

From the traces to definition of the monumental space

The case of Bartolomeo Ammannati's "Fontana di Sala Grande"

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Abstract: Art and Architecture are two meaningful parts of the humanity cultural heritage, being a product from the human artistry they are subject to the declination of the taste, of the styles, of the decisions of the historical period they belong to. In this case study, the specific approach to the Ammannati's Juno Fountain opens the paths to a series of lectures and interpretations to clearly read the original shape and setup of an "unrealized" masterpiece from the XV Century. The physical reconstruction, kept in the National Museum of Bargello in Florence, leave open the "mystery" about the original Ammannati's plot, the design intentions he was bringing on for the "Sala Grande" in Palazzo Vecchio.

To correctly read them and to define correct strategy of intervention the need to understand and have a clear knowledge about the contest and the studied monument is mandatory; any choice far from this will fail or in the worst situation may cause fake interpretations.

The investigation will be proposed to hypothesize about this meaningful monument and its possible asset inside the "Sala Grande" before the Vasari's intervention (today it call "Salone dei Cinquecento").

The resetting of Fountain involved questions about original project of south wall of "Sala Grande" that was part integrating of the Monument.

This kind of reasoning represents an important step to apply an academic study to display matters. In fact, the part developed is peculiar for to communicate at Palazzo Vecchio's visitors that the Salone is changed and that they can find a piece of the old configuration in the Bargello. The acquaintance on the space that contained the Fountain is important in order to understand the Ammannati's masterpiece. So the theory part is the first step to develop a Site Specific Project. The digital modelling based on accurate 3D scanner survey allowed to use high quality models to verify and check the possible reconstructions and combinations from the single pieces to the possible original setup. The use of physical light simulation and of virtual sun positioning system, allowed the correct conditions to "see" the possible Ammanati's plots behind the "Fontana di Sala Grande" project.

Keywords: Culture Heritage, Florence, Juno's Fountain, Bartolomeo Ammannati, Sala Grande

Introduction

History of the Juno's Fountain

In the middle of the XVI Century, Florence is one of the capitals of the artistic and architectural culture. In these years a great works of transformation and embellishment of the city are carried out. The protagonists of this venture are Bartolomeo Ammannati and Giorgio Vasari under the aegis of Cosimo I Medici. Both

architects contribute to the transformation of Palazzo Vecchio, where Cosimo moved to establish the base of his government.

In 1555 Vasari is nominated chief of the *"Ducal fabbriche"*. Thanks to Vasari, Ammannati obtains his first main task as architect and artist for the Medici family.

At the beginning the works of renewal of the throne room is by Baccio Bandinelli and Giuliano di Baccio d'Agnolo, who designed the inside of the North wall there. The project was very ambitious. It forecasted a Medici's pantheon and the creation of a huge number of statues, ending on the South wall with an extraordinary fountain (fig. 1). When Vasari takes the place of yard director the works inside the Sala Grande stopped. They started again on the occasion of Francesco I's wedding in 1564.

When the project of Ammannati's fountain was presented to Michelangelo he wrote to the Duke:

*"I have seen the drawings for the rooms by Sir Giorgio and the model of the great hall with the design of the fountain of Messer Bartolomeo going to that place ... About the model of the room it seems to me low. It should, because you spend so much, be raised at least of 12 braccia... About the fountain by Messer Bartolomeo, which goes in that room, I think it is a nice fantasy, and it will be bound to succeed admirably"*¹.

Then this advice was applied by Vasari, while Ammannati's project wasn't lucky and was stopped.

The fountain was probably abandoned for a change inside the politics or for technical reasons. Anyway the fountain went in the villa of Pratolino first, then at Castello and finally at Pitti. The change of location suggests a change of meaning, before there was the celebration of Eleonora of Toledo, Cosimo's wife, portrayed as Juno in the group of statues composing the fountain.

Then when the marbles were transferred to the gardens they are referred to the fairy water circle.

Finally, at the end of the XX Century, the statues were placed under the vaults of the Museum of Bargello, this work was done to protect them from damages and injuries they received during the long abandon.

In 2010 it came the decision to attempt a reconstruction of the fountain, this work was to be completed for the opening of the exhibition *"L'acqua, la pietra, il fuoco - Bartolomeo Ammannati Scultore"* celebrating the Five hundred years from the birth of this important architect and sculptor. The exhibition was design by prof. Giacomo Pirazzoli, the process of data acquisition and virtual reconstruction of the group of statues was coordinated by prof. Giorgio Verdiani.

¹ FREY K (1923), *Il Carteggio di Giorgio Vasari*, München CCIV, notes 6, p.559

A brief story of the Fountain reconstruction²

The reconstructions involved scholars and researchers, working in different fields: art historians, restorers and architects. The operating conditions and the timeline programme of the interventions to prepare the exhibition have necessarily conditioned all the steps of survey and data processing.

Two different surveys were chosen: a first, global one, based on a phase shift laser scanner. This laser scanner surveys had the purpose of the creation of a three dimensional digital model. It was used a laser scanner Cam2 Faro Photon 120. Then, in order to cover the missing part, a second laser scanner survey campaign was planned; it was carried out with a more accurate scanner, based on laser-stripe technology, with limited operative range but capable to reach the “hidden” parts of the statues.

Finally a last survey campaign was programmed, using the laser-stripe unit, that operation allowed to document all the elements remained hidden until that moment.

