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Gothic Architecture by Remote Control: An Illustrated Building Contract of 1340

Franklin Toker

Intensive research in the last decades has produced unexpectedly rich insights on the technical, aesthetic, social, liturgical, and even economic sides of Gothic architecture. But the majority of these studies have explored only the first and last steps of the architectural process: design and construction. Much less is known about the middle step, in which Gothic architects communicated their designs to the cathedral builders. Surviving Gothic drawings have been minutely studied, but a paucity of documentation on the communication process and, worse, a subtle conflict between the textual evidence and the surviving architectural graphics severely limit our understanding of the critical moment between conception and realization in Gothic architecture.

It remains unclear exactly how a Gothic architect ran a building project. The term "Gothic architect" is itself both inaccurate and prejudicial. The usual medieval term for a professional in charge of building was "master" (*magister*, *maître*, *Baumeister*, *maestro*), and only rarely "architect."¹ Gothic masters functioned as both architects and builders. Still, they were not architects in the modern sense because their professionalism consisted in being able to both design and construct, while the professionalism of contemporary architects consists in their ability to draw up buildings with such specificity that they need *not* personally direct their construction.

The distinctions among master, architect, and builder create a problem in the study of Gothic architecture that extends beyond the merely philological. To misunderstand their respective roles is to misunderstand a key element in the creative process behind Gothic buildings. One instance of the importance of the question is the current confusion about Villard de Honnecourt. To the nineteenth century

Villard was the most celebrated of Gothic architects. In recent literature he appears instead as no architect at all, but as a master mason, a carver, a metalworker curious about building, an administrator, and even as a cleric dabbling in architecture. Another instance is the current controversy over the authorship of the design of the cathedral at Chartres, which according to one theory was not promulgated at one moment by an architect but emerged through a succession of a dozen master masons at the job site.² This equivocation on the title and status of the Gothic master has its roots in the Middle Ages itself. In medieval England a "master" was any guild member in full standing, such as a *master* baker. Modern English copies this indiscriminate use by applying the term master in formal situations to any boy, and by varying and abbreviating it (as Mr.) into the standard designation for any male adult. But medieval English also used "master" as a stand-alone term in two totally disparate contexts: for clerics of the second academic degree and for builders, particularly masons and carpenters. This confusion was carried one step further by the title "master of the works" (*magister operis*), which implies a professional builder, but which in fact was held by lay or clerical administrators in charge of building projects. In France just the opposite was true: *maîtres d'oeuvre* were generally experienced builders rather than administrators, but exceptions to this rule are legion. Enough confusion was apparent by the thirteenth century that a French writer of the period advised his readers that a *Petrus Magister* would be a builder, but a *Magister Petrus* would be a scholar. Of all the Continental languages only German was relatively straightforward on the point. A *Meister* was a member of any guild, but building operations were generally headed by a *Baumeister* or *Werkmeister*.³

Fieldwork for this study was conducted during a year-long residence in Siena in 1968. I wish to acknowledge the kind cooperation I received then and during subsequent research from the Monte dei Paschi, the Archivio di Stato, and the Soprintendenza per i Beni Artistici e Storici, all in Siena; and from Professor Giancarlo Breschi of Florence for generous consultation in matters of transcription and translation. I thank Professors James Ackerman and David Friedman for their close and constructive readings of earlier drafts of this study.

¹ There are numerous studies on the evolution of the architectural profession in the Middle Ages. Particularly important are those by Pevsner, Harvey, Mortet and Deschamps, Booz, Gimpel, Aubert and Du Colombier, listed in the bibliography or cited in footnotes below. Still useful is the chapter on the Middle Ages in M. Briggs, *The Architect in History* (Oxford, 1927), New York, 1974, 53-129, while recent contributions to the problem include a historiographic review in A. Saint, *The Image of the Architect*, New Haven, 1983, 19-50, and studies by Kostof, Ettlinger,

Wilkinson and Rosenfeld in S. Kostof, *The Architect: Chapters in the History of the Profession*, New York, 1976.

² C. Barnes, *Villard de Honnecourt: The Artist and His Drawings*, Boston, 1982, xxxii-xxxix; J. James, *Chartres: The Masons who Built a Legend*, London, 1982, esp. chap. 7. In this summation of a decade of publications that have preceded it, James does not specifically deny that an architect might have been asked to design Chartres, but proposes that the holding power of the original design was so slight that the final appearance of the building was effectively controlled not by an architect but by the builders themselves. L. Shelby, "The Contractors of Chartres," *Gesta*, xx, 1, 1981, 173-78, offers a skeptical reply.

³ Du Colombier, 65; V. Mortet, "La maîtrise d'oeuvre dans les grandes constructions du XIIIe siècle et la profession d'appareilleur," *Bulletin monumental*, lxx, 1906, 262-270. The special question of the Italian term *maestro* is treated in n. 50 below.



1 A.W.N. Pugin, title page of *True Principles of Pointed or Christian Architecture*, London, 1841



2 E.-E. Viollet-le-Duc, title page of *Dictionnaire raisonné de l'architecture française*, Paris, 1854

In the light of this inherited ambiguity, contemporary scholars face two equally unsatisfactory alternatives: either reproduce intact the original terms *maître* and *magister* or translate them into such modern equivalents as "architect" or "builder." The first alternative does nothing to reduce the inherent ambiguity of these terms, and the second actually compounds it by creating the impression that there was not merely a specialization but a true split between design and building in Gothic architecture, which was not the case. The latter alternative is nevertheless widely followed today, with the predictable result that such leading Gothic masters as Raymond du Temple and Henry Yevele appear in some studies as architects, in other studies as masons or master builders.

The tendency to split the Gothic designer-builder into two distinct callings stems in part from the ambiguity of the medieval texts and in part from the natural desire of art historians to find modern analogies and sometimes even self-portraits in their historical material. To Erwin Panofsky, for example, the Gothic master was the building counterpart of the learned Scholastics, whereas John Ruskin and William Morris saw him as a prototype Christian Socialist. To Viollet-le-Duc he was a reform-minded technocrat; to A.W.N. Pugin a devout Catholic. Viollet-le-Duc and Pugin left behind graphic reconstructions of their Gothic masters in two images that well express the main stereotypes held even today: to the former the *magister* was a hardy builder inscribing his plans in the earth with a pair of giant dividers; to the latter he was an ermine-caped architect drawing plans in a sumptuous studio (Figs. 1, 2).⁴ For Ruskin and Viollet-le-Duc, the creation of Gothic architecture took place directly at the building site; for Pugin it took place by remote control.

The sole point of agreement between these two extreme interpretations is their emphasis on drawing. Viollet-le-Duc's master might have created sketches for his own use

⁴ Pugin created two closely similar portraits of the Gothic master: the first in 1834 for his father's *Examples of Christian Architecture*, and the second as the title page for his own *True Principles of Pointed or Christian Architecture* of 1841. Both conceptions were based on tombstones showing richly clad masters with their plans or models. Two such tombstones still survive in St.-Ouen at Rouen, while Hugues Libergier's celebrated tomb at St.-Nicaise now stands in Reims Cathedral (illustrated in Du Colombier, figs. 35, 55, 62). Viollet-le-Duc wrote on the Gothic architect in his *Dictionnaire raisonné de l'architecture française du XI^e jusqu'au XVI^e siècle*, 10 vols., Paris, 1854-1861, I, 107-116, in which he reproduced a miniature from the "Life of King Offa" in the British Museum (Cotton ms Nero D. 1, fol. 23v). This seems to have been the basis for his title page, with the possible help of the image of Master Bernard of Soissons with giant dividers, from the labyrinth of Reims Cathedral, and the 13th-century miniatures of Master Lanfranco of Modena in the "Relatio Translationis Corporis Sancti Geminiani," Modena Cathedral archives (Du Colombier, figs. 58, 23). In his article on laborers (*Dictionnaire*, VI, 454-56), Viollet-le-Duc was emphatic that in the Middle Ages there was no separation between the head master and the common laborers at the job site, which he regarded as a modern affliction: "Le système de construction admis par les architectes du moyen âge les obligeait à se mettre en rapport direct avec les ouvriers. . . . Ainsi, il est bien certain qu'au moyen âge, entre le maître de l'oeuvre et l'ouvrier il n'y avait pas la distance immense qui sépare aujourd'hui l'architecte des derniers exécutants."

or used the written specifications of his patron as a design guide, but he is shown devising his plan directly on the ground, where it will be laid out by means of trenches, chains, and stakes. This interpretation appears valid for the Romanesque and Early Gothic periods before ca. 1220, from which time no practical architectural drawings survive. Written and pictorial sources for the period confirm Viollet-le-Duc's interpretation of the Gothic masters as builders, directing construction orally through personal commands to the workmen. How critical it was that the master be in daily superintendence we know from the case of William of Sens, who fell from the scaffolding in September 1178 while directing the rebuilding of Canterbury Cathedral, and was obliged to resign his commission when his infirmity kept him too far from his workmen.⁵

But if Viollet-le-Duc's conception of the master-as-builder is correct for the period before 1220, it does not necessarily follow that Pugin's conception of the master-as-architect automatically applies to all *magistri* after 1220. The master who both designs and builds, with or without using architectural graphics, is a fixture of every historical period right to our own day. Nonetheless there is ample evidence that at least some masters in the High and Late Gothic epochs did concentrate on design only and supervised construction mainly by remote control. This evidence is of two sorts: primary documents, such as contracts, which show that Gothic masters travelled widely and supervised multiple building jobs at once by using second-in-commands called *appareilleurs* (*apparator*; *parlier*; *aparejedor*) at each building site; and secondary texts, which show that by the mid-thirteenth century the leading masters were prized not simply as artisans but as intellectual creators.

That Gothic masters executed buildings far from their home base is well known: Villard de Honnecourt in Hungary; Etienne de Benneuil in Sweden; other French designers in England, Bohemia, and the Holy Land; German masters in Spain and Italy. There are parallel instances from every corner of Gothic Europe that show certain masters working primarily as designers and supervisors rather than as builders. In Italy, Arnolfo di Cambio was provided with horses to travel between the jobs he held simultaneously in Rome and Perugia. In Germany, Conrad Roriczer was

guaranteed by contract that he could superintend churches both in Nuremberg and Regensburg simultaneously, and he designed buildings in Nördlingen, Eichstätt, and Ingolstadt besides. But the most striking examples are from late medieval France, where Gautier de Varinfroi, Pierre de Montreuil, Jean des Champs, Raymond du Temple, and Martin Chambiges reached a peak in pre-modern professionalism in their supervision of various complex projects at once. The on-site involvement of such masters with certain of their building projects could be as little as three to six days a year.⁶ The surviving contracts do not always specify the nature of this involvement, which in some cases must have been limited to consultation. But in other cases it is clear that the master had already designed the building and overseen its beginnings, and was now periodically returning to see that the design was being correctly executed. It was only as a designer, not as a builder, that Hanns von Burghausen could have "built" the six churches in five different Bavarian towns with which he was credited on his memorial in 1432. Similarly Master James of St. George acted as a design professional and not as a builder when in quick succession he erected a dozen castles on the Welsh border at the close of the thirteenth century. It was the institution of the second-in-command, the *appareilleur*, in the latter half of the thirteenth century, that allowed the master to distance himself from the work site, secure in the knowledge that his plans were being properly interpreted and executed.⁷

The high prestige of the master builders in the era of Chartres, Reims, and Amiens was a phenomenon not merely evident with hindsight, but striking to contemporaries. Particularly significant in this regard was the frequency of use and the meaning given to the old classical term *architector*, which was briefly revived in France in the mid-thirteenth century and again in early fourteenth-century Tuscany before its definitive reinstatement in European languages in the Renaissance.⁸ There are numerous cases after 1220 of such lordly or near-lordly architects as Philippe Chinard and Pierre d'Angicourt, knighted by Frederick II and Charles I of Naples, respectively; Master James of St. George and Raymond du Temple, created constable and sergeant-at-arms by Edward I and Charles V,

⁵ T. Frisch, *Gothic Art 1140-c. 1450: Sources and Documents*, Englewood Cliffs, NJ, 1971, 19. The tragedy of William of Sens had a comic echo three centuries later in the stratagem of Filippo Brunelleschi, who called in sick at a critical point in the construction of the cupola of Florence Cathedral in order to paralyze work and manifest the ineffectiveness of his unloved partner Lorenzo Ghiberti. See A. Manetti, *Vita di Filippo Brunelleschi*, ed. D. de Robertis, G. Tanturli, Milan, 1976, 93.

⁶ H. Dixon, "Arnolfo di Cambio: Sculpture," Ph.D. thesis, S.U.N.Y., Binghamton, 1978, 156; Harvey, 133-36; Shelby, 8-11; Rosenfeld (as in n.1), 162-66; and P. Kurman, D. von Winterfeld, "Gautier de Varinfroi, ein 'Denkmalpfleger' im 13. Jahrhundert," *Festschrift für O. von Simson zum 65. Geburtstag*, Berlin, 1978, 101-159. Aubert, 81, cites three of numerous recorded instances of short visits by masters to their works: Nicholas de Chaumes, superintending the building of Sens Cathedral although in residence only three days a year (1326); Gautier de Varinfroi, superintending Evreux Cathedral just two or three days a year (1253); and Jacques de Narbonne, present at Narbonne Cathedral for six days a year

(1320).

⁷ R. A. Brown, H.M. Colvin, A. J. Taylor, *The History of The King's Works*, I, London 1963, 203-05 and 212; A. Martindale, *The Rise of the Artist in the Middle Ages and Early Renaissance*, New York, 1972, 48; J. W. Cook, "A New Chronology of Hans von Berghausen's Late Gothic Architecture," *Gesta*, xv, 1976, 97-104.

On the *appareilleur* see Mortet (as in n. 3); Du Colombier, 79; Aubert, 11-13; D. Kimpel, "L'apparition des éléments de série dans les grands ouvrages," *Dossiers histoire et archéologie*, XLVII, November, 1980, 58, and the bibliography in his n. 18.

⁸ Du Colombier, 61-74; Pevsner, 555-562. Foremost among those who revived both the classical term and meaning of *architector* or *architectus* was Thomas Aquinas: "Take architecture for example: you apply the terms 'wise' and 'master-builder' [sapiens et architecton] to the artist who plans the whole structure, and not the artisans under him who cut the stones and mix the mortar" (*Summa Theologiae*, Blackfriars ed., 60+ vols., New York, 1964-; I, ed. T. Gilby, Ia: I, 6, pp. 22-23). See also n. 14 below.

respectively; John Sponle, Henry Yevele, and William of Wynford, esquires to Edward III; Jean de Cambrai, esquire to Charles VII; and hundreds of other designers who derived ample wealth and prestige in return for their services.⁹ Another striking testimony to the changing status of the *magister* is the tombstone of the distinguished builder Pierre de Montreuil, of 1267, which listed him for posterity not as a master but as *doctor* of the masons. But the most telling argument for a metamorphosis of the Gothic master into an architect is a passage in a sermon delivered in 1261 by the Dominican Nicholas de Biart, who spoke in astonishment of certain masters who wore gloves and directed other masters to cut stone, while appearing to do no work themselves. That passage, and a parallel text from the *Distinctiones* attributed to Nicholas de Biart, follow:

Masters of the masons, carrying a yardstick and with gloves on their hands, say to others: "Cut it for me this way," and do not work; yet they receive higher pay, as do many present-day bishops.

Some work by word alone, for in those great buildings there is wont to be one chief master who ordains by word alone, rarely or never setting hand to the work, and yet gets higher pay than the rest. So there are many in the Church who have fat livings, and God knows what good they do. They labour with the tongue alone saying, "Thus you should do," while they themselves do none of these things.¹⁰

It cannot be coincidence that the rise in status of the

Gothic architect and the practice of having a permanent second-in-command at the job site were both phenomena of the mid-thirteenth century, for this was also the moment when reliable architectural drawings make their first appearance. The presumption is inevitable that it was through drawings that the architect began to manage his building operations by remote control, and that it was this liberation from daily involvement at the construction site which fed his new and higher status. Certainly the making of drawings was regarded as the key attribute of the High Gothic master builder. Numerous miniatures, sculptures, and tombstones of the Gothic master with his straightedge, set squares, compass, and dividers bear this out. The provision of paper or parchment appears often as the first step in the construction of great monuments, and as an essential point in contracts between patrons and their professional builders.¹¹ Ample documentation attests to the importance of drawings and, less frequently, of models in decision-making once a project was underway, and it was commonplace for the architect's drawings to be urgently recalled by the building committee after he had died or left the site.¹² There are, moreover, numerous recorded cases in which an old plan was executed posthumously or in which a plan was drawn up by a master in one city and sent out for independent execution by masons elsewhere.¹³ The exploitation of such graphics called into being a parallel terminology. Villard de Honnecourt referred in his sketchbook to the plans and elevations (*esligements* and *montées*) he made of the rising choir of Cambrai Cathedral in the 1220's, while even an outsider such as Thomas Aqu-

⁹ On the wealth and status of Gothic masters see Aubert, 22-26; Harvey, 75-80; and Du Colombier, 96-103. A. Middeldorf Kosegarten, "The Origins of Artistic Competitions in Italy," in *Lorenzo Ghiberti nel suo tempo*, 2 vols., Florence, 1980, I, 170-72, argues for a reappraisal of their intellectual stance and self-awareness as well.

Whether Pierre d'Angicourt was a knight who turned to architecture (primarily but not exclusively fortifications) or an architect who was knighted by his patron is not yet clear. E. Bertaux, "Les artistes français au service des rois angevins de Naples," *Gazette des beaux-arts*, Sér. III, xxxiv, 1905, 97-99, assumed the first case but Du Colombier, 150, n. 144, rejected Bertaux's arguments on the basis of d'Angicourt's career documents.

¹⁰ On the Montreuil tombstone see A. Prache, "Un architecte du XIII^e siècle et son oeuvre: Pierre de Montreuil," *Dossiers histoire et archéologie*, November, 1980, 38. The two de Biart quotations were first published in Mortet, 1906 (as in n. 3), 267-68; the English translation is given in Harvey, 1972, 78.

¹¹ On the centrality of drawing in written and pictorial sources on the medieval builders see Du Colombier, 103-111, 175-187; Salzman, 15-18; K. Gerstenberg, *Die deutschen Baumeisterbildnisse des Mittelalters*, Berlin, 1966; White, 50, 168.

The general bibliography on Gothic architectural drawings is vast: the most accessible introductions in English are Briggs (as in n. 1), 86-102, and Bucher, 1968 and 1979. Specialized studies by country include Branner, 1963, for France; B. Degenhart and A. Schmitt, *Corpus der italienischen Zeichnungen 1300-1450*, 7 vols., Berlin, 1968 and 1980, on Italy; on English drawings Salzman 15-22, and L.R. Shelby, "Medieval Masons' Templates," *Journal of the Society of Architectural Historians*, xxx, 1971, 140-154; on German drawings O. Kletzl, *Plan-Fragmente aus der deutschen Dombauhütte von Prag in Stuttgart und Ulm*, Stuttgart, 1939, and H. Koepf, *Die Gotischen Planriße der Wiener Sammlungen*, Vienna and Cologne, 1969. Other notable studies on medieval and Renaissance architectural drawings are listed in the Bibliography.

¹² Documentation on the use of drawings is especially plentiful in the building of Florence Cathedral, where drawings and models were consulted at every stage. See G. Guasti, Docs. 150, 169, 170, 176, 341, etc. Some entries may refer to three-dimensional models ("modellum seu disegnam") but others unequivocally cite a "charta de pechora" or "modelli in cartis pecudinis." The recall of drawings is documented at Siena in 1369 (Milanesi, I, 253); at Stuttgart in 1497 (Kostof, as in n. 1, 87); at Ulm and Milan (Du Colombier, 64); and in numerous legal controversies all over Europe on the theft or misappropriation of architectural graphics (J. Harvey, *The Gothic World 1100-1600*, London, 1950, 33-34).

¹³ *Ibid.*, 28: drawings sent from Strassbourg to Basel in 1414; from Augsburg to Bolzano in 1499. P. Booz, *Der Baumeister des Gotik*, Munich and Berlin, 1956, 32, reported a case of posthumous execution whereby the Sakramentshaus of St. George at Nördlingen was executed in 1511 from drawings made in 1470, while a special, but no less spectacular case was the construction of the façade of Cologne Cathedral in the mid-19th century following the rediscovery of its lost Gothic elevations in Darmstadt (G. Germann, *Gothic Revival in Europe and Britain*, Cambridge, MA, 1972, 93). Salzman recorded five more cases of building by "remote control": a tower built in Savoy in 1386, for which the "form or pattern set out on paper in colors was brought from Paris"; a builder's contract of 1436 from Winchester, which contained the phrase: "The werk to be y made as the trasynng schewith y drawe in a parchment skyn by twyn hem y made"; a third similar instance at Dunster in 1442; and two cases involving Henry Yevele: one the indenture of Nicholas Typerton, who contracted in 1381 to build the south aisle of St. Dunstan's, London, according to the plan ("solom la deuyse") of Master Henry; the other the completion of Westminster Hall in 1395 from designs supplied by Yevele (Salzman, 16; Appendix B, Docs. 123 and 36, pp. 583-84 and 462-63). In France in 1383 Guy de Dammartin was paid for drawing plans which were then given for execution to other masons; the following year he was paid merely to supervise the drawing of plans by master Jean Gérout (Rosenfeld, as in n. 1, 165).

nas understood the concept of a “master plan” (*artificialium actuum*) which carried the essence of a projected building.¹⁴

There is an almost contemporary ring to these accounts of Gothic masters creating drawings of such specificity that they could be clearly read and executed by their *appareilleurs* or by independent builders. Such plans must have served the same role as modern working drawings, but this, unfortunately, is the precise point of contradiction between the surviving written and graphic documentation.¹⁵ Despite a mass of textual evidence of Gothic architects working by remote control, scholars have yet to find a single incontrovertible example of a Gothic working drawing.¹⁶ Either every exemplar was consumed in the construction process, which is statistically untenable, or scholars have incorrectly defined what they are looking for. The conflict between the written and graphic documentation need not lead us to reject them both. The fact that Gothic drawings were less detailed than modern blueprints does not invalidate execution by remote control as a significant component of Gothic architecture. Rather than ignoring the textual evidence, we should accept it, and then ask what it was in Gothic drawings and the wider building process that made the drawings the *equivalent* of modern blueprints.

