

About the *Gonfalone* of the City of L'Aquila, or for an Hypothesis on the Use of *Camera Obscura* in XVI Century

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Abstract

The representation of the city of L'Aquila, in the banner, the so called Gonfalone, painted in 1579 by Giovan Paolo Cardone, is the oldest known view of the historic center. Contrary to what usually occurs in devotional representations, mostly symbolic, the banner gives a surprisingly detailed image, where the numerous elements still recognizable today appear strongly corresponding. The mountainous nature of the territory, even close to the city, allow to have points of view from above of the urban center that offer sights similar to the one represented. The contribution, based on the reconstruction of the historical and cultural context, as well as through a detailed analysis of the artifact and the critical comparison with the current panorama, proposes that a camera obscura has been used to realize the view depicted in the gonfalone.

Keywords: camera obscura, Gonfalone, points of view, perspective, photography.

Introduction

The banner of the city of L'Aquila, the so called *Gonfalone*, has been completed in 1579 by Giovan Paolo Cardone [Leonetti 2010], it is painted on silk, has such relevant dimensions (442x315 cm), and belong to the collection of National Museum of Abruzzo. The painting represents the four patron saints in the act of donation of the city to the risen Christ. The representation of L'Aquila fills the central portion of the banner and presents elements of particular interest, offering a bird's eye view of the historic center in the second half of the XVI century. Contrary to what usually occurs in devotional drawings, mostly symbolic, the banner gives a surprisingly detailed image, where the numerous elements still recognizable today appear strongly corresponding. Above all, the similarity of

the representation with the views actually possible from the hills around the historic center is surprising. This similarity led to the conviction that it was from those hills that the preparatory studies for the realization of the view were carried out. At the same time, however, it has also been hypothesized that there was a relationship with the representation of the city made by Ieronimo Pico Fonticulano (1541-1596), in the same years.

This paper, based on the reconstruction of the historical and cultural context, as well as through a detailed analysis of the artifact and critical comparison with the current panorama, proposes that a camera obscura has been employed to realize the view depicted in the *Gonfalone*.



Fig. 1. The Gonfalone of the city of L'Aquila by Giovanni Paolo Cardone, 1579.

The banners of the city of L'Aquila

Through historical sources, it is possible to document how the *Gonfalone* was part of a series that lasted for over a century, maintaining a stable iconography. The importance of these banners is testified by their use in particular circumstances, such as the Jubilee pilgrimages to Rome, and by the commitment to their realization of very important painters in the artistic scene of L'Aquila. The first known *Gonfalone* of the city dates back to 1462 [Clementi, Piroddi 1986, p. 91, 186, n. 2]. Its realization is linked to the seismic swarm that struck the city between November 1461 and March 1462, and is remembered in the Chronicle by Francesco d'Angeluccio di Bazzano [D'Angeluccio 1742]. The incessant tremors had exasperated the population, that had spent the winter in shacks and huts. Various devotional initiatives were taken, inspired by a Franciscan friar called Timoteo de Verona [D'Angeluccio 1742, p. 902]. In addition to prayers and processions, the friar ordered the realization of the banner, paid by the municipality, and made in honor of the Virgin Mary. It was completed on July 25, 1462 [D'Angeluccio 1742, p. 902]. The author of the chronicle also records the iconography, which anticipates the one represented by Giovanni Paolo Cardone, with the Virgin Mary, the city at his feet supported with his hands by the patron saints: Saint Pietro Celestino, Saint Bernardino, Saint Massimo and Saint Egidio. Below appears Blessed Giovanni da Capestrano. All was adorned with gold, blue and many other beautiful and fine colors [D'Angeluccio 1742, pp. 902, 903]. This first banner, of which we ignore the author, is followed by others, in whose realization we find engaged some of the most eminent painters of the artistic history of L'Aquila. First of all, Saturnino Gatti, who receives payments for a banner, but it was probably not intended to replace the previous one conserved in the church of San Bernardino [Simone 2015, p. 93], as instead had to do the one commissioned to Cola dell'Amatrice [Pezzuto 2018], about which the Municipality issued a resolution in June 1528 [Simone 2015, p. 93]. In the Jubilee of 1575, the banner was left as a gift to St. Peter's Basilica in the Vatican. For this reason arises the need to make a new one, and it is precisely for this that Giovanni Paolo Cardone is commissioned on June 27, 1578 by act of Notar Angelini [Simone 2015, p. 117]. In the act it is specified that this banner had to be in conformity with the one left as a gift in Rome. This specification

