Architectural Conservation Studio

Calogero Bellanca

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Architectural Conservation Studio

Calogero Bellanca

with contributions by

Susana López Verdú and Alejandro Iniesta Muñoz

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Dedicated to Giuseppe Zander

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Fig. 1. General view of the bastion in its enviroment. Photo by C.B. 1986.

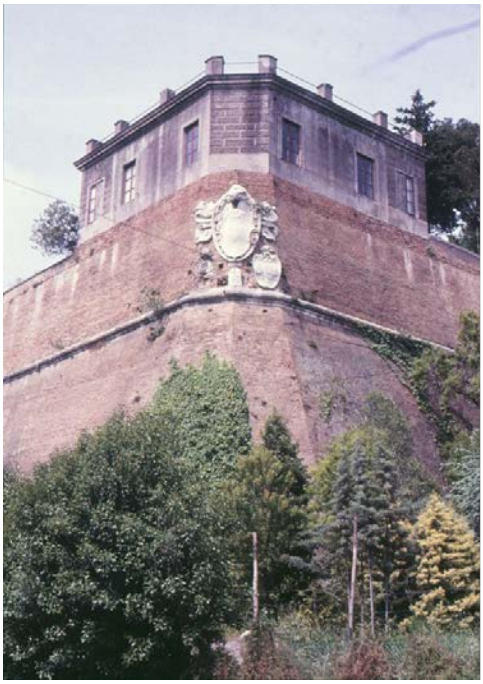
The fortifications built by Antonio da Sangallo for Paolo III in Rome, highlight one of the most significant moments for military architecture. From 1534 to 1537, after some pirate raids, it was urgent to "reinforce" the city walls, in fact, Fichard visiting the city in 1535 had denounced the high state of degradation of the mura Aureliane, collapsed in some points (1) (Figs. 1-4).

Paolo III entrusts Antonio il Giovane with a letter on 14th January 1538: "*Dilecto filio Antonio de Sangallo laico Florentino Architecto nostro,... fabricae, murorum almae urbis ad nostrum beneplacitum tibi assegnamus…"* (2).

Works had started some months before, in autumn 1537, in three points: in Porta Ardeatina, in colle di S. Saba and in front of Porta S. Paolo, in the locality called la Colonnella (3). Sangallo considered the unique conditions of the soil for doing the intervention with the appropriate works to adapt the fortifications of the "new system" (4), as Giovannoni wrote "*studiare minutamente gli elementi come i pezzi di una macchina*" (5).

Across the payment mandates for the works of the fortifications in Rome, kept in the Archivio di Stato (6) and in part published by Rocchi (7), it is possible to reconstruct the events for the construction and the interruption of the Bastion of the Colonnella.

A first mandate, dated the 7th October 1537, is assigned to *maestro Francesco de Philippo del Manzino fiorentino et compagni a fare il baluardo della Colonnella.*



Figs. 2, 3. General view from the corner of Sangallo il Giovane's bastion. Photo by C.B. 1985.

A Francesco fiorentino muratore qual lavora alle fort. Scuti 4 a bon conto sopra detto lavoro. 7 ottobre 1537.
A.M. Francesco… convenuto a fare un nuovo baluardo sul monte di S. Sabina scuti 15, saranno a bon conto sopra sua mercede di quello ha da lavorare alla d. fabrica. 17 novembre 1537.

Other mandates were signed on 24th November, and in the month of December. On 21st December it was stipulated the public act with the contractors *"Conctructio Beluardi Magni, Die XXI mensis Decembris 1537, li magnifici Pietro de Maximi et Bernardino Caffarello Deputati a la fabrica de la fortificazione di Roma con la presentia et auctorita di monsignore Philippo Archinto governatore de questa alma cita de Roma,… videlicet prout in Capitulis alterius beluardi della Colonnella sub die tertia huius factis et che se intenda tanto del muro facto per insino adesso quanto farsi"* (8).
A.M. Lorenzo, Florentine sculptor, "*depositario, ecc. pagante a M. Lorenzo*

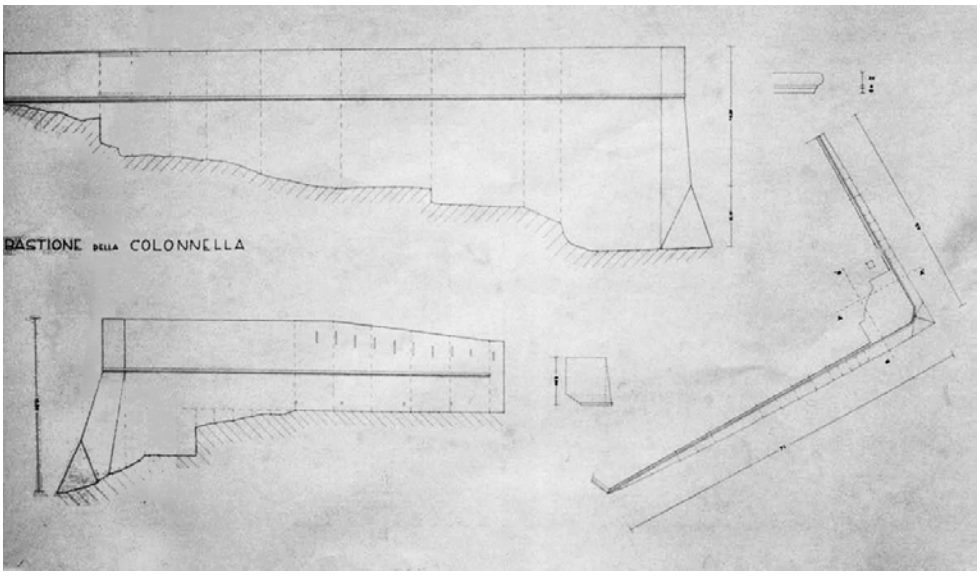


Fig. 4. Drawing with heights and dimensions (geometrical analysis), 1:100, by C.B. 1985.

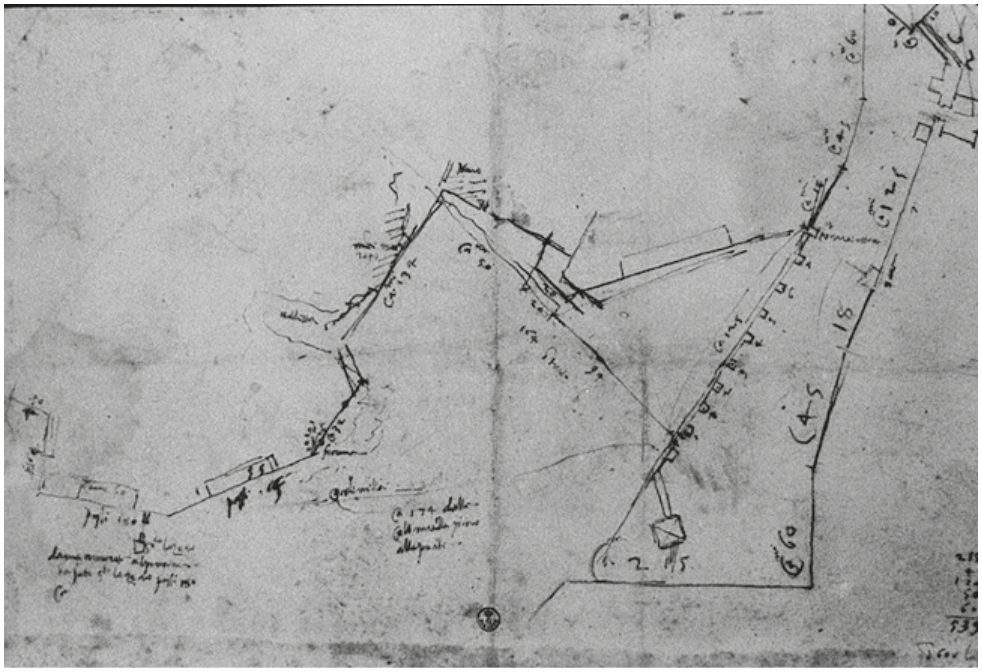


Fig. 5. Gabinetto Disegni e Stampa degli Uffizi, drawing n. 1019A.

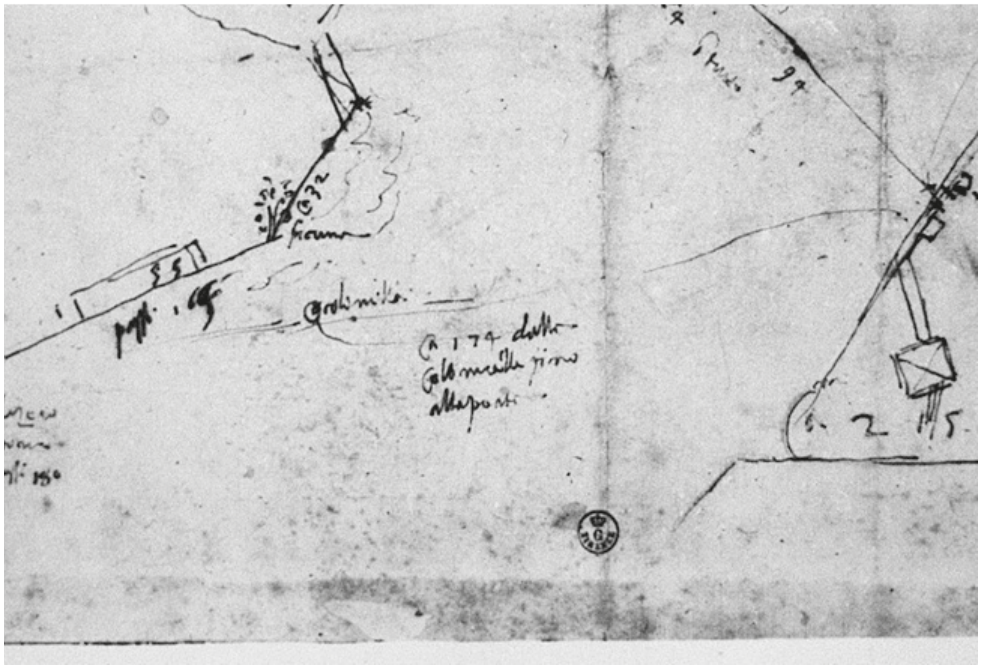


Fig. 6. Gabinetto Disegni e Stampa degli Uffizi, drawing n. 1015A.

scultor fiorentino scudi 50 et saranno a bon conto per lavorare l'arme de la S.ta di N.Sre et del populo romano; quali se ne hanno da mettere al beluardo de la Colonella" 6 giugno 1538 (9).

The payment mandates show that works for construction of the bastion were interrupted in September 1539. Paolo III because of the high expense, decided to limit the fortifications for the Borgo, getting back to the plan of Niccolò V (10).