The laser scanner used in the second and third campaigns was a Nextengine, an instrument based on laser-stripe technology³,

The opportunity to create a three dimensional digital model was fundamental; the process of data followed four main directives:

- the creation of a digital 3D model composed by continuous surfaces, suitable to represent the group of statues with enough realism;
- the realization of a series of 2D drawings;
- the creation of 3D digital models suitable for the realization;
- the creation of the base for the reconstruction simulation and all the needed support to the planning of the real reconstruction.

The definition of missing parts, the arch in particular, has required a careful study of the geometry present in the statues and a thorough analysis of many related elements.

In the first instance, the process was based on a two-dimensional reconstruction, a procedure based on "exclusions" where the lost arch has been thought to be curved according to circular and elliptical shapes. The model was also investigated by applying mathematical regression procedures.

At the end a definitive version was chosen as the best suited to reconstruct the original appearance of the fountain. The final arch model resulted in a significant coincidence with the previous reconstruction made by

² The technologies and the various passages made for the reconstruction are deeply explained inside the report wrote and presented on the occasion of the 18TH VSMM by Verdiani G., Pirazzoli G., Cerri G. (2012) *The Reconstruction of the “Fontana di Sala Grande” and some hypothesis about its original layout.*

³ ibidem

Detlef Heikamp⁴ (fig.2). This was an interesting confirmation of the overall quality level reached by the Heikamp research and on the other side it confirms the quality of the proposal developed in this research (fig.3).

The reconstruction as an exercise study

A crucial point, parallel to the reconstruction phase that also was kept on afterwards, it was to understand how Ammannati designed the South wall of the throne room. The resetting of the fountain involved questions about the original project of the south wall of "Sala Grande" that was an integrating part of the Monument. The investigation will be proposed to hypothesize about this meaningful monument and its possible asset inside the "Sala Grande" before Vasari's intervention (today called "Salone dei Cinquecento").

This exercise represents an important step to apply an academic study to display matters. In fact, the developed part is peculiar to communicate Palazzo Vecchio's visitors that the Salone has changed and that they can find a piece of the old configuration in the Bargello.

This study is again an example of multidisciplinary work. Various studies have been done on Palazzo Vecchio and for this purpose were collected with the aim to discover the old display of the room.

It is based on 3D surveys of the Salone de' Cinquecento, on geometrical surveys, on achievements and yard documents. In particular the studies by prof. Emanuela Ferretti⁵ and prof. Maria Teresa Bartoli⁶ were very useful.

Unfortunately the totalities of information aren't sufficient to define a historical model.

This approach based on composition to this possible, alternative reality of the Sala Grande does not aspire to have scientific basis, we recreate the context of the Fountain by Ammannati through fragments and suggestions

It was used a method similar to the way in which the artist and architects, in the 18th and 19th century during their *Grand Prix d'Italie*, drew the ruins and hypothesize the original appearance.

And we took the enlightened concepts of cataloguing and comparison following the example of Louis Nicolas Durand in "*Recueil et parallèle des édifices de tout genre, anciens et modernes, remarquables par leur beauté, par leur grandeur ou par leur singularité, et dessinés sur une même échelle*".

⁴ Detlef Heikamp, Bartolomeo Ammannati's Marble Fountain for the Sala Grande of the Palazzo Vecchio in Florence", in: *Fons Sapientiae: Renaissance Garden Fountains*, ed. Elisabeth MacDougall and Naomi Miller, Washington: Dumbarton Oaks, Trustees of Harvard University, 1978 (Dumbarton Oaks Colloquium on the History of Landscape Architecture, 5)

⁵ FERRETTI E. (2011) Bartolomeo Ammannati, la Fontana di Sala Grande e le trasformazioni del Salone dei Cinquecento da Cosimo I a Ferdinando I, in PAOLOZZI STROZZI B., ZIKOS D. (edited by), *L'acqua, la Pietra, il fuoco. Bartolomeo Ammannati Scultore*, ed. Giunti, Firenze

⁶ BARTOLI M.T. (2007) *Musso e non quadro*, ed. Edifir, Firenze

The hypothesis of the architectural configuration of the apparatus of the south wall of the Sala Grande with its fountain of Juno represents an exercise of composition that is based on the research and on the study of architecture and proportions of the sixteenth century.

References

As an exercise, it is not possible to know the final result, for there is no confirmation whether it is right or wrong, and proposals tend to infinity and give back all the many possible variables.

We considered together:

- the Ammannati's architectural works;
- his skills and references;
- the architectural characteristics of the Sala Grande;
- other similar examples of interior fountains at the 16th century.

Indeed for the elements of the Sala we must highlight the extensions of the room. The big difference between before (Sala Grande) and after (Salone de' Cinquecento) is the height of the ceiling, which was about 12 meters at the time of the Ammannati's project against the 18.5 meters reached after the Vasari's redesign (fig.4-5).

Two peculiar things to consider are the light and the water. In the time of Ammannati's project the entrance of light was allowed only by the openings in the walls of both the heads, which could not fulfil the need for lighting, with the result that the centres of the hall was always a dark area.

Probably Ammannati had studied the problem of the light in this room trying to face it using his previous experiences in scenography, mixing them with his sculptor behaviours, knowing the peculiar importance of light, true source of life for statuary. It is now possible to imagine Ammannati's Fountain in an environment completely different from the actual one: dark, low and wide.

The presence of water was a parameter determining the magnificence of power. An example of water inside the room is to be found in the Palazzo Farnese in Caprarola by Jacopo Barozzi from Vignola.

The common references for Florence and Caprarola were the nymphaeum along the walls in the patrician Roman houses, the thermal bath complexes, the triclinium in the imperial villas, temples and theatres.