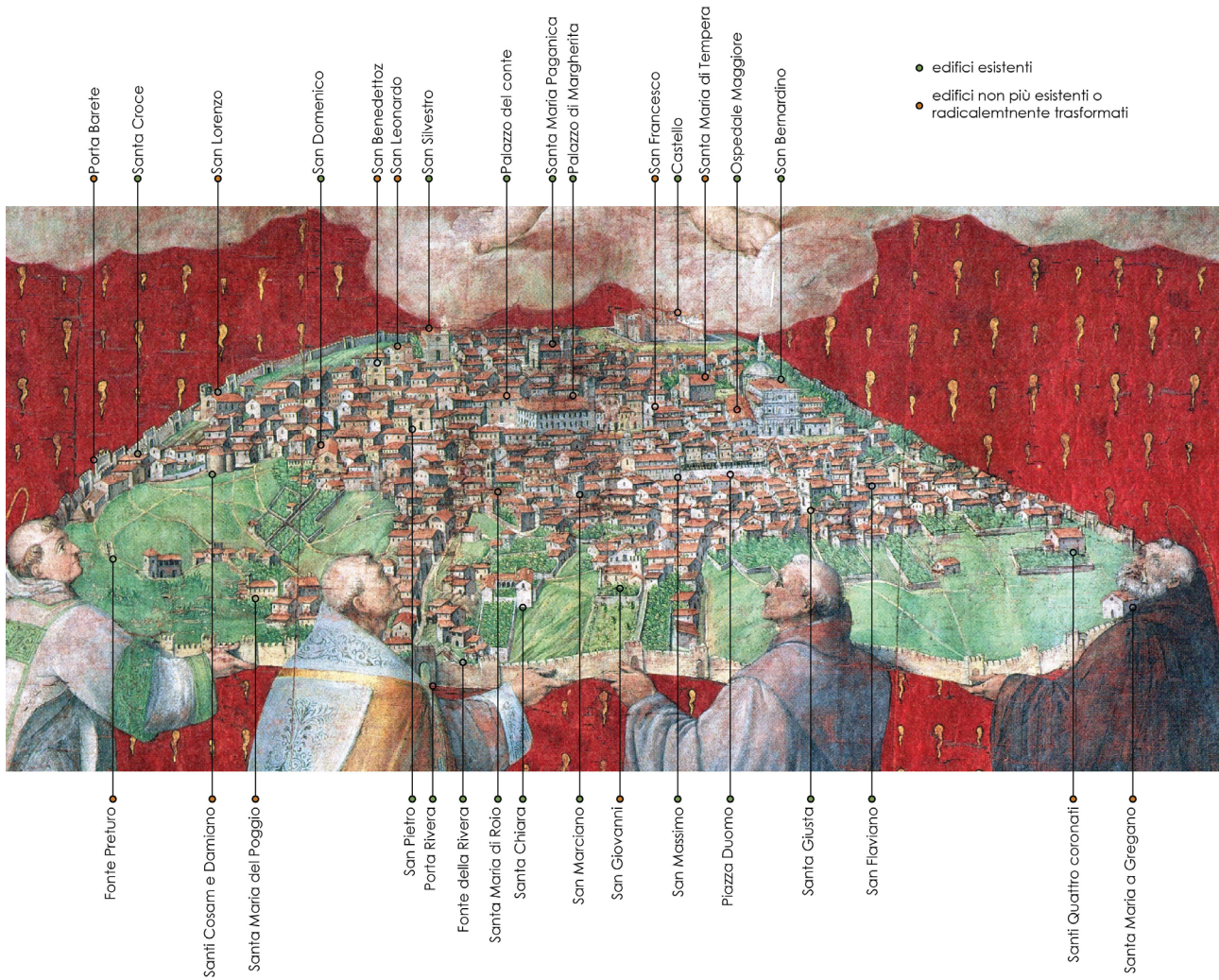


Fig. 2. The view of the city of L'Aquila in the Gonfalone. In evidence identifiable elements.

testifies the iconographic continuity of the various banners. The work was completed by 24 December 1579, as appears from the payments [Simone 2015, pp. 119, 120].