In fact, from 1537 only for the Colonnella and Ardeatino bastions were spent "*440.000 ducati forniti da un'imposta sul grano*" (11).

In the Corpus of drawings preserved at the Gabinetto dei Disegni e Stampe degli Uffizi, the studies about fortifications on the left shore of the Tevere are numerous.

Drawings n. 1019A, n. 1015A, n. 938A, show among other topics the Bastion of the Colonnella. The n. 1019 A (Fig. 5) as Rocchi writes is "*il rilievo di campagna*

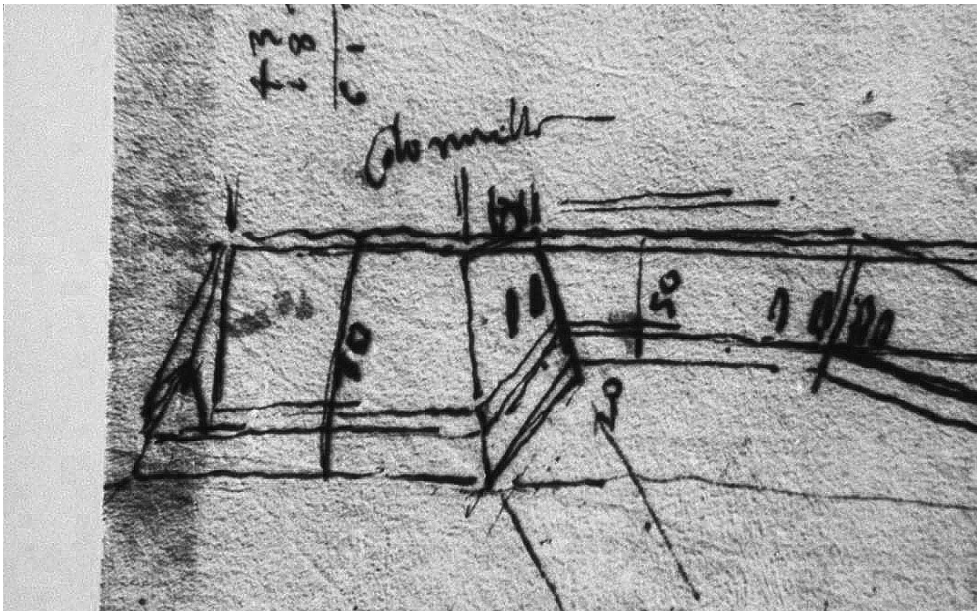


Fig. 7. Some of Sangallo´s sketches, with the different heights of the bastion, Firenze, Gabinetto Disegno e Stampa degli Uffizi, drawing n. 938A.

senza esattezza geometrica della regione compresa tra l'angolo sud-occidentale dell'Aventino presso Santa Maria del Priorato; la porta Ostiense e le mura Aureliane ad oriente di detta porta fino alla Torre ottava" (12).

The drawing is illustrated with accurate indications *"Santo Lazero – da Marmorata al pontone, passato Santo Lorenzo, passi 180 canne"* – 174 from the Colonnella to the porta (corresponding to the junction of Via di S. Sabina, today Via Porto Lavernale), then eighth tower – Valletta-Monte murato – wall. The drawing contributes to define the distances from Porta S. Paolo and from the left side of the Colonnella.

Drawing n. 1015 (drawn from a dusting) is a geometrical drawing (Fig. 6) includes the study of the new city walls with the bastions, from the occidental limit of Aventino to S. Saba. The scheme of the defensive lines traced in this sheet of paper is very interesting for the urban history of the city, in fact the limit of the "*regione meridionale*" (13) is deduced and it demonstrates the program of Sangallo on applying the bastion shapes in a particular orographic territory.
In the south-occidental limit it was expected a fortress named del Priorato di Malta with a projection through the river (never done), while the Colonnella, as a fulcrum between the two fronts, is located on the left side with a projection through occident. The importance of the drawing 1015 is reflected on the "reinforcing" project of Camillo Orsini, made between 1556 and 1557, reproducing the Sangallo's trace and presented in the plan of Beatrizet. The indications for the drawing, already described by Rocchi and recovered by Giovannoni, provide an accurate reference of the place and they illustrate the characteristics of the time.

"... Piano di Testaccio – Monte Testaccio, canne 30 – colonna, Monte Aventino di scogli di tevertino (travertino) canne 120 marmorata – muro canto al fiume...".
"*La pianta del Testaccio, in mezzo alla quale il monticello è disegnato in forma di cuore, risulta completamente abbandonata*" (14). In this context it is appropriate to reiterate the importance of this drawing, because it anticipates the development of the bastions in the elevation profile compared to the projects of Vauban (15) or other events of the military architecture in the East-Central Europe. The drawing n. 938A is the most significant of the Colonnella drawings.

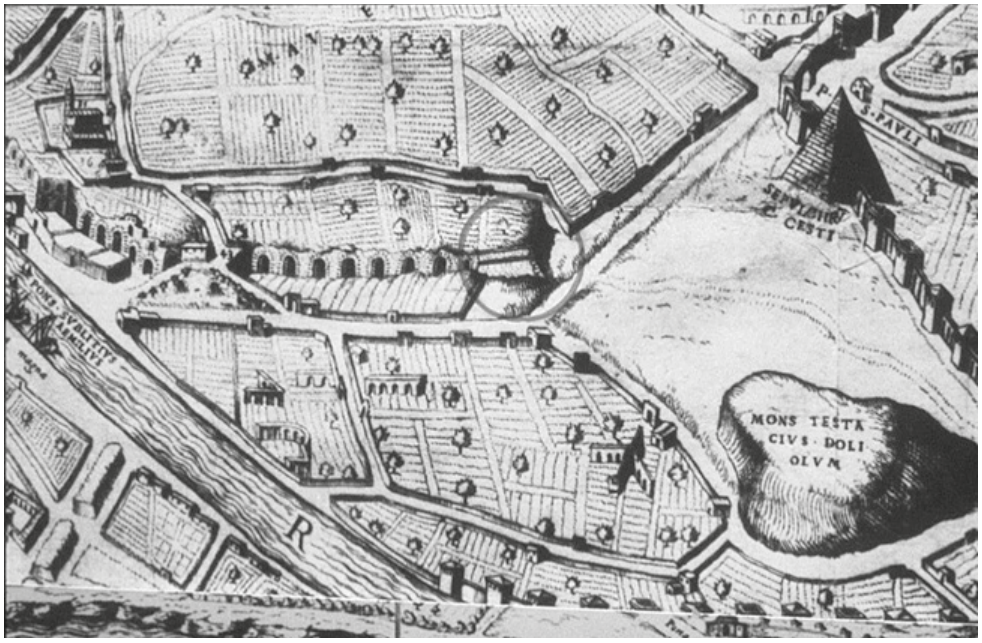


Fig. 8. Historical map, by Mario Cartaro, with the location of the bastion, in A. Frutaz, *Le piante di Roma e del Lazio*, Roma 1972, Vol.1.

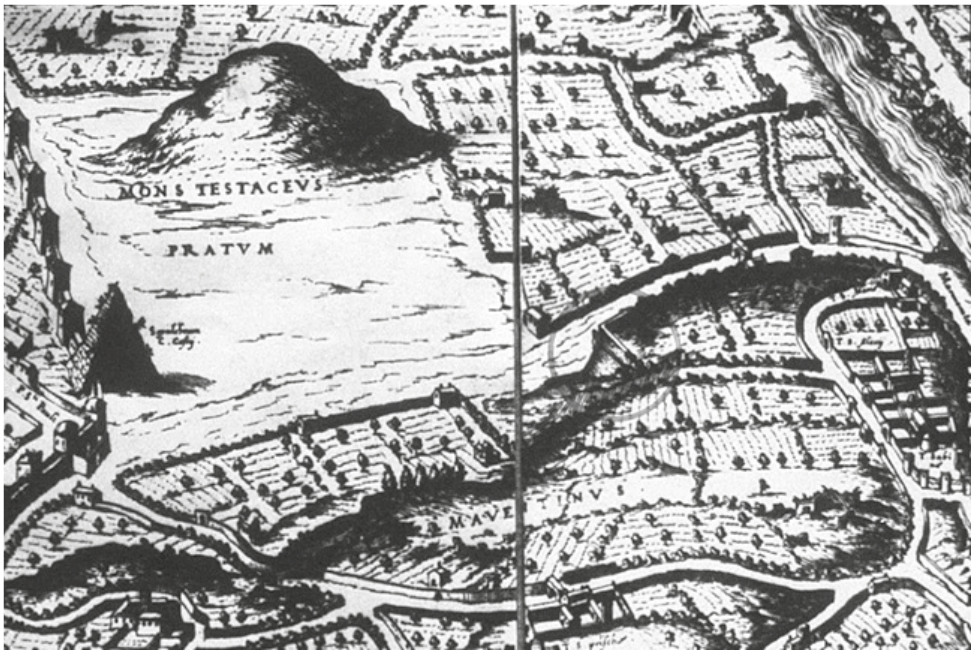


Fig. 9. Historical map, by E. Duperac, with the location of the bastion, in A. Frutaz, *Le piante di Roma e del Lazio*, Roma 1972, Vol.1.

It shows a prospective sketch made with pen on a white sheet of paper, with an accurate description of the Ardeatino and the Colonnella Fortress. On the left side of the drawing a pyramidal element is recognized on the base of the projecting area (Fig. 7).

This is a characteristic sign of the language of military architecture, for that is enough to see the pages of the treatise of Francesco di Giorgio (16), while the "*scarpa*" and the "*toro*" are not well highlighted.

"Lo piano de sopra del baluardo Antoniano cioè el piano de sopra, alto palmi 50 sopra al piano dello scarpone e batte in la vignia del signor Noferi Santa Croce alto palmi 4 in circa segniato una stella in un cerchio grosso e al baluardo in sulla muraglia che va a S. Pagolo batte sopra al piano del terreno p. 65, come apare una crocetta nel muro di mattoni dal canto di dentro quale è più basa ch'el di sopra del cordone pal 50; e da ditta croce in terra di fuori si è pal. 15. El piano de lo scarpone de la Colonnella si è più basso ch'el muro di marcantonio,

Fig. 10. Historical map, by G.B. Nolli, 1748, with the location of the bastion, in A. Frutaz, *Le piante di Roma e del Lazio*, Roma 1972, Vol.1.