Fortunately a Gothic drawing of special help in untan-

¹⁴ Bucher, 1979, 97. Aquinas (as in n. 8), xxviii, ed. T. Gilby, *la2ae*: 93: 3, pp. 58-59, referred to plans as an analogy of the derivation of secondary principles from original principles: “. . . thus also in architecture the master-plan of the building descends from the architect to the workmen” (“et in artificialibus etiam ratio artificialium actuum derivatur ab architectore ad inferiores qui manu operantur”).

¹⁵ The working drawing is generally defined as any plan, section, or elevation that has been scaled, measured, and annotated to serve as the self-sufficient guide to building. See R. Sturgis, *A Dictionary of Architecture and Building*, 3 vols., New York, 1902, III, col. 1128. It is one of five general categories of modern architectural graphics, the other four being the schematic diagram, including fantasy sketches, which the architect creates for his or her personal use; presentation drawings for the patron and the wider public; large-scale shop drawings or templates for the execution of details; and the drawing of record, for completed buildings.

¹⁶ Shop drawings and templates, placement drawings for ribs, even diagrams scratched on the floors or walls of numerous Gothic churches were in a narrow sense “working” drawings, but they will be excluded here either because they controlled details rather than broad components of a design, or because they were not drawn by the master for use by a workman, but by one workman for another, or by a workman for himself. The “working plans” catalogued in Bucher, 1968, 55, and *idem.*, “Medieval Architectural Design Methods, 800-1560,” *Gesta*, xi, 2, 1972, 35-51, are without doubt working drawings, but fail to satisfy either or both of these additional conditions. Similarly the statement in Harvey, 101, that “many working drawings from the Middle Ages have survived” is backed up only by placement or shop drawings. Representative of the majority view that there were no Gothic working drawings are Saalman, 103: “[the late-medieval builder’s] drawings and models were of a crudity that would render them almost useless in modern practice . . . no equivalent of the modern blue prints existed in the period [14th-15th centuries] we are considering”; and L. Shelby, “Monastic Patrons and Their Architects: A Case Study of the Contract for the Monks’ Dormitory at Durham,” *Gesta*, xv, 1976, 95: “There are no surviving medieval architectural drawings which carry the fully detailed information of the blueprints essential to the modern building process.” Branner, 1963, 138 and 140-41, felt on the contrary that “project” drawings came into general use in France

gling this question reappeared during the last decade, after being inaccessible to scholars for over a century. It is the illustrated contract of 1340 for the reconstruction of the north half of the Sansedoni Palace in Siena. Earlier than any comparable document from Gothic Europe, it consists of both a lengthy text and a detailed drawing for the project, together with the resulting building itself. The contract thus provides a verbal description, a graphic definition, and a physical entity as three interpretations of a single design. Through it we can study all three stages of a Gothic building project, and take readings also on the parallel evolutionary process by which the *magister* of Gothic buildings emerged as the *architectus* of the Renaissance.

The Sansedoni Contract

The Sansedoni contract is preserved today in the archive of the Monte dei Paschi di Siena, the current owners of the palace.¹⁷ The text was published in 1764 and 1854, but without the numerical and textual annotations on the drawings which are transcribed and translated in full in the Appendix.¹⁸ The contract is a large document, one Tuscan *braccio* (0.58m) wide and 1.22m long (Figs. 3-6). It consists of two pieces of paper — not parchment — glued together and written in Italian with bistre in angular Gothic script. From the nature of the errors marked by erasures and super-

between 1220 and 1240, although at first as supplementary aids rather than as self-sufficient construction documents.

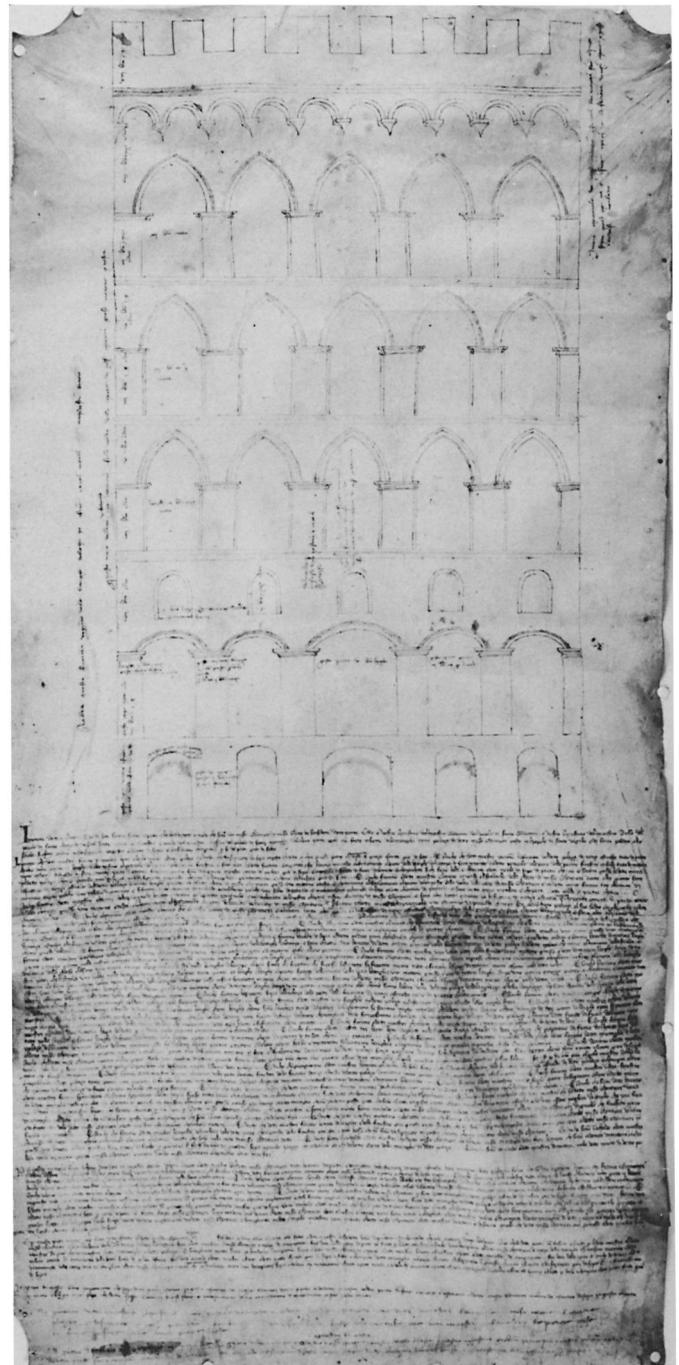
¹⁷ The Sansedoni contract has had a history not much less eventful than the palace itself. It has long been regarded with curiosity, and was cited in a public document as early as 1466. It apparently remained in the Sansedoni family from 1340 to at least 1611, in which year Bishop Giulio Sansedoni of Grosseto reported in his study, *Della Vita del Beato Ambrogio Sansedoni*, that he owned both the palace and its elevation drawing. The contract then passed out of the family into the archives of the Ospedale S. Maria della Scala, from which it was retrieved in 1775 by Giovanni Ambrogio Sansedoni. The palace and its contract were sold to Dandolo Mattoli of Florence by the Sansedoni heirs in 1934, and by Mattoli to the Monte dei Paschi di Siena in 1973. The document is in generally good condition, but bears marks of abuse where one or more owners folded it into a 29 x 32cm packet, perforated it with a complete border of nails, and underlined those passages relating to money.

¹⁸ The first surviving transcription of the text dates from the early 18th century (Biblioteca Comunale degli Intronati, Siena, C.VI.8, “Capitoli S. Domenico di Siena,” fols. 315-325.) It was then published in G. della Valle, *Lettere sull’arte senese*, II, Siena, 1764, 131ff., and a second time in Milanese, I, Doc. 51, pp. 232-240. Several of its terms were cited as architectural definitions in N. Tommaseo and B. Bellini, *Dizionario della lingua italiana*, Rome, Pisa, Naples, 1873ff. The contract was mentioned in G. Rohault de Fleury, *La Toscane au Moyen Âge: Lettres sur l’architecture civile et militaire en 1400*, II, Paris, 1874, and a photograph of it was printed in a local pamphlet, *L’Università e le istituzioni culturali di Siena*, in 1935. Because of zealous custodianship, the contract has been virtually inaccessible to scholars since Milanese examined it in 1854. W. Braunfels, *Mittelalterliche Stadtbaukunst in der Toskana*, Berlin, 1953, 81, discussed it on the basis of the photograph published in 1935, and regarded it as only a crude sketch by a notary or by Gontiero Sansedoni himself. The Braunfels citation then formed the basis for the scant footnote on the drawing in Degenhart and Schmitt (as in n. 11), I, 1, p. XXI, n. 41. The contract was given its first public analysis in May 1973, in a lecture by the author at the Harvard University Center for Italian Renaissance Studies in Florence. It was subsequently described in A. Garzelli, “Un disegno di architettura civile del 1340,” *Antichità viva*, XII, 2, 1973, 36-41, and cited in Goldthwaite, 370-71.

scripts, the contract text does not appear to have been composed directly but made as a clean copy of an earlier draft.

What distinguishes this contract from the thousands of builders' specifications surviving from medieval Europe is its illustration. Above the text is an elevation drawing 40.60cm wide and 70.10cm high, which represents (at 1:48 scale) a basement of five low barrel vaults, a ground floor occupied by a wide *portone* and four shop entrances, all with depressed segmental arches; a mezzanine of small lunette windows; and three upper floors, each with five pointed-arch windows for typical Sienese *trifore*. The windows themselves are left blank. The whole is crowned by a corbel table of ten arches, a sawtooth cornice and eight disproportionately large battlements. Each floor is set off by stringcourses, with prominent impost blocks between the windows. The profiling of both stringcourses and impost blocks is progressively simplified toward the top; so also the story heights and the window heights and widths expand incrementally from the bottom of the palace to the top. The drawing is extensively annotated with about two dozen sets of Roman numerals for the widths and heights of all visible detailing and of internal wall thicknesses. Vertical measurements are annotated vertically, horizontal measurements horizontally. The basement height called for was 6 *braccia*; the ground-floor 13 $\frac{1}{4}$ *braccia* (6 $\frac{1}{4}$ to the imposts of the shop entrance vaults, 7 to the stringcourse above); the three upper floors 9, 9 $\frac{1}{2}$, and 10 *braccia* high, respectively. Again each floor is subdivided below and above the window imposts: 4 and 5 *braccia*; 4 $\frac{1}{4}$ and 5 $\frac{1}{4}$ *braccia*; 4 $\frac{1}{2}$ and 5 $\frac{1}{2}$. The attic story and the battlements are together 8 $\frac{1}{4}$ *braccia* high. All the door and pier widths are inscribed, and the window widths expand from 3 $\frac{1}{2}$ to 3 $\frac{3}{4}$ and finally to 4 *braccia*.

The sketchiness of the elevation, which is apparent even in photographs, is owed to the fact that it is a freehand copy (probably but not necessarily a tracing) of what must have been an original draft in straightedge, rather than to any inherent roughness of the drafting. There are no ruled or incised lines in the elevation, and the only use of a compass occurred in the corbel table, which was inserted by mechanical drafting and employs perspective. The corbel table is not original to the elevation, however. Under its lines one distinguishes clear traces of the nine arches called for in the text, which had been drawn in freehand and in orthogonal elevation but later erased and replaced by the ten arches now visible. Apart from this late change, the remainder of the drawing is a strictly orthogonal elevation. The process of transcription is also evident in the numerous scribal errors, misplacements, and erasures in the dimensional notations, and in the casualness of the freehand drawing of all lines except those of the inserted corbel table. The roughness of this surviving copy of the Sansedoni elevation was no impediment to its principal use here, which was legal. The more accurate original was presumably



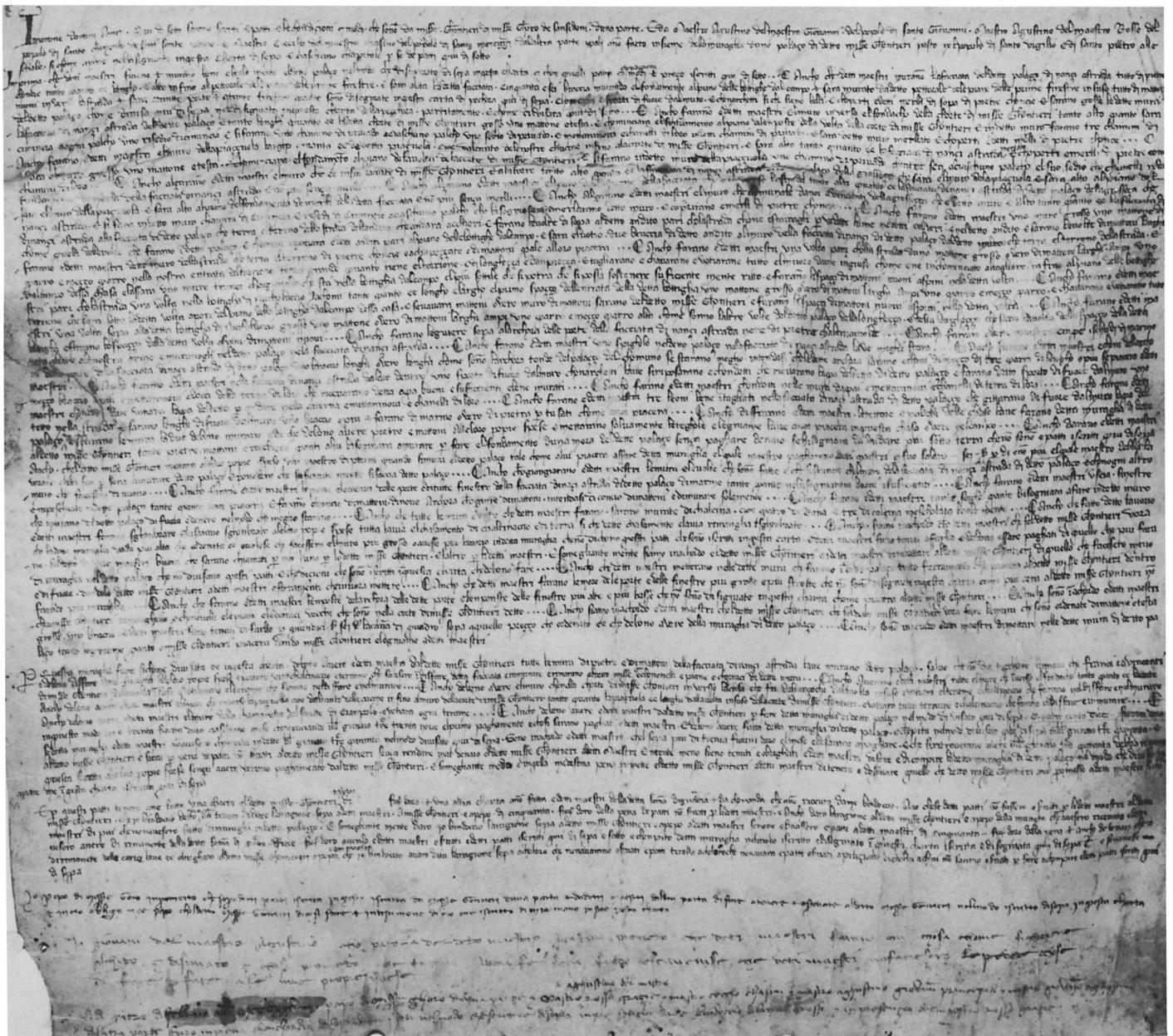
3 Sansedoni Palace contract, sheet .58 x 1.22m, 1340, Siena, Monte dei Paschi di Siena

retained by the builders for execution.¹⁹ Below the drawing follow seventy-nine lines of text in seven paragraphs and forty specific pacts indicated in the original by section marks [§].

The first paragraph opens with the identification of the patron and the three masters Agostino di Giovanni, Agostino di Rosso, and Cecco di Casino, who agree to build the

¹⁹ Both written and graphic documentation attest that copying drawings was a standard medieval practice: see Harvey, *Gothic World* (as in n. 12), 29-30, and S. Murray, "The Gothic Façade Drawings in the Reims

Palimpsest," *Gesta*, xvii, 1978, 51-55. Salzman, 16, noted several English building contracts that had been written out in duplicate, including an illustrated example of 1380 with its plan also rendered in duplicate.



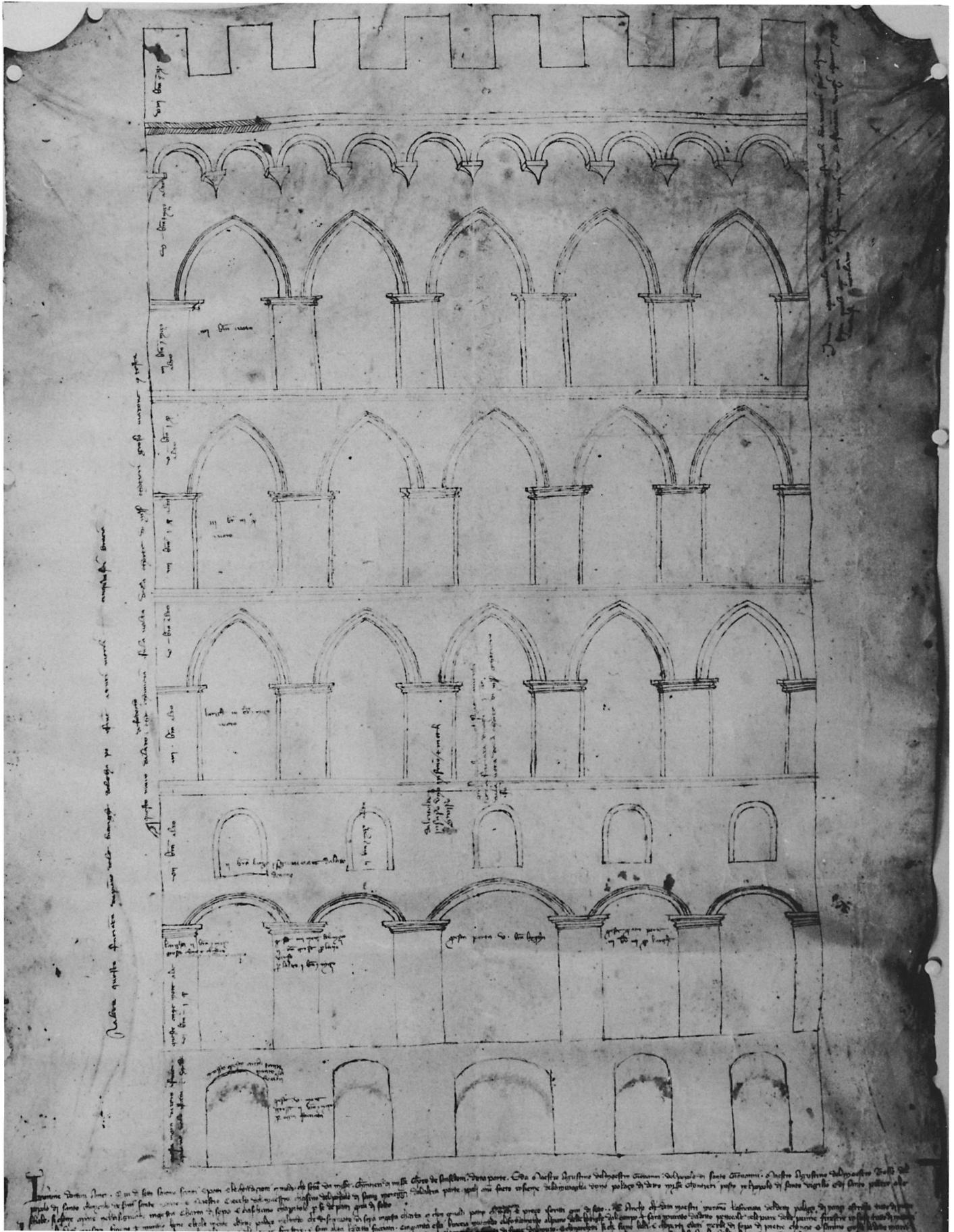
4 Sansedoni Palace contract, text

palace for him.²⁰ This is followed by a statement of the co-authority of the drawing and the text as guides to building the palace, although in practice it is the drawing that enjoys