The water, like a mirror reflecting light within the room, lights up the statues like a reflector.

The way to tilt the marbles forward, a sort of Ammannati's style, almost like they were coming out to seek light, has inspired some reflections on the type of lighting that was there to enhance the fountain. How the architect arranges the opens? What kind of effect it would obtain?

Through the 3D digital model of the fountain and working on a simple model of the original Sala Grande it was possible to experiment some openings in the wall, and simulate their relationship with the fountain. This was done using Autodesk 3D Studio Max with its Sun simulator tool (fig.6).

The use of physical light simulation and of virtual sun positioning system, allowed the correct conditions to "see" the possible Ammannati's plans behind the "Fontana di Sala Grande" project. For example, trying to

combine it with a Serliana window solution, it was possible to test how it would changed the room lighting and the appearance of the statues in a sort of "photo lapse" sequence simulated on 21st June 1555⁷ (fig. 7).

Site Specific characters

Understanding the artistic value of this masterpiece is fundamental to suppose how it articulated the back wall: the kind of openings and their size, the wall thickness, the presence or absence of a diaphragm or a fake wall that could reverse the perception of the main artwork, the type of basin and its relationship with the architecture, are other problems to solve and they are not easy to be interpreted at all.

The undertaken path, the social-cultural context, the models, the orders and the architectural situation of Palazzo Vecchio in the Half of XVI century represent the introduction to deal with an argument that it has not a scientific meaning but an exhibition purpose.

As said before, it is a composition exercise: the right proportions and the studying of the Renaissance architecture are the bases of all hypotheses. The lack of documents prevents the historical reconstruction, indeed the options are customized "alla maniera" of those artists that, during the Grand Tour d'Italie, provided rebuilding ancient ruins in their sketches, basing them on their capacity of observation and thanks to the deeply knowledge of history and technology of architecture. To define the criteria that drive the digital reconstruction the first meaningful passage is to identify the key elements in the fountain setup.

The following elements are the traces from where all the thinking starts (fig.8).

North Wall by Baccio Bandinelli and Giuliano di Baccio d'Agnolo⁸

The Ammannati's wall can be compared to this example. It is possible to speculate about the differences or similarities between the North wall and the possible South one.

Dimensions⁹

The throne room was 12 Florentine arms lower than today (about 6 metres) and the fountain was designed for an hall with that size and proportions

Width of the South wall¹⁰

Several works added during the centuries didn't allow knowing certain data.

It is not possible to determine how the exactly the width of the wall was in this part of the palace in Ammannati's age. In this side the width goes from 2,06m to 3,16m, so it is possible to suppose a dimension of about 3 metres.

⁷ The Autodesk 3D Studio Max Sun simulator tool as is well known doesn't allow going back freely in time, so this was the most interesting accessible date to test.

⁸ ALLEGRI E. CECCHI A (1980) *Palazzo Vecchio e i Medici*, ed. S.P.E.S. Firenze.

⁹ BARTOLI M.T. (2007) *Musso e non quadro*, ed. Edifir, Firenze

¹⁰ FERRETTI E. (2011) *op cit.*

*Irregular shape*¹¹

The trapezoid shape of the walls based on a Gothic lotto characterized the Sala.

Vasari designed the regularization of the Sala. Seen the relationship between the two masters, it is also possible to romanticize a similar “vasarian” solution in the Ammannati’s work.

*Windows*¹²

The opens are the other set of variables; they are linked to the inside prospect and the variation allows to bring the brightness inside. In some yard documents¹³ it is possible to find the word “taglio” (cut), it suggests the execution of a window or a niche in the wall¹⁴. The three existing windows on Via della Ninna could be an evidence for this question.

*Serlian*¹⁵

It is a leit-motif of Ammannati’s poetic. It is an elastic element and is adaptable in several contexts. If Palladio¹⁶ is the Venetian interpreter of the Serliana (or venetian window-finestra veneziana), Ammannati represents the Florentine one¹⁷.

The Basin

Its shape, dimensions and depth are fundamental, besides his position in the room. These elements could give a different aspect because the basin modifies the perception of the light.

The absence of others similar internal fountain makes difficult taking consisting references. The oval shape came from the example of the Juno’s fountain when it was placed in Boboli¹⁸.

¹¹ BARTOLI M.T. (2007), *op. cit.*

¹² MOROLLI G. (1994), *Palazzo Uguccioni e il foro mediceo. Un’idea ‘veneziana’ di Ammannati?*, in Del Turco N., Salvi F. (edited by) *Bartolomeo Ammannati. Scultore e Architetto 1511-1592*, Alinea, Firenze, 1995, Atti del Covegno 1994

¹³ FERRETTI E. (2011) *op. cit.*

¹⁴ FERRETTI E (2011), *ibidem*, The restoration works and refurbishment of Palazzo Vecchio (1865-1866) are described in a relation by Falconieri C, “Annali di storia di Firenze”, VI, (2011) ; <<Molto impattanti sull’immagine complessiva della sala sono inoltre le grandi finestre centinate aperte sulla parte sommitale dei due lati corti del salone, ritenute indispensabili dall’ingegnere per garantire un’adeguata illuminazione al vasto ambiente.>>. In the same essay he describes the works that define the current aspect of South head <<Nell’addossare alla parete sud la tribuna parlamentare - consistente in un articolato emiciclo in ferro e legno di cui il progettista delinea i caratteri costruttivi con dovizia di particolari - fu danneggiato il partito architettonico messo in opera alla fine del Cinquecento (paraste e nicchie), tanto da determinare il rifacimento dell’articolazione parietale (1874) su progetto di De Fabris, soluzione che ancora oggi è in situ con le parziali modifiche di Lensi nel secondo decennio del ‘900>>.