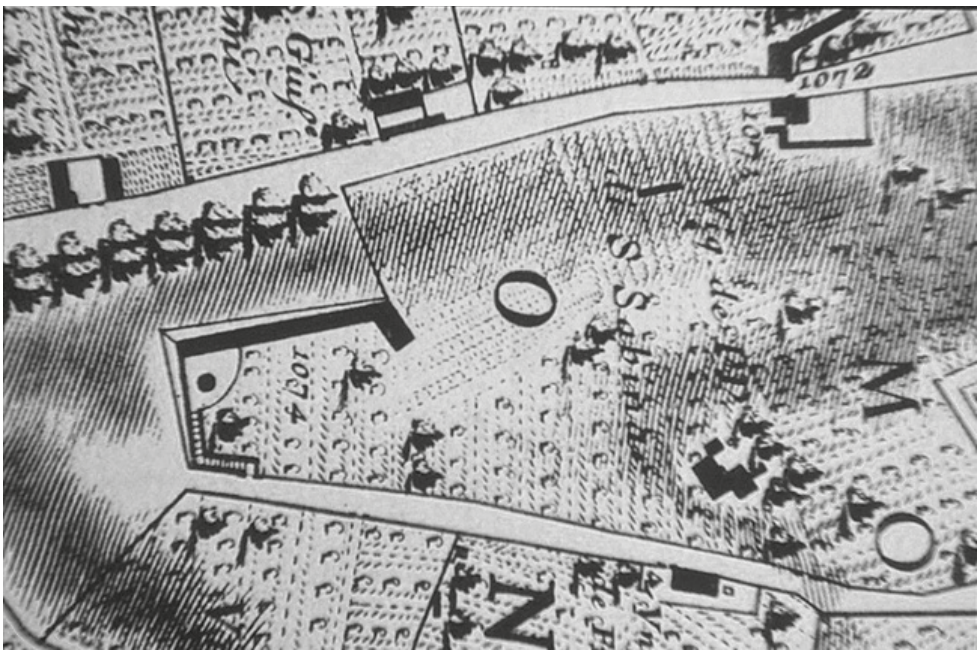


Fig. 11. Historical map, by G.B. Falda, with the location of the bastion, in A. Frutaz, *Le piante di Roma e del Lazio*, Roma 1972, Vol.1.

dove a essere la porta pal. 8; el piano di sopra del cordone della Colonnella metendolo alto pal. 50. Veria alla porta alto 42" (17).

Additional contributions for the identification of the bastion are provided by the historical cartography.
A first description is provided by Leonardo Bufalini in a plan of 1551. The Fortress of the Colonnella "*è rimasto isolato tra I dirupi e primo anello nell'ordine di posizione della catena dei capisaldi della cinta divisata dall'ingegnere fiorentino a partire dal Tevere*" (18).

The big plan of Mario Cartaro, 1576 (Fig. 8) shows on the left shore a perspective of the fortress. A strange *bugnato* is recognized on the projection element, while it highlights other recurrent details in the fortification of 16th century, as the "*toro*" and the emblem.

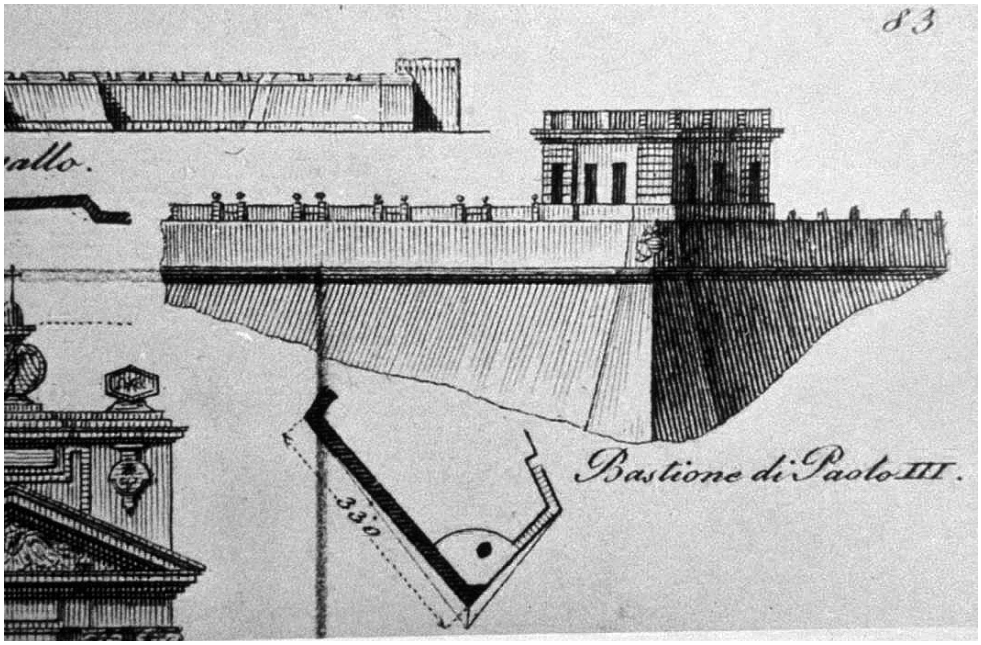


Fig. 12. G.B. Cipriani, *Itinerario figurato di Roma*, Roma 1835, pp. 243-244, tav. 83.

I agree with the affirmation of Enrico Rocchi on identifying the higher interest of the cartographic representation of the bastion on the adherence with the mura Serviane or better, on the continuity of the construction in reference to the preexistence, diversifying through the executive technique.
In the successive letter of Ètienne Duperac (Fig. 9), "*la Colonnella è disegnata come un forte chiuso*" (19). In reference to the plan of Cartaro, the last one fits more to reality because it respects proportions.

On the 18th century, the plan of Giambattista Nolli (1748) represents the bastion geometrically above the avenue that drives to Porta S. Paolo and it is possible to read "*Vigna dei Padri di Santa Sabina*" (20) (Figs. 10, 11).
In this plan, besides of specifying the denomination of the place, it shows the communication trench, which on that time was still readable to reach from the parade ground to the gallery of scarpa, that is, to the "*camere di contrammina*".

In the last century the Pontifical Cadaster, highlights the bastion on its geometric essence with land above designated to a vineyard.
The "monument in time" (21) continues to live with its usual additions and stratifications, in fact in the particle 535 there are some indications of a "*Casina delle Delizie*" (22) belonging to the house with courtyard and water well for it use by the vineyard of Padri Domenicani di S. Sabina.
Giovanni Battista Cipriani (23), in 1835, among the architectural monuments of the Aventino includes the bastion of Paolo III, the plan proposes again the Nolli's one, while the elevation is clearly different; the "*toro*" that separates the "*scarpa*" from the top curtain, the Farnese emblem, not easily readable, the "*Casina delle Delizie*" and a balustrade complete the presentation (Fig. 12).

It is significant to report the description of the bastion, made by Alberto Guglielmotti, "Casanatense" theologian, on his history about fortifications in the roman beach.

"Il sagliente tra I dirupi s'appoggia a largo sperone, la muraglia sale su fino al dorso del monte, un cordone semplice e grandioso lo cinge nel mezzo, ed al posto di onore si vede lo stemma di Paolo III (24)*. Finalmente sulla piazza*

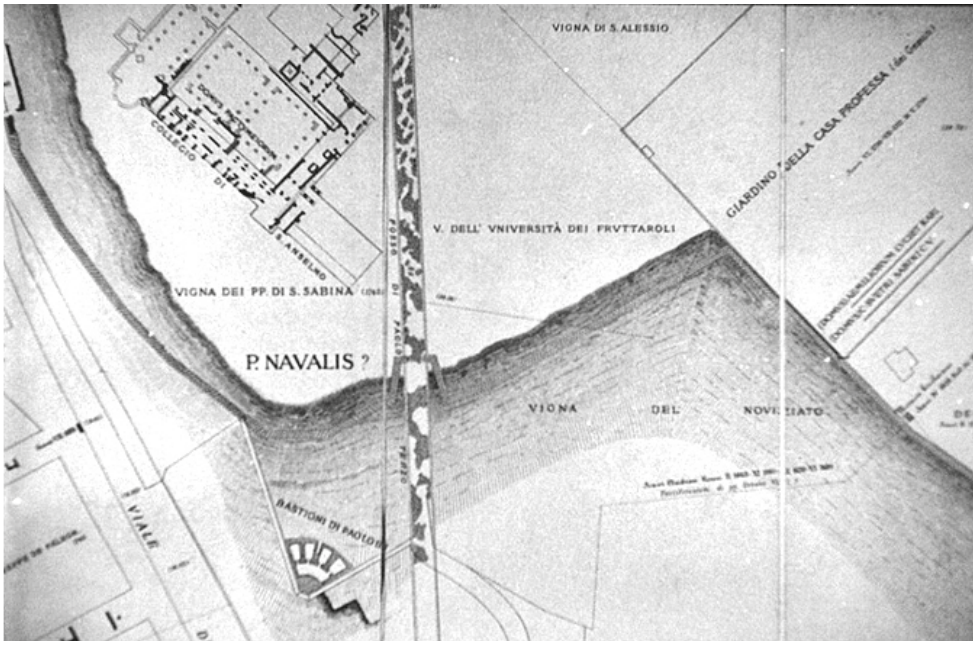


Fig. 13. Historical maps with the location of the bastion, in Archivio Primaziale S. Anselmo.

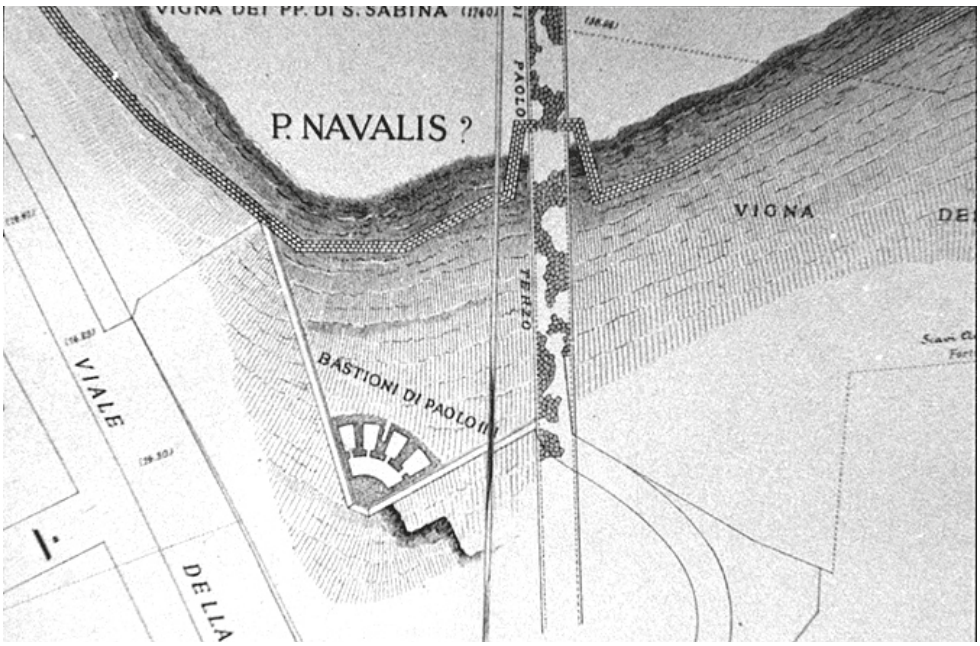


Fig. 14. R. Lanciani, *Forma Urbis Romae consilio et autoriatate Regiae Academiae Lyncaeorum formam dimensus est ad modulam 1:1000*, Milano 1893-1901.

suprema ritrovi piccolo e gentil casino, ai nostri giorni fabbricato da un vecchio cavaliere romano, che vi si era ridotto a solitudine, opera laterizia, ornati e spigoli di travertino: stile, costruzione, solidità, e tutto alla maniera sangallese, e alla similitudine dell'altro baluardo… mantiene le due facce mentre delle due troniere a tromba semplice ad apertura interna di metri due e mezzo, non c'è più nessuna traccia. Nel corpo del baluardo sotto la piazza apronsi quattro casematte a voltoni massicci: una sola delle quali verso il sagliente, arroge nel fondo ampia camera circolare di contrammina" (25).