The representation of the city in the *Gonfalone* of 1579

The banner by Giovan Paolo Cardone depicts the city seen from the South, from a rather elevated point. Of the city represented, which stands out against the crimson background, we recognize first of all the perimeter, exactly coinciding with the city walls. There are only two significant exceptions: the first one in the surrounding of the castle, which lonely and isolated dominates from an apical position the urban core; the second one around the half of the right margin, close to Bazzano's gate, where the walls, which regularly runs around 700-710 m a.s.l., goes down to the altitude of 680 m, following the natural compluvium where the gate lies. The shape of the urban perimeter is roughly triangular, with the horizontal base being supported by the patron saints, and the other two sides tending to converge forming a vertex around the castle, following a substantially straight path on the right and describing a curve trajectory on the left. The building does not fill the urban perimeter, leaving large green spaces, partly cultivated, and reaching the walls only at the Bazzano's gate to the East, the Rivera's gate to the South and the Baret's gate to the West. This condition is well documented also by other further representations and various studies on urban shape [Clementi, Piroddi 1986; Spagnesi, Properzi 1972; Centofanti, Brusaporci 2011]. The buildings of the city are characterized by the earthy color of the tiles that alternate with the light colors of the plaster. The scale of the buildings is substantially constant and remains consistent throughout the representation. Most of the buildings have no particular features: the holes are usually rectangular, with an absolute prevalence of solids on voids. From the urban fabric emerge a number of churches, generally characterized by horizontal crowning facades, rose windows and bell towers. By carefully analyzing the image we can identify numerous architectures, some of them still existing, others disappeared or radically transformed that can be identified in ancient maps (fig. 2). Among these, those that stand out most are the castle, which has already been mentioned, the Basilica of San Bernardino, on the left, of which stands out particularly the design of the facade, designed by Cola dell'Amatrice in 1528, as well as the dome and the towering bell tower,

and the Palazzo di Margherita, with its tower facing the square and an absolutely greater size than the surrounding buildings. Another prominent element is the large market square, characterized by the presence of wooden porches and stalls of shops, as well as the cathedral of San Massimo, of which we do not see the facade, but we recognize the southern front and the roofs and we can identify the three-aisled plant, the great transept and the bell tower.

Other buildings that we can identify with sufficient certainty are the Ospedale Maggiore, next to San Bernardino, the church of Santa Maria di Tempera, still left, the church and the convent of San Francesco on the opposite side of the square of Palazzo di Margherita and the Palazzo del Conte, now called Palazzo Pica-Alfieri. In the northern part we can recognize the churches of Santa Maria Paganica, San Silvestro and San Leonardo di Porcinaro, San Benedetto and San Pietro; on the southern side we distinguish the bell towers of San Marciano and Santa Maria di Roio, the convent of Santa Chiara, the Fonte della Rivera and the Rivera's gate: the numerous references indicate that the image is not an idealized representation, but a real and realistic view, which returns a very precise urban geography.

Because of the topographical correctness of the representation of the city, several authors have considered that the image has been elaborated starting from the relief in plan made in the same years by Ieronimo Pico Fonticulano [Simone 2015, p. 106].

Problems of the use of plants for the realization of the view

The two plants of the city due to the architect and treatise Ieronimo Pico Fonticulano are the oldest known. The first one, made after 1578 [1] is the *Plan of the city of L'Aquila*, drawn in pen on paper, and included in the manuscript known as *Geometria* [2]. The second is an engraving, made and printed by Iacopo Lauro in November 1600, from a design by Pico Fonticulano, an undoubtedly earlier design, in reason of his departed in 1596.

Due to the dating of the *Gonfalone*, we can consider as a possible starting point only the plan included in the manuscript. The other plan, the one engraved by Iacopo Lauro is certainly later, as indeed it is very probable, although not completely documentable, that the drawing on which it was made is also later to 1579. This drawing, in fact, is probably a re-elaboration of that which had to

be sent to Rome to make it painted among other cities in the corridor of the palace of his Holiness (the Vatican Gallery of Maps), paid to Fonticulano 10 ducats on 27 June 1581 [Riviera 1905, p. 116]. The drawing of the manuscript is indeed very schematic, and although the circuit of the walls and the main roads have been measured [Centofanti 1996], everything else is returned in an idealized way through the checkerboard scanning of the main streets and the ordinary ones. The presence of the cells filled with their number, and the fountains, marked by the rounds, allow us, however, to identify numerous corresponding points between this plant and the banner (fig. 3).