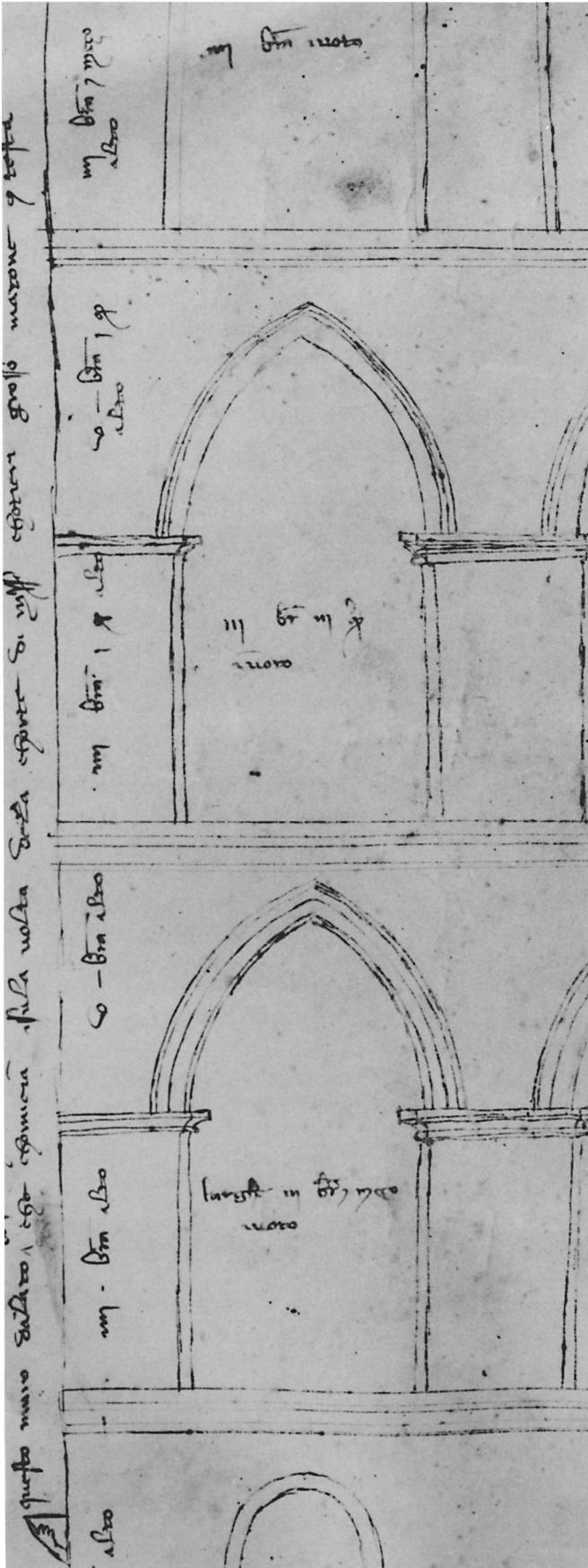
primacy over the text. In the second paragraph, for example, the dense passages spelling out the small details of the construction make no written allusion at all to the num-

²⁰ Maestro Agostino di Giovanni was a prominent sculptor and state architect. Although not so prolific as Vasari's many attributions would suggest, he was clearly in the first rank of Tuscan artists from about 1310 to his death ca. 1347. See G. Vasari, *Le vite de' più eccellenti pittori scultori ed architettori*, Florence, 1568 (ed. C. Milanesi, 5 vols., Florence, 1906), I, 429-445, and *idem*, ed. P. Barocchi, Florence, 1966, II, 1, 125-131, and commentary, II, 2, 412-432. Modern commentary on Agostino di Giovanni and his son Giovanni di Agostino is found in U. Thieme and F. Becker, *Allgemeines Lexikon der Bildenden Künstler*, I, Leipzig, 1907, 128-130, and xiv, 1921, 102; W. Cohn-Goerke, "Giovanni d'Agostino," *Burlington Magazine*, lxxv, 1939, 180-194; A. Garzelli, *Sculture toscane nel dugento e nel trecento*, Florence, 1969, 96-99; White, 287-89; and J. Pope-Hennessy, *Italian Gothic Sculpture*, New York, 1955, 189-190. Agostino's most ambitious work of sculpture was the Tarlati tomb in the

Cathedral of Arezzo; as an architect he was involved (alone or with Agnolo di Ventura) in building the Porta Romana in Siena, ca. 1327, the fortress of Massa di Maremma in 1336, and the tower of the Palazzo Pubblico in Siena, ca. 1339. As an engineer Agostino contracted in the same month of February 1340 with Jacopo di Vanni and the goldsmith (and Cathedral *capomaestro*) Lando di Pietro to bring water to the Campo for 6000 florins. (F. Bargagli-Petrucci, *Le Fonti di Siena ed i loro acquedotti*, 2 vols., Siena, 1906, II, 215). Giovanni di Agostino was born around 1311 and worked extensively in Tuscany and Umbria as sculptor and architect. He was recorded as *capomaestro* of Siena Cathedral in 1336, in the same position at Orvieto Cathedral in 1337, and finally as *capomaestro* at Siena again in 1340. He worked either seven or eight years in that position, which was later held by his brother Domenico di Agostino from 1351 to his death in 1369.



5 Here attributed to Giovanni di Agostino: façade elevation in the Sansedoni Palace contract, size of drawing 0.406 x 0.710m



6 Sansedoni Palace contract, façade elevation detail

ber, size, or shape of the thirty openings, nor to the number of floors or their heights. Apart from the statement that the full height of the façade from the basement floor to the battlements will be fifty-six *braccia*, the text nowhere duplicates information already visible in the drawing, but concentrates exclusively on those things that an elevation cannot express, such as the number of flues and drains for fireplaces and toilets, the herringbone pattern of the brick vaults, and how much of the old palace the builders shall destroy. It is again the drawing rather than the text that informs us on all critical wall thicknesses in and adjoining the façade: in all, seven of the inscriptions report on the width of the party wall to the west, the thicknesses of various arches, and the depths of the basement and ground-floor piers. Both text and drawing are silent on the plan of the floors to be built behind the façade, probably because these floors would follow the plan of the bearing walls at the foundation level, which in turn were largely dictated by preexisting constructions. It is more remarkable that despite the numerous references to the authority vested in the drawing, sections 30 and 31 give the patron the power to deviate from the set proportions of the spandrel zones in height and width, and to make the windows higher or wider than set out in the drawing.

Paragraphs three and four concentrate on the financial terms and duration of the work: 410 gold florins for work from January 1, 1340, to January 1, 1341 (dates given in modern style, adjusting for the beginning of the Sienese year on March 25 rather than January 1). The three masters will pay the salary of a fourth master to “personally work on the construction of the said palace,” which implies that they are supervisors rather than workers on the project. Reference follows to two other contracts that had already been signed — but that have not survived — in which each party has placed fifty gold florins in escrow to guarantee against default. The contract refers unambiguously to construction taking place in the future (for example §21), so that it must have been drafted during 1339. It was not signed until February 1340, a month after construction was slated to begin. Either the start of building was delayed one month, or it began on time but not all the requisite signatures were affixed until later.

Paragraphs five, six, and seven constitute further guarantees: in a handwriting not seen before in the contract, Pepo di Goro Sansedoni agrees to pay for the work if his brother Gontiero defaults; in a third hand and in new ink Master Giovanni di Agostino agrees to complete the building if the three principal masters (one of whom was his father) default. The last paragraph identifies the author of the contract, Bindoccio di Latino de’ Rossi, and concludes with the date of February 4, 1339 (= 1340) and the citation

of a witness, Master Rosso Grazie, father of one of the three builders.²¹

It is not immediately apparent where or even whether the results of this project can be seen at the Sansedoni Palace today. Milanese in fact concluded his transcription of the contract in the last century by saying that nothing remained of the work done in 1340. It is easy to be deceived by the vast bulk of the palace, which contains a hundred rooms in its seven levels and twelve-bay width. Its main façade fronts south on the piazza del Campo, while a secondary façade on the north overlooks the via Banchi di Sotto. The two alleys of vicolo dei Boresellai and vicolo dei Pollaioli pass below its midpoint and alongside its east end (Figs. 7-11). The structural nucleus of the palace is a keep (*torrione*) of the twelfth or thirteenth century; the four bays on the right side of the Campo façade were probably recast to conform to the 1297 ordinance that all windows on the Campo should be modeled after the new *trifore* (three-light windows) of the Palazzo Pubblico itself. Documents cite the mercantile Sansedoni family as owners of the original nucleus by 1255, but they seem to have lived there for at least a century before that.²² In 1319 Gontiero di Goro Sansedoni inherited the major portion of the family house, and it was he who funded the substantial rebuilding of 1340. The palace remained unchanged until the late seventeenth century, when the interior was splendidly redecorated. In the eighteenth century two other palaces were annexed to the west, resulting in a new and uniform Rococo façade on Banchi di Sotto and a neo-Gothic façade on the Campo. Around 1779 the floor levels in the original palace were drastically changed, the high tower cut down, and the top story and crowning battlements on via Banchi di Sotto shaved off. These changes produced the interior and exterior aspects of the palace essentially as one sees them today.

Although the extensive modifications of the seventeenth and eighteenth centuries wiped out the original room disposition of the upper floors of the palace, the five barrel vaults of the basement still survive, and correspond closely to the section in the contract drawing (Fig. 5). The ground plan of the basement therefore delimits the extent of the new work done in 1340: approximately twenty meters wide and nine meters deep. At the basement level the new work abutted directly against the older palace on the Campo. The façade design as shown and as built was a somewhat

peculiar amalgam of old-fashioned features and unprecedented new ones. The basic schema of a five-day front with three upper floors and a ground floor with entrance and four shops was a conventional one. The Ranuccini Palace in via Cecco Angiolieri in Siena is a thirteenth-century product of that mold, while the Castellani-dei Giudici Palace in Florence is another variant almost exactly contemporary with the Sansedoni façade. The Sansedoni front was also slightly anachronistic in its use of stone and not brick for the ground floor, and its segmental double-centered arches (*archi ribassati*) also harkened back to the Tolomei Palace of the previous century.²³ Interestingly, and certainly not coincidentally, the revival of the late Romanesque segmental arch in Sienese trecento architecture was apparently begun by Agostino di Giovanni in his Porta Romana city gate of 1327, and furthered by his son Giovanni di Agostino's prominent side portal in the Duomo Nuovo, of about 1345.²⁴

Above street grade the new palace used a party wall on the west, but the masters had to construct three new exterior walls: the north façade on via Banchi di Sotto; the south, courtyard wall facing the older palace on the Campo; and the east wall overlooking a second courtyard and the vicolo dei Pollaioli. The only explicit reference to interior work on the upper stories are to side-wall thicknesses and to the elaborate system of fireplace flues and toilet drains. The flues are still discernable in the third story of the palace, built into both side walls. From an examination of family wills and state tax records, it appears that the Sansedoni Palace in its Gothic phase consisted of six main apartments, each occupying one entire floor on the north or on the south wings of the palace, and accessible only by a common staircase in the central courtyard. The 1340 work involved the north wing of the medieval palace, and provided four shops, a mezzanine floor, and three apartments above. One can reconstruct the appearance of these upper floors from similar but better-preserved trecento palaces such as the Buonsignori-Bichi-Tegliacci, now the Pinacoteca of Siena, and the Davizzi-Davanzati of Florence. Each upper floor would have constituted a single apartment in one undivided volume stretching from the street façade back to the cortile, with temporary partitions added as needed. Using these contemporary palaces and the Sansedoni family records as guides, one can reconstruct the stipulated work of 1340 (Fig. 12).

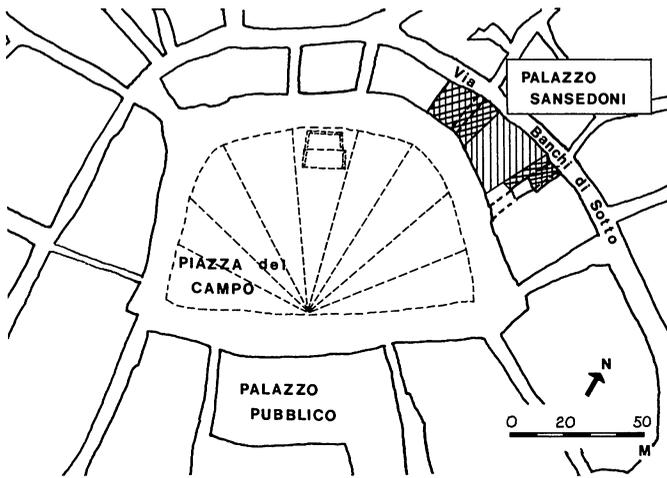
²¹ On the model of similar documents in Siena and Florence we can regard the Sansedoni contract as a viable legal instrument even though Bindoccio di Latino de' Rossi was not a notary but a prominent private citizen. As chief *operaio* of Siena Cathedral, Bindoccio de' Rossi was ideally placed to be the arbiter of this private negotiation: he was a peer of Gontiero Sansedoni and also a trusted acquaintance of Giovanni di Agostino, whom he engaged just a month later in a five-year contract as architect of Siena Cathedral. (Milanesi, I, Doc. 52, 240-41.) The Cathedral contract was written in Latin and regularly notarized, and in it the father Agostino di Giovanni appeared as surety and consultant to his son Giovanni, in an exact reversal of the roles the two played in the Sansedoni contract.

²² These details on the Sansedoni family and their palace derive from numerous manuscripts in Sienese and Florentine public and private archives,

and will ultimately form part of the author's monograph on the palace.

²³ On the medieval palace in Siena, see G. Chierici, "La casa senese al tempo di Dante," *Bullettino senese di storia patria*, xxviii, 1921, 343-380; V. de Vecchi, "L'architettura gotica civile senese," *Bullettino senese di storia patria*, lvi, 1949, 3-52; D. Balestracci and G. Piccini, *Siena nel Trecento: Assetto urbano e strutture edilizie*, Florence, 1978, 77-101; and Rohault de Fleury (as in n. 18), II, pls. XII-XVI.

²⁴ Garzelli, 1969 (as in n. 20), fig. 232, p. 194. S. Sinding-Larsen, "A Tale of Two Cities: Florentine and Roman Visual Context for Fifteenth-century palaces," *Acta ad Archaeologiam et Artium Historiam Pertinentia*, vi, 1975, 169, cited a mid-13th-century doorway in the Bargello tower as the first appearance of the segmental arch in Florence.



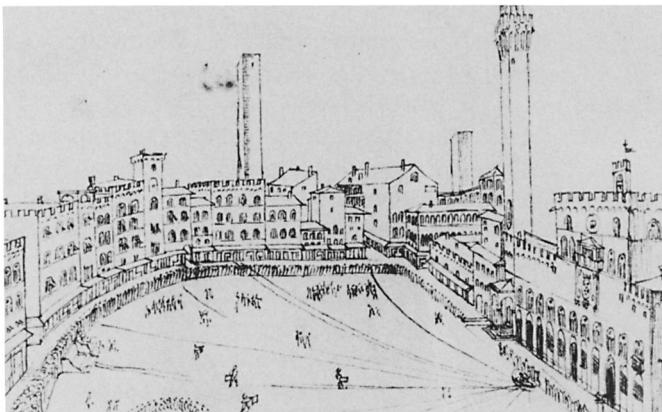
7 Location of Palazzo Sansedoni on Piazza del Campo; cross-hatching indicates post-medieval additions (drawing: author)



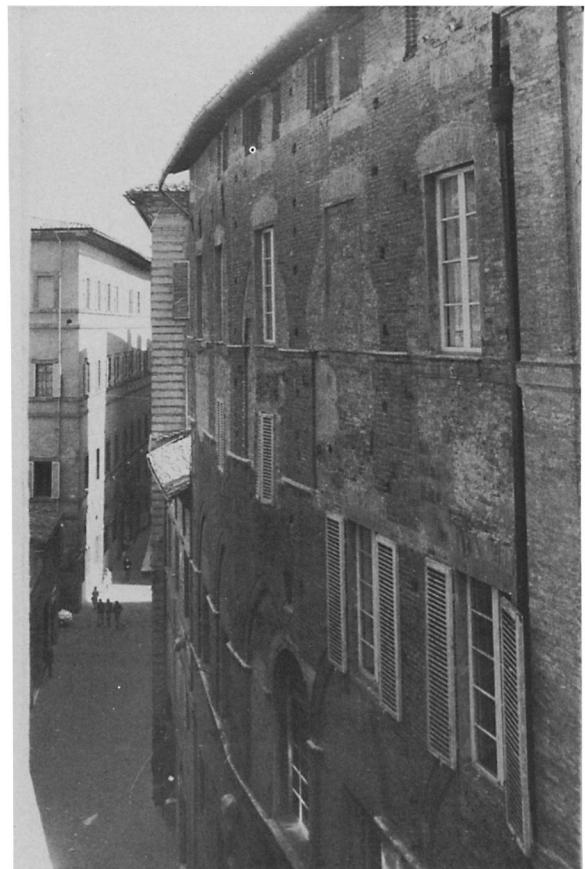
8 Siena, Palazzo Sansedoni, south façade on the Campo: four original Gothic bays on the right (photo: author)



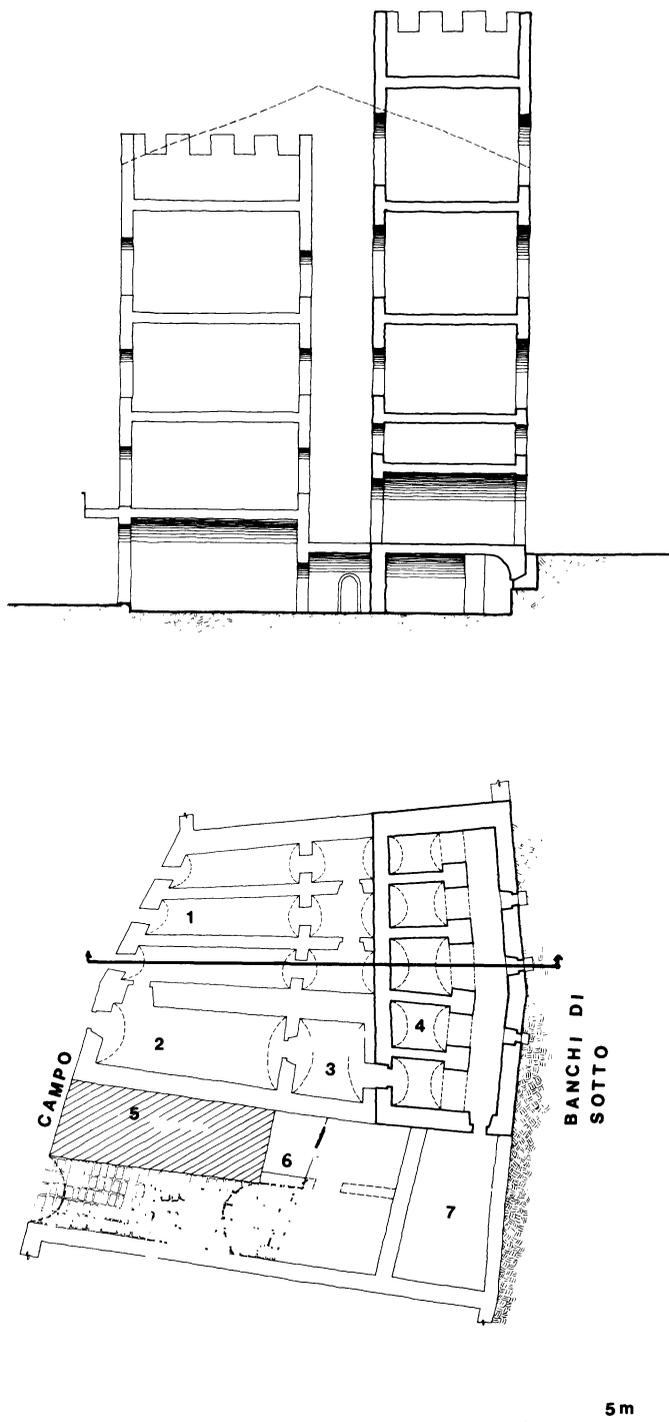
10 Palazzo Sansedoni: north façade on Via Banchi di Sotto, from the east (photo: author)



9 View of the Campo, late 16th century: Palazzo Sansedoni in center, with high tower; Palazzo Pubblico on right, Salzburg, Bibliothek, ms H.21



11 Palazzo Sansedoni: north façade, showing remnant of Gothic third-story range of trifore (photo: author)



12 Author's reconstructed plan and section of the Sansedoni Palace after the completion of the north half on via Banchi di Sotto in 1341; broken line in section indicates modern roofline. Nos. on plan refer to seven parts of Palace complex mentioned in 1340 contract: (1) Bottighe del Campo (2) Torre (3) Torrione (4) Cellieri (5) Fondacho (6) Chorte del missere ghontieri (7) Casamento

It is absorbing to watch the minor but not insignificant changes from the proposed elevation on the drawing to the palace façade completed a year later. Only one of the changes would have been meaningful to the typical observer, which is the slope from lower left to upper right that slightly truncated the intermediate and end piers on the right half of the façade. Almost all streets slope in Siena. The slopes are either terraced in front of palace façades, or simply ignored and carried across façades as conditions dictate. The Sansedoni draftsman was aware that execution of his design would be marginally affected by a slope, and had provided for it in his drawing. He indicated the true height of the ground-floor piers in the line of dimensions to the left of the drawing, knowing that only the leftmost pier would exhibit its full height to passersby. The builders would have no difficulty incorporating the slope in their finished product, especially since they had the full picture of the basement story provided as their guide below. The seven changes not provided for by the elevation drawing (one in width, three in height, three in detailing) would have been all but imperceptible to viewers. The addition of $1\frac{1}{4}$ *braccia* in width slightly expanded the central door, regularized the two end piers despite the fact that one abutted a party wall and the other did not, and minutely thickened the intermediate ground-floor piers, by about three centimeters. The changes in height involved three-quarters of a *braccio* more on the mezzanine floor, two *braccia* more on the *piano nobile*, and $1\frac{1}{2}$ *braccia* more on the second floor. It is now impossible to determine whether the top floor was heightened also, as it has been shaved off, but the other changes probably brought the palace height beyond the specified fifty-six *braccia*. Slight changes of profile involved a minute flattening to the segmental arches of the ground-floor portals and the widening of the mezzanine windows from lunette to segmental-arch proportions mimicking those of the doorways below. Rather than the three slightly different mutations of the *trifore* window openings, the builders settled for the top-floor profile from the drawing and used it on the other two levels also.