Rodolfo Lanciani in his *Forma Urbis*… highlights the bastion delimited by the Marmorata on the left and by the Fosso di Paolo III (Via di S. Sabina) on the right side, while he provides a different lecture of the internal element, compared to the one given by Guglielmotti, no more circular rooms but quadrangular ones (26) (Figs. 13-16).

The Bastion of the Colonnella together with the Ardeatino, is one of the most interesting fortifications' works of the first part of the 16th century because

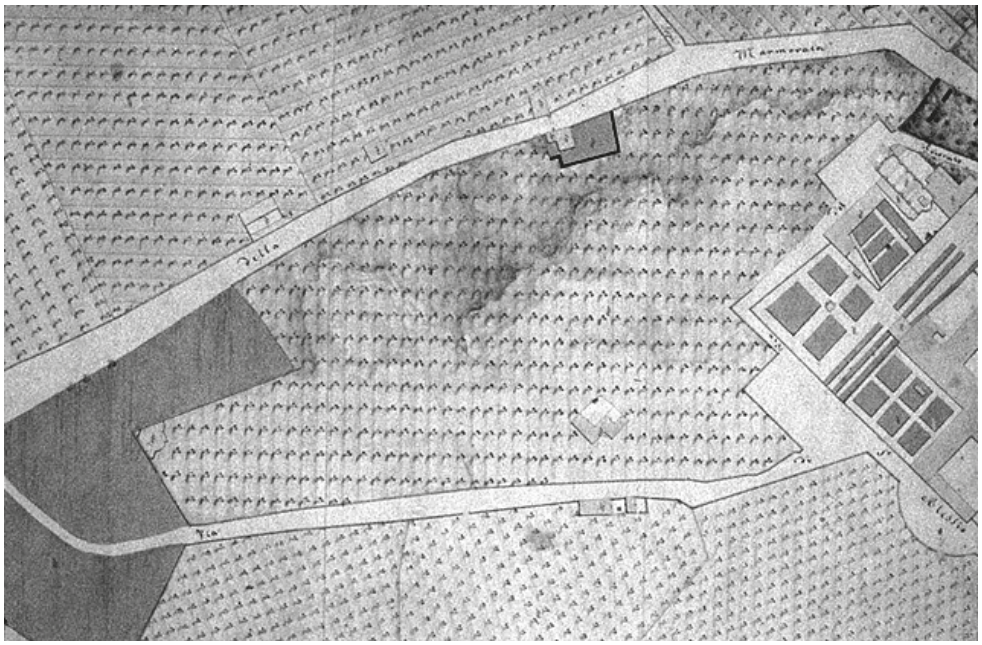


Fig. 15. Historical maps with the site of the bastion, in Archivio Primaziale S. Anselmo.

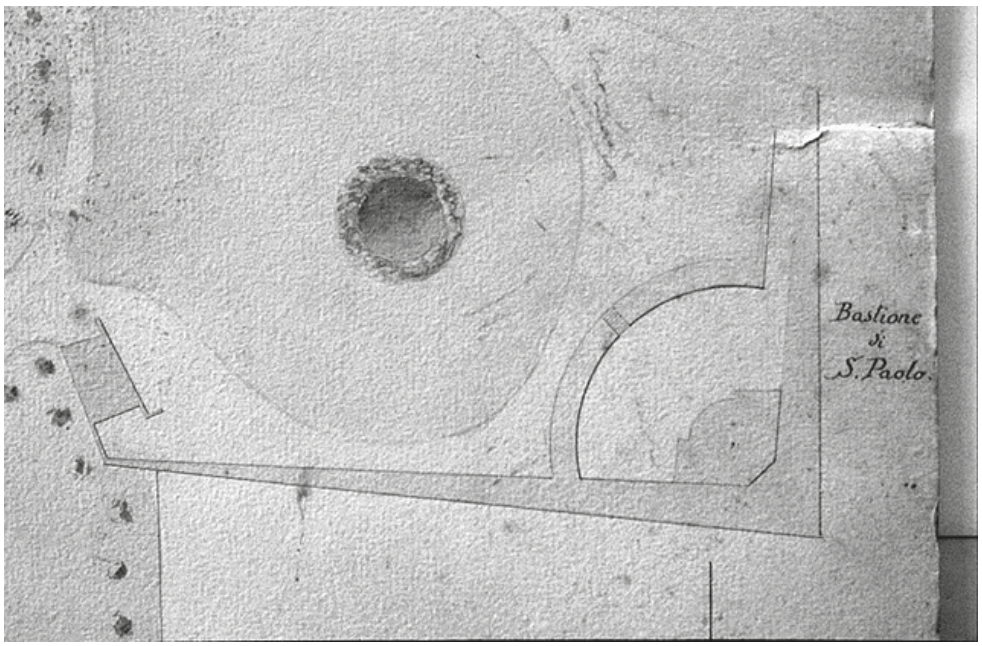


Fig. 16. Historical maps with the site of the bastion, in Archivio Primaziale S. Anselmo.

it contains some technical principles in addition to the substantial structural innovations (27).
The geometrical shape and the structural stability stand out from the whole complex. This structure uses the precedent elaborations of the bastioned front of Antonio il Vecchio (Fortezza Vecchia di Livorno) (28).

An example is evident in the *scarpa*, "*quell triangolo scaleno, o prima addossato alle mura, e il capitano Frate da Modena ne fissa tra l'altro l'altezza per soli due terzi del muro*" (29).

As observed by Francesco Paolo Fiore, "*i Sangallo adottano una forma canonica nelle architetture militari, mentre la tensione creativa è riservata nei particolari e nelle giunzioni dei materiali e superfici ad andamento geometrico diverso, nel toro ma anche nelle ammorsature d'angolo, nelle troniere, nei coronamenti*" (30), here in the Colonnella also in the pyramidal element on the basis of the projection part (Figs.1-3, 20, 21).

Figs. 17, 18. Detail of the Pope Paul III shield and the salient cut. Photo by C.B. 1985.

Fig. 19. Detail of the bastion´s masonry, made of brick with the *toro*. Photo by C.B. 1985.

The aim of this contribute is the direct recognition and the elevation of the construction that I have done also to read some of these characters (31).

The meridional front along Via Marmorata is 71 metres, with a variable height from 20.30 m to 5.30 m; while the oriental front has a development of 42 metres with a total height between 7.50 and 18.50 m (32).

The constructive character highlights a defensive wall with a *scarpa*, covered by a brick wall, marked with a *toro* of 26 cm. higher side. Along the oriental front, the curtain has some "*fuciliere*" located according to an almost regular distance of 1.80 m with an opening of 15/20 cm (Figs. 17-25).

Fig. 20. General view of the masonry, highlighting the *toro* and the loopholes. Photo by C.B. 1985.

Fig. 21. Detail of the *toro* and the loopholes. Photo by C.B. 1985.

Fig. 22. Detail of a loophole of the Bastion of la Colonnella. Photo by C.B. 1985.

The bastion shows in the projection element the remains of the Paolo III's emblem, with in both of the smaller sides and also mutilated, those of the *popolo romano*, on the left and the Camerlengo Guido Ascanio Sforza, on the right (33).

Today the bastion can be use internally only in one circular *camera di contrammina*. The room is accessible through a helicoidal ramp that assimilates the gap of 8.20 m. The circular element has a diameter of 6.60 m and a height of 8.20 m; the vault is at 5.10 m from the impost to the skylight (Figs. 26-31).

The environment is characterized by a shapeless masonry in the lower part, while the top is delimited by a dome of rotation according to the "*spinapesce*" pattern. The "*spinapesce*" is formed by bricks of 26-12-3,5 cm with mortar of 1 or 2 cm. The way of construction of the vault is typical of the constructive technique of the Tuscan Quattrocento and "*rivela nell'autore un interesse per le opera di Brunellesco*" (34) e "*verso l'architettura romana antica*" (35).

Even if more accurate drawings of the bastion have not being found, the reference with the drawing 900 A of the Uffizi is certain (36).

The spherical vault, "*unica tra tutte non richiede armature poiché essa non è fatta soltanto d'archi, ma anche di anelli sovrapposti… e una volta che siano costruiti gli anelli uno sull'altro anche facendo l'ipotesi che la costruzione voglia crollare non si vede da che parte potrebbe cominciare*" (37).

This constructive scheme *"delle spirali di mattoni a spina di pesce si riscontra in tutte le cupole brunelleschiane"* (38).

Fig. 23. Photo of the fortress area, completely covered by the snow. Photo by C.B. 1985.

Fig. 24. Photo of the "trap door" that allows the entrance from the top of the vault, discovered after the melting of the snow. Photo by C.B. 1985.

An interpretation of the *spinapesce* is given by P. Sanpaolesi in his essay about the technical knowledge of Brunelleschi; "*esse sono le spalle entro le quali si incastra una porzione di filare. Messi a forza i mattoni piani fra queste spalle come tante piattabande minori essi non scivolano più*" (39).

I think is appropriate to conclude to point out the current conditions of the monument. The external brick curtain shows a remarkable degradation state due to a pronounced bulging of the bricks with partial collapse. The wall is attacked by vegetation in addition to water infiltrations, especially in the *camera di contrammina*.

Fig. 25. Detail of the helicoidal ramp. Photo by C.B. 1985.