¹⁵ WILINSKI S.(1965), *La serliana*, in “Bollettino del C.I.S.A. Andrea Palladio”, VII ,Il part , pp. 115-125

¹⁶ BULGARELLI M (2008), *Leon Battista Alberti 1404-1472. Architettura e Storia*, Electa, Milano

¹⁷ FOSSI M (1968), *Bartolomeo Ammannati Architetto*, Morano, Napoli

¹⁸ ACIDINI LUCHINAT C. (1980), *Bartolomeo Ammannati Artefice di Fontane*, in Del Turco N, Salvi F. (edited by), *Bartolomeo Ammannati. Scultore e Architetto 1511-1592*, ed. Alinea, Firenze

About the Decorations

In this study we take care of the relation between the architectural partitions without considering the plastic parts.

Some Hypothesis (fig.9)

The solutions presented are divided in two groups: the first where the fountain is placed directly on the wall and the second where another wall is inserted.

The visual representations are simple, like sketches, in order to show the relations between the fountain and the architectural principles and for each example there are highlight pro and cons.

Hypothesis A (fig.10)

In this hypothesis we use the form and the articulation of the opposite wall by Giuliano di Baccio d'Agnolo and Baccio Bandinelli, according to the hypothesis made by prof. Ferretti¹⁹.

This continuity of language determines a homogeneous place and the relationship between fountain and architecture are balanced. The irregularity of the plan forces to model the architecture in order to deceive the eye creating the impression of a less inclined wall, but the problem among the shapes of the basin and plan is still unresolved. The perfect symmetry doesn't appear a right choice because the 'lexicon' by Ammannati is far from the authors of the north wall. We could notice similar characteristics but the use of them is not proper of Bartolomeo. The water theme is common in each example, and as we said is a reference to ancient Roman models and Moresque architecture.

Hypothesis B (fig.11)

It is a solution that creates a regular plan. The partition of wall following Bandinelli's model in the horizontal composition but modifying the size of the serlian. The niche, of the same size as the fountain, gives the module.

The side serlians maintain the arch as in previous examples, while the entablature becomes longer using the elastic characteristics of the serlian, as Palladio did in the Basilica in Vicenza. Here we highlight the ambivalence of the word "cut" used in the ancient records of the yard that in this case is a niche.

The reference is the fountain in Palazzo Farnese in Caprarola by Vignola and to Pirro Ligorio's fountain in Tivoli. The negative characteristics are the shadows on the statues, which are a paradox due to the fact that the marbles take life with the light.

Hypothesis C (fig.12)

This example takes references from the loggia of Villa Lante at Gianicolo by Giulio Romano for the series of serlians, where the white stucco works help the brightness of setting²⁰.

¹⁹ FERRETTI E. (2011) op. cit

²⁰ BELLUZZI A., FORSTER K.E.(1989) *Giulio Romano architetto alla corte dei Gonzaga Mantova*, in E. H. Gombrich, M. Tafuri, S. F. Pagden, C. L. Frommel, K. Oberhuber, A. Belluzzi, K. W. Forster, H. Burns (edited by), in *Giulio Romano*, ed. Electa, Milano

Also the correspondence between external and internal windows, like in Villa Giulia in Rome again by Giulio Romano, gives a good lighting and recalls the architectural theme of Verone. The negative elements are the uneven space between the north wall and the new one.

Hypothesis D (fig. 13)

In this last example it was used the module from the North wall applied on the second wall. That one, in order to be placed next to the fountain and its basin, is moved towards. The central opening is the same on the two walls while for the side windows have a size and a shape clearly referred to the typical aspect a window of this kind can show in a manual. The reference is the loggia on the piazza, as an internal square, the position of the fountain recalls the nympeum.

The negative elements are the difficult link between the twist and the orthogonal wall maybe tied by the oval shape of the basin. The brightness of the Concerto di Statue and the room is good; the effect of refraction of the solar radius finds in this kind of configuration its maximum effect.

In conclusion, this explains how the knowledge of the space that contained the fountain is important to understand the Ammannati's work and the real meaning of this masterpiece.

The theoretical part is the first step to develop an exhibition as Site Specific Project.

Having proper documentation is a necessary condition in order to have the possibility to study and, if it is possible, to virtually (or even physically) reconstruct the works of art to its original idea.

But in cases like that it is impossible to resolve the challenge telling the final word. The correct documentation came from a deductive method, following the great example from Detlef Heikamp, who created his theory without having the meaningful contribution of the technologies of our time, but supported by a deep and long study about the history of Art and Architecture of Bartolomeo Ammannati.



Fig. 1 – Venus, Juno's fountain by Bartolomeo Ammannati (photo by Stefano Mennonna)



Fig. 2 – Reconstruction of the Juno's Fountain by Detlef Heikamp. (HEIKAMP ,1978)



Fig. 3 – Comparison between Heikamp 's version and the reconstruction executed in 2011.