What explains these deviations from drawing to brickwork? Paradoxically, the two major deviations — the greater width and the introduction of a slope — say nothing about the self-sufficiency of the drawing as a guide to building. The slope was anticipated as a minor blemish on the finished building which required no guidance from the drawing. The addition of $1\frac{1}{4}$ *braccia* to the palace width was a consideration of real estate and not of architectural design. Gontiero Sansedoni must have commissioned the elevation at some point in 1339, when he anticipated having a $32\frac{3}{4}$ *braccia* streetfront to build on. He passed on all the specifics of the site to his designer, including the peculiarity of the party wall on the right. This the designer incorporated in his façade by means of the asymmetrical end piers. Just before construction started, Gontiero evidently secured an additional $1\frac{1}{4}$ *braccia* from his brothers on the left side of the site, probably a tiny alley or gap alongside an adjoining palace on the street. When construction began in January or February 1340 the new width of thirty-four *braccia* was already set by the basement ex-

cavation. It was either unimportant or impossible for Sansedoni to track down the façade designer to have a new elevation drawn up in accord with the changed width.

Gontiero Sansedoni specified in sections 28, 30, 31, and 33 of the contract that he reserved the right to modify the design during construction. This implies that he saw no substantial difference between the project and the final construction. The master builders followed most of the dimensions on the elevation to the letter. Where there were deviations, they were clearly departures of an extra half or quarter-*braccia*, rather than instances of sloppy misreading of the original dimensions on the plan. Their decision to make all fifteen *trifore* windows follow the top-floor pattern shows that they understood the drawing perfectly even when they chose to depart from it. True, the finished building was in many respects less elegant than the elevation design, but the patron and his builders must have regarded it as more practical. It standardized construction units, which would have represented a considerable economy in the carving of the stone tracery for the windows. The standardization of floor heights was equally expedient. The extra two *braccia* given to the spandrel zones over the windows had two probable advantages: they stiffened the façade with greater wall mass, and brought the levels of the new apartments on the north half of the palace into line with those of the preexisting south half on the Campo (Fig. 12). The floor levels stipulated in the elevation would instead have been at variance. But there may have been an aesthetic difficulty with the elevation concept as well. In general, Tuscan palace façades of the dugento and trecento tend to have progressively shorter windows toward the top, as does the Castellani-dei Giudici design.²⁵ Sieneese façades generally featured a constant window height (Palazzo Pubblico, Tolomei and Ranuccini Palaces) or a diminishing window height (Bandinelli, Alessi, Petroni Palaces). In only a few cases were façades designed with increasing window heights (Monaldi, Accarigi-Lombardi, Rector's Palace at the Ospedale della Scala), but these all show correspondingly diminishing window widths. Sieneese façades were not intended to engage the wall and the window in dynamic syncopation. The Palazzo Pubblico and all house façades were conceived as inert masses of wall perforated by windows: skin and not bones. The proposed Sansedoni façade placed a much greater emphasis on structure and a tenuous balance between solids and voids. The cancellation of the incremental-height scheme and the much higher percentage of spandrel wall in the executed building may represent second thoughts by a conservative patron about the innovations in his proposed design.

The Sansedoni Contract and the Late Medieval Building Industry

The survival of both the Sansedoni contract and palace provides an excellent opportunity to test several hypotheses on the working and design methods of the Gothic masters. Examining the Sansedoni contract as a representative legal document of the late medieval building industry, one is struck by its many similarities with the modern construction specification, but also with certain differ-

ences. Chief among the differences is the degree of variation built into the terms between patron and builder. Many decisions, including the dimensions of the foundation walls, were made orally on the site. So too the contract provided for a good deal of leeway on the proportion of windows and doors "as messer Gontiero may wish" and in structural considerations where the builders were free to decide "in whichever way is best." It would be an error, however, to mistake this informality for laxity in the conception or construction of a medieval building. The reference in section 14 to the voussoirs of the Palazzo Pubblico arches as possible models for the Sansedoni portal voussoirs was a practical expedient in an age without catalogues of architectural parts. The four sections stipulating that the patron may change the original dimensions is also not totally foreign to the spirit of modern specifications, which recognize the inevitability of some changes, and it includes provision for arbitration by two neutral judges on the extra payment for such work. It was sensible rather than haphazard to leave to the last the decision of where to place a bend in the façade (section 13). While the stipulations in the text were less detailed and rigid than those of today, they foresaw all eventualities and provided a means for resolving them. It would have been artificial and wasteful to specify the detailing beyond what the elevation drawing called for: the builders worked this out in terms of the local idiom, as smaller contractors still do today. It is noteworthy that the spirit of terminological flexibility disappears when the contract text turns to questions of legal responsibility. The fact that the patron appointed a fourth master of his own choice but at the expense of the three contracting masters to "supervise that the said palace is adequately built" (§21) suggests that this additional master had an obligation to safeguard the interests of the patron, akin to the advocacy role of a contemporary architect.

The Sansedoni contract is informative also in clarifying distinctions between the designing and building functions of the four Gothic masters whose names appear on it. From internal and external evidence we may assume that Giovanni di Agostino drew the Sansedoni elevation, Agostino di Giovanni coordinated the work, and Agostino di Rosso and Cecco di Casino were the on-site superintendents. Giovanni di Agostino was clearly the prize sculptor and architectural designer in Siena in 1340. Only twenty-nine years old, he had already served once as *capomaestro* at the Cathedral, and would have been deep in negotiations exactly at this time with Bindoccio de' Rossi, in the latter's capacity as lay head of the Cathedral, for his second contract as *capomaestro* beginning in March 1340. Giovanni's façade and side portal for the Duomo Nuovo of Siena still stand as testimonials to the lightness and elegance he attempted to bring to Sieneese architecture. With his many projects in Siena, Pistoia, Arezzo, and Orvieto, Giovanni would not have had the time or inclination to be involved

²⁵ On architectural proportions in trecento Tuscany see E. Guidoni, *Arte e urbanistica in Toscana 1000-1315*, Rome, 1970, 215-234, especially table III, with proportions of nine façades.

with the Sansedoni Palace beyond drawing the elevation. His father Agostino was equally committed to a half-dozen important public-works projects for the Republic, and could have had little more than a cursory connection with the palace. Agostino di Rosso had already represented Agostino di Giovanni in 1336, when the latter built the Siense fortress at Massa di Maremma, and it appears likely that he and Cecco di Casino were the effective builders of the Sansedoni Palace as well. Yet even they were not explicitly tied to daily construction superintendence, paying instead still another *maestro di pietra* to carry out that task.

The participation of Agostino di Giovanni and his son Giovanni in this relatively minor project makes sense only as a useful favor to a powerful Siense bourgeois and as an opportunity for financial speculation. The 410 gold florins stipulated in the contract seem to have represented only the labor and management costs of the project: Gontiero Sansedoni supplied the masters with their building materials, which probably cost an equivalent sum. Both the salary of six *soldi* a day for the supervising master and the overall cost of about 800 gold florins for four shops and three apartments were typical for the period. Costs were held down by the simplicity of the structure, which mainly employed brick rather than stone, and avoided complex vaulting.²⁶ Gontiero Sansedoni paid the 410 gold florins to the builders at the rate of one-twelfth a month, with a performance guarantee of fifty gold florins withheld to the end. Thus a degree of venture capital was required by the builders at the outset to cover materials, equipment, and payroll. Like the capitalist-architects Pierre de Montreuil two generations before and Henry Yevele a generation later, Agostino and his son were evidently entrepreneurs behind this and other projects.²⁷ Their modern title would be *impresario*, as contractors are called in Italy today; like their modern counterparts they would have coordinated arrangements, furnished or solicited a design, and provided capital and workmen. Masters Agostino and Giovanni thus practiced architecture under three different roles in their careers: as contractors or the silent partners of contractors in private commissions; as salaried employees for

specific state or church projects; and as consultants paid by retainer under long-term contracts. In the group of four masters signing the Sansedoni contract we have an excellent case of the Pugin/Viollet-le-Duc stereotypes of those masters who design and those who build. Yet all four masters were also the sons of building masters, and one's overall impression from the contract is not of their fragmentation but of their cohesion despite differences in professional status.

Design Methods in Gothic and Renaissance Architecture

The investigation of the Sansedoni contract text has until now stressed the masters' activities as builders. The contract drawing tells us even more about their activities as designers by clarifying several fundamental points about Gothic design procedures. First, the drawing affords an unprecedented chance to observe how a Gothic master proportioned his building. Analyses of medieval proportioning systems generally depend either on drawings for which no building survives, or on buildings for which no drawing survives. By contrast the Sansedoni elevation has two independent controls: the surviving building, and the precise measurements on the sheet itself (Fig. 13). Since the drawing is a copy, one would not expect, and will not find, marks of the proportioning constructions on the sheet itself. But the deliberateness with which certain dimensions are named on the drawing and in the text, the peculiarity that the story heights increase rather than diminish toward the top, and the inclusion of the invisible basement story as an integral part of the dimensions, suggest that the designer worked in the same tradition of "constructive geometry" that Mathes Roriczer, Hanns Schmuttermayer, and Lorenz Lechler demonstrated in their design books in the second half of the following century.²⁸ Not surprisingly, the geometric schemata used on the Sansedoni façade were the two most common and reliably documented medieval constructions, the *ad triangulum* and the *ad quadratum*.

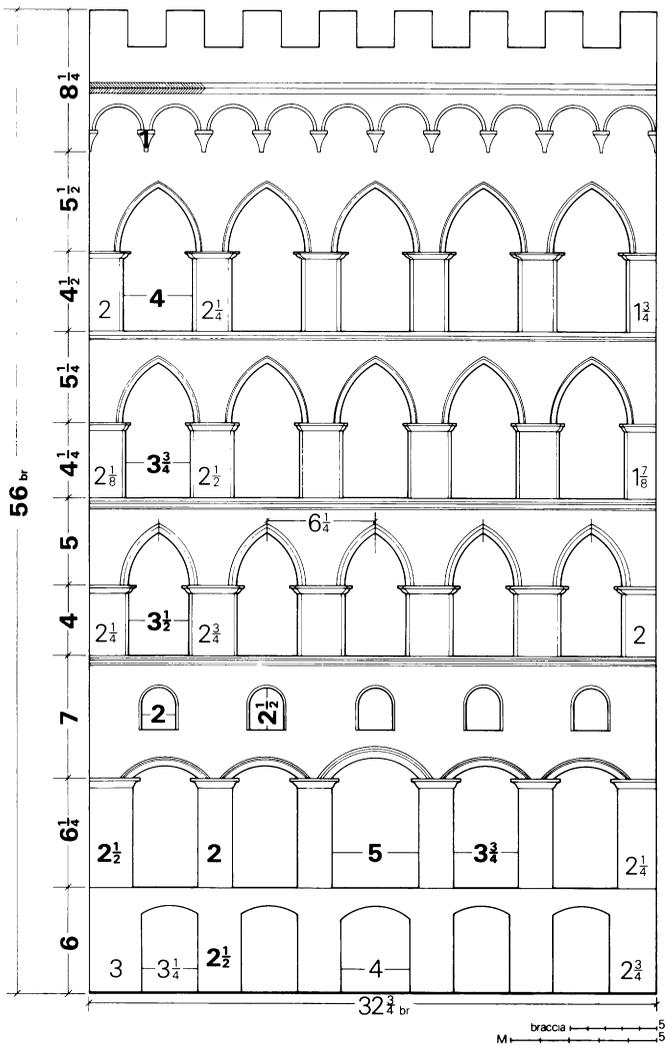
Of these two geometric constructions the first was the more basic, involving an equilateral triangle on the base

²⁶ Goldthwaite, 124-147, provides an excellent sampling of trecento and quattrocento building contracts in Florence. The full text of a contract of comparable detail to that of the Sansedoni project was published by P. Sanpaulesi, "Un progetto di costruzione per una casa del secolo XIV," *Atti del IV Congresso di Storia dell'Architettura*, Milan, 1940, 259-266. R. Davidsohn, *Storia di Firenze*, Florence, 1965, vi, 54, cited wages of six *soldi* a day for master stonecutters in Florence in the 1320's during the winter, seven *soldi* in summer. Manual laborers received half that. The salary paid to the supervising master at the Sansedoni job site represented approximately ten percent of the 410 gold florins in labor costs. Several masters may have participated physically in the work, each with a separate job crew under him. In 1345-46 Neri di Fioravante and seven other masons, together with their work crews, rebuilt the great hall of the Bargello in Florence for 850 gold florins, exclusive of building materials. This was a rib-vaulted project of a much more demanding technical nature than the Sansedoni palace. Seven hundred gold florins was the cost of a row house and a detached house sold in Florence in the same year of 1340 (Archivio di Stato, Florence, Dip., Opera S. Maria del Fiore, August 25, 1340). The early trecento gold florin contained 3.536 grams of gold, about

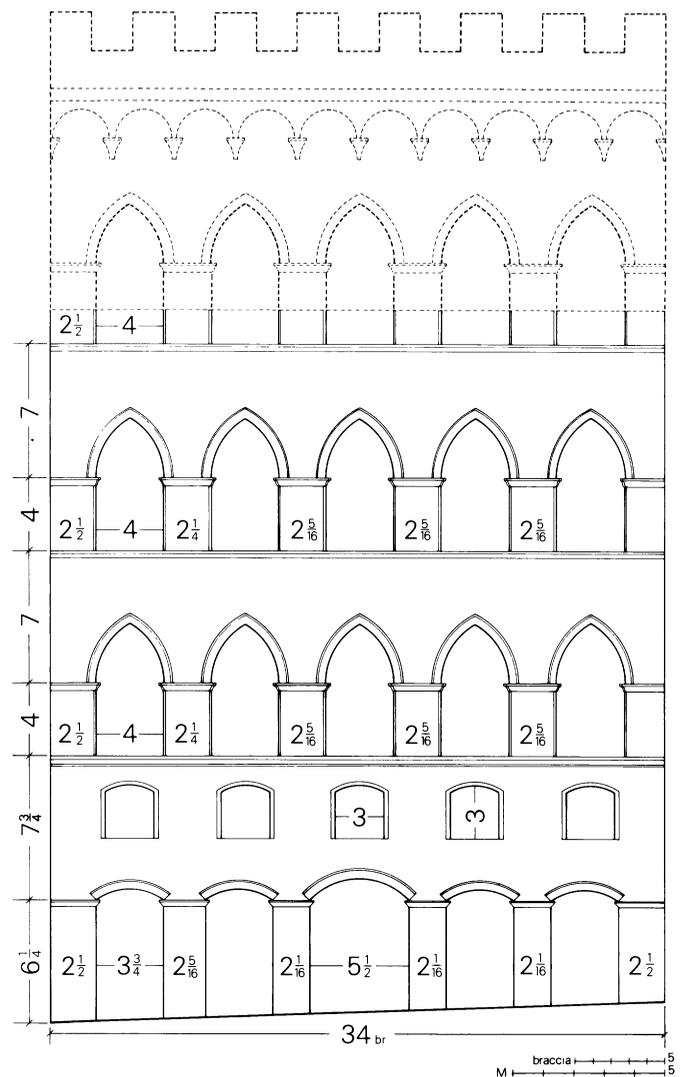
one eighth of an ounce, yet in 14th-century documents both before and after the Black Death, its buying power seems to have been as much as ten times that. Some comparable guides to buying power are given in C. Cipolla, *Money, Prices and Civilization in the Mediterranean World*, New York, 1967, 60-61.

²⁷ Du Colombier, 101, cited parallel instances of architects operating as construction entrepreneurs. Yevele and de Montreuil, for example, both supplied stone from their personal quarries. See Salzman, 132, and Prache (as in n. 10), 26.

²⁸ On the "constructive geometry" of the medieval masters, see Shelby, 1977, *passim*; *idem*, "The Education of Medieval English Master Masons," *Mediaeval Studies*, xxxii, 1970, 1-26; and *idem*, "The Geometrical Knowledge of Mediaeval Master Masons," *Speculum*, xlvii, 1972, 395-421. The literature on medieval proportioning systems in general is vast and not always profitable, but particularly pertinent are P.H. Scholfield, *The Theory of Proportion in Architecture*, Cambridge, 1958, Appendix; L. Hauteceur, "Les proportions mathématiques et l'architecture," *Gazette des beaux-arts*, xviii, 1937, 269; and K. Freckmann, *Proportionen in der Architekturbau*, Munich, 1965, 169.



13 Author's reconstruction of the Sansedoni elevation drawing. Measurements in **boldface** appear on the original drawing; other measurements are derived from them



14 Author's reconstruction of the north façade of the Sansedoni Palace as executed in 1340

line of the palace width of $32\frac{3}{4}$ braccia. The height of this triangle determined the level of the third-floor stringcourse, which the architect gives on the elevation drawing as $28\frac{1}{4}$ braccia. The height of an equilateral triangle is incommensurate with its base, but the dimension of $28\frac{1}{4}$ braccia may be verified by arithmetic approximations. The process begins with the Pythagorean theorem that the square of the hypotenuse of a right-angled triangle equals the sum of the squares of the other two sides. The square of the height of an equilateral triangle must therefore equal the square of its base minus the square of half its base:

$$(h^2 = w^2 - \frac{w^2}{2}).$$

The modern geometric expression of the

formula would be $h = w \frac{\sqrt{3}}{2}$, and its arithmetic resolution $h = \frac{(32.75 \times 1.732058)}{2} = 28.36$ braccia. The

placement of the Sansedoni third-floor stringcourse at 28.25 braccia is thus a deviation of one third of one percent from

the true result of 28.36 braccia, but it will be seen that this deviation was not an error but the result of a deliberate process whereby the Sansedoni architect rounded off odd fractions into more easily buildable numbers.

From the *ad quadratum* formula the architect derived three more important dimensions. The *ad quadratum* principle is that in a series of squares, the side of each successive smaller square is equal to half the diagonal of the larger.