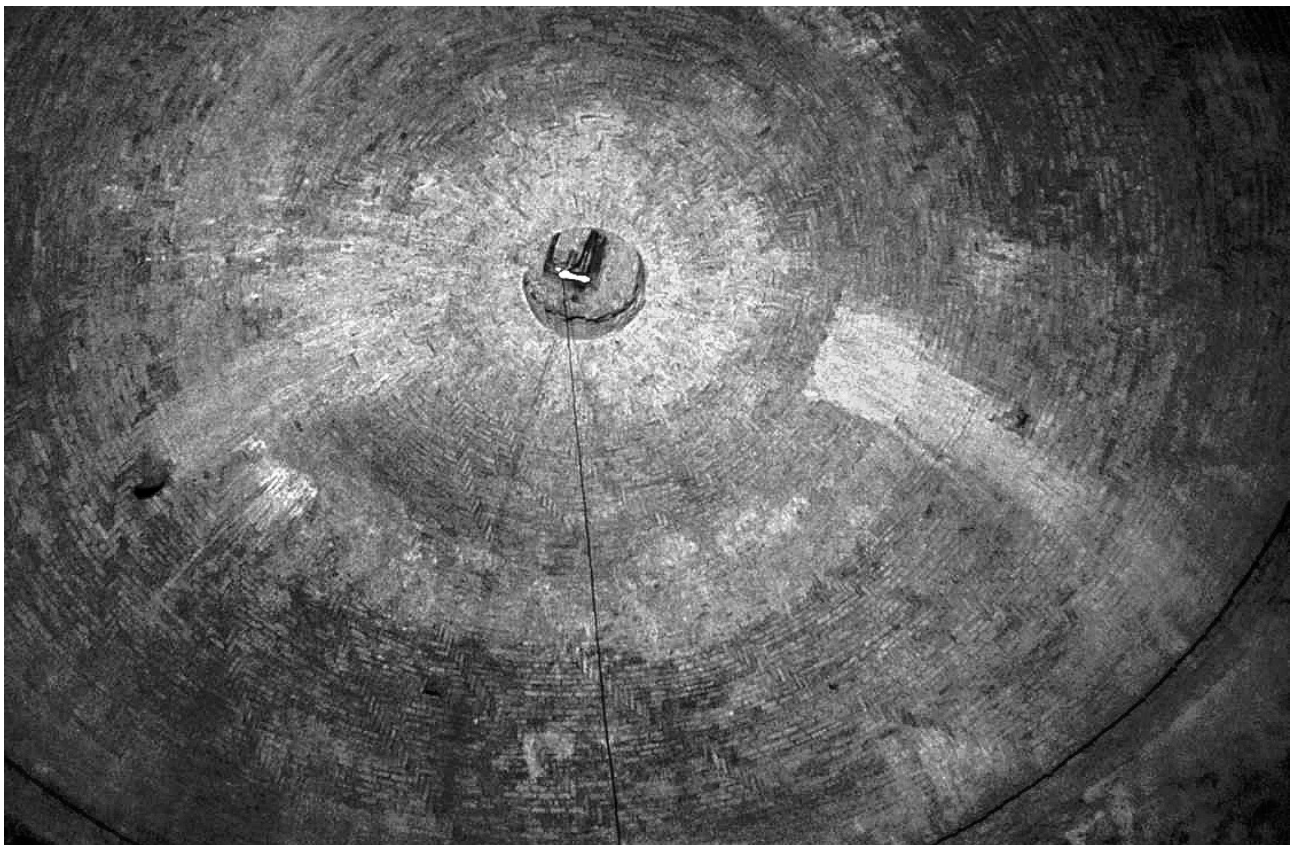


Fig. 26. Detail of the calotte made with a "*spina di pesce*" pattern. Photo by C.B. 1985.

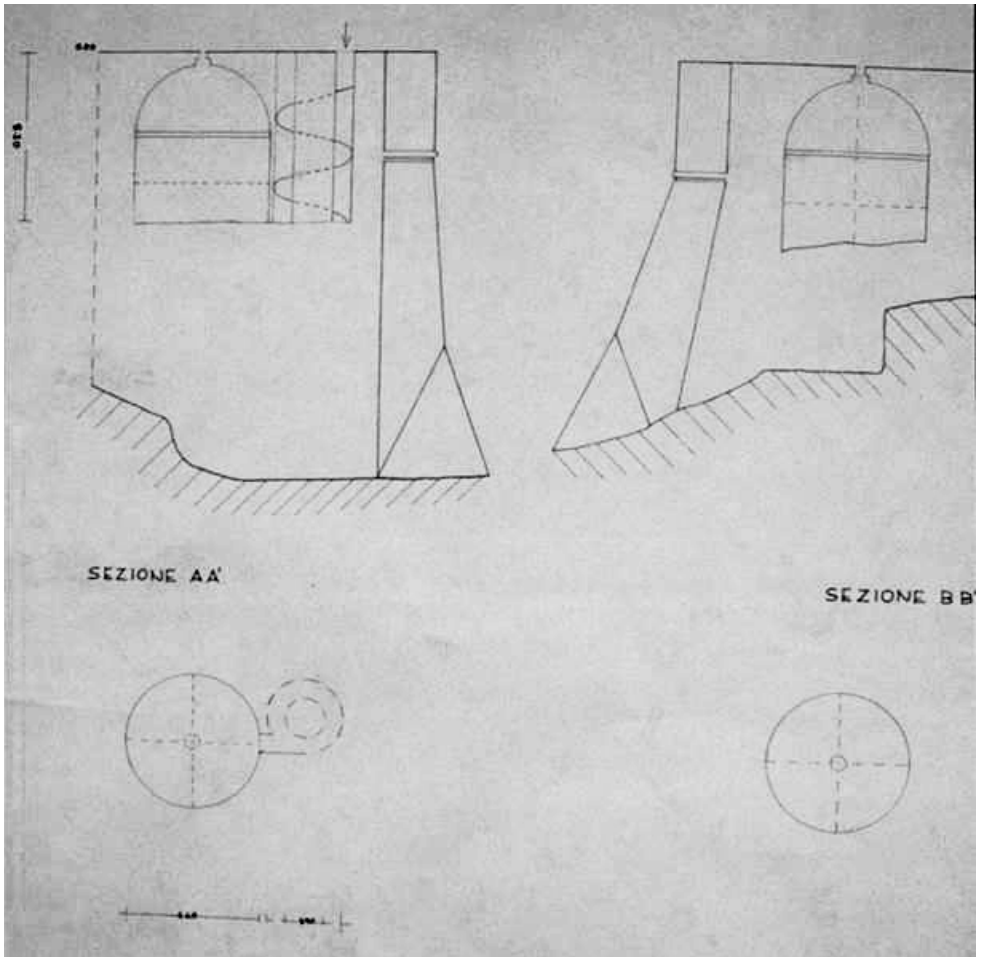


Fig. 27. Sections and plan of the bastion 1:100, by C.B. 1985.

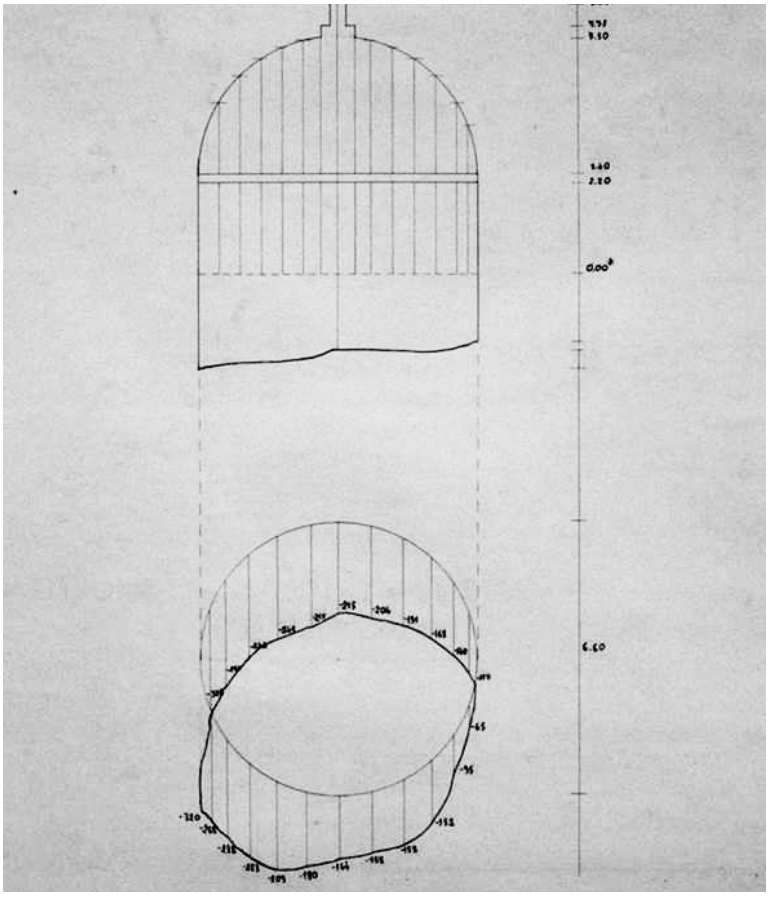


Fig. 28. Geometric and dimensional survey of the cupola, 1:50, by C.B. 1985.

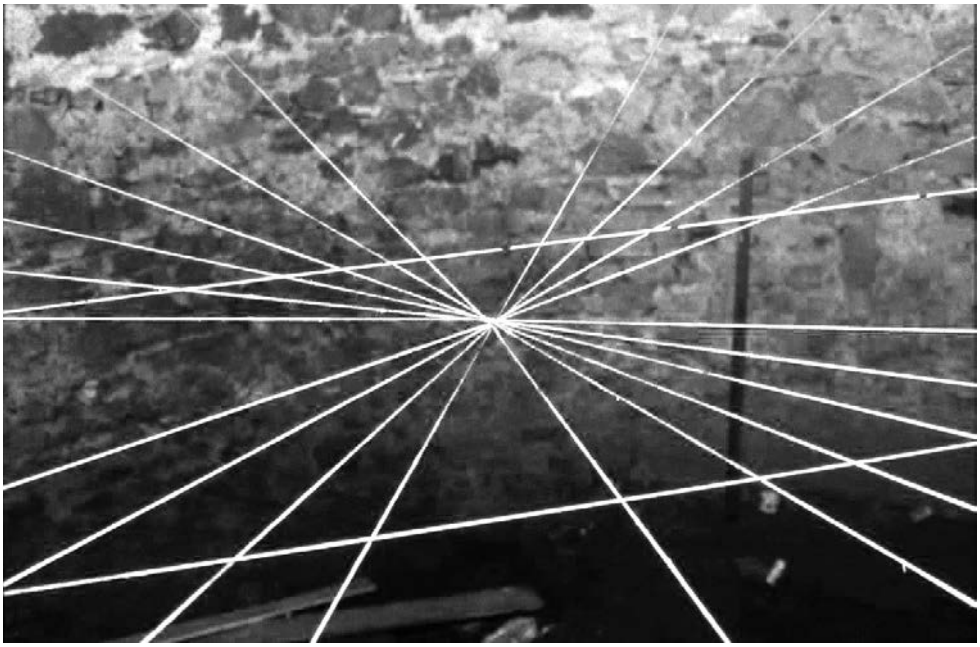


Fig. 29. Traditional survey, according to the Renaissance system used by Antonio da Sangallo il Giovane. Photo by C.B. 1985.