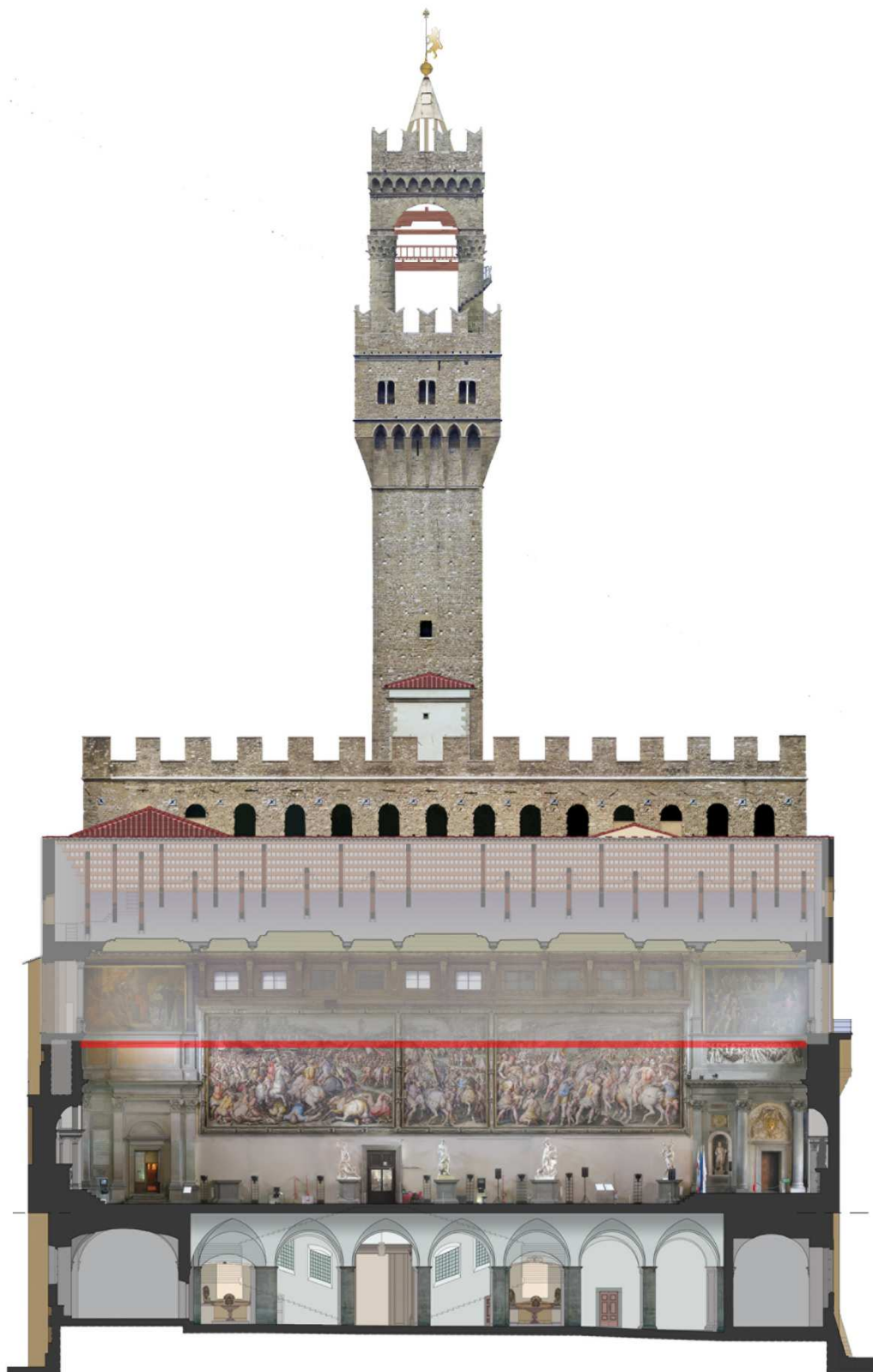


Fig. 4 – Palazzo Vecchio. The red sign shows the high of the ceiling before the Vasari's intervention (Ortophotomap by Sara Peluso).