Observing the layout of these points, also leaving aside some approximation, a series of problems emerge. First of all the lack of correspondence of the geometries of the perimeter of the city walls: in the plan is very evident the offshoot that surrounds the Campo di Fossa (fig. 3), completely absent, or at last just visible in the banner. Another problem, much more serious, concerns the reciprocal position of the recognizable elements. Assuming, for example, as a reference the vertical alignment between the Palazzo di Margherita and the church of Santa Maria Paganica, the point of view would be located to the southwest of the city (fig. 3). As a result, for example, the castle should be on the left of this axis, at last aligned with it, instead in the banner is on the right. Assuming instead the vertical alignment between the castle and the cathedral, the position of the churches of San Flaviano and Santa Giusta is reversed, and would be incompatible, for example, the vertical alignment of San Pietro and San Silvestro. But perhaps, even more than this type of geometric inconsistencies, it is worth highlighting that in the view of the banner there is no evidence of the orthogonality of the roads, which is instead the dominant theme of the plan. Finally, Ieronimo Pico Fonticulano in his survey of the city does not report any altitude information that instead in the *Gonfalone* appears very accurate.

The possible points of view

The main conclusion from the analysis of the *Gonfalone* and the comparison between the view and the plans is that it is not possible to identify a single point of view that is completely consistent with the image. At the same time, however, in the literature it is easy to find evidence



Fig. 3. The plan of L'Aquila by Ieronimo Pico Fonticulano, about 1579.

of the widespread opinion that, the one of the *Gonfalone* is a view from the hill of Monteluco [Simone 2015, p. 106]. In addition to this, there is another observation point historically documented by the sources, namely the convent of San Lorenzo della Serra [3]. These two peaks, both south of the city, respectively 950 and 990 m a.s.l., are just over a kilometer apart, being on the two sides of the Roio Poggio pass, a locality of the immediate contour of the city, although higher than a few hundred meters.

The dense pine forest that since the late XIX century grows on the hill of Monteluco makes it impossible to directly experience the point of view, but rising above the trees with a drone [4], it has been possible to take pictures that are satisfactorily approximate to it. Even the ruins of the convent of San Lorenzo are located in a pine forest, which however thin out just a few dozen meters far.

Comparing the images taken from both points of view with the view of the *Gonfalone*, the findings are surprisingly accurate.

In particular, comparing the photograph from Monteluco with the view of the *Gonfalone* (fig. 4) it is possible