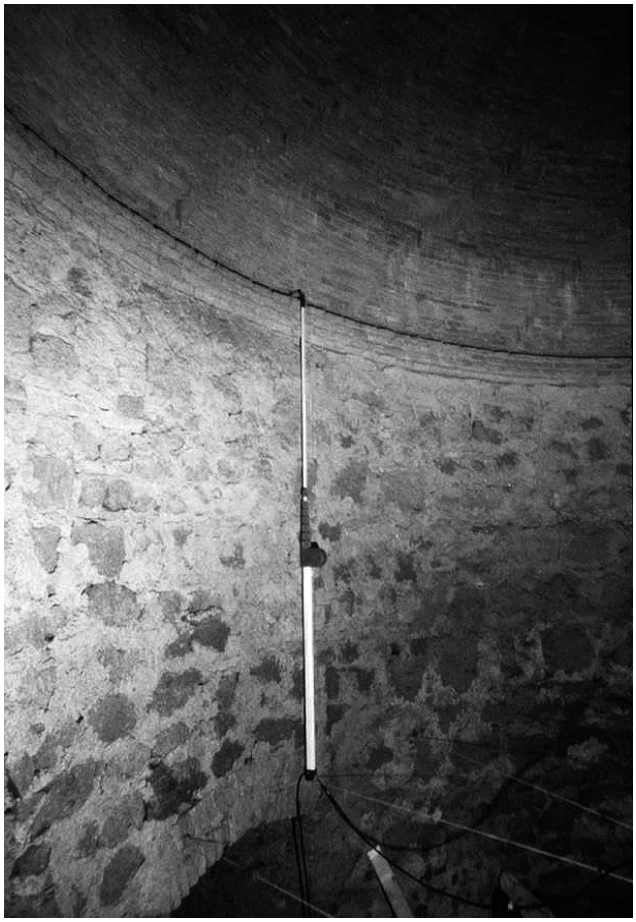


Fig. 30. Traditional survey, according to the Renaissance system used by Antonio da Sangallo il Giovane. Photo by C.B. 1985.

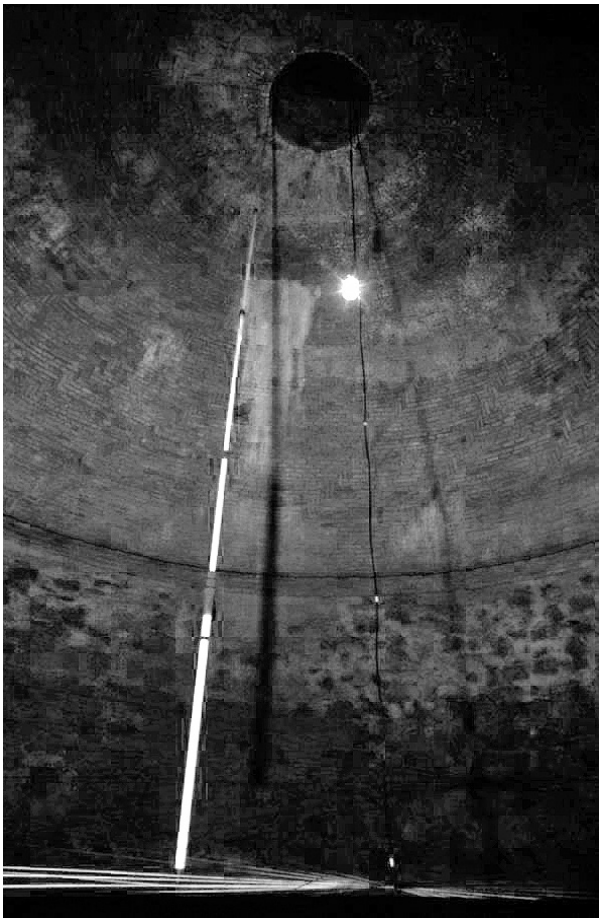


Fig. 31. Inside of the *camera di contrammina*. Traditional survey, according to the Renaissance system used by Antonio da Sangallo il Giovane. Photo by C.B. 1985.

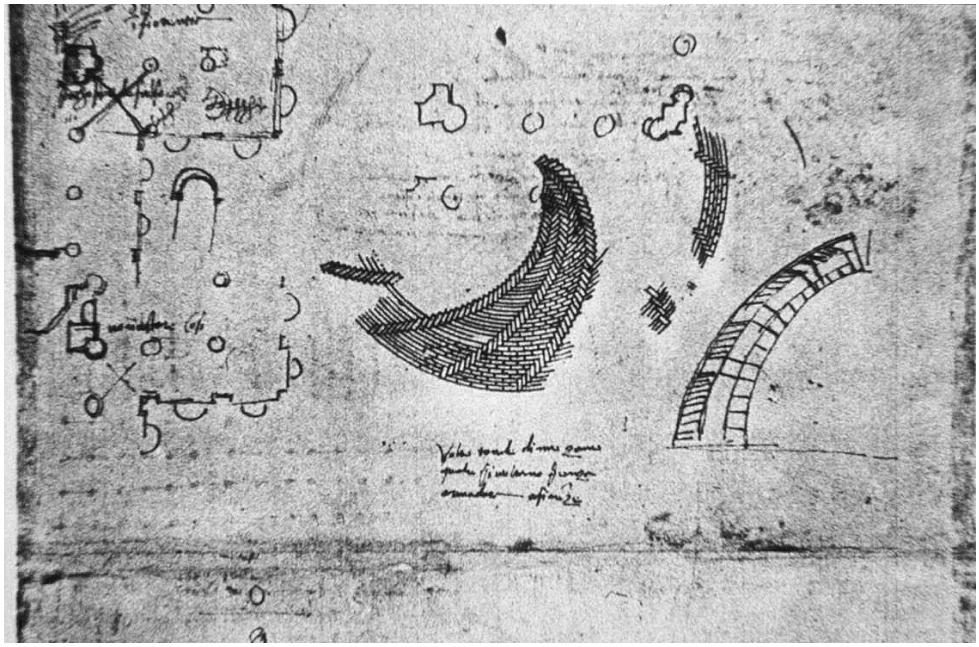


Fig. 32. Detail of the "*spina di pesce*" pattern, by Antonio da Sangallo il Giovane, in Firenze, Uffizi Gabinetto Disegno Stampe, drawing n. 900A.

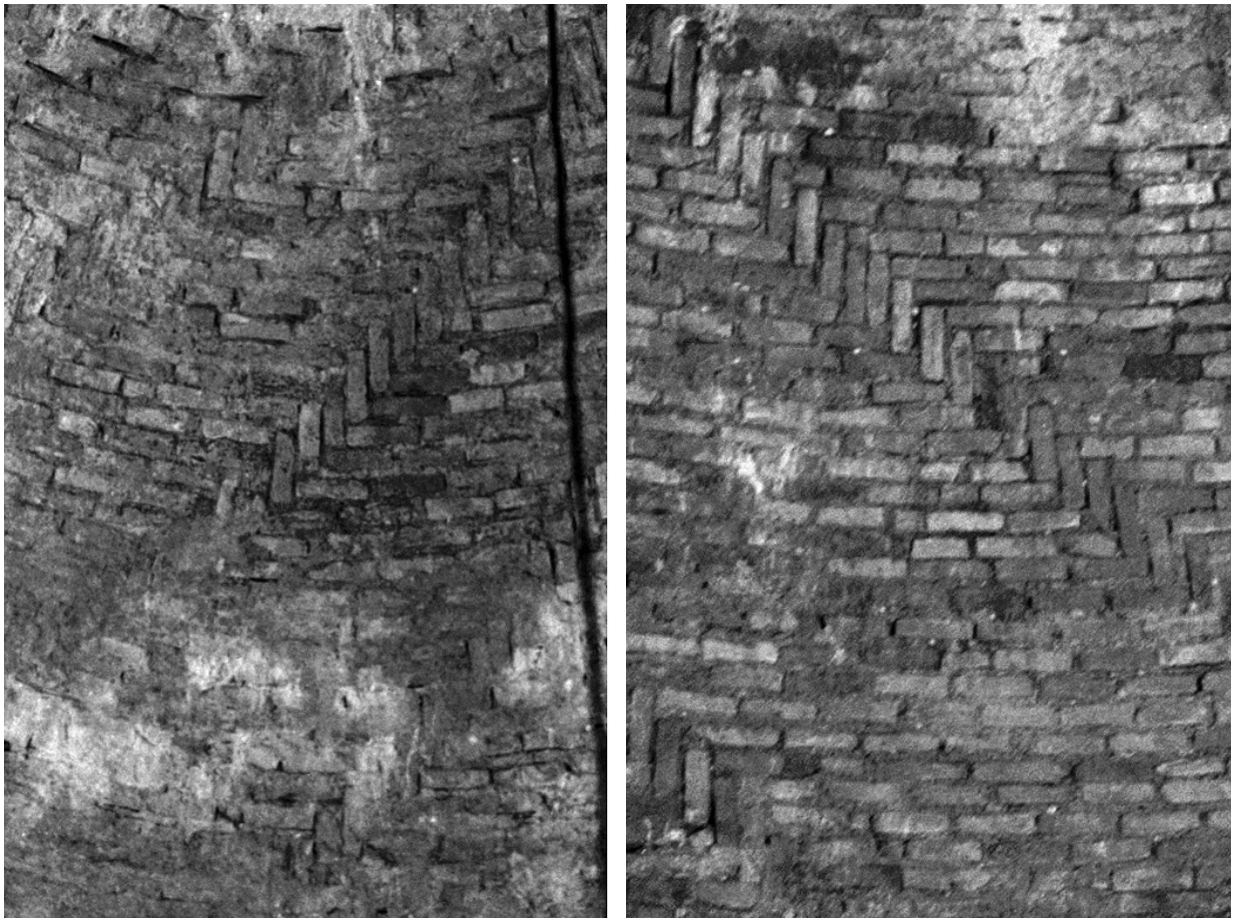


Fig. 33. Details of the "*spina di pesce*". Photo by C.B. 1985.

