to strongly suggest that if Wright is indeed correct in his thesis that the numerical structure of Dufay's motet is referential or representational (as Warren first vainly attempted to show), the dimensions of such allusion may have been more complex than he argues. The internal cross-referentiality of text and score and the referentiality of the motet as a whole to the Temple-Marian nexus occurred in a work whose ostensible purpose was to embellish the consecration of a building, which is explicitly mentioned in the motet's text. This building was not only numerologically linked to the music but, perhaps more importantly, was itself profoundly and visibly shaped by a referentiality, deeply rooted in Florentine as well as church ideology, to the same Temple-Marian knot of meaning that informs the music. The motet, in other words, would be multiply referential, in both text and score, to the very ideological nexus that shaped the actual form and dimensions of the Duomo, dimensions that find parallels in the music. Although it is of course impossible to prove that *any* of the apparent allusion was conscious



and motivated, once we accept the presence of such motivation in this picture I find it difficult, if not impossible, to draw a line between what may be admissible and what should be excluded. The strongest case is Wright's cross-referencing of musical score and text — there the 2.4.7 set is so densely and comprehensively present as to virtually exclude any doubt. But once the referentiality becomes external to the motet — a referentiality that the motet's text and purpose unambiguously warrants — it seems to me that a provisional inclusivity is the preferable and more profitable interpretative strategy, given the observations I have made about the Duomo and, in general, Krautheimer's theory, with its emphasis on the complex polyvalence of medieval architectural symbolism and "vibration."

In the present instance such "vibration" would have been far more complex than with any of Krautheimer's examples — certainly far more difficult for us to try to imagine. Whereas Krautheimer was imagining the contemplation of a given building and its model(s), here we are considering the simultaneous experience of such architectural factors together with vocal music, involving both text and score. More than that, unlike a given building or other work of the visual arts, which we can experience directly or through reproduction, unless we are a musician or musicologist we cannot meaningfully experience a motet through reading a score: we need to hear it performed, in this case preferably in the space that it was meant to be — only once — performed. Moreover, ideally — and impossibly — we would need to hear the performance with the "ears" of the Quattrocento audience.

Nevertheless it is possible to speculate on the experience of the participants of that exalted moment in 1436, to describe what may have been possible for them to hear, see, and imagine. The performance of *Nuper rosarum flores* briefly made the building (in my interpretation), not just a theatrical setting and auditorium, but an integral part of the performing arts, integrally part of the performance. For the ideally knowledgeable and attentive participant, the words, structure, and "images" of the music-text were mirrored in the piers, walls, and vaults all around. Yet simultaneously the building seemed to be echoed in the music, and all such sensuous experience reflected and was reflected by the multilayered ideological, imagetext knot of Temple and Virgin, Temple as the Virgin, Virgin as the Temple, Temple as New Jerusalem, all converging with a (self)-consciousness of site and meaning intricately fused with the city of Florence and its mythical/mystical identity. In which directions such thoughts, perceptions, and feelings actually might have run, whether, indeed, any of the auditors, even the most knowledgeable, actually experienced much of what was theoretically possible, we shall, of course, never know (we don't even know at what point in the consecration ceremony the motet was performed, and in any case, the

Duomo has terrible acoustics). Perhaps only Dufay himself, or the other members of the papal chapel singing under his direction, would have registered much of the referential system at all. Technically it would have been difficult indeed for even the informed listener to follow with the ear the long durational sequences inherent in the motet, although clearly heard by all, literally or figuratively trumpeted, would have been the four words of the *cantus firmus*, “*terribilus est ipse locus*,” the central words of the famous vision of Jacob’s Ladder in which angels are seen going up and down from Heaven (and perhaps evoking for some listeners this vision, even the “heavenly” space directly around them). But my main point here is to suggest that a cross-referential, multimedia experience of music, architecture, and text-based meaning as suggested in this paragraph may have been at least theoretically possible, or imagined as thus by the composer, for some of the culturally elite members of his audience.