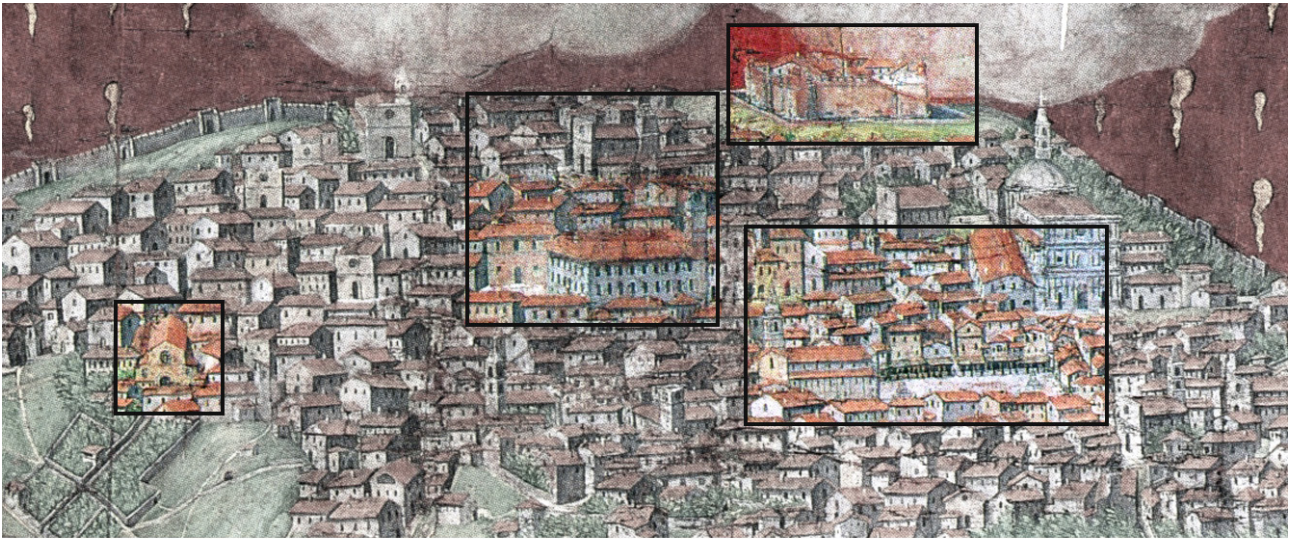


Fig. 4. Comparison between the view of the city of L'Aquila in the Gonfalone and a photograph taken from the hill of Monteluco.

to appreciate how the castle, the Palazzo di Margherita and the Palazzo del Conte, present themselves with the same angle. The same goes for San Domenico, whose image is perhaps the most responsive, for the cathedral of San Massimo and Santa Maria Paganica. There are vertical alignments between the latter and the Palazzo di Margherita, as well as between the cathedral and San Francesco, and as well as between the eastern front of Piazza Duomo with the Ospedale maggiore and the facade of San Bernardino.

Turning instead to the view from San Lorenzo (fig. 5), we can see how the reciprocal position between the churches of San Domenico, San Pietro and San Silvestro comes to be significantly similar to that which we see in the banner, as well as the one of Santa Giusta and San Flaviano, which was impossible from Montelucio. San Bernardino and the Ospedale Maggiore, as well as the Rivera's gate and the Fonte della Rivera, presents angles that coincide with those found in the banner.

Even evaluating the results in the plan (fig. 6), we can see how the geometric conditions about alignments and positions of the identifiable buildings are consistent alternately with one or the other point of view.

It would therefore seem to be a recomposition of images elaborated from two different points of view.

About the possible use of a camera obscura

The optical device, named camera obscura for the first time by Kepler in 1604 [Kepler 1604, p. 451], is based on a phenomenon already known in the classical era, but whose use would seem to take hold in Italy during the Renaissance. Famous are the representations of the device by Leonardo da Vinci in the Codex Atlanticus [5], dated to 1478, in which already appears a convex lens placed at the pinhole to magnify the brightness. However, the first descriptions in the treatises appear about a century later. The first is the one by Daniele Barbaro in his *La pratica della prospettiva* [Barbaro 1569] in which the phenomenon is described in sufficient detail. The text proposes the use of a lens to improve brightness, in particular the use of a thick lens, such as those used for glasses of the elderly [6]. The experience is presented as a possibility intended for the study of perspective, but not directly to representation, in fact the author proposes to use a sheet of paper, to be moved to focus

the image, but not to draw [7]. The author also remains silent about the whole problem of reversing the image. Only four years later, Egnazio Danti [Centofanti 2016] returns to deal with the phenomenon in his translation of the Perspective by Euclid, in which, in relation to the first theorem, proposes in the annotation as an explanatory experience to drill a hole in the shutter of a window, eliminating all other light sources so as to see on the opposite wall the projection of what is beyond the window [8].

In addition to practical warnings, the author highlights the reversal of the image that will appear upside down. The author proposes as a solution to the problem the use of a mirror, of which, however, he does not clarify geometry and material [9].

Giovan Battista Della Porta (1535-1615), a Neapolitan philosopher of the sixteenth century, who extensively deals with optics and in particular lenses and mirrors in the seventeenth book of his *Magie Naturalis* [10], seems to restart exactly from this last point. The author deals with the reversal of images in mirrors already in Chapter II, proposing a first solution with the use of flat mirrors [Della Porta 1677, p. 475], but it is in the following, which deals with the concave mirrors, that an effective solution is provided. Chapter VI is entirely dedicated to the camera obscura; after a description of the room, similar to the others, the author adds the advice to add a crystal lens in order to improve not only brightness, but sharpness too [Della Porta 1677, p. 485]. However, the image is still upside down [11].

Discarded the option of using multiple flat mirrors to straighten the image because they reduce too much brightness and sharpness, the author proposes the combined use of two convex lenses solving the optical problem for geometric aspects and image quality, using basically glasses lenses.