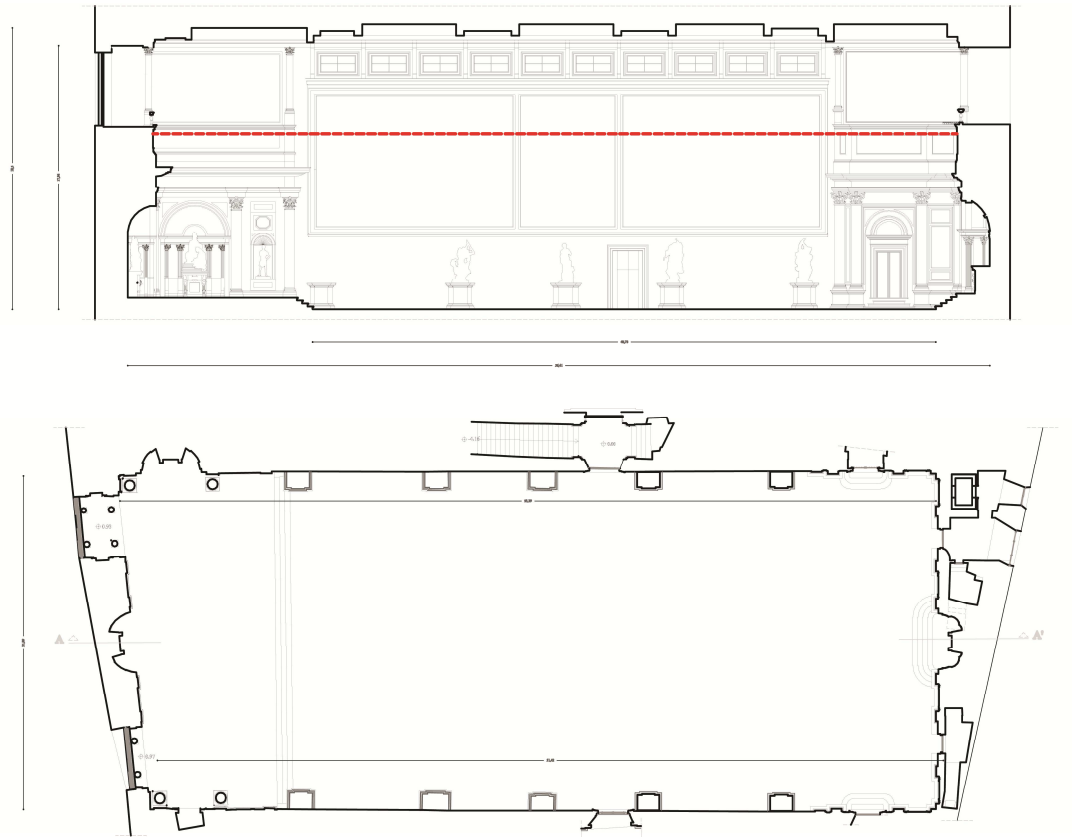


Fig. 5 – Salone de' Cinquecento. The red sign shows the high of the ceiling before the Vasari's intervention.



Fig. 6 – Digital reconstruction of the Ammannati's fountain

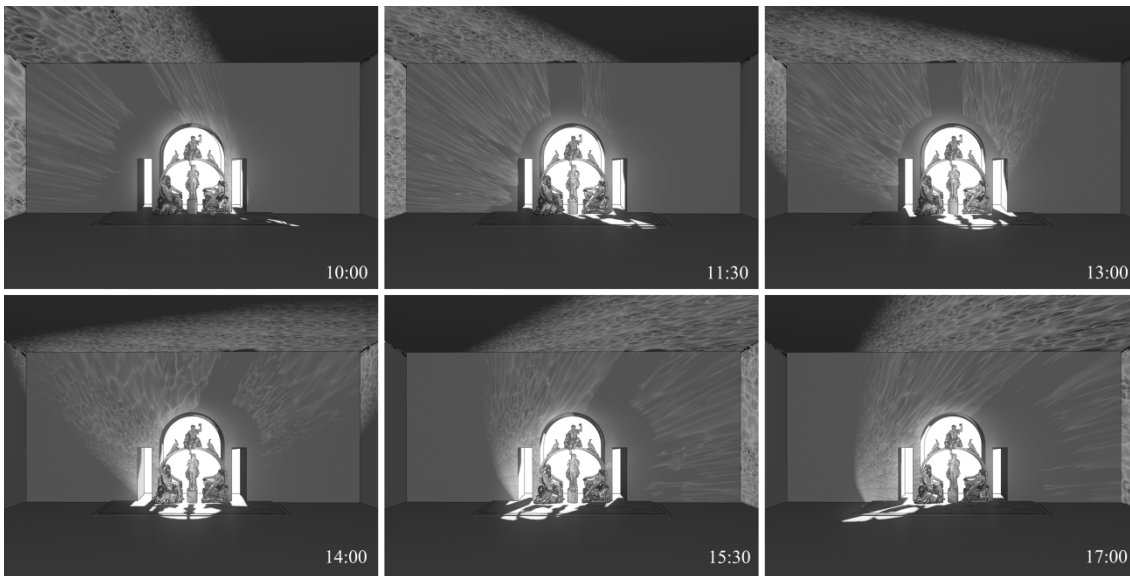


Fig. 7 – Simulation of lighting in 1555.