The modern geometric formula is $h = \frac{w\sqrt{2}}{2}$. The height

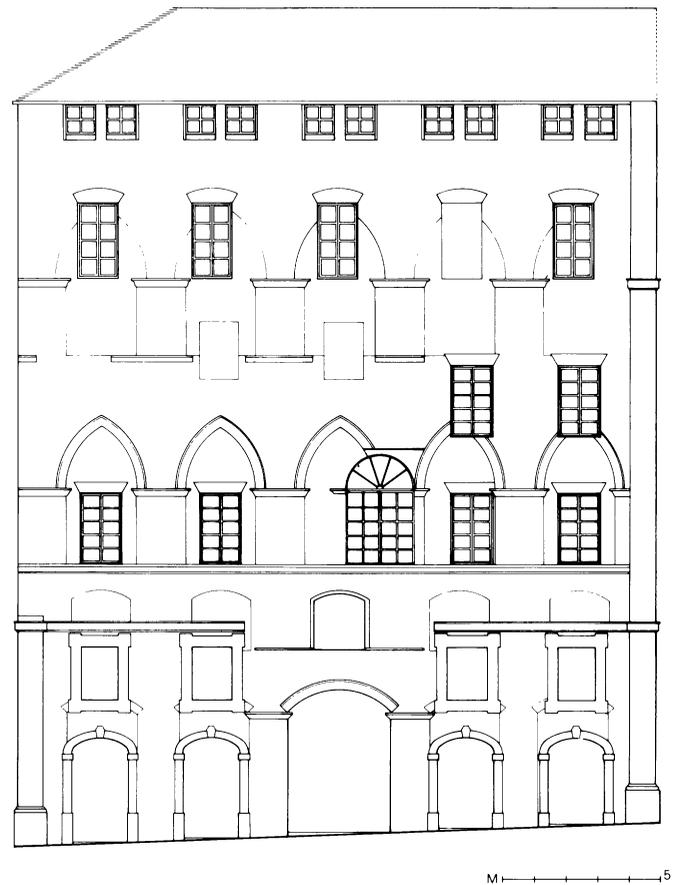
of the Sansedoni Palace from the basement floor to the top of the *merli* is specified both in the text and in the drawing as fifty-six braccia. This height consists of the combined lengths of two successive squares in the *ad quadratum* series, or in its modern formulation:

$$h = w + \frac{w\sqrt{2}}{2} = 32.75 + \frac{(32.75 \times 1.414)}{2} = 55.90$$
 braccia. The result-

ing height was then raised one fifth of one percent to the

round figure of fifty-six *braccia*.²⁹ The architect also used the 32.75 *braccia* width of the palace as the height of the impost of the second-floor windows, and the half-diagonal of the base width, 23.15 *braccia*, became the impost of the first-floor windows. The four numbers thus created were rounded out to quarter-*braccio* measurements (in no case deviating by more than one percent, usually by much less), and two more stringcourses and an additional impost line were drawn in to produce the six most important horizontal divisions according to a precise schema of quarter-*braccio* increments.³⁰

The accuracy of resolution of these incommensurable ratios into numbers is remarkable, and leads to the second question answered by the Sansedoni contract. Centuries would pass before mathematicians showed that $\sqrt{2}$ could be expressed mathematically as 1.414, or that the base of an equilateral triangle related to its height as 1:1.155. How then did the Sansedoni architect turn geometry into arithmetic? This was the question asked by Paul Frankl, Erwin Panofsky, and James Ackerman in the case of the builders of Milan Cathedral around 1390. The Milanese masters were incapable of resolving their architectural geometry into buildable numbers, and overcame their problem only by appealing to the professional mathematician Gabriele Stornaloco.³¹ But how did ordinary builders without the resources of the Visconti dukes achieve the same solution? The answer from the Sansedoni contract is scale drawings. Working very economically, the architect would draw a geometric construction such as the *ad triangulum* on scaled paper and read off its whole-number equivalents (Fig. 16). The technique is explained by both "Master II" in the Villard de Honnecourt sketchbook and by Mathes Roriczer, but this is its earliest complete demonstration. Further use of a compass, ruler, set-square, and protractor gave the average medieval architect the ability to incorporate $\sqrt{2}$, $\sqrt{3}$, and the Golden Section in his designs, bypassing both



15 North façade of the Sansedoni Palace today (drawing: author)

Pythagorean theorems and mathematics.³² The 1521 Cesariano edition of Vitruvius included an elegant diagram to show how the value of $\sqrt{2}$ could be derived for any number by the use of a scale drawing, but Villard de Honnecourt

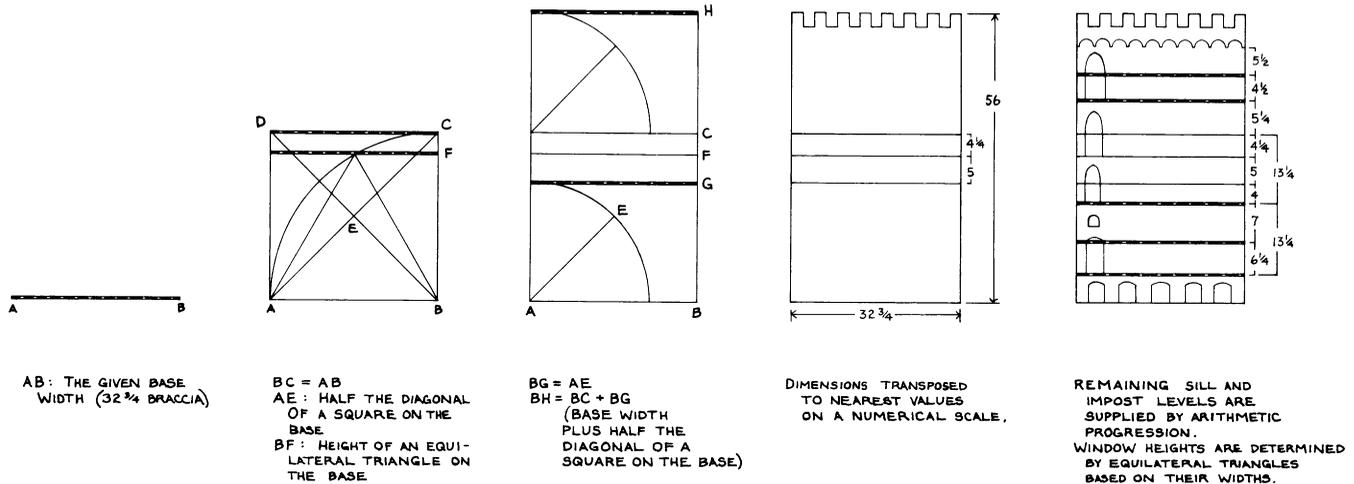
²⁹ These calculations parallel those in Shelby, 1977, 184, wherein the ratio of lengths within a square is 1:1; the ratio of lengths in two successive squares (the *ad quadratum* principle) is 1:0.7071. Adding the lengths of the two successive squares would give 1.7071. The Sansedoni proportion of 32.75 to 56 *braccia* equals 1:1.7099. The difference between this ratio and the ideal ratio of 1.7071 is one-fifth of one percent. An architect today would proportion the façade much more simply by using the square root on a base of 32.75 to give a height of 57.2276 *braccia*. Giovanni di Agostino could not have performed this arithmetic exercise, and in any case would have preferred the longer geometric construction because it left its mark not only on the topmost height but in a series of stringcourses and impost lines on the façade. The "Fibonacci series" would have been known to him and would have yielded a roughly similar proportion of 34:55 *braccia*, but again would not have helped dimension the intermediate levels of the façade.

³⁰The quarter-*braccio* increments in the design do not constitute a true module, since they emerge at the end rather than at the beginning of the design process. They would, however, have been a convenience or even a mnemonic device for the builders, since a quarter-*braccio* was the width of a standard trecento brick, or the thickness of two bricks stacked together. The economy of this geometric-arithmetic design contrasts with the older idea, especially propagated by G. Lesser, *Gothic Cathedrals and Sacred Geometry*, 2 vols., London, 1957, that an infinite number of geometric relationships may be detected in medieval façade. Paul Frankl, 47-

48, scorned such modern reconstructions "... invented by marvelous assiduity and imagination. Some of these figures are so complicated and dense that by them one can prove nearly anything." Garzelli, 1973 (as in n. 18), 41, reconstructed the geometry of the Sansedoni façade as a series of about fifty separate operations, compared to the six reconstructed here. The disparity between the two reconstructions results from a number of Garzelli's departures from the actual drawing: she reconstructed the façade 32 *braccia* wide and symmetrical, rather than 32.75 *braccia* wide and asymmetrical, and reduced the ten arcades of the corbel table to eight. It is unclear why Garzelli excluded the basement and crenellations from her geometric scheme, since both text and drawings make explicit that they were included in the all-important height of 56 *braccia*.

³¹Frankl and Panofsky, 47-48; Ackerman, 1949, 90. The mathematician Giovanni dell'Abaco was paid by the *Opera* of Florence Cathedral "for effort and counsel" in 1417, presumably in reference to the design of the cupola.

³²The question of how architects attained their desired ratios is well treated in G. Beaujouan, "Réflexions sur les rapports entre théorie et pratique au Moyen Âge," in *The Cultural Context of Medieval Learning*, ed. J. Murdoch, E. Sylla, Dordrecht and Boston, 1975, esp. 449-463, with an explanation of the Stornaloco formula differing from that of Panofsky. On Villard's ratio system see H. Kayser, *Ein harmonikaler Teilungskanon: Analyse einer geometrischen Figur im Bauhüttenbuch von Villard von Hon-*



16 Geometric-arithmetical construction of the Sansedoni Palace north façade (drawing; author)

had arrived at essentially the same technique three centuries earlier.³³

The presence of numbers on the Sansedoni elevation leads to a third clarification of Gothic design procedures. Number-based design has long been regarded as one of the key points in distinguishing the Renaissance philosophy of architecture from earlier periods. This position was particularly emphasized in Rudolf Wittkower's 1949 landmark study, *Architectural Principles in the Age of Humanism*. It was further reinforced in Wittkower's third edition of 1962 with the republication of his earlier statement that "commensurability of measure [is] the nodal point of Renaissance aesthetics," together with the visual contrast of the Pythagorean geometry of a head by Villard de Honnecourt with the numerical proportioning of a sketch by Leonardo da Vinci. But Wittkower never excluded a secondary role for metrical elements within Gothic design, and so would not have been surprised to find them on the Sansedoni elevation. Following Ackerman, he saw these metrical proportions only as arbitrary elements within the basically geometric schemes of Gothic architects, not to be confused with the total harmony of metrical relationships in Renaissance designs.³⁴ The Sansedoni elevation now shows us how Gothic designers could have arrived at their occasional metrical proportions though scale drawings. The results could be termed not modular but pseudo-modular:

floor heights or window widths partaking of a limited mathematical sequence but not a meaningful integration with other dimensions across the entire building.

The Sansedoni elevation accords with Wittkower's distinctions between Gothic and Renaissance design theory, but puts particular emphasis on the question of legibility. We now know, thanks in large measure to Wittkower, that Renaissance architects did not give up the geometric schemata of their Gothic predecessors. Alberti and Francesco di Giorgio in particular would begin their designs in geometry and only later transform them into whole-number harmonic relationships.³⁵ Their approach was, however, only superficially similar to that of the Sansedoni architect, who did not wipe away his geometric scheme as he transformed it into numerical ratios, but simply translated it into its nearest arithmetic equivalents. The consequence of the Renaissance approach is a building such as a Palladian villa or Francesco Giorgi's memo on the plan of S. Francesco della Vigna in Venice, in which the intentions of the architect are made legible to the initiated visitor through an arithmetic key that gives the rationale behind the design. No such key was provided for the spectator looking at the Sansedoni façade, even had it been executed precisely as given in the elevation, because the façade was conceived in the architect's private language of geometry and executed according to the different language of arithmetic. Not

necourt, Zurich, 1946, reprinted in H. R. Hahnloser, ed., *Villard de Honnecourt: Kritische Gesamtausgabe des Bauhüttenbuchs ms. fr 19093 der Pariser Nationalbibliothek*, 2nd ed., Graz, 1972, 360-61. Harvey, 127, argued persuasively for the existence in the Gothic period of special set-squares which would have automatically coordinated lines in predetermined ratios.

³³ C. Cesariano, *Di Lucio Vitruvio Pollione de Architectura Libri Decem Traducti de Latino in Vulgare*, fol. 98r (Como, 1521) New York, 1968; illustration reproduced in R. Wittkower, *Architectural Principles in the Age of Humanism*, 3rd ed. repr., New York, 1971, fig. 48. The exactness of Cesariano's method is remarkable: he showed $12 \times \sqrt{2}$ as 17, while modern calculations figure it at 16.968. Alberti, *De Re Aed.*, ix: 6, ed. Orlandi, 831, knew that the diagonal of a square whose sides are 1 is $\sqrt{2}$, but could not express this arithmetically: "Haec enim quanta sit ad numerum, ignorantur." The Gothic architect could have attained the ratio

of $1 : \sqrt{2}$ by the use of the Archimedes spiral shown by Master II in the notebook of Villard de Honnecourt. (See R. Branner, "Villard de Honnecourt, Archimedes, and Chartres," *Journal of the Society of Architectural Historians*, xix, 1960, 91-96 and xx, 1961, 143-46). Saalman, 94, suggested that a drawing attributed to Pisanello embodies the same function.

³⁴ Wittkower (as in preceding note), 158-59, figs. 41a and b; 160, with citation of Ackerman, 1949, 105.

³⁵ *Idem.*, 161. Nearly all Renaissance architects used geometric formulas at some point, as designers continue to do today. See Ackerman, 1954, 8-9, and D. Nyberg, "Brunelleschi's Use of Proportion in the Pazzi Chapel," *Marsyas*, vii, 1957, 1-7, with the observation that in 1421 Brunelleschi used both the old geometric, irrational-value, dimensioning system for the Old Sacristy of S. Lorenzo, and the new arithmetic-modular system for the body of the church.

even the builders knew what the overall controlling scheme was. The Sansedoni design is both metaphorically hidden by the transfer from one language to another, and literally hidden by the placement of the base lines for the *ad triangulum* and *ad quadratum* formulas in the basement. Conceived in solitude or with a few colleagues, Gothic buildings speak a closed language — the so-called “secret” of the master masons. Conceived in dialogue with a learned patron, Renaissance buildings seek to include the viewer in the generative process of their design.

It is characteristic of the experimental nature of the Sansedoni elevation that its design philosophy is solidly Gothic, but the resulting product prefigures many aesthetic objectives of the Early Renaissance. The façade is unmistakably Gothic in its verticality and sense of underlying armature. But its typology of balanced solids and voids has equal affinity with the mid-quattrocento concept of simplicity of features and planarity of the wall set between discrete divisions of stringcourses and impost blocks. With its *trifore* reduced to mere blanks and no indication of texture on the drawing, the Sansedoni elevation could be mistaken for a fragment of the Medici or Pitti Palaces in Florence, a century away. Is this a case of Gothic anticipating Renaissance, or rather of a shared aesthetic viewpoint? Certainly a tendency to flatness and linearity of outline was already marked in Italy by ca. 1310 in the façade of Orvieto Cathedral. It has been argued that these features were actually induced by the new architectural practice of conceiving buildings on paper.³⁶ It prevailed throughout the trecento in such Florentine examples as Orsanmichele and the Loggia dei Lanzi. The Sansedoni design also shows a precocious concern for perspective correction from a predetermined viewpoint. Knowingly or not, the Sansedoni designer followed the advice of Vitruvius (*Arch.* III: iii: 11) to “counteract the ocular deception by an adjustment of proportions” when he enlarged the upper windows. This preceded by almost two centuries similar perspectival adjustments by Bramante for the side walls and spiral staircase of the Cortile del Belvedere.³⁷ The imposition of the incremental-heights formula on the façade in spite of its possible structural risks and its clearly unappreciated novelty constitutes in itself a Renaissance characteristic. Critics such as John Ruskin held Italian Gothic dear and Italian Renaissance contemptible precisely because they were sure Gothic designs never entrapped their users in unworkable schemes for the sake of formalism. Was the ascendancy of formal over structural values another symptom of the change from buildings designed on the job site to buildings designed on paper?

The Sansedoni Elevation and Architecture by Remote Control

The Sansedoni elevation bears all the hallmarks of the modern blueprint: an orthogonal elevation, scale, measurements, and accompanying notes. Yet it would not qualify today as a working drawing. It is not totally self-sufficient as a building guide, since it lacks detailed window tracery and blown-up sections of stringcourse profiles, and is silent on the location of the bend in the façade and the sloping grade of the street. Moreover, the contract text shows that the drawing was not regarded as a binding specification for the final building, only as a recommendation. On the other hand, if it is not a working drawing, what is it? It is not a paradigmatic drawing or a sketch, since it is dimensioned and highly specific to its site, noting its peculiar width, asymmetry, wall thicknesses, and the necessity of linking the basement vaults with the preexisting shops on the Campo. The elevation has none of the pictorial elements that are found in presentation drawings. Certainly the representation of the basement would be out of place both in a sketch and a presentation drawing. Although technically co-equal with the specifications, the drawing was made first and had exclusive authority over the design of the palace. The contract text followed as a technical commentary on the drawing. The predominance of the graphic over the written medium is exemplified by one telling detail: when it was decided to modify the arcades in the corbel table from nine to ten, they were erased and drawn in anew on the elevation, but the incorrect number was left unchanged in the contract text (§24). Had the drawing survived and the text perished, the builders could still have executed about eighty-five percent of the building correctly, given the predetermined foundations. Had the text survived but the drawing perished, the builders would have known only that the palace was to have been fifty-six *braccia* high, with fireplaces and toilets.

The Sansedoni elevation was, as already noted, only one element in the wider social and legal context that allowed a Gothic architect to design and build by remote control. A contemporary architect creates buildings by remote control through the intermediary of four standardized construction documents: the client-architect and the client-builder contracts; working drawings; and construction specifications. The Sansedoni contract synthesized all four of these documents on one sheet. The palace designers and builders worked together as a single entity rather than as the two adversary camps one finds in modern practice. Hence their construction specifications, while elaborate, al-

³⁶ Martindale (as in n. 7), 83.

³⁷ “Forcing” perspective was certainly understood in the trecento: the incrementally diminishing bays of Sta. Maria Novella in Florence may have been laid out for that purpose, and the same arrangement in Arnolfo di Cambio’s design for Sta. Maria del Fiore certainly was. See White, 8; F. Toker, “Arnolfo’s S. Maria del Fiore: A Working Hypothesis,” *Journal*

of the Society of Architectural Historians, XLII, 1983, 115. The incrementally *expanding* windows in the Sansedoni elevation would have set Platonic appearance ahead of Aristotelian reality, a rarer phenomenon in the Middle Ages but not without precedent; in the preceding year 1339 the Piazza del Duomo in Florence was cut down about a meter because its high grade made the Cathedral and Baptistery appear lower than they were (“videntur ita basse”). (Guasti, Doc. 53, pp. 51-52).

lowed for some decisions to be made on site. Agostino di Rosso and Cecco di Casino signed the contract as *appareilleurs*, partners in the working out of the design, not robots. The elevation provided them with all the information they needed for its execution. What we might regard as "missing" details would have been obvious to them: the bend and the slope of the street would be worked in as appeared best on the site; the window tracery and molding profiles would emulate parallel features in the Palazzo Pubblico. For these builders, invested with decision-making authority by both the patron and the original designer, the Sansedoni elevation was indeed a working drawing.

Preserved together, the Sansedoni elevation, the contract, and the palace seem to constitute a *unicum* in Gothic architecture, but there is no evidence that the drawing itself was unique. Many more surviving architectural graphics should qualify as "working drawings" once their specific Gothic contexts are explored. The question of scale is a good case in point. It is widely reported that medieval architectural drawings were not drawn to scale. What is meant is simply that scales rarely appear on such plans. The 1:48 scale of the Sansedoni elevation can be rapidly calculated from the measurements on the drawing.³⁸ Had there been no measurements, traditional formulas governing the widths of doors, piers, and windows would have given the scale. When such "hidden" scales are decoded it becomes apparent that it was not the scaled drawing but the *un-scaled* drawing that was a rarity in the Middle Ages.³⁹

³⁸ The ratio of 1:48 signified in medieval terms $\frac{1}{4}$ *crazia* = 1 *braccio*, the equivalent of the common Anglo-American scale of $\frac{1}{4}$ inch = 1 foot. Like the *lira* of currency, the Tuscan *braccio* (pl. *braccia*) of 0.583626m was divided into sub-units of 20 *soldi* and 240 *denari*; but there existed also two other subdivisions into 12 *crazie* and 24 *once*. See A. Martini, *Manuale di metrologia ossia misure pesi e monete in uso attualmente e anticamente presso tutti i popoli* (Turin, 1883), Rome, 1976, 206ff. The module used by Agostino di Giovanni in his Tarlati tomb in Arezzo was in fact the 0.583626m *braccio*.

³⁹ The statement in Frankl and Panofsky, 49, that "most of the medieval drawings for architecture since the thirteenth century were made without scale" has not stood up to later research in Germany and Italy. Almost all known German Gothic drawings were made to scale, whether marked on the sheet or not (K. Hecht, "Zur Maßstäblichkeit der mittelalterlichen Bauzeichnung," *Bonner Jahrbucher*, clvi, 1966, 253-268; Bucher, 1968, 51). Without exception, all the Italian plans and elevations I have personally examined have been drawn to scale. The elevation drawing related to the campanile of Giotto, now in the Siena Cathedral archives, is at 1:48 scale, as are the Sansedoni contract elevation; the two elevation drawings for the façade of Orvieto Cathedral; the elevation for the Baptistery façade of Siena Cathedral; and Andrea Bonaiuti's painted representation at Sta. Maria Novella of the 1368 project for Florence Cathedral. This last, not normally regarded as an architectural drawing, is in fact a pure orthogonal elevation apart from the buttresses. The elevation drawing of the Cappella della Piazza, ca. 1350, in the Opera del Duomo mu-

The appearance of dimensions on the Sansedoni elevation was also less remarkable than is commonly supposed. Villard de Honnecourt had placed dimensions on his drawing of a catapult a century before our example. Numerous measurements in Arabic numerals appear on the surviving plans and perspective created in the 1330's and 1340's by Abbot Richard of Wallingford as a guide for the construction of his famed astronomical clock at the monastery of St. Albans. The drawings were evidently sufficient guides for construction, since the clock was completed decades after the death of its designer.⁴⁰ Although there are few surviving measured plans from the late Middle Ages, the explanation may lie in the nature of the types of plan most likely to survive: presentation drawings, whose elegance would have been compromised by the presence of numbers, and personal sketches, which were not site-specific. Numbers would have been needed most on layout diagrams, which were used right at the job site and presumably lost in the process. Nor was paper the only medium for such diagrams: plaster tracing floors and any available stone surface served equally well or better. Although few have survived on paper, Gothic layout plans required numbers because of the increasingly common use of numerical as well as geometric dimensioning in the churches themselves. Close examination of Cluny III and the cathedrals of Chartres and Amiens has revealed an extensive use of numbers in the plans, and as early as the mid-12th century Abbot Suger lavished praise on the *geometricis et arit-*

seum in Siena, was drawn at 1:24 scale. The scales are commonly based on ratios of 1:12 or 1:20, which could be extended to the 1:120 scales of the two surviving plans for Siena Cathedral (one of these with a visible scale in a Renaissance hand), the 1:192 scale of the plan of St. Gall, and the 1:240 scale of the 3rd-century marble "Forma Urbis Romae" plan. The 1:24 scale was drawn out on the elevation for a Barocelli chapel in the *tramezzo* of S. Croce (Archivio di Stato, Florence, 279, Dip., Fondo Strozzi-Uguccioni, 6). See E. Borsook, "Notizie su due cappelle in Santa Croce a Firenze," *Rivista d'arte*, xxxvi, 1961-62, 89-107, and the confirmation of the exactness of this scale by excavation in M.B. Hall, "The Tramezzo in Sta. Croce, Florence, Reconstructed," *Art Bulletin*, lvi, 1974, 327.