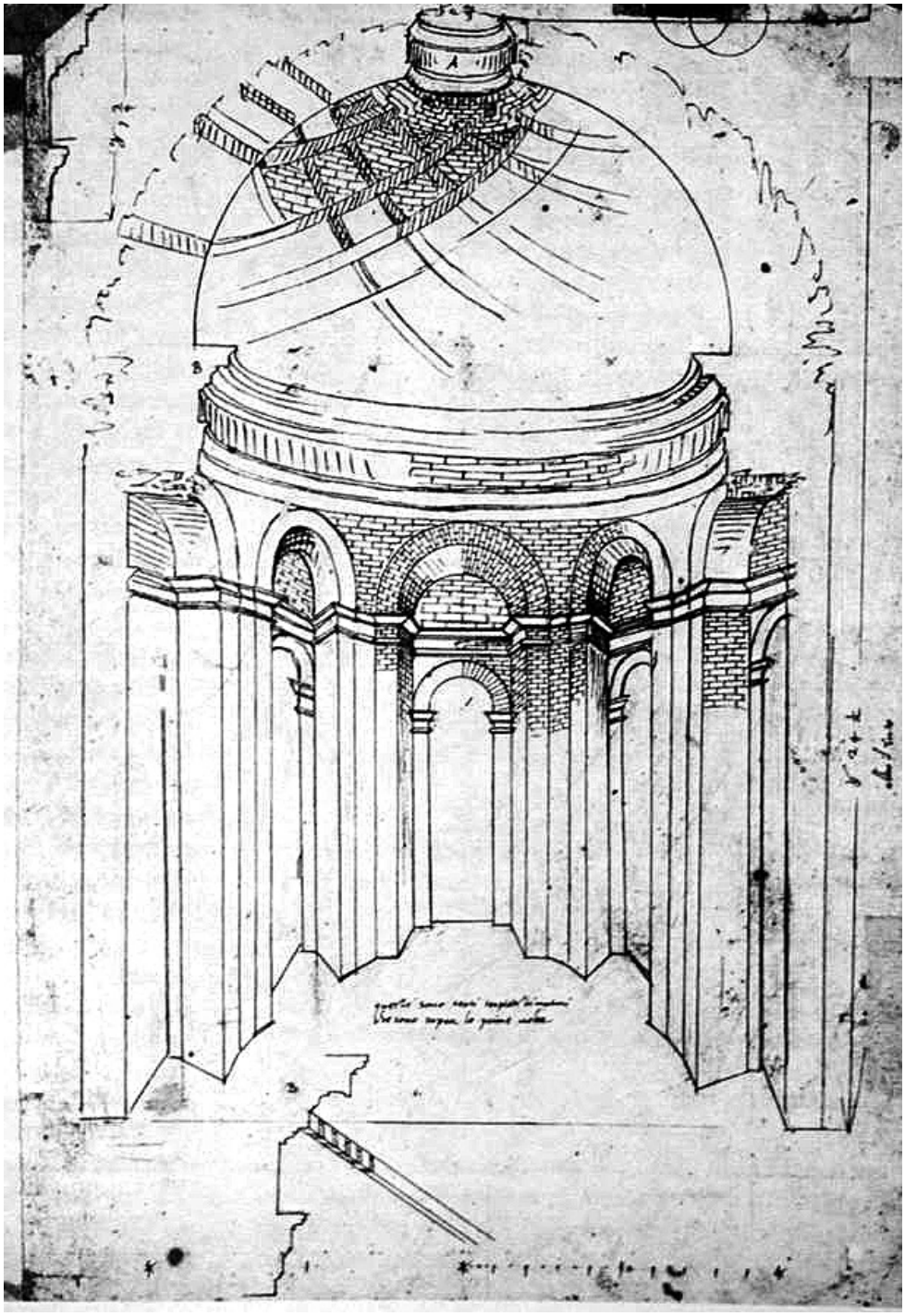
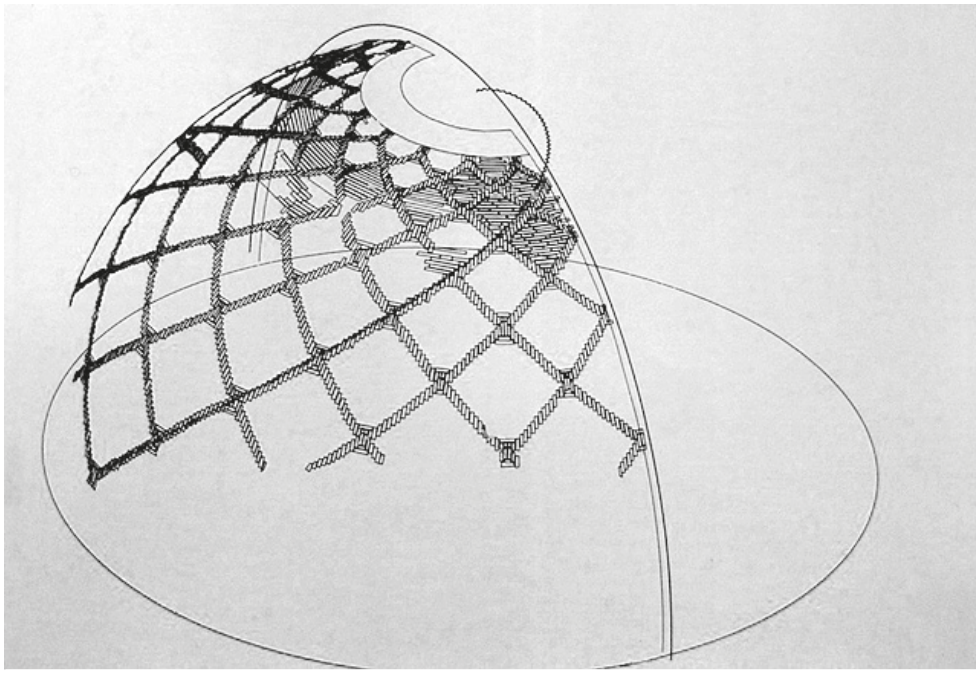
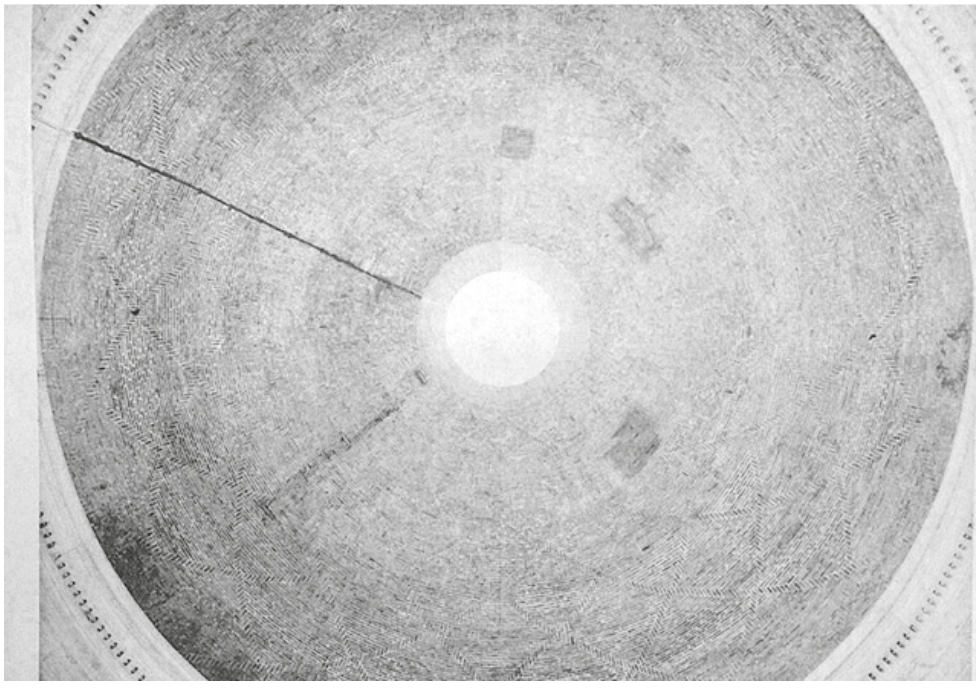


Fig. 34. Ottagono di San Pietro, by Antonio da Sangallo il Giovane, in G. Zander, *Gli ottagoni di San Pietro riconosciuti nel Dis. Arch. Uff. n. 1330*, in "Palladio" 1, giugno 1988, pp. 67-82. Particularly see p. 69.





Figs. 35, 36. Detail of the double spiral of the Ottagono di San Pietro, photogrammetric restitution by Mario Docci, 1990; In M. Docci, R. Migliari, *La costruzione della spinapesce nella copertura della Sala Ottagona di Simon Mago nella fabbrica di S. Pietro*, in "Palladio" n.3, gennaio-giugno 1989, pp. 61-72.

Notes

I would like to thank the Benedictine Fathers from the Abbazia Primaziale di Sant´Anselmo for allowing me to examine the monument and for helping me concretely during the research.

1. L. PASTOR, *Geschichte der Papste*, Freiburg 1886 translation to Italian *Storia dei Papi*, Vol. V, Paolo III, Roma 1914, p. 706.

2. Published letter from E. MÜNTZ, *Le monuments antiques de Rome a l´epoque de la Renaissance*, nouvelles recherches, *Les murs et les portes*, in "Revue Archeologique, Antiquite e Moyen Age", Troisienne Seire, Tome VII, Paris 1886, p. 329; from G. CLAUSSE, *Les Sangallo,* Paris 1900-2. Vol. II, (Rome fortifications 1537), pp. 340-341; and from E. ROCCHI, *Le piante Iconografiche e prospettiche di Roma del secolo XVI, colla riproduzione degli studi originali autografi di Antonio da Sangallo il Giovane per le fortificazioni*, Torino-Roma 1902, pp. 230-231.

3. I mention synthetically some of the authors that address the issue of the bastion in their studies; A. GUGLIELMOTTI, *Storia delle fortificazioni nella spiaggia romana, risarcite e accresciute dal 1560 al 1570*, Roma 1880; E. ROCCHI, *Le piante*, op. cit,; L. PASTOR, op. cit.; G. GIOVANNONI, *Antonio da Sangallo il Giovane*, Roma 1959; G. MIARELLI MARIANI, Sangallo in "Dizionario Enciclopedico di Architettura e Urbanistica", Roma 1969 Vol. V, p. 395; A. BRUSCHI, *A. Cordini* in "Dizionario Biografico degli Italiani", vol. 29, Roma 1983, p. 14.

4. F. DI GIORGIO MARTINI, *Trattato di Architettura Civile e Militare*, edited by C. Saluzzo, Torino 1849.

5. G. GIOVANNONI, op. cit. p. 80.

6. Archivio di Stato di Roma, Rubrica Soldatesche e Galere, indicating envelopes "Mura e Fortificazioni di Roma, per la Colonnella", busta 15.

7. E. ROCCHI, *Le piante*, op. cit., parte terza, I Mandati di Pagamento delle fortificazioni di Roma pp. 225-257.

8. E. ROCCHI, op. cit. pp. 239-40.

9. The Roman Governor and the providers for the reparation of the public manufactures entrusted to the Mastro Lorenzo fiorentino to make four arms of Paolo III in travertine with other two smaller… in F. GORI, *Archivio Storico Artistico Archeologico e Letterario della città e provinciale di Roma*, vol. III, Spoleto 1878-79, p. 223.