Finally, I would point out that this triangulated interpretation of Dufay, the Duomo, and their biblical/Mariological sources, as some readers will have realized, effectively has raised another intriguing possibility regarding Krautheimer’s protean theory of medieval architectural iconography. In his analysis, the iconographic model is typically subject to three operations in the process of transfer: “the disintegration of the prototype into its single elements, the selective transfer of these parts, and their reshuffling in the copy” (126). Krautheimer himself notes that this reductive, recombinatory procedure, so widely operative in “real” architectural modeling, that is, the way actual buildings “copy” real or imaginary architectural prototypes, also characterizes architectural representation in other media. As he puts it, “Representations of buildings in medieval sculpture and painting appear to confirm the peculiar relationship between copy and original in medieval architecture” (126). What the present study has found is not only that the various ways in which S. Maria del Fiore “copies” the Temple/Heavenly Jerusalem “prototypes” correspond to Krautheimerian rules of disintegration, selection, and reshuffling — as indeed we might have expected — but also that Dufay’s *musical* representations of both the real cathedral (in my reading) and of the legendary text-based Solomonic/Marian prototypes (in Wright’s reading) play by these same rules.

Of course music and architecture were densely bonded in the period by their common Pythagorean proportioning, and intimately bonded by the way that monumental architecture was the place of musical performance.<sup>52</sup>

<sup>52</sup>Wittkower, 131–32, emphasizes that Renaissance architects did not try to “build” music but rather were self-consciously using the same rules of mathematics as music used; the proportions of sounds and spaces were not related directly but through the universal validity of a common harmonic system, which was rooted in divine order.

But here we appear to have stumbled across something more. In the story of *Nuper rosarum flores* we discover a singularly clear case of the intersection of medieval music and medieval architecture in the sphere of representation, and we find moreover that the Krautheimerian method of architectural representation (or “copying”) for the plastic-visual arts, at least in this one particular instance, evidently also methodologically guided the architectural representation of the greatest European composer of the moment.

This conjunction will not surprise Zeitgeist-believers, but it does puzzle me as to its ground of possibility and implications. Although only a musicologist, if anyone, will ever be able to work this issue out thoroughly, I offer the following observation. Architecture, so functionalist and gravity-bound, is the most physical and material of all artistic media; although its spaces and masses may be diligently shaped and ordered by number and proportion, music — especially polyphony — is itself quintessentially proportion and number. This would mean that music was inherently more sympathetic than architecture to Krautheimer’s rather abstract, numerologically centered methodology: in other words, music was potentially more fitting to the Krautheimerian mode of architectural representation than architecture itself. Thus, one could almost say that at some point in the period an instance of dense musical representation of architecture was an event fated to happen. That it appears to have happened in Florence is not surprising.