⁴⁰ J.D. North, *Richard of Wallingford: An Edition of His Writings*, 3 vols., Oxford, 1976, II, 309-320, 361ff., illustrated and discussed the St. Albans plans now in the Bodleian Library. On Villard's catapult plan see Bucher, 1979, 162. Bucher, 1968, 50, also noted the existence of an "exceptional" group of Gothic measured drawings that have not yet been published in detail; *idem*, "L'architecture vernaculaire, ou l'empreinte des particularismes locaux," *Dossiers histoire et archéologie*, xlvii, 1980, 70, with the measured plan of a crane from Frankfurt, ca. 1500. The plan/section of Milan Cathedral made in 1390 by Antonio di Vincenzo and carried back by him to Bologna is fully annotated with measurements in a mixture of Milanese and Bolognese feet, which indicates that the original Milanese plan from which Master Antonio copied was a measured drawing as well.

meticis instrumentis that were responsible for the correct alignment of the new choir with the old nave of St.-Denis.⁴¹

The creation of a drawing of the practicality and specificity of the Sansedoni elevation was certainly not a fluke. Architectural graphics of comparable usefulness were being produced everywhere in Western Europe by the fourteenth century, although Tuscany and specifically Siena were probably ahead of other regions. Siena had a detailed urban plan by the early thirteenth century, probably one of the first in Europe. Moreover, it had the most sustained and important tradition of urban views and architectural renderings on the Continent, as is made clear at a glance at the *oeuvre* of Duccio, Simone Martini, and the Lorenzetti. Seven of Tuscany's twelve surviving scaled plans and elevations from the trecento (three of these *measured* graphics) are today preserved in Siena, and reasonable claims for Sieneese authorship have been put forward for four of the remaining five.⁴² This is an important, early, and cohesive group among European architectural drawing collections, and it is significant that all the drawings were intended for execution, without a fantasy sketch among them. Their Tuscan connection would not seem to be coincidental. A generation ago Wolfgang Braunfels advanced the thesis that in fourteenth-century Tuscany it was *disegno* and not engineering that was perceived as the primary skill of architectural designers. The existence of this group of Tuscan elevation drawings accords with the known instances in which painters such as Giotto and Orcagna, sculptors (Arnolfo di Cambio, Giovanni Pisano, Andrea

Pisano, Lorenzo Maitani [?], Agostino di Giovanni, and Giovanni di Agostino), and goldsmiths such as Lando di Pietro began to edge out construction specialists in the great Tuscan building projects of the fourteenth century. It has been proposed that the two surviving elevations for Orvieto Cathedral constitute a design competition by two of these paper-oriented rather than construction-oriented artists.⁴³ Whether they were the result of a competition or not, the elevations are strikingly astructural, and even as built the cathedral façade "floats" as a two-dimensional work totally free of volumetric considerations in the building behind it. The Orvieto façade and the Sansedoni elevation represent the first voices in what would become an anthem a century later in the Renaissance: the primacy of conception over execution in architecture.

Working Drawings, Remote Control, and Nonverbal Communication

There remains one disability to the thesis that remote control in architecture appeared first in Gothic and not Renaissance architecture. We know that around 1420 Filippo Brunelleschi attempted but failed to run his building projects by means of working drawings.⁴⁴ About thirty years later, in his *De Re Aedificatoria*, Leon Battista Alberti used the working drawing as a key element of his proposed reform of architectural practice.⁴⁵ It seems inexplicable that working drawings would be perceived as an innovation in the Renaissance had this method already existed among the Gothic masters. But the argument can also be reversed.

⁴¹ The major study of numerical ratios in medieval churches is F.V. Arens, *Das Werkmass in der Baukunst des Mittelalters*, Würzburg, 1938. For the individual cases of Amiens, Chartres, Cluny, and St.-Denis, see N. Luning Prak, "Measurements of Amiens Cathedral," *Journal of the Society of Architectural Historians*, xxv, 1966, 209-212; R. Branner, "Gothic Architecture," *Journal of the Society of Architectural Historians*, xxxii, 1973, 329; K. Conant, "The After-life of Vitruvius in the Middle Ages," *Journal of the Society of Architectural Historians*, xxvii, 1968, 33-38; O. von Simson, *The Gothic Cathedral: Origins of Gothic Architecture and the Medieval Concept of Order*, Princeton, 1974, 21ff, 29, 211ff; G. Forsyth, "'Geometricis et Aritmeticis Instrumentis,'" *Archaeology*, June, 1950, 74-79.

Evidence regarding the accuracy of medieval surveying is contradictory. A number of sources, such as the late medieval surveyor Bertran Boyssset of Arles, suggest its unreliability (see J. Schulz, "Jacopo de' Barbari's View of Venice," *Art Bulletin*, lx, 1978, 433, n. 21), but early in the 13th century Leonardo Fibonacci of Pisa reported that "fields and the dimensions of houses are measured with poles and linear feet and inches" (Harvey, 108). In 1094 a Tuscan land transfer included a drawing of the local foot of 51.80cm. on the parchment to avoid ambiguity (G. Uzielli, *Le misure lineari medioevali e l'effigie di Cristo*, Florence, 1899, 24).

⁴² Apart from the Sansedoni contract, the two Sieneese measured drawings are the mid-trecento project elevation for the Cappella della Piazza, cited in n. 39 above, which is fully annotated with such dimensions as $1^{13}/_{16}$ and $10^{1}/_{2}$ *braccia*, and a late trecento or early quattrocento drawing of a defence tower at Montalceto to protect the Sieneese village of Asciano. The latter is preserved in the Archivio di Stato di Siena, Scritture concistoriali, Vol. 2456, No. 28, and was published by G. Venerosi Pesciolini, "Una torre medioevale del Contado Senese," *La Diana*, v, 1930, 219-223. Most of the other scaled but not measured Tuscan project drawings are illustrated in Degenhart and Schmitt (as in n. 11): figs. 45-46, 141-42; pls. 24-28, 65-70, 85-87, 165-66; cat. entries 11-12, 37-39, 54, 119. They include the two elevations for the façade of Orvieto Cathedral (at least one at-

tributed to the Sieneese Lorenzo Maitani); a drawing for the Orvieto pulpit, sometimes attributed to Giovanni di Agostino or Orcagna; the two ground plans for Siena Cathedral; the elevation related to Giotto's campanile for Florence Cathedral; the Baptistery façade elevation for Siena Cathedral; the Baroncelli Chapel drawing for Sta. Croce (these five cited in n. 39 above); and a measured façade elevation for the Alessandri Palace in Florence. This last has proved at least momentarily inaccessible in the private archives of the Alessandri family, but it was published by Rohault de Fleury (as in n. 18), I, 151-55, who attributed it to a Sieneese master named Bartolo Vanni. The painted scale elevation of Florence Cathedral by Andrea Bonaiuti (n. 39) is not the only one of that genre to have survived. Post-flood restoration of a wall in the cloister of SS. Annunziata in Florence after 1966 revealed two full-scale elevations of pier bases proposed by competing masters in 1357 for the Cathedral.

⁴³ Middeldorf Kosegarten (as in n. 9), 177-78; Braunfels (as in n. 18), 224-230.

⁴⁴ Manetti (as in n. 5), 99-100, 116-17, reported that Brunelleschi made a scaled working drawing for the portico of the Ospedale degli Innocenti in Florence, but the job captain could not interpret the drawing, and botched the work in Brunelleschi's absence. When later building S. Lorenzo and the Barbadori and Parte Guelfa Palaces, Brunelleschi employed drawings for his personal use, but communicated with his workers by direct oral commands like a common foreman.

⁴⁵ Alberti mentioned the architectural drawing frequently in his treatise. Prominent among his opening remarks is the statement: "It is the role and function of the drawing to give buildings and parts of buildings a suitable layout; an exact proportion; a proper organization; and a harmonious plan, such that the entire form of the construction is borne fully within the drawing itself" (*De Re Aed.*, I: 1, p. 19). Alberti referred to architectural graphics at several points in the succeeding seven books, then returned in Book IX to the importance of self-sufficient drawings as the device whereby the architect controls the execution of his projects without

Gothic elevations such as the Reims palimpsest designs were almost pure orthogonals, while the drawings of Alberti's own time and for a century after him were mainly perspectives. Alberti's appeal for the use of orthogonal sections and elevations was conservative, not innovative; not a call for a new type of drawing but for preservation of an old type that was being phased out.⁴⁶ By the time orthogonal drawings emerged in common use, in the mid- and later sixteenth century, their popularity seems to have owed little or nothing to Alberti's recommendations three generations earlier. Seen in this light, the Brunelleschi-Alberti interest in working drawings would appear quite separate from cinquecento developments, and qualify as an abortive revival of a Gothic tradition rather than the beginnings of a standard Renaissance practice.⁴⁷

The hypothesis that working drawings and the wider urge to produce buildings by remote control antedate the Renaissance accords well with certain other precocious examples of nonverbal communication before the spread of printing in the sixteenth century.⁴⁸ The few nonverbal documents so far published from the Middle Ages are of such specialized character that one assumes the popularization of nonverbal communication had to await the Renaissance. On the other hand, a nondescript, almost popular-level document like the Sansedoni contract drawing suggests that the initiative to nonverbal communication was well in place by the thirteenth or fourteenth century. With its long text, the Sansedoni contract hardly qualifies as "nonverbal," but without its drawing the contract would have had to have

been thousands of lines long, as other construction specifications occasionally were. If the building masters of Siena had reached a high level of codification by 1340, it can be supposed that similar efforts toward nonverbal communication were taking place all over the Continent. It is significant that among the early products of the age of printing are the three self-help guides to design by Lechler, Roriczer, and Schmuttermayer. Such precocity implies that nonverbal communication was an important part of the late medieval building industry even before the invention of printing.

The appearance of the Sansedoni and other detailed architectural drawings in trecento Tuscany is a manifestation of two fundamental transformations in European science and the professions at the close of the Middle Ages: the drive to specialization, and the codification of corporate knowledge. Both these changes involved writing down the kernel of the "profession" so that it could be taught to new recruits and thus release those at the top from mere repetitious labor. Law and theology, the professions most deeply committed to writing, began the process of codification in pre-medieval times. The arts and sciences demanded not only verbal but graphic codification, the practice of which was relatively common in antiquity and in Arab science but stagnated in the West until revived in the Middle Ages. In the forefront of nonverbal communication were the natural sciences, producing Gothic herbals and bestiaries, followed by medicine and cartography. The fine and performing arts followed one by one, with dance codified into

being personally drawn into it: "[A] prudent man should take care to maintain his reputation, and it is sufficient to give honest advice and accurate designs to those who seek your services. . . . If, afterwards, you decide to supervise and complete the work yourself, you will inevitably be held responsible for all the faults and mistakes made by others in their ignorance or negligence. These works must be entrusted to skilful, prudent, thorough workmen, who will see that everything necessary is carried out with precision, care and diligence" (*De Re Aed.*, ix: xii, 862-64). (Translations from F. Borsi, *Leon Battista Alberti*, Oxford, 1977, and H. Burns, "A Drawing by L. B. Alberti," *Architectural Design Profiles*, 21, n.d., 45-56.) E.J. Johnson, *S. Andrea in Mantua: The Building History*, University Park, PA, 1975, 49, contended that Alberti's own plans were buildable by remote control, which of course was Alberti's own working method. Nonetheless the unique design published by Burns lacks measurements, which suggests that Alberti either intended to send a detailed text with the drawing, or expected his "skilful, prudent, thorough workmen" not merely to interpret his plans but to flesh them out from the bare bones of the drawing into full buildings.

⁴⁶ Whereas Vitruvius, *De Arch.*, i: ii: p. 2, advised the architect to use plans, elevations, and perspectives, Alberti (*De Re Aed.*, ii: i, p. 98) insisted that perspectives were for painters; architects should employ plans and orthogonal elevations and sections. Still, almost all quattrocento architectural drawings are perspectives. See W. Lotz, "Das Raumbild in der Architekturzeichnung der italienischen Renaissance," *Mitteilungen des Kunsthistorischen Instituts in Florenz*, vii, 1956, 193-226, now "The Rendering of the Interior in Architectural Drawings of the Renaissance," in W. Lotz, *Studies in Italian Renaissance Architecture*, Cambridge, MA, 1977, 1-65. Lotz observed (p. 33, n. 4) that Alberti's preferred orthogonal, with occasional perspective and shading, was the standard Gothic device, as in Villard de Honnecourt's interior sections of Reims Cathedral. In an

interview in March, 1974, Lotz, who had been unaware of the Sansedoni elevation, accepted it also as a forerunner of Alberti's method.

⁴⁷ Lotz (preceding note), 31, pointed to Antonio Sangallo, Jr., as the first architect to use correct orthogonal projections consistently, beginning with his appointment as *coadjutore* of St. Peter's in 1516. The orthogonal projection received widespread imitation only two generations later, however, in the publications of Andrea Palladio in the 1550's and 1570's. While Saalman, 105, regarded early 16th-century Rome as the birthplace of the effective use of architectural drawings as construction guides, for Lotz the earliest "architect by remote control" (his phrase) was Galeazzo Alessi in the 1560's ("Introduzione ai lavori del convegno," *Galeazzo Alessi e l'architettura del Cinquecento*, Genoa, 1975, 10). How much, if anything, these developments owed to Alberti is much in doubt. The *De Re Aedificatoria* was republished at Rome in 1550, indicating a certain currency, and as Saalman, 105-06, observed, the letter sent (by Raphael?) to Pope Leo X in 1519 on the survey of Rome repeats the phraseology of Alberti on the orthogonal section. Nonetheless there is no direct Alberti connection with the development of working drawings in 16th-century Rome. Ackerman, 1954, 9, points out that Alberti's interests and those of the cinquecento had little convergence.

⁴⁸ In architecture the pioneer in nonverbal communication is thought to be the "Tratto di architettura" prepared for publication by Francesco di Giorgio in several drafts in the last quarter of the 15th century but never issued. See E.S. Ferguson, "The Mind's Eye: Nonverbal Thought in Technology," *Science*, cxvii, August 26, 1977, 82, 118-128. On the wider question of printing and perceptual change in the Renaissance, see E.L. Eisenstein, *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early Modern Europe*, 2 vols., New York, 1979; and W. Ivins, *Prints and Visual Communication*, Cambridge, MA, 1953, 21-50.

universally accepted notations only in the twentieth century.⁴⁹ Of the various arts, music and architecture were peculiar in going through two stages of codification. Musical notation first began in late antiquity in the form of the neumes still in use today in synagogue and Gregorian chants, but the note was not effectively employed until codified in the early eleventh century by its ascribed creator, Guido of Arezzo. The neume was intelligible only to those who knew the basic melody, while the note was a fully symbolic language, allowing singers to interpret correctly even music they had never heard before. Such drawings as the Gothic masters used may be thought of as sheets of neumes rather than sheets of notes: they would have been explicit guides to building as their analogues were to singing, but they presumed a cadre of workmen already versed in the prevailing building tradition.

The comparison of architectural and musical notation helps us to understand better the objectives of Leon Battista Alberti, who may be imagined as the Guido of Arezzo in the development of the modern working drawing. It has been frequently observed that Alberti's *De Re Aedificatoria* was directed at patrons rather than architects, but it is worth asking what group Alberti had in mind to fill the role of the ideal architect whose program he laid out in detail in the Prologue. It is evident from the disdain with which Alberti refers to building masters that he imagined them capable only of execution and not of conception in architecture. In the Florence known to Alberti in the 1430's and 1440's the three preeminent architectural designers Brunelleschi, Ghiberti, and Michelozzo were not trained as builders but as goldsmiths. Ghiberti and Michelozzo eased their entry into the field of building by joining the appropriate guild, the *Arte dei Maestri di Pietra e di Legname*. Brunelleschi refused to join, and appears without the title of *maestro* in the Florence Cathedral building records. In a notorious incident in 1434 the *Maestri di Pietra* had Brunelleschi jailed for practicing building outside its jurisdiction, but the indictment was quashed.⁵⁰ The careers of Brunelleschi, Michelozzo, and Ghiberti continued an important trecento tradition connecting goldsmiths to architectural work, undoubtedly because both goldsmiths and architects

planned their costly projects with detailed working drawings.⁵¹ Alberti's intent seems to have been to build on several attractive features of Gothic practice, above all the concepts of execution by remote control and of high technical proficiency, to which he would bind the formal and social implications of architecture originally explored by Vitruvius. The working drawing was critical to Alberti as a bridge between the intellectual and mechanical sides of architecture. In principle it gave dominance to neither one side nor the other, but strengthened both.

At the conclusion of this investigation into Gothic architecture by remote control, several key elements emerge quite differently than imagined at the start. Alberti now assumes the role of godfather rather than father to a concept that had its roots in thirteenth-century France. Although their architectural graphics had only approximate self-sufficiency, the leading Gothic masters now appear to have operated by remote control when they designed a building too small to be worth their physical supervision (as in the Sansedoni case) or, conversely, at complex projects where their designs could be effectively interpreted by trained specialists in the several building trades. The relatively primitive working drawings used by the Gothic masters encouraged professional specialization but prevented a fixed split between architects and builders. That split would come only with the perfection of the working drawing after the mid-sixteenth century, although social and economic factors would also play a part. With the standardization of the working drawing, building masters effectively came under the control of "architects," a much looser professional group who, even as late as the nineteenth century, tended to be generalists who had wandered in from some other career.

What emerges as unexpected from this investigation is that architecture by remote control is a mixed blessing, since the distance it creates between architect and builder is a professional risk as well as an advantage. The Gothic masters seem to have regarded the working drawing much as Alberti did, as a bridge to unite the brainwork and the handwork (Ruskin's terms) of architecture. Through most

⁴⁹ Labanotation, developed by Rudolph Laban in 1928, is generally regarded as the first comprehensive symbolic language for recording human movement. Despite the anachronism of its late notation, there were much earlier attempts in the Gothic and Early Renaissance periods to record dance steps in diagrams. A special type of choreography, the performance of the Mass, was first recorded through nonverbal communication in the 14th century. See F. Wormald, "A Medieval Processional and Its Diagrams," *Kunsthistorische Forschungen Otto Pächt zu seinem 70. Geburtstag*, Berlin, 1972, 129-134.

⁵⁰ Goldthwaite, 258-59 and 356-57. Italian builders were termed *magistri* as early as the legal code of King Rotharis in the 7th century. Use of the term *maestro* in medieval and Renaissance Italy was essentially parallel to contemporary practice north of the Alps (see n. 3 above), except that painters and sculptors ("Maestro Giotto," "Maestro Nicola") frequently used it also as a stand-alone designation without further qualification by specialty. Though every member of a builders' guild was a *maestro*, the reverse was not necessarily true, and medieval Italian documents cite painters, friars, or private citizens as *maestri* when they controlled build-

ing operations. The commissions of appointment of these "outsiders" generally spoke of the proficiency they had gained in architecture: so the sculptor Arnolfo was a "most famous builder of churches" and the goldsmith Lando di Pietro was "proficient not only in his art but in many others." But the painter Giotto had no building experience before his appointment as *gubermator* of construction at Florence cathedral in 1334; in consequence his commission lauded only his "*scientia et doctrina*." The Arnolfo, Giotto and Lando di Pietro commissions are discussed and reproduced in full in Braunfels (as in n. 18), 216-241 and 260-263; translations provided in Frisch (as in n. 5), 74, 75, 80.

⁵¹ Filarete, in his *Trattato di architettura*, ed. A.M. Finoli, L. Grassi, 2 vols., Milan, 1972, 1, 250-51, complained of the power of goldsmiths in Florentine art, both those who were native-born and immigrants from elsewhere in Italy and from France and Germany. M. Trachtenberg, *The Campanile of Florence Cathedral: "Giotto's Tower"*, New York, 1971, 44, points out that the impact of Northern goldsmiths on Italian architectural planning was already substantial a century before.

of its history, however, the working drawing has served not as bridge but as barrier. By isolating themselves from building, architects opened themselves to the dangers of irrelevant formalism, technological rigidity, and the takeover of the whole profession by neighboring fields such as engineering. With each step away from the Gothic cathedrals it has become less and less clear what it is that an architect does, until he or she now seems to be only a sociologist with graphic skills. With the next step, replacing the blueprint with a computer database, building by remote control may yield no control at all.