10. L. PASTOR, op. cit., p. 709.

11. L. PASTOR, op. cit., p. 709.

12. Gabinetto Disegni e Stampe degli Uffizi, drawing n. 1019 A, sanguine pen in white paper, described by ROCCHI, op. cit. p. 180.

13. Gabinetto Disegni e Stampe degli Uffizi, drawing n. 1015 A, sanguine pen in white paper with punctures made by a pinpoint, described by ROCCHI, op. cit. p. 182.

14. G. GIOVANNONI, op. cit., p. 361.

15. E. ROCCHI, op. cit., pp. 182-183.

16. P. MARCONI, F.P. FIORE, G. MURATORE, E. VALERIANI, *I Castelli, Architettura a difesa del territorio tra Medioevo e Rinascimento*, Novara 1978.

17. Gabinetto Disegni e Stampe degli Uffizi, drawing n. 938 A, ROCCHI op. cit., p. 185.

18. E. ROCCHI, op. cit., p. 42.

19. G. GIOVANNONI, op. cit., p. 359.

20. G.B. NOLLI, map of Rome, Roma 1748, Bastion of Paolo III, particle n. 1074.

21. G. MIARELLI MARIANI, *Monumenti nel tempo, per una storia del Restauro in Abruzzo e nel Molise*, Roma 1979.

22. Archivio di Stato di Roma, Pontifical cadaster, Region XII.

23. G.B. CIPRIANI, *Itinerario figurato di Roma*, Roma 1835, pp. 243-244, tav. 83.

24. The surviving emblems have been abraded and rendered almost shapeless by the chiseling during the French occupation of 1799. R. BATTAGLIA, *L´Aventino nella rinascita e nel barocco attraverso I documenti iconografici*, Roma 1942.

Other probable damages were suffered in 1848 as the General VAILLANT writes in *Giornale delle operazioni dell´artiglieria e del genio dell´assedio di Roma*, Paris 1851, already mentioned by ROCCHI p. 65.

25. A. GUGLIELMOTTI, op. cit., p. 324 .

26. R. LANCIANI, *Forma Urbis Romae consilio et auctoriatate Regiae Academiae Lyncaeorum fromam dimensus est ad modulam 1:1000*, Milano 1893-1901.

27. F.P. FIORE, *Città e macchine del Quattrocento nei disegni di F. Di Giorgio Martini*, in Accademia Toscana di Scienze Lettere e Arti, la Colombara, studi XLIX, Firenze 1978.

28. G. PIANCASTELLI POLITI, *La fortezza Vecchia in Livorno, progetto e storia di una città*, catalogue of the exposition in Fortezza Vecchia e nei Bottini dell´olio, Pisa 1980.

29. F. DI GIORGIO, op. cit., p. 247.

30. F.P. FIORE, *Città e…* op. cit., p. 60.

31. M. DOCCI, D. MAESTRI, *Il rilevamento Architettonico Storia Metodi e disegno*, Roma – Bari 1984.

32. The height variations in both of the fronts are due to the alterations of the bastion´s underlying terrain along the years.

33. G. GIOVANNONI, op. cit., ill. 384; I think is necessary to specify that the master fell into in a typographic oversight, the illustration in the second volume should refer to the bastion of the Belvedere and not to the Colonnella one.

34. P. SANPAOLESI, *Le cupole e gli edifici a cupola del Brunelleschi e la loro derivazione da edifici romani*, in Atti del I Congresso di Storia dell´Architettura, Roma 1936 pp. 37-41.

35. But where Brunellesco copies the romans is on the use of constructive expedients that he used constantly, as always he used the same light vaults as romans, and it was from them that he learnt how to build quickly, P. SANPAOLESI, Atti… op. cit.; the opening that we can find in the vault refers to the skylights that were made in the top of the vaults. It was the easiest point, constructively and geometrically speaking, to make the light penetrate inside of the buildings, in G. DE ANGELIS d´OSSAT, *La forma e la costruzione delle cupole nell´Architettura Romana*, Atti del III Congresso di Storia della Architettura, Roma 9-13 october 1938, Roma 1940, p. 231.

36. "*Volte tonde di Mezzane, quali si voltano senza armature a Firenze*". The drawing 900A of Antonio, with some notes of the plan of S. Spirito on the left and an example of a spinapesce spiraling vault on the right, is similar to the one in the Fortezza da Basso, C.L. RAGGHIANTI, *F. Brunelleschi un uomo un universe*, Firenze 1977.

37. F.P. FIORE, op. cit., pp. 44-48, mentions L. B. ALBERTI, *De Re Aedificatoria,* cop. IX.

38. P. SANPAOLESI, op. cit., Atti Congr. 36 and also about the technical knowledge of Brunelleschi, *F. Brunelleschi la sua opera e il suo tempo*, Atti del convegno internazionale di studi, VI centenario (Firenze, October 1977), Florence 1980; P. A. ROSSI, *Le cupole del Brunelleschi, capire per conservare*, Bologna 1982.

39. P. SANPAOLESI, Atti Brunelleschi, op. cit., p. 156.

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C. BELLANCA, *Il bastione della Colonnella, note di storia e conservazione*, in G. SPAGNESI, ed., *Antonio da Sangallo il Giovane: la vita e l´opera*, Atti del XXII Congresso di Storia dell´Architettura (Roma 19-21 febbraio 1986), Roma 1986, pp. 383-391.

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F.P. FIORE, *Francesco di Giorgio e il rivellino "acuto" di Costacciaro*, in Quaderni dell´Istituto di Storia dell´Architettura, Saggi in onore di Guglielmo de Angelis d´Ossat n.s.I-I0, 1987, pp. 197-208.

G. ZANDER, *Gli ottagoni di San Pietro riconosciuti nel dis. Arch. Uff. n. 1330*, in "Palladio", I/1, 1988, pp. 67-82.

G. ZANDER*, Geometry and structure of the Domus of Eight Octagonal Rooms in the Basilica di San Pietro in the Vatican*, in *International Symposium on Domes from Antiquity to the present*, Istanbul, 30th May – 3rd June 1988.

B. ADORNI, *Le fortificazioni di Parma e Piacenza nel Cinquecento. Architettura militare, espropri e disagi*, in C. DE SETA and J. LE GOFF, eds., *La città e le mura, Roma* 1989, pp. 128-165.

M. DOCCI, R. MIGLIARI, *La costruzione della spinapesce nella copertura della Sala Ottagona di Simon Mago nella fabbrica di S. Pietro*, in Palladio n.3, gennaio-giugno 1989, pp. 61-72.

C.L. FROMMEL, N.ADAMS, T*he architectural drawings of Antonio da Sangallo the Younger and his circle*, in C. JOBST (a cura di), *Fortifications, Machines, and Festival Architecture*, Volume I, MIT Press Cambridge Massachusetts, and London, England 1994, p. 170: U 938A recto, Antonio da Sangallo the younger; Rome, elevation of the fortifications on the Aventine hill and the Colonnella bastion at the new Porta San Paolo, 1537.

Dimensions: 180x219 mm

Paper: Yellowed on the edges, trimmed except on the right side.

Technique: Pen and brown ink.

Drawing Scale: Roman palmi.

INSCRIPTION: *Lo piano di sopra del cordone del baluardo antoniano cioe el piano di sopra / alto palmo 50 sopra alpiano dello scarpone e batte in lavignia del S[igno]re noferi / Santa Croce alto palmi 4 in circha segniato*

una stella in uno cerchio grosso / e al baluardo in sulla muraglia cheva asanpagolo batte sopra alpiano del / terreno p[almi] 65 come apare una crocetta nelmuro di mattoni dalcanto di / dentro quale e piu basa cheldi sopra delcordone p [almi] 50 e da ditta croce atterra / di fuora sie p[almi] 15 / E piano de lo scarpone della Colonnella sii e piu basso chelmuro di marcant[oni]o dove / assere laporta p[almi] 8 elpiano di sopra delcordone della Colonnella mettendolo / alto p[almi] 50 verria alla porta alto 42; Colonnella.

This is the only elevation of the walls planned by Antonio il Giovane for the left bank of the Tiber. The walls vary in height from 50 *palmi* for the curtain (slightly more than 11 metres) to 65-70 *palmi* (from 14.5 to 15.5 metres) for the bastions; these measurements correspond precisely to those for the Colonnella bastion. Antonio´s comments reveal how preoccupied he was with the vertical connection of the various parts, starting with the Colonnella up to the "antoniano", that is, the Ardeatine bastion (not shown). While both Rocchi (1902) and Giovannoni (1959) identified the drawing as a preparation for the Ardeatine bastion, the design, in fact, shows the Colonnella bastion. The Colonnella bastion is readily identifiable by the blunt angle with a spur at its base, as is clearly shown in the design and still recognizable today on site. Such specific detail suggests that this sheet represents the definitive solution for the plan which is characterized by the placement of a bastion corresponding to the small Aventine hill and just before the new recessed Porta San Paolo. The gate is characterized by an arch and indications of a double architectural order on one side. Beyond the gate the battered angle of another bastion may be glimpsed, probably similar to the variation of U 143IA. See also U 1019A, 1514A, 1015A, 1431A r. and v.

M.C. PIERDOMINICI, *Il bastione del Sangallo: note di restauro,* in Bollettino d'Arte, 6, Ministero per i Beni e le Attività Culturali, Direzione Generale per il Patrimonio Storico, Artistico e Demoetnoantropologico, Firenze 1998, pp. 141-158.

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F.P. FIORE, *Architettura e arte militare. Mura e bastioni nella cultura del Rinascimento*, Roma 2017, particularly see: *Episodi salienti e fasi dell'architettura militare di Antonio da Sangallo il Giovane* pp. 139-156; *Rilievo topografico e architettura a grande scala nei disegni di Antonio da Sangallo il Giovane per le fortificazioni di Roma al tempo di papa Paolo III* pp. 171-180; *Le porte doriche di Antonio da Sangallo il Giovane per le fortificazioni di Roma* pp. 181-190, e le illustrazioni dalla 97-99.

The book provides a series of reflections on the study of architectural preexistences that have matured during the almost thirty-five years of study and research in Italy and Europe. Furthermore, it shows how the discipline of restoration of monuments is all based in architecture, intended in its many-faceted meanings. The methodical approach to the restoration of historic architecture consists in the historical-critical analysis, central nucleus of the study of architecture and is composed by specific in-depth thematic sessions (the historical iconography; the analysis of the constructive features; the constructive model; the volumetric layout; metrological and proportional analysis; the theme of the figurative model; the analysis of masonry; the theme of decorations; spolia and reemployed; comparisons, analogies and differences; the reading of the architectural organism through the synthesis of the monument in time). The author and his team have collected thematic essays on key issues that have great interest not only in Italy but also abroad. From the general concepts to examples of the application of Italian consolidated restoration methodology to the analysis and conservation of historic architecture.

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