INSTITUTE OF FINE ARTS,  
NEW YORK UNIVERSITY

## Bibliography

- Ackerman, James S. 1949. "Ars Sine Scientia Nihil Est,' Gothic Theory of Architecture at the Cathedral of Milan." *Art Bulletin* 31: 84-111.
- Borsook, Eve. 1981. *Francesco Sasseti and Ghirlandaio at Santa Trinita*. Doornspijk.
- Braunfels, Wolfgang. 1964. *Der Dom zu Florenz*. Freiburg.
- Clark, Alice V. 1998. "Dufay at the Institute for Advanced Study." *Current Musicology* 60-61: 165-71.
- Crossley, Paul. 1988. "Medieval Architecture and Meaning: The Limits of Iconography." *Burlington Magazine* 130: 116-21.
- Davis, Charles. 1988. "Topographical and Historical Propaganda in Early Florentine Chronicles and in Villani." *Medioevo e Rinascimento* 2: 33-51.
- Friedman, David. 1988. *Florentine New Towns*. New York.
- Gaborit-Chopin, D. 1984. "Lampe ou brûle-parfum en forme d'édifice à coupes." In *Le Trésor de Saint-Marc de Venise*, exhibition catalogue. Paris and New York. 237-43.
- Gori-Montanelli, L. 1971. *La tradizione architettonica toscana*. Florence.
- Guasti, Cesare. 1887. *Santa Maria del Fiore*. Florence.
- The Holy Bible*. 1816, reprint. King James Version, 1641. Reprint, New York.
- Hopper, Vincent Foster. 1938. *Medieval Number Symbolism: Its Sources, Meaning, and Influence on Thought and Expression*. New York.
- Krautheimer, Richard. 1942. "Introduction to an 'Iconography of Medieval Architecture.'" *Journal of the Warburg and Courtauld Institutes* 5: 1-33.
- Krinsky, Carol. 1970. "Representations of the Temple of Jerusalem before 1500." *Journal of the Warburg and Courtauld Institutes*: 1-20.
- Meiss, Millard. 1951. *Painting in Florence and Siena after the Black Death*. Princeton.
- Meyer, Heinz. 1975. *Die Zahlenallegorese in Mittelalter: Methode und Gebrauch*. Munich.
- Paatz, Walter. 1937. *Werden und Wesen der Trecento-Architektur in Toskana*. Burg.
- , and Elizabeth Paatz. 1940-1954. *Die Kirchen von Florenz*. 7 vols. Frankfurt.
- Ryschawy, Hans, and Rolf W. Stoll. 1988. "Die Bedeutung der Zahl in Dufay's Komponistionsart: *Nuper rosarum flores*." In *Musik-Konzepte 60: Guillaume Dufay*, ed. Heinz-Klaus Etzger and Rainer Riehn, 42-51. Munich.
- Saalman, Howard. 1980. *Filippo Brunelleschi: The Cupola of S. Maria del Fiore*. London.
- Sauer, Josef. 1902. *Die Symbolik des Kirchengebäudes*. Freiburg.
- Scherer, Margaret R. 1955. *Marvels of Ancient Rome*. London.
- Sedlmayr, Hans. 1950. *Die Entstehung der Kathedrale*. Zurich.
- Sinding-Larsen, Staal. 1965. "Some functional and iconographical aspects of the centralized church in the Italian Renaissance." *Acta ad archaeologiam et artium historiam pertinentia* 2: 203-40.
- Smith, Christine. 1992. *Architecture and the Culture of Early Humanism*. Oxford.
- Stookey, Laurence Hull. 1969. "The Gothic Cathedral as the Heavenly Jerusalem: Liturgical and Theological Sources." *Gesta*: 35-41.
- Toker, Franklin. 1978. "Florence Cathedral: The Design Stage." *Art Bulletin* 60: 214-30.
- . 1983. "Arnolfo's S. Maria del Fiore: A Working Hypothesis." *Journal of the Society of Architectural Historians* 42: 101-20.

- Trachtenberg, Marvin. 1971. *The Campanile of Florence Cathedral*, "Giotto's Tower." New York.
- . 1979. Review-article on *Der Dom zu Florenz* by G. Kreytenberg. *Art Bulletin* 61: 112-31.
- . 1983a. "Brunelleschi, Ghiberti, and 'L'occhio' minore of Florence Cathedral." *Journal of the Society of Architectural Historians* 42: 249-57.
- . 1983b. Review-article on *Filippo Brunelleschi: The Cupola of S. Maria del Fiore* by Howard Saalman. *Journal of the Society of Architectural Historians* 42: 292-97.
- . 1991. "Gothic/Italian 'Gothic': Towards a Redefinition." *Journal of the Society of Architectural Historians* 50: 22-37.
- . 1993. "Scénographie urbaine et identité civique: réflexion sur la Florence du Trecento." *Revue de l'art* 102: 11-31.
- . 1997. *Dominion of the Eye: Urbanism, Art, and Power*. Cambridge.
- Von Simson, Otto. 1974. *The Gothic Cathedral*. Princeton.
- Waldman, Louis. 1998. *The Choir of Florence Cathedral: Transformations of Sacred Space*. Ph.D. diss., Institute of Fine Arts, New York University.
- Warren, Charles. 1973. "Brunelleschi's Dome and Dufay's Motet." *The Musical Quarterly* 59: 92-105.
- Whitehead, Philip Barrows. 1927. "The Church of SS. Cosma e Damiano in Rome." *American Journal of Archaeology* 3: 2-3.
- Wittkower, Rudolf. 1971. *Architectural Principles in the Age of Humanism*. New York.
- Wright, Craig. 1994. "Dufay's *Nuper rosarum flores*, King Solomon's Temple, and the Veneration of the Virgin." *Journal of the American Musicological Society* 47: 395-441.