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Appendix

Text and Translation of the Sansedoni Palace Contract⁵²

Annotations on the Drawing⁵³

Outside left margin: Alta questa facciata dapiano de le butighe del chanpo infine a tuti merli — cinquanta sei braccia. [*Height of this façade from the level of the shops on the Campo to all the crenelations: 56 braccia.*]

Inside left margin, begins with pointing hand: Questo muro dalato ^{de fondacho} che chomincia su la volta de la chorte di missere Ghontieri grosso matone *et* testa. [*Thickness of this wall alongside the fondaco, which begins at the vaults of the square of Messer Gontiero: a brick and a half wide.*]⁵⁴

Vertical annotations on the left edge of the building, starting at the basement: Questo muro da terra affino/ a piano de la strada vj braccia. [*Height of this wall from ground level to street grade: 6 braccia.*]

Ground floor: Queste cinque more alte vj braccia -i quarro. [*Height of these 5 piers: 6¼ braccia.*]

Mezzanine: vij braccia alto. [*Height: 7 braccia.*]

First floor below and above the window imposts: iiij braccia alto; v braccia alto. [*Height: 4 braccia; height: 5 braccia.*]

Second floor: iiij braccia i quarro alto. [*Height: 4¼ braccia; height: 5¼ braccia.*]

Third floor: iiij braccia *et* mezzo alto; v braccia *et* mezzo alto. [*Height: 4½ braccia; height: 5½ braccia.*]

On the left crenelation: viiiij braccia *et* quarro alto. [*Height: 8¼ braccia.*]

Left penultimate mezzanine window: ij braccia *et* mezzo alta. [*Height: 2½ braccia.*]

First floor on left antepenultimate window pier—cancelled: de le volte/ insuso uno infino e' merli/ [*erased*] grosso. [*Thickness from the vaults above one [braccio?] up to the crenelations.*]

First floor middle window: Grosso questo muro infino merli/ de la facciata dinanzi i-i braccia/ de la mora de la chorte di missere ghontieri/ in su. [*Thickness of this wall up to the crenelations of the façade opposite [the street]: 1½ braccia from the buttress in the square of Messer Gontiero and up.*]

Left penultimate console—erased or abraded: Largho uno braccio. [*Width: 1 braccio.*]

Right margin: Muro chomunale da missere Ghontieri e fratelli e da vicienti sarà alzato/ sopra questa chè ora è infino apari de la facciata dinanzi chome *et* grosso/ [*illegible*] merlato. [*Party wall belonging to Messer Gontiero and his brothers and to the Vincenti: to be raised higher than it is now, to be level with the façade opposite [the street], as in its [present?] thickness [] crenelated.*]

Horizontal annotations, beginning with the left vault of the basement: Grosso questo archo [*added later:*] tanto quanto la volta. [*Thickness of this arch equal to that of the vault.*]

Penultimate left basement pier: Queste v more/grosse ij braccia *et* mezzo/ per ogni facciata. [*Width of these 5 [actually four] piers 2½ braccia a side.*]

Ground floor, left pier: Largho ij braccia *et* mezzo/ grosso chome è il muro/ [*erased below:*] [*illegible*] i braccio *et* mezzo. [*Width: 2½ braccia; thickness same as the wall [] 1½ braccia.*]

Ground floor, penultimate left pier: Queste iiij more del mezzo/ ij braccia grosse per l'uno/ verso per l'altro i braccio *et* mezzo. [*Width of these 4 central piers: 2 braccia wide on one face by 1½ on the other.*]

Ground floor, central arch: Questa porta v braccia largha. [*Width of this door: 5 braccia.*]

Ground floor, penultimate right arch: Queste quattro porte/ iiij braccia iiij quarro larghe. [*Width of these 4 doors: 3¾ braccia.*]

Mezzanine, left window: ij braccia largha [*illegible*] dalato/ dentro. [*Width: 2 braccia [] of the inner side.*]

First floor, left window: Larghe iiij braccia *et* mezzo vuoto. [*Clear width: 3½ braccia.*]

Second-floor window: iiij braccia iiij quarri vuoto. [*Opening: 3¾ braccia.*]

Third-floor window: iiij braccia vuoto. [*Opening: 4 braccia*]

Contract Text

In nomine Domini, Amen. Qui di sotto saranno scritti e' patti e le condizioni *et* modi, che sonno da missere Ghontieri di missere Ghorò de' Sansedoni d'una parte; E da maestro Agustino del maestro Giovanni del popolo di santo Giovanni, maestro Agustino del maestro Rosso del popolo di santo Chimento de' Servi *sante Marie*, e maestro Cieccho del maestro Chasino del popolo di santo Moreggi da l'altra parte, i quali àno fatto insieme, della muraglia d'uno palazo di detto missere Ghontieri posto nel popolo di santo Vigilio e di santo Pietro alle Schale, sí chome apare nel disigniato in questa charta di sopra e ciaschuno capitolo per sé de' patti qui di sotto.

Imprima ch'e detti maestri farano *et* muranno bene e leale-

⁵² Author's transcription and translation from the manuscript original in the archives of the Monte dei Paschi di Siena. The orthography and punctuation hold closely to the original (e.g., ç has been retained as distinct from its modern equivalent z), except where such fidelity would be misleading or merely pedantic. Capital letters, commas, apostrophes, and accents have been added. Editorial additions are marked in square brackets.

⁵³ The annotations are visible in Fig. 6, with the dimensions indicated in boldface in the reconstruction in Fig. 13. Vertical notes and measure-

ments are given first, from left to right in the drawing, followed by the notes and measurements written horizontally, from bottom to top in the original.

⁵⁴ A wall "un mattone e testa" wide consisted of the length and the width of one standard brick. Trecento bricks were half a *braccio*, or 29cm in length; a quarter of a *braccio*, or 14cm in width, and about 6cm thick. This wall on the east side of the palace addition was thus specified as 43cm thick, which is in fact the thickness of the surviving west wall of the palace today.

mente el detto palazo nel modo ch'è disegnato di sopra in questa charta *et* chon quelli patti *et* ^{chondicioni} modi *et* preço iscritti qui di sotto. [1] § Ancho ch'è detti maestri muranno la facciata del detto palazo dinançi a strada tutto di pietre choncie, tanto quanto è longho e alto in fino al pettorale de le piane de le prime finestre. E sarà alta la detta facciata cinquanta e sei braccia murando el fondamento al piano delle bottighe dal Canpo; *et* sarà murato da detto pettorale de le piane delle prime finestre in suso tutto di mattoni nuovi in verso la strada; *et* sarà a tantte porte *et* a tantte finestre quante sonno disegnate in questa carta di pechora qui di sopra; cho' merlli e sporti di fuore dal muro e chon archetti, sì che sieno belli, e choperti e' dette merlli di sopra di pietre choncie; e saranno grosse le dette mura del detto palazo chome divisa qui di sopra nel disignato in questa charta della pechora partitamente e chome divisarà qui di sotto. [2] § Ancho faranno e' detti maestri el muro inverso el fondacho della chorte di missere Ghontieri, tanto alto quanto sarà la facciata dinançi a strada del detto palazo, e tanto longho quanto è la detta chorte di missere Ghontieri, grosso uno mattone e testa; e chomincerà el fondamento al piano de la 'nposte della volta della chorte di missere Ghontieri; e in detto muro farano tre chamini di ciminea, a ogni palcho uno risedio di ciminea. E sì farano uno chamino di privado, a ciaschuno palcho uno sedio di privado; e metteranovi e' chanelli di loro in detti chamini di privadi, e sarà detto muro merllato e choperti e' detti merlli di pietre chonce. [3] § Ancho farano e' detti maestri el muro della piaçuola largho quanto è la detta piaçuola, cioè dal canto de le nostre chucine infino a la chorte di missere Ghontieri, e sarà alto tanto quanto è la facciata dinançi a strada ^{merlato} e choperti e' merlli di pietre concie, e sarà el muro grosso uno mattone e testa; e chomincerà el fondamento al piano de la volta de la corte di missere Ghontieri, e sì farano in detto muro della piaçuola uno chamino di privado, chon tre sedi; a ciaschuno palcho el suo sedio; cho chanelli ne' detti chamini di loro. [4] § Ancho alçaranno e' detti maestri el muro che è infra la chorte di missere Ghontieri e la torre tanto alto quanto è l'affacciata dinançi a strada di detto palazo della grosseça che sarà el muro de la piaçuola, e sarà alto al piano del fondamento de' merlli della facciata dinançi a strada e non più, sença merlli. [5] § Ancho alçarano e' detti maestri el muro delle chucine della facciata che è in verso la strada, tanto alto quanto è la facciata dinançi a strada di detto palazo, de la grosseça che sarà el muro della piaçuola, e sarà alto al piano del fondamento de merlli della detta facciata e non più, sença merli. [6] § Ancho alçarano e' detti maestri el muro ch'è chomunale da noi a' Vincienti, della grosseça che è detto muro, e alto tanto quanto è la facciata dinançi a strada. E si farà in detto muro chamini di ciminea e resedi di ciminee a ciaschuno palcho che bisogno sarà, e merlaranno detto muro e coprirano e' merli di pietre choncie. [7] § Ancho farano e' detti maestri uno muro grosso uno mattone di dinançi a strada alla facciata di detto palazo, che terrà el tereno della strada dell'andito che andarà a' cellieri. E farano le volte di sopra al detto andito pari cho la strada, chone ismiragli per vedere lume ne' detti cellieri e nel detto andito; e sarano le volte di mattoni larghi chome quelli delle volte che farano in detto palazo. E chavarà e votiarà e' detti anditi pari al piano delle bottighe del Canpo. E sarà el votio due braccia di detto andito al muro della facciata dinançi di detto palazo dal detto muro che terrà il tereno della strada. E faranno e' detti maestri detto muro della strada che terrà el tereno di pietre choncie o achapeçate o di mattoni, quale alloro piacerà. [8] § Ancho farano e' detti maestri una volta pari cholla strada d'uno mattone grosso overo di mattoni larghi, anpi uno quarro e meçço quarro, nella nostra entrata del torrione, tanto grande quanto tiene el torrione e di longheça e d'anpieça; e tagliarano e chavarano e votiarano tutto il muoro da ine in giuso,

chome àne inhominciato a ttagliare infino al piano delle bottighe dal Canpo d'essa chasa, e lassarà uno muro tra noi e' l' pigionale che sta nella bottigha dal Canpo el più sottile che si potrà, che si possa sostenere suficientemente ritto. E faranno li spaççi di mattoni nuovi a spini nella detta volta. [9] § Ancho farano e' detti maestri pari cho la strada una volta nella bottigha di Niccholuccio Jachomi, tanto quanto è longho e largho el primo spaçço dell'entrata della detta bottigha, uno mattone grosso overo di mattoni larghi, anpi uno quarro e meçço quarro. E chavarano e votiarano tutto terreno che sarà sotto la detta volta a pari del piano della bottigha dal Canpo d'essa casa. E se v'avarà mattoni overo muro di mattoni, sarano del detto missere Ghontieri, e faranno li spaççi di mattoni nuovi a spini della detta volta. [10] § Ancho farano e' detti maestri una volta sopra alla detta bottigha di Niccholuccio grossa uno mattone overo di mattoni larghi, ampi uno quarro e meçço quarro, alta chome sonno l'altre volte del detto palazo, della longheça e della largheça che sarà la volta dello spaçço della detta bottigha, e farano lo spaçço della detta volta a spini, di mattoni nuovi. [11] § Ancho farano le guiere sopra al'archora delle porte della facciata dinançi a strada nere, di pietre chalcinaiuole. [12] § Ancho farano e' detti maestri cinque ischudi di marmo intagliati a la nostra arme e muranogli nel detto palazo ne la facciata dinançi a strada. [13] § Ancho farano e' detti maestri uno spigholo nel detto palazo nella facciata dinançi a strada là 've meglio starà [14] § Ancho farano e' detti maestri e' choni dell'archora delle porte della facciata dinançi a strada di detto palazo, uno braccio longhi overo longhi chome sonno l'archora tonde del palazo del Chomuno, se starano meglio. Intendasi che le dette archora sarano e' choni di meçço di tre quarri de longho o più se piacerà a' detti maestri. [15] § Ancho farano e' detti maestri nella facciata dinançi a strada da lato dentro uno sporto di fuore dal muro chon archetti là 've si riposarano e' chondotti che ricievarano l'aqua del tetto di detto palazo. E farano detto sporto di fuore dal muro uno meçço braccio o più, e metteranovi e' docci della terra di loro, che ricevarano detta acqua buoni e sufficienti e bene murati. [16] § Ancho farano e' detti maestri chondotti nelle mura da'quai e metteranovi e' chanelli di terra di loro. [17] § Ancho farano e' detti maestri chondotti là 've votiarà l'aqua del tetto per andare nella citerna e metteranovi e' chanelli di loro. [18] § Ancho farano e' detti maestri tre leoni bene intagliati nella facciata dinançi a strada di detto palazo che gitarano di fuore dal muro l'aqua del tetto nella strada e sarano longhi di fuore dal muro uno braccio o più e sarano di marmo overo di pietra, pertusati chome a noi piacerà. [19] § Ancho disfarano e' detti maestri le tettoie e palchi della chasa là 've farano detta muraglia di detto palazo *et* disfarano le mura là due debono murare e di che debono aver pietre e mattoni alle loro propie spese e metterano salvamente le teghole e legniamè là 've a noi piacerà in questa chasa overo nel Canpo. [20] § Ancho darano e' detti maestri al detto missere Ghontieri tante pietre, mattoni e rochioni quanti a lui bisognerà a murare per fare el fondamento d'una mora del detto palazo sença paghare denaio se bisognerà da andare più sotto terra che non sonno e' patti iscritti qui di sopra. [21] § Ancho ch'el detto missere Ghontieri mettarà a le loro propie ispe uno maestro di pietra quando si mura el detto palazo tale come a lui piacerà affare detta muraglia; el quale maestro paghararano e' detti maestri per suo salaro sei soldi per dì e non più; el quale maestro debba lavorare cho' la sua persona a murare detto palazo e provvedere che suficientemente si faccia detto palazo. [22] § Ancho chongiongiarano e' detti maestri le mura e le volte cho' sonno fatte e che si farano chol muro de la facciata dinançi a strada di detto palazo e chon ogni altro muro che facesero di nuovo. [23] § Ancho farano e' detti maestri le piane e le cornici delle porte e di tutte finestre della facciata dinançi a

strada di detto palaço di marmo, tante quante ne bisogniarano buoni e suficienti. [24] § Ancho farano e' detti maestri uscia, finestre e 'mpeschiate in detto palaço tante quante a noi piacerà e farano el concio di mattoni di nove archora chon guire di mattoni: intendasi di concio di mattoni e di murare solamente. [25] § Ancho farano e' detti maestri tante seghe quanto bisognerà a fare in detto muro, che murano di detto palaço di fuore e dentro nel modo che meglio starano. [26] § Ancho che tutte le mura e volte ch'è detti maestri farano sarano murate di chalcina, cioè quatro di rena e tre di chalcina, mescolata lealmente. [27] § Ancho che fatto detto lavorio e' detti maestri farano sghonbrare e lasarano sghonbrato a le loro propie spese tutta la via e'l chasamento di chalcinaccio e di terra sì che detto chasamento e la via rimangha isghonbrato. [28] § Ancho siamo in achordo cho' detti maestri che se'l detto missere Ghontieri vorà che la detta muraglia vada più alta che ordinata èe o volesse che facessero el muro più grosso o avesse più lavorio in detta muraglia che non dichono questi patti che sonno iscritti in questa carta, e' detti maestri sieno tenuti affarla e debono essere paghati di quello che più farano al detto di due maestri buoni che sarano chiamati per noi: l'uno per lo detto missere Ghontieri e l'altro per li detti maestri. E somegliantemente siamo in achordo el detto missere Ghontieri e i detti maestri di ribattare al detto missere Ghontieri di quello che facessero meno di muraglia nel detto palaço che non divisano questi patti e chondizioni che sonno iscritti in questa charta che debono fare. [29] § Ancho ch'è detti maestri metterano nelle dette mura che farano in detto palaço tutto ferramento che piacerà al detto missere Ghontieri dentro e di fuore, dandolo detto missere Ghontieri a' detti maestri e' ferramenti che vi vorà mettere. [30] § Ancho ch'è detti maestri farano le more de la porte e delle finestre più grosse e più strette che non sonno disegnate in questa charta come piacerà al detto missere Ghontieri non faendo più muraglia. [31] § Ancho che faranno e' detti maestri le 'nposte de l'archora delle dette porte e le 'nposte delle finestre più alte e più basse che non sonno disignate in questa charta chome piacerà al detto missere Ghontieri. [32] § Ancho sonno in achordo e' detti maestri che a missere Ghontieri rimanghino e' chononelli e le piane e le cornici vecchi che sonno nella corte di missere Ghontieri detto. [33] § Ancho siamo in achordo e' detti maestri chol detto missere Ghontieri che s'el detto missere Ghontieri vorà fare le mura che sonno ordinate di mattone e testa grosse uno braccio, e' detti maestri sieno tenuti di farlo per quindici soldi sei denari la canna di quadro sopra a quello preçço che ordinato èe che debono avere della muraglia di detto palaço. [34] § Ancho sonno in accordo e' detti maestri di mettere nelle dette mura di detto palaço tanto legniamme quanto a missere Ghontieri piacerà, dando missere Ghontieri e' legniamme a' detti maestri.

Per questa muraglia fare sichome divisata èe in questa charta debono avere e' detti maestri dal detto missere Ghontieri tutte le mura di pietre e di mattoni della facciata dinançi a strada là 've murano detto palaço; salvo che non die tocchare la mora ch'è fra noi e a Vincenti e debono disfare detta facciata alle loro propie spese e portare via chalcinaccio e terrame che facesero in disfare detta facciata e in murare e rimarano al detto missere Ghontieri e' chononelli e piane e chornici di dette mura. [35] § Ancho averano e' detti maestri tutto el muro ch'è inverso el fondacho tanto quanto èe la corte di missere Ghontieri da la volta in suso, e votiarano el terame che farano nel disfare e nel murare. [36] § Ancho debono avere el muro ch'è nella chorte di missere Ghontieri inverso la casa che fu de li Arçochi da la volta in suso e votiare el terame e chalcinaccio che farano nel disfare e nel murare. [37] § Ancho debono avere e' detti maestri el muro ch'è inverso la piaçuolla cioè dal canto delle cucine infino al muro della corte di missere Ghontieri tanto quanto la piaçuolla èe longha dalla volta insuso

dalla corte di missere Ghontieri, e votiare tutto terrame e chalcinaccio che farano in disfare e in murare. [38] § Ancho debono avere e' detti maestri el muro della chameretta del fantte di Cianpolo e votiarà ogni terame. [39] § Ancho debono avere e' detti maestri dal detto missere Ghontieri per fare detta muraglia di detto palaço, nel modo divisato qui di sopra: quatrocentodiece fiorini d'oro in questo modo cioè trenta fiorini d'oro ciaschuno mese chominciando in kalende gienaio trecentotrentanove el primo paghamento, e chosì sarano paghati e' detti maestri. E debono avere fatta detta muraglia di detto palaço e chompita nel modo divisato quanto di sopra in kalende gienaio trecentoquaranta. E se detta muraglia e' detti maestri non avesero chompita in dette kalende gienaio trecentoquaranta nel modo divisato qui di sopra, sono in achordo e' detti maestri che'l sopra più di trenta fiorini d'oro el mese che sarano a paghare, e che si ritroverano avere in kalende gienaio trecentoquaranta debba rimanere al detto missere Ghontieri e sieno per pena de' patti non servati al detto missere Ghontieri sença rendere mai denaio el detto missere Ghontieri a' detti maestri e niente meno sieno tenuti e obrighati e' detti maestri di fare e di compire la detta muraglia di detto palaço nel modo ch'è divisa in questa scritta alle loro propie spese sença avere veruno paghamento dal detto missere Ghontieri e somegliante modo e in quella medesima pena promette el detto missere Ghontieri a' detti maestri di tenere e d'osservare quello che detto missere Ghontieri àne promesso a' detti maestri sì chome ^{apare} in questa charta iscritta qui di sopra.

E per questi patti tenere àne fatta una charta el detto missere Ghontieri e Pepo di ^{fiorini d'oro} e una altra charta àno fatta e' detti maestri della detta somma di guardia e d'achomanda che àno ricevuto da me Bindoccio a ciò che s'è detti patti non fussero oservati per li detti maestri al detto missere Ghontieri, che io Bindoccio detto ^{dia} e sia tenuto di dare la ragione sopra a' detti maestri a missere Ghontieri e a Pepo di cinquanta fiorini d'oro della pena de' patti non servati per li detti maestri. [40] § Ancho darò la ragione al detto missere Ghontieri e a Pepo della muneta che avesero ricevuto e' detti maestri di più che non avesero fatto di muraglia in detto palaço. E somegliantemente darò io Bindoccio la ragione sopra a' detto missere Ghontieri e a Pepo a' detti maestri se none oservassero e' patti a' detti maestri di cinquanta fiorini d'oro della pena. Ancho de' denari che avesero avere di rimanente della detta somma di quatrocentodiece fiorini d'oro avendo e' detti maestri oservati e' detti patti iscritti qui di sopra e fatto e chonpito detta muraglia nel modo iscritto e disegnato in questa charta iscritta e disegnata qui di sopra *et caetera*. E se v'avesse di rimanente delle carte là 've èe obrighato el detto missere Ghontieri e Pepo ^{e' detti maestri} che io Bindoccio avarò data la ragione sopra a choloro che non avarano oservati e' patti terolla a choloro che non avarà e' patti oservati a pitizione di colui a chui non sarano oservati per fare achonpire e' detti patti iscritti qui di sopra.

Io Pepo di messere Goro inprometto ch'è sopra detti patti iscritti in questa iscritta da messere Gontieri d'una parte e da detti maestri da l'altra parte di fare atenere e oservare al detto messere Gontieri nel modo iscritto di sopra in questa charta e in ciò obbligo mee Pepo chol detto messere Gontieri di così fare e in testimone di ciò one iscritto di mia mano in sue questa charta.