The treatment of Della Porta is not only maintained at a theoretical level of simple speculation, on the contrary, it abounds with practical indications intended to encourage the replicability of experience. The application for purposes of representation is quite explicit. The author emphasizes that by applying this method even those who are not able to paint can achieve excellent results in drawing and colors [Della Porta 1667, p. 485].

There are further indications in the text on the use of mirrors and lenses and their production. The importance of Della Porta's contribution, also because of the

1 - San Domenico, San Pietro, San Silvestro



2 - San Bernardino e Ospedale Maggiore



3 - Porta e Fonte della Rivera



4 - Santa Giusta e San Flaviano

Fig. 5. Comparison between the view of the city of L'Aquila in the Gonfalone and a photograph taken from the hill of San Lorenzo della Serra.

great diffusion of *Magie Naturalis*, is evidenced by the explicit reference of Kepler in *Vitellionem paralipomena*: “*Hanc artem primus, quod sciam, I. Baptista Porta tradidit, magiaeque naturalis non minimam partem fecit. Sed experientia contentus, demonstrationem non addidit. Atqui vel hoc solo experiment potuissent Astronomi statuere de sua deliquii solaris imagine*” [Keplero 1604, p. 51].

Overall, the various chapters of Book XVII provide all the elements useful to achieve the necessary device to realize a wide and detailed view at a great distance, as the one in the *Gonfalone*.

The key character to connect L'Aquila, the Neapolitan philosopher, and Egnazio Danti is still Ieronimo Pico Fonticulano. The link between Pico Fonticulano and Egnazio Danti is due to the experience of the Gallery of Maps in the Vatican [Malafarina, Angeli 2006], of which Danti is in a sense the director, and in which Pico participates by sending the drawing of the city. Of this contribution is charged by the Municipality, and paid 10 ducats on 27 June 1582 [Rivera 1905, p. 116]. We also know that Fonticulano certainly goes to Rome for the Jubilee of 1575 and probably also later. We can also attest the presence of Fonticulano in Naples where it is possible, although not documentable, that he met Dalla Porta, which housed in his house an academy; his house was very frequented also by nobles and intellectuals from all over the kingdom of Naples and his circle was considered an attraction of the city [12].

Finally, as for the practical aspect of the use of lenses, we know that at the court of Margherita d'Austria, it was very easy to find them, especially considering that also Daniele Barbaro recommends using lenses taken from glasses. Indeed, the inventory of Margherita of Austria's belongings, drawn up after her death, includes a large quantity of glasses. Excluding the pair circled with gold and the 12 pairs that Margherita had with her at the time of her death in Ortona [Bertini 2010, p. 36], there were fifty-one pairs in L'Aquila, at her palace [Bertini 2010, p. 76].

Further evidence of how much this object had spread at that time comes from the large canvas of the crucifixion in San Bernardino, in which, the Brussels Aert Mytens, native of the Spanish Netherlands of which Margherita had been governor between her two stays in L'Aquila, painting in 1600 an iconic pair of glasses, [D'Antonio, Maccherini 2020, pp. 35-37, fig. 41].

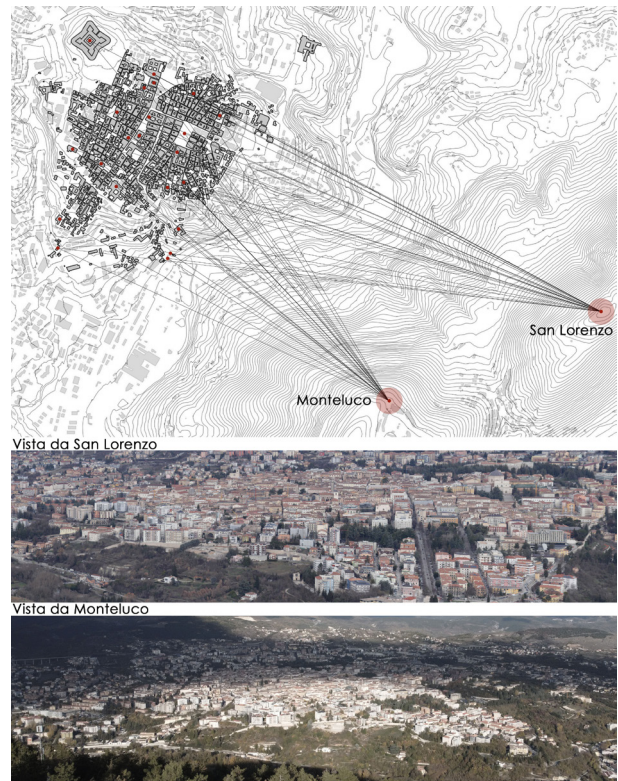


Fig. 6. Plan of the two points of view used for the realization of the view.