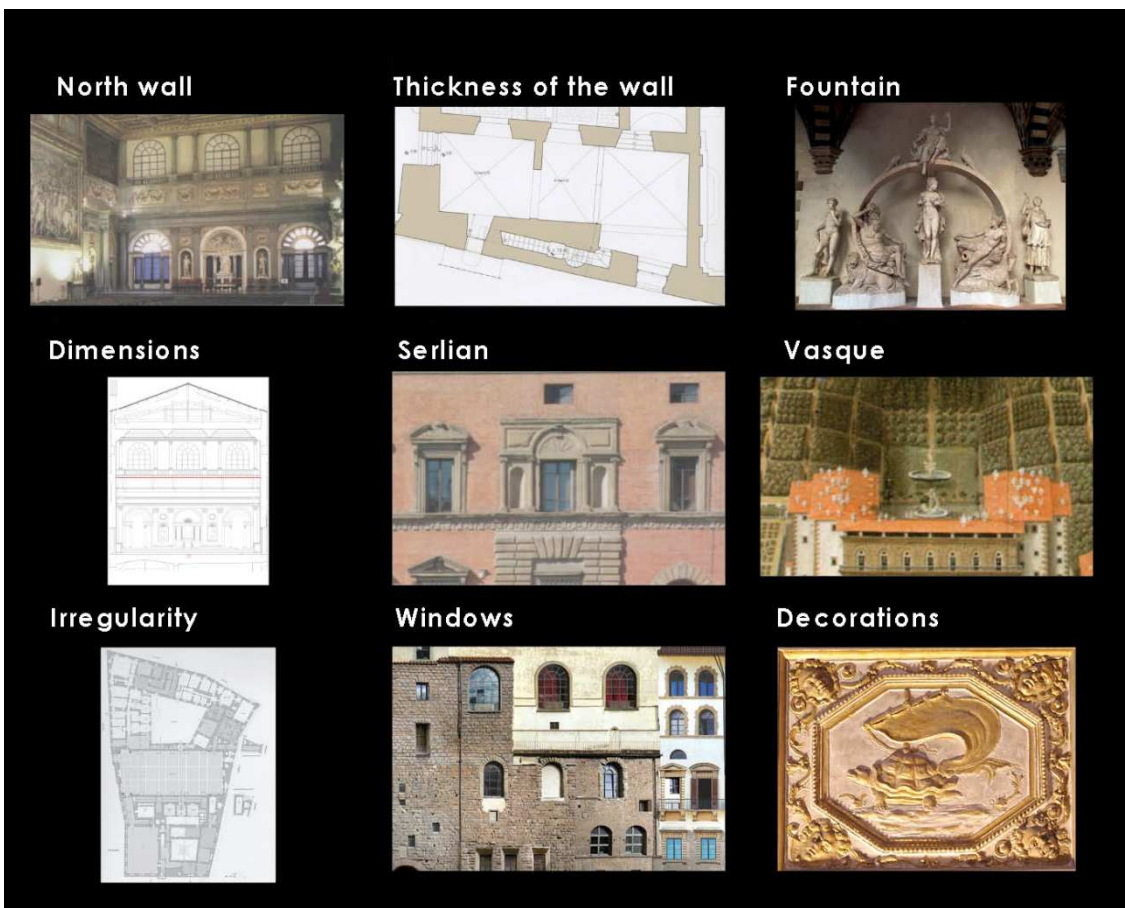


Fig. 8 – Peculiar characteristics of "Sala Grande".



Fig. 9 – Various hypothesis on the architectural display of South wall of “Sala Grande”.

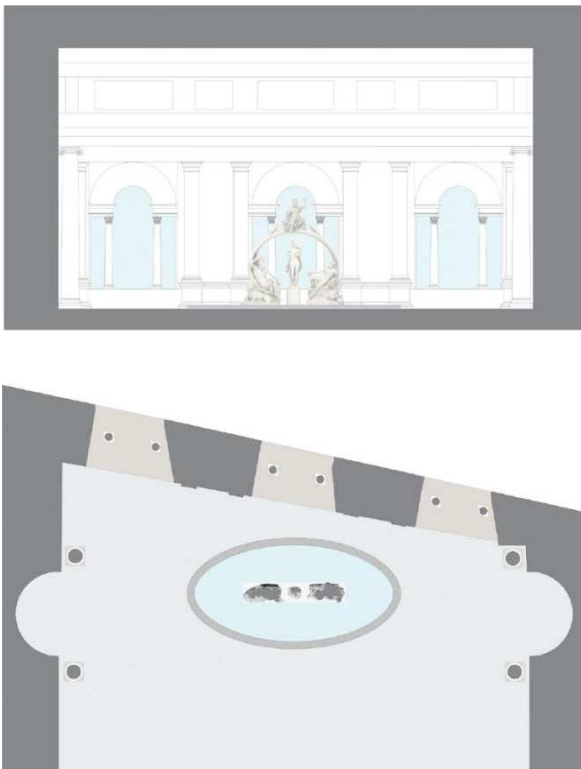


Fig. 10 – Hypothesis A.

REFERECENS



Baccio Bandinelli
Giuliano di Baccio D'Agnolo
north wall of Pal. Vecchio, Florence



Room of Fountain, Ista, Palermo



Sebastiano Serio
Veneziana (Serian), Libro Quarto



Domus romana



Barloмео Ammannati
Arco Benavides, Padova



Barloimeo Ammannati
Palazzo Firenze, Rome

Pros

LIGHT
SYMMETRICAL to the Baccio D'Agnolo's wall
HOMOGENEITY

Cons

IRREGULAR plan
Architecture far from Ammannati

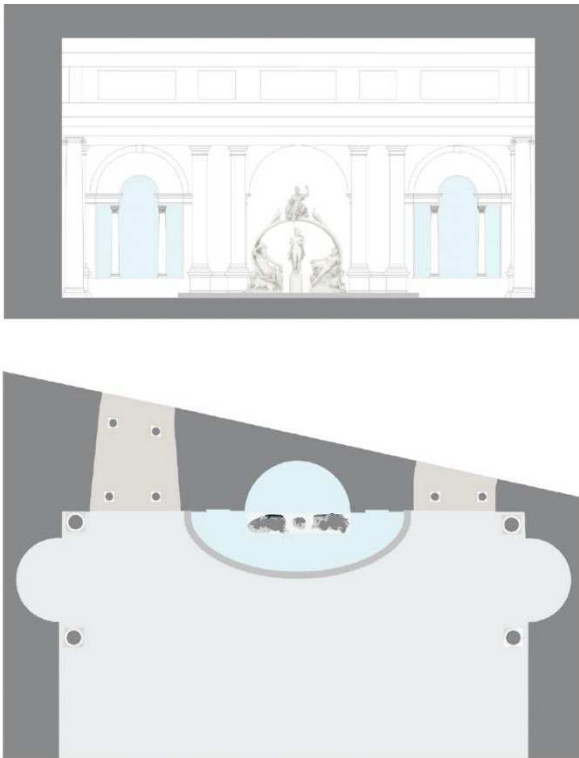


Fig. 11 – Hypothesis B.