Io Giovanni del maestro Agustino cho' parola del deto maestro Agustino prometo ch'è detti maestri farano oni chosa chome si chotiene ischito *et disiniato et chosì* prometo che farano a bona fè sença frodo. E se avvenisse ch'è detti maestri no facesero le predete chose, di fare *et fare* a le mie propie ispese.

A dì quatro di febraio anni mcccxxxviiiij Pepo di missere Goro da una parte *et* mastro ^{Aghustino del mastro} Rosso Graçie e mastro Ceccho Chasine e mastro Aghustino Giovanni principali, *et* mastro

Giovanni Aghustini da l'altra parte furo in piena choncordia de' sopradetti patti nel modo che scritto è di sopra in presençia di me Bindoccio di Latino de' Rossi et in presençia del maestro Rosso Graçie.

In the name of God, amen. Here below will be written the terms, conditions, and means which are agreed to by Messer Gontiero di Messer Goro de'Sansedoni of the first part; and by Master Agostino del Maestro Giovanni of *popolo* S. Giovanni; Master Agostino del Maestro Rosso of *popolo* S. Clemente dei Servi S. Maria, and Master Cecco del Maestro Casino of *popolo* S. Moraggi of the second part; who have contracted together for the building of a palace for the said Messer Gontiero, located in the *popolo* S. Vigilio and in S. Pietro alle Scale; as it appears in the drawing above in this document, and in each chapter specifically in the terms below:

Firstly, that the said masters will make and construct the said palace well and faithfully in the manner that is drawn above in this document and with these terms,⁵⁵ and conditions ways and price written below. [1] § Further, that the said masters will build the façade facing the street of the said palace all of dressed stone, its full width and height up to the stringcourse at the sills of the first windows. And the said façade will be fifty-six *braccia* high, erecting the foundation on the level of the shops on the Campo,⁵⁵ and it will be built above the said stringcourse at the level of the sills of the first windows entirely of new bricks, facing the street; and it will be built with as many doors and as many windows as are drawn above on this parchment; with crenelations and projections out from the wall, and with arcades, so that they will look handsome: and the said crenelations will be covered above with dressed stone.⁵⁶ And the said walls of the said palace will be as thick as is specified above separately in the drawing on this parchment; and as it will be specified below. [2] § Further, the said masters will make the wall of the courtyard of Messer Gontiero, opposite the *fondaco*,⁵⁷ as high as will be the façade of the said palace facing the street, and as long as the said courtyard of Messer Gontiero, with the thickness of a brick in length and a brick in width. And the foundation will begin at the level of the impost of the vault in the courtyard of Messer Gontiero. And in the said wall they will make three flues for fireplaces: at each floor will be a setback for a fireplace. And they will make a privy shaft: at each floor there will be a setback for a privy, and they will put in these privy shafts terracotta pipes. And the said wall will be crenelated and the said crenelations will be covered with dressed stone. [3] § Further, the said masters will erect the wall of the small square; that is, from the side of our kitchens, as far as the courtyard of Messer Gontiero.⁵⁸ And it will be as high as the façade facing the street, crenelated and the crenelations covered with dressed stone; and the wall will have the thickness of a brick in length and a brick in width; and the foun-

ation will begin at the level of the vault of the courtyard of Messer Gontiero. And in the said wall of the small square they will make a privy shaft with three setbacks; at each floor its own setback, with terracotta pipes in the said shaft. [4] § Further, the said masters will raise the wall which is between the courtyard of Messer Gontiero and the tower, as high as the street façade of the said palace, of the same thickness as the wall of the little square; and it will be as high as the level of the base of the crenelations of the street façade and no higher; without crenelations. [5] § Further, the said masters will raise the wall of the kitchens of the façade which is towards the street, as high as is the façade facing the street of the said palace; of the same thickness as the wall of the small square. And it will be as high as the level of the base of the crenelations of the said façade and no higher; without crenelations. [6] § Further, the said masters will raise the wall which is in common between us and the Vincenti, of the thickness of the said wall, and as high as the street façade. And in the said wall will be made flues for fireplaces, and setbacks for fireplaces at each floor as will be necessary, and they will place crenelations on the said wall, and they will cover the crenelations with dressed stone.⁵⁹ [7] § Further, the said masters will make a wall as thick as one brick-length before the street at the façade of the said palace, which will retain the earth in the street from the passage which will go to the cellars. And they will make the vaults over the said passage level with the street, with grills to allow light into the said cellars and in the said passage: and the vaults will be of wide bricks, as those of the vaults which they will make in the said palace, and the said passages will be excavated and hollowed out, level with the shops on the Campo; and the said passage will have a breadth of two *braccia* to the wall of the street façade of the said palace, from the said wall which will retain the earth of the street. And the said masters will make the said wall of the street which will retain the earth, of dressed stone, or of rubble or of bricks, as they wish. [8] § Further, the said masters will make a vault, level with the street, as thick as one brick-length, or of bricks of a width of a palm and a half in our entrance to the great tower [*torrione*]; as large as the great tower is long, and as wide; and they will cut and excavate and hollow out the entire wall from here to there, continuing where the excavation was started, as far as the level of the shops on the Campo of this house, and a wall will be left between us and the tenant in the shop on the Campo, as thin as possible but still providing steady support and they will make the vault sections of new bricks set in herringbone in the said vault. [9] § Further, the said masters will make, level with the street, a vault in the shop of Niccoluccio Jacomi, as long and as wide as the first dimensions at the entrance to the said shop, as thick as one brick-length, or of bricks of a width of a palm and a half; and they will excavate and empty all the earth that will be below the said vault, level with the shop on the Campo of this house. And if there will be bricks or a wall

⁵⁵ Fig. 12 shows that the "shops on the Campo" were in the preexisting palace, considerably lower than the ground floor of the new palace on via Banchi di Sotto.

⁵⁶ The reference to "carta di pechora" is not to be taken literally: as noted earlier, the contract is written on paper rather than parchment.

⁵⁷ Fig. 12 shows the location of the "Fondaco" or "Fondaco Buio," an ancient warehouse with several apartments overhead, which was owned jointly by the consortium of the Sansedoni and the neighboring Ugurgieri clans. The part ownership of the Sansedoni was recognized in the tax rolls of 1316 and again in 1370, when the façade of the warehouse was cut back to regularize the Campo perimeter: see S. Borghesi and L. Banchi, *Nuovi documenti per la storia dell'arte senese*, Siena, 1898, I, Doc. 20, pp. 31-

36; Balestracci and Piccinni (as in n. 23), 120, 135, 139. The "courtyard of Messer Gontiero" opened out to the vicolo or chiasso dei Pollaioli, and was apparently surrounded on three sides by Sansedoni property. A vestige of it remains today.

⁵⁸ The section in Fig. 12 shows the "small square" between the old and new palaces (the "piaççuola"). The opening survives today as a Baroque stair hall in the palace.

⁵⁹ The latrines and fireplaces built into the wall would have approximated the appearance of contemporary French examples illustrated in Viollet-le-Duc's *Dictionnaire* (as in n. 4), VI, 163-170 (the Sienese example being much narrower, with the use of terracotta pipes); and III, 169-219, esp. fig. 18, p. 215.

of bricks, they will belong to the said Messer Gontiero: and they will make the vault sections of new bricks set in herringbone in the said vault. [10] § Further, the said masters will make a vault above the said shop of Niccoluccio, one brick-length thick, or of bricks a palm-and-a-half wide, as high as are the other vaults in the said palace, or a length and width which will be equal to the vault of the area of the said shop and they will make the section of the said vault in herringbone, of new bricks. [11] § Further, they will make the archivolt over the arches of the doors in the façade facing the street black, of limestone. [12] § Further, the said masters will make five shields of marble, inlaid with our coat-of-arms and they will build them into the said palace, in the façade facing the street. [13] § Further, the said masters will set a bend [*spigholo*] in the façade of the said palace facing the street, wherever is the best place.⁶⁰ [14] § Further, the said masters will make the vousoirs of the arches of the doors in the street façade of the said palace one *braccio* long, or as long as the round arches in the Communal Palace, if it will be better: it is agreed that in the said arches the keystones will be three palms in length or more if the said masters wish it. [15] § Further, the said masters will make in the street façade, from the inside, a projection beyond the wall with a corbel table, on which will be placed pipes which will catch the water from the roof of the said palace; and they will place the said projection half a *braccio* or more beyond the wall, and they will place there corresponding pipes of clay, which will catch the said water: good and ample and well built. [16] § Further, the said masters will make gutters in the wall and put there corresponding clay pipes. [17] § Further, the said masters will make gutters into which will empty the water from the roof, to lead it into the cistern, and put there corresponding pipes. [18] § Further, the said masters will make three lions well inserted in the street façade of the said palace, which will carry the water from the roof away from the wall onto the street; and they will be a *braccio* or more in projection from the wall and will be of marble or stone, perforated, as we shall prefer. [19] § Further, the said masters will demolish the overhangs and balconies of the houses where they will execute the said construction of the said palace, and they will destroy the walls where they must build; and to do this they must have stones and bricks at their expense, and they will place safely the roofing tiles and the wood, where we want it, in this house or else on the Campo. [20] § Further, the said masters will give to the said Messer Gontiero all the stones, bricks, and cylindrical stones that he will need in building, to make the foundation for a pier of the said palace, without paying more money if it will be necessary to dig further below ground beyond what is specified in terms written above. [21] § Further, that the said Messer Gontiero will appoint a stone-mason of his choosing at their expense when the said palace is built, to execute the said construction; the said masters will pay this mason's salary of six *soldi* a day and not more. This mason must personally work on the construction of the said palace and supervise that the said palace is adequately built. [22] § Further, the said masters will join the walls and the vaults which have been built and which will be built, with the wall of the street façade of the said palace, and with all other walls which may be newly built. [23] § Further, the said masters will make the sills and the frames of the doors and of all the windows of the street façade of the said palace of

marble, as much as they will need, good and ample. [24] § Further, the said masters will make doors, windows, and grills in the said palace, as many as we shall want, and they will make the corbel table of brick with nine little arches with archivolt. It is agreed that the bricks should be a brick frieze, constructed of separate elements. [25] § Further, the said masters will make as many setbacks as will be needed in the said wall which they will build in the said palace, outside and in, in whichever way is best. [26] § Further, all the walls and vaults which the said masters will build will be bound with mortar; that is, four parts of sand and three of lime, mixed thoroughly. [27] § Further, once the said work is completed, the said masters will clear away, and at their own expense have the whole street and palace cleared of cement and earth, in order that the said palace and street be cleaned. [28] § Further, we are in agreement with the said masters that if the said Messer Gontiero wants the said construction to be higher than was specified, or would wish them to make the wall thicker, or if there happens to be more work in this construction than is specified in the terms which are written in this document, then the said masters are obliged to carry it out and they must be paid for the extra work they will do, according to the judgment of two worthy masters who will be requested by us; one by the said Messer Gontiero and the other by the said masters. And similarly we, the said Messer Gontiero and the said masters are in agreement to deduct from the sum owned by the said Messer Gontiero if there is less work than anticipated in the construction of the said palace, in proportion to what is specified in these terms and conditions which are written in this contract, and which must be done. [29] § Further, that the said masters will place in the said walls that they will make in the said palace, all the ironwork that the said Messer Gontiero may wish, both inside and out, with the said Messer Gontiero giving to the said masters the ironwork that he wishes to have placed there. [30] § Further, that the said masters will make the spandrel zones between the doors and windows wider or narrower than are drawn in this document, as Messer Gontiero may wish, without carrying out more construction. [31] § Further, that the said masters will make the imposts of the arches of the said doors and the imposts of the windows higher or lower than are drawn in this document; as Messer Gontiero may wish. [32] § Further, the said masters are in agreement that Messer Gontiero will retain possession of the columns and the stringcourses and the old entablatures, which are in the courtyard of said Messer Gontiero. [33] § Further, we are in agreement, the said masters with said Messer Gontiero, that if the said Messer Gontiero would like the walls that are specified at a thickness of a brick in length and a brick in width, instead one *braccio* thick, then the said masters are obliged to do it for fifteen *soldi*, six *denari* per square *canna* above their stipulated payment for the construction of the said palace.⁶¹ [34] § Further, the said masters are in agreement to insert in the said walls of the said palace as much woodwork as Messer Gontiero may wish; Messer Gontiero giving this woodwork to the said masters.

In the execution of this construction, as it is specified in this document, the said masters must receive from the said Messer Gontiero all the walls of stones and bricks of the façade facing the street, where they will build the said palace; except that the buttress between us and the Vincenti will not be touched: and the

⁶⁰ This bend (a common feature in a Sienese palace façade) was necessitated by the curve of via Banchi di Sotto itself. The celebrated bend in the façade of the Palazzo Massimi alle Colonne in Rome, designed two centuries later by the Siena-born Baldassare Peruzzi, may be a reminiscence of these medieval bent façades.

⁶¹ On the "mattone e testa" thickness see n. 54 above; a wall one *braccio* thick would have been as wide as two bricks placed lengthwise (58cm). The *canna* varied between four and eight *braccia* in different regions of Italy: in Siena it appears to have been the length of five *braccia*, or 2.92m.

said façade must be demolished at their own expense and they must carry off the rubble and earth that will come from the demolition of this façade and in their construction: but the columns and the stringcourses and entablatures of the said walls will remain in the possession of the said Messer Gontiero. [35] § Further, the said masters will have all the wall that is toward the *fondaco*, as wide as is the courtyard of Messer Gontiero, from the vault up; and they will clear out the earth that they will throw up in demolition and in construction. [36] § Further, they must have the wall that is in the courtyard of Messer Gontiero opposite the house that was of the Arzocchi, from the vault up, and they must clear out the earth and rubble that they will throw up in demolition and in construction. [37] § Further, the said masters must have the wall that is opposite the small square, that is alongside the kitchens, as far as the wall of the courtyard of Messer Gontiero, as wide as the small square, from the vault up, in the courtyard of Messer Gontiero, and to clear out all the earth and rubble that they will throw up in demolition and construction. [38] § Further, the said masters must have the wall of the little room of the servant of Gianpaolo, and clear out all the earth.⁶² [39] § Further, the said masters must have from the said Messer Gontiero, in order to carry out the said construction of the said palace in the manner designated above, four hundred and ten gold florins, in this manner, that is, thirty gold florins each month, beginning on the first day of January, three hundred thirty-nine [= 1340, modern style] in the first payment: and in this wise will the said masters be paid. And they must have carried out the building of the said palace and completed in the manner designated above, by the first day of January, three hundred forty [= 1341]. And if the said masters have not completed the said construction on the said first of January three hundred forty, in the manner designated above, the said masters agree that the sum above the payment of thirty gold florins a month that will be left to pay on the first day of January three hundred forty, must remain in the possession of Messer Gontiero, and will be as a fine for the terms not carried out for the said Messer Gontiero; without the said Messer Gontiero ever giving [more] money to the said masters. And no less, the said masters are obliged and compelled to make and to complete the said construction of the said palace, in the manner designated in this document, at their own expense, without receiving payment from the said Messer Gontiero. And similarly, and with this same fine, the said Messer Gontiero promises the said masters to hold to and to observe that which the said Messer Gontiero has promised the said masters; as it appears written in this document above.

And to safeguard these terms, the said Messer Gontiero and Pepo have drawn up an instrument for [] gold florins,⁶³ and the said masters have made another instrument for the same amount, as protection and guarantee that they have received from me Bindoccio: so that if the said terms are not observed by the said masters for the said Messer Gontiero, that I, the said Bindoccio will give and am obliged to give the above security of the said masters, to Messer Gontiero and to Pepo, in the sum of fifty gold florins as the fine for the non-fulfillment by the said masters of the terms: [40] § Further, I will give that sum to the said Messer Gontiero and to Pepo, of any excess that the said masters will

have received, if they will not have completed the construction of the said palace. And similarly I Bindoccio will give the above sum of fifty gold florins as a fine from the said Messer Gontiero and Pepo to the said masters if they do not fulfill their conditions to the said masters, and in addition any money that they may rightfully have as a remainder of the said sum of four hundred and ten gold florins; the said masters having observed the said terms written above and carried out and completed the said construction in the manner written and drawn in this document, written and drawn above *et caetera*. And if there should happen to be a remainder of the securities by which are bound the said Messer Gontiero and Pepo and the said masters then I Bindoccio will give the above securities from those who have not observed the conditions; I will take from those who have not observed the terms, on the request of those whose [terms] were not fulfilled, to compel the fulfillment of the said terms written above.

I⁶⁴ Pepo di Messer Goro promise to see that Messer Gontiero holds to and observes the above-said terms written in this document by Messer Gontiero of the first part and by the said masters of the second part, in the manner written above in this document; and in that I Pepo commit myself with the said Messer Gontiero to do this: and in testimony whereof I have written this document from here above in my hand.

I⁶⁵ Giovanni del Maestro Agostino, with the word of the said Master Agostino, promise that the said masters will do everything as is included in writing and drawing; and thus promise that they will work in good faith, without cheating. And if it happens that the said masters will not do the promised work, to do it and [have it] done at my own expense.

On⁶⁶ the fourth day of February in the year 1339 Pepo di Messer Goro of the first part, and Master Agostino del Maestro Rosso Grazie and Master Cecco Casino and Master Agostino Giovanni, principals, and Master Giovanni Agostino of the second part, were in full concordance on the above-said terms, in the manner written above, in the presence of me, Bindoccio di Latino de' Rossi, and in the presence of Master Rosso Grazie.

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⁶² Although Gontiero Sansedoni appears in the contract terms as if he were sole owner of the palace, shares were also held by his nine brothers and by a sister. Pepo Sansedoni was one of these brothers; Gianpaolo Sansedoni was a nephew residing in the palace. Tax returns and wills show that about five-score inhabitants lived in the palace in the trecento; their living pattern will be the subject of a later article.

⁶³ Lacuna in the original, which from context should read "fifty."

⁶⁴ New hand.

⁶⁵ Third hand, new ink.

⁶⁶ Fourth hand, writing with same ink as third.

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Juries, Protests, and Counter-Exhibitions Before 1850

William Hauptman

Tout jury, électif ou non doit être attaqué . . . un jury, quel soit le mode adopté pour sa formation, fonctionnera mal.
— Ingres¹

It is agreed by art-historical consensus that the justly celebrated Salon des Refusés of 1863 represented one of the most decisive moments in the development of modern art.² Fundamentally, this landmark exhibition brought into focus the very question of jury decisions, criteria for public exhibitions, and whether the State art establishment had the right to prohibit works from being shown if they were not fully in accord with its own changing aesthetic ideals. In much of the literature devoted to the Salon des Refusés, there are brief indications that other similar expressions of publicly manifested artistic discontent had occurred earlier; yet none of these significant precedents has been examined

in depth. Although the prime importance of the Salon des Refusés of 1863 cannot be contested, it must also not be seen as a single protest against the jury, unique in its purpose, but rather as the end result of the conflict between the artist's assumed right of exhibition and the jury's assumed right of judging what may and may not be exhibited. The following essay brings to light some neglected documentation concerning the jury system, the problem of the spiraling number of artists' works refused, and, finally, how these artists expressed their indignation in the form of protests and counter-exhibitions. The facts themselves provide insights into a largely hidden aspect of the Salon system in the period discussed.

As is well known, the nineteenth-century Salon³ was the only viable avenue for public exhibition *en masse*. During the period of the July Monarchy, more than one million

¹ Ingres' comments were made in connection with a commission organized on October 29, 1848 to discuss the problems of the Salon system after the Revolution. Delaroche, Delacroix, Duban, and Nieuwerkerke also participated, while David D'Angers refused and had to be replaced by Charles Blanc. See J.-L. Fouché, "L'opinion d'Ingres sur le salon," *La chronique des arts*, March 14, 1908, 98-99, and April 4, 1908, 129-130. On Ingres' ideas in general on the Salon jury system, see Amaury-Duval, *L'atelier d'Ingres*, Paris, 1924, 167-174 and 205f.

² On the Salon des Refusés of 1863, see the important background material in J. Rewald, *Histoire de l'Impressionisme*, Paris, 1955, 70f. On the exhibition itself, see G. Wildenstein, "Le Salon des Refusés de 1863," *Gazette des beaux-arts*, LXVI, 1965, 125-130, with a reprint of the catalogue. Important information is also contained in Boime, 411-426, and G. Lacambre, "Les institutions du Second Empire et le Salon des Refusés," in Haskell, 163-176.

³ Despite the prime importance of the Salons in the history of 19th-century art, there is relatively little literature that discusses the structure, organization, or actual history of these exhibitions or how they were juried. Useful but sometimes awkwardly organized information is contained in Tabarant and Lethève for certain important Salons, as in Lafenestre, 104f. For the period of the July Monarchy, Rosenthal, 227f, is essential. For political and administrative information on the Salon system, see M. Vachon, "Études administratives: Le Salon," *Gazette des beaux-arts*, xxiii, 1881, 104-135, and E. Duranty, "Variations dans le régime des salons," *La chronique des arts*, July 14, 1877, 235-37. With regard to the problems of rejected artists and the concept of conservatism within the Salon system, see Ivens, 52-94. Also essential for a list of reviews and articles concerning the Salon exhibitions is M. Tourneux, *Salons et expositions d'art à Paris (1801-1870), essai bibliographique*, Paris, 1919.