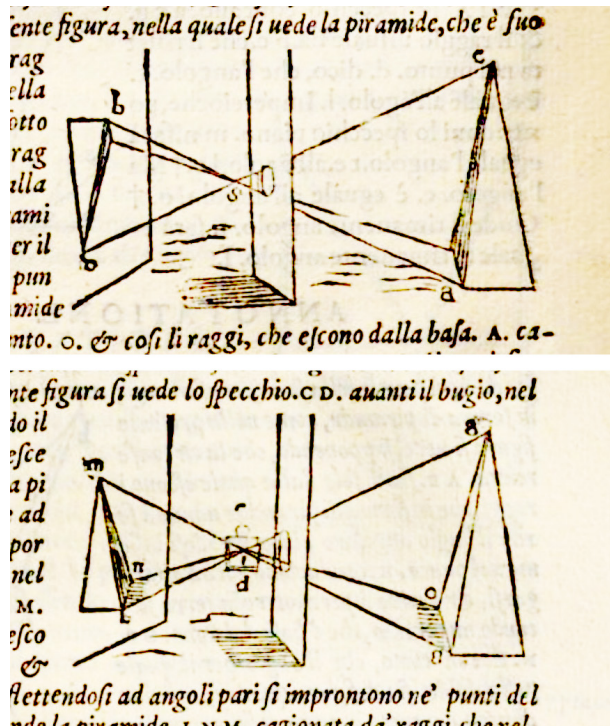


Fig. 7. The problem of the reversal of the image and its theoretical solution in the illustrations by Egnazio Danti [Danti 1573, pp. 82, 83].

Conclusions

The *Gonfalone* by Paolo Cardone offers a representation of the city of L'Aquila not idealized but overall iconic, both in the monuments and in the urban fabric. It can be excluded that the image was made starting from the Plant of L'Aquila included in the manuscript of Ieronimo Pico Fonticulano, either for the lack of information contained in it, either for it is not possible to determinate a single point of view. At the same time the comparisons between the *Gonfalone* and the photographs taken by Monteluco and San Lorenzo provide clear evidence of the real points of view, and highlight how the representation derives from the composition of two different points of view.

There is no documentary evidence that confirms the hypothesis of the use of a camera obscura for the realization of the view in the *Gonfalone* of 1579. At the same time, however, it has been shown that the use of the camera obscura was known and widespread in the second half of the sixteenth century, and how figures in the cultural field of L'Aquila, first of all Ieronimo Pico Fonticulano, could have theoretical and practical notions, and tools –such as lenses availability of glasses for the elderly– to realize and use that optical device. Therefore, if the hypothesis concerning the use of a camera obscura cannot be documented, it seems to be the only one that can validly justify the methods of realization of the painting of the *Gonfalone*.

Credits

With the exception of the *Introduction* and *Conclusions* edited by Stefano Brusaporci, the text, the photographs and the graphic elaborations are edited by Luca Vespasiano.

Notes

[1] The manuscript, in which the plan in question is included, on page 196 recto, refers to the death of the bishop of Aquila Juan de Acuna, occurred in July 1578, so the plan should be later.

[2] The manuscript is conserved in the Regional Library Salvatore Tommasi di L'Aquila, in the manuscript collection, under the signature Ms.57.

[3] At San Lorenzo, Fortebraccio da Montone set up his camp, during the siege of the city from May 1423 to June 1424.

[4] A DJI Mini 2 drone was used for the photographs (sensor: 1/2.3" CMOS; lens: FOV: 83, format 35 mm equivalent: 24 mm, aperture: f/2.8).

[5] The two drawings are on pages 5 and 34 recto. The entire codex is available in digitized version at <<https://codex-atlanticus.ambrosiana.it/>> (accessed June 4, 2023).