REFERENCENS



Baccio Bandinelli
Giuliano di Baccio D'Agrolo
north wall of Pal. Vecchio, Florence



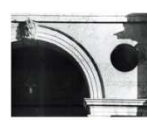
Piero Ligorio
Villa D'Este, Tivoli



Jacopo Barozzi da Vignola
Fontaine, Pal. Farnese, Caprarola



Sebastiano Serlio
Seriano, Libro Quarto



Bartolomeo Ammannati
Arco Benavides, Padova



Bartolomeo Ammannati
Palazzo Farnese, Roma
(Letarouilly)

Pros

Horizontal division similar to north wall
NICHE
HOMOGENEITY

Cons

WIDTH of the walls of the palace
LIGHT
SHADOW on the Fountain

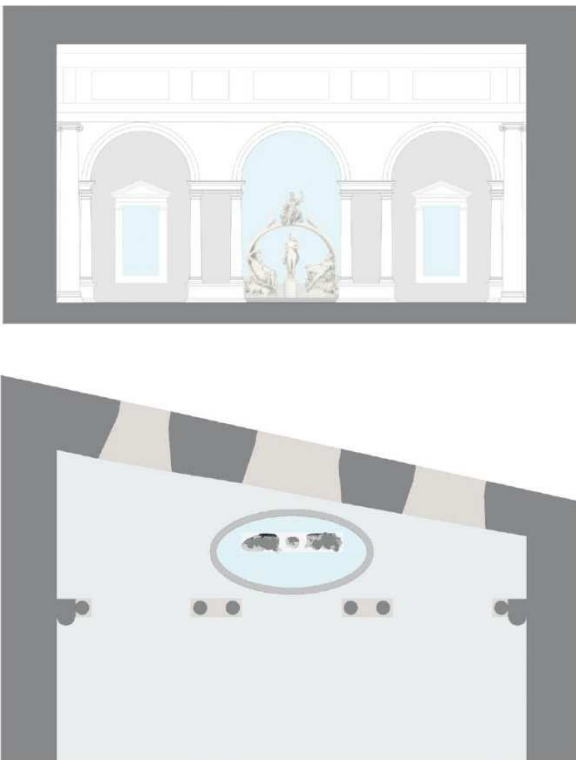


Fig. 12 – Hypothesis C.

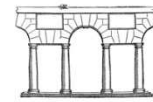
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Granada, Spain



Sebastiano Serlio
Rustic Order, Fourth Book



Bartolomeo Ammannati
Nymphaeum of Villa Giulia, Rome



Bartolomeo Ammannati
Arco Benavides, Padova



Cave of Villa Medici
in Pratolino, Florence
(Painting by Giusto Utens)

Pros

LIGHT
LOGGIA on the "Piazza"
Fountain included in the module

Cons

Proportion compare to north wall
Proportion compare to statues
Windows too big

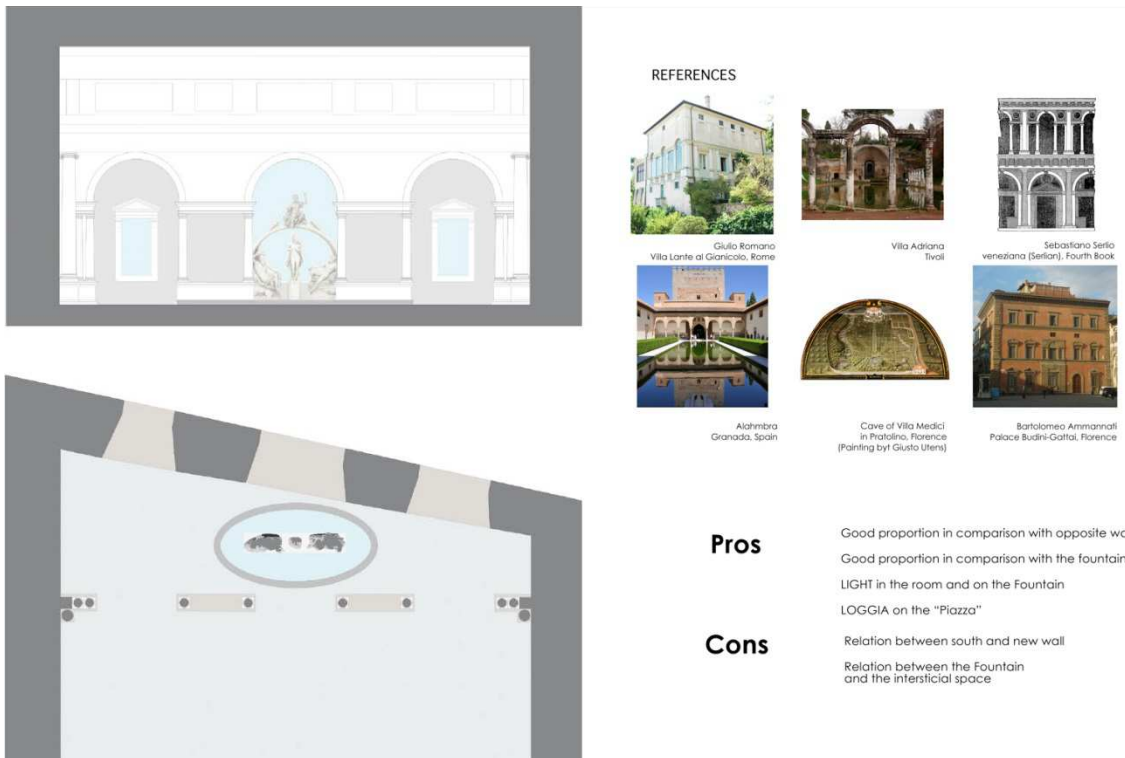


Fig. 13 – Hypothesis D.

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