[6] Here is the original text: "*piglia un'occhiale da vecchio, cioè che habbia alquanto di corpo nel mezzo & non sia concavo, come gli occhiali da giovani, che hanno la vista curta. & incassa questo vetro nel bucco assaggiato*" [Barbaro 1569, p. 192].

[7] Can be inferred from the following passage: "*piglia poi uno foglio di carta, et ponlo incontra il vetro, tanto discosto, che tu veda minutamente sopra'l foglio tutto quello che è fuori di casa, il che si fa in una determinata distanza più distintamente*" [Barbaro 1569, p. 192].

[8] The explanation continues with the exposure of the problems that arise: "*Si deve avvertire, che all'incontro della finestra fa mestieri, che il muro sia bianco, & pulito, accio vi si possano improntare le imagini, che vengono di fuori per il picciolo bugio dalle cose vedute, ma quando il muro fosse impedito, si potrà stendervi un lenzuolo bianco, che farà il medesimo effetto; In oltre bisogna che il sole non percuota nel detto bugio, perché disgregheria i raggi visuali, ma si bene percuota nelle cose da vedersi, acciò i raggi imprimino i colori più gagliardamente dentro nel muro della Stanza. Terzo si deve avvertire che tutte le cose, che si vedranno riflesse nel detto muro saranno volte sotto sopra; del che ne sono cagione i raggi, che vanno à percuotere nel muro à retta linea, & quelli che si muovono di sotto percuotono da capo il muro, & quelli di sopra da piedi, & li destri alla sinistra, & li sinistri alla destra*" [Danti 1573, p. 82].

[9] Here is the original text: "*Hor se vorremo, che l'imagini tornino per il*

verso loro, metteremo uno specchio sotto il bugio dentro alla finestra come nella presente figura si vede lo specchio .CD. avanti il bugio, nel quale percuotendo il raggio. AC. che esce dalla punta della piramide si riflette ad angoli pari, & riporta detta punta nel muro al punto. M. così i raggi, che esco no da' punti. G. & O. della basa riflettendosi ad angoli pari si improntano ne' punti del muro. N L. La onde la piramide. L N M. cagionata da' raggi, che nello specchio percuotendo si riflettono, & non caminono rettamente, vien figurata per il verso suo come sta quella, che la cagiona. È ben vero, che queste imagini che sono cagionate da' raggi riflessi non si vedono così scolpite, ne di si vivi colori, come fanno quelle che da' raggi retti sono causate. Perché i raggi visuali riflessi, sono più debili, che non sono i retti" [Danti, 1573 p. 83].

[10] There are many printed editions and translations from the Latin of this work, composed only of four books in the first edition of 1558 and subsequently enriched and expanded up to twenty books, among which the seventeenth is exclusively dedicated to optics. In particular, the Italian translation and the English one are mentioned in the bibliography.

[11] The text continues: "If you will that all shall appear right, This is a great secret: many have tried it, but none could obtain it: For some setting Plain Glasses obliquely against the hole, by reverberation against the Table, they could see some things somewhat direct, but dark and not discernable. I oft-times by putting a white paper obliquely against the hole, and looking just against the hole, could see some things direct: but a Pyramis cut obliquely, did show men without proportion, and very darkly. But thus you may obtain your desire: Put against the hole a convex Glass; from thence let the Image reflects on a Concave-glass: let the Concave-glass be distant from the centre, for it will make those Images right, that it receives turned, by reason of the distance of the centre. So up on the hole and the white paper, it will cast the Images of the Objects so clearly and plainly, that you will not wonder a little" [Della Porta 1658, p. 364].

[12] Pompeo Sarnelli, in the introduction of the translation of the *Magie Naturalis* [1677, p. VIII-XII] writes: "*Per commodamente filosofare, e con gli amici, e con se stesso, egli nella Città per i primi mantenea nel suo Palagio sito nella gran strada, hoggi detta di Toledo l'accennata Accademia; [...] Era nelle conversazioni amabile, e motteggievole; ma senza livore. Chi una volta era ammesso ad ascoltare i suoi discorsi, non mai satio poteva più allontanarsene, in modo che veniva chiamato le Delitie della nostra Città, e veramente era tale, mentre la sua casa veniva di continuo frequentata dai primi nobili signori di questo regno*" [Dalla Porta 1677, pp. XI-XII].

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