

Defending a border. Piedmont and Lombardy cities in the first half of the Seventeenth Century

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# Draughtsman Engineers Serving the Spanish Monarchy in the Sixteenth to Eighteenth Centuries

Alicia Cámara Muñoz (ed.)



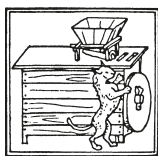
FUNDACIÓN JUANELO TURRIANO



*JUANELO TURRIANO LECTURES ON THE HISTORY OF ENGINEERING*

**Draughtsman Engineers  
Serving the Spanish Monarchy  
in the Sixteenth to Eighteenth  
Centuries**

Alicia Cámara Muñoz (ed.)



FUNDACIÓN JUANELO TURRIANO



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# **DRAUGHTSMAN ENGINEERS SERVING THE SPANISH MONARCHY IN THE SIXTEENTH TO EIGHTEENTH CENTURIES**

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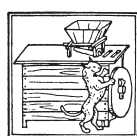
*El dibujante ingeniero al servicio de la monarquía hispánica. Siglos XVI-XVIII (DIMH)*

[draughtsman engineers serving the Spanish monarchy in the sixteenth to eighteenth centuries]

Funded by the Spanish Ministry of the Economy and Competitiveness

Head researcher, Alicia Cámara Muñoz

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## FOREWORD

From the time of the Renaissance when *engineers* began to be spoken of until the specialization of the branches of engineering which took place in the 18<sup>th</sup> century, history has told us a lot about the uses these professionals made of drawing. Some fragments of this history are related in these pages, which are the result of a research project that seemed to be necessary because drawing was involved in all the studies carried out on the history of engineering in the Modern Age. Research had to turn its spotlight on these images, which is why we assembled an interdisciplinary team to develop the project *El dibujante ingeniero al servicio de la monarquía hispánica. Siglos XVI-XVIII* [draughtsman engineers serving the Spanish monarchy in the sixteenth to eighteenth centuries] (HAR2012-31117), financed by the Ministry of Economy and Competitiveness. This book is the result of the project.

The collection *Juanelo Turriano Lectures on the history of engineering* is the ideal vehicle for publishing the results of this research, previously in the original language and now in English.

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# Preface

ALICIA CÁMARA

In 1590 a Flemish youth was discovered measuring the walls of La Coruña. We don't know what happened to him afterwards, but he was probably discovered as a result of the control that the *corregidor* [local, administrative and judicial official in the city designated by the king] had to exercise to ensure that no one should draw the city walls, especially in threatened cities like La Coruña which had been attacked by the English the year before. Measurements and drawings guaranteed the exactitude of the information on city walls and frontiers, whether one's own or those of the enemy. Drawing skills were not always imperative when the need was urgent, and we imagine that the drawings of the Flemish youth who was measuring the walls were not very good, but they would have given invaluable information to the English enemy. In the opposite case, among the papers of García de Loaysa conserved in the National Library of Spain, there is a clumsy but expressive drawing of the Tower of London, which accompanied a map of the European scene through which the Spanish armada was going to move against England. The world of spying could permit the lack of perfection in the representations, but the king's engineers had to make exact drawings, with no concessions to invention with the exception of adornments and cartouches, and if they were not good draughtsmen they had to have recourse to capable painters. Thus for example, when Giovan Antonio Nobile was designated Chief Engineer of the kingdom of Sicily in 1572, he had to look in all the places which were going to be fortified for painters who were masters of colour and drawing, to make the plans of the projected fortifications and the territory in which they were to be built. The uses of images can be approached from so many different scientific disciplines and this one of the exercise of power over territories is just one more, but we believe that it is determinant to evaluate the important role of engineers' drawings in the government of states throughout the Modern Age.

The engineers drew, but these drawings had to be seen, analyzed, debated and decisions on the execution of the projects had to be made; and this was the job of the king and his counsellors. We know that drawing and the science of fortification were part of the education of princes and noblemen, and even emperors, as Francisco de Holanda reminds us when talking of Charles V and Maximilian. In *De rege et regis institutione*, the work dedicated by Juan de Mariana to the education of Phillip III, the prince was recommended to learn geometry and arithmetic, among other reasons to «construir edificios y fortificar de acuerdo con la ciencia de los castillos y baluartes» [construct buildings and fortify according to the science of castles and bastions]. And the fact is that territories and fortifications, explained and represented in maps, with chorography and drawings, only existed if there was an image with which to recognize and travel through the dominions. For example, Sancho de Londoño wrote in 1568 that to understand a battle field it was necessary to have a painting of the province, the roads, and everything that could affect an army at war. It was also necessary in times of peace, and thus, in 1574 the state of Milan was so important for the Spanish monarchy as it was «paso y puerta de Italia» [the pass and door to Italy], that it became necessary to have a «carta, y descripción» [chart and description] with all the forts, passes, mountains, valleys, rivers, streams, and any other circumstances which would permit a thorough knowledge of those territories. This also applied to the cities at war, and at the beginning of the 18<sup>th</sup> century it was specified that a general had to have the drawn plan of the city he was going to besiege, but also the surrounding terrain with its hills, valleys, rivers, woods, swamps and roads by which help could come.

In the progressive professionalisation of the engineers' drawings, the description co-existed with the plan, and in this process the difference with the military, often claimed to be the true sages of fortification, was more and more evident. Cristobal de Rojas in his treatise echoed what was happening when underlining that these «soldados viejos» [old soldiers] knew so much about fortification «porque lo tratan al vivo, y lo demás es pintado» [because they deal with it directly, and the rest is painted]. This «painted» element introduced a radical change not only in military history but also in engineering, architecture and the history of science, and was accompanied by the development of scientific instruments to measure the world. This «painted» element is what we are speaking of here, leaving for another occasion the three dimensional models which were created, of which we conserve very few, and which have to be traced in archived documentation. The description of the frontiers, of necessity secret, was one of the responsibilities of the engineers, and their drawings constitute an important heritage for understanding the territories as they were then and their transformation, which is why one part of this book is devoted to these frontiers.

The permeability between architecture and engineering throughout the three centuries studied, has led us to devote another section to the study of a professional differentiation which many testimonies refute. As an example, at the end of the 16<sup>th</sup> century the count of Portalegre, governor of Portugal, speaking about the military engineer Leonardo Turriano related him, naturally without having to explain it, with drawing and architecture, when writing that he had to find out what the engineer was complaining about him for if «architectos y dibujantes me gobiernan» [architects and draughtsmen control me]. This Leonardo Turriano, who was present like a modern day Pliny at the

eruption of a volcano in order to describe it, and said of himself that «no soy solamente historiador, ni exclusivamente geógrafo, ni tampoco simple arquitecto militar» [I am not only a historian, nor exclusively a geographer, nor a simple military architect], developed all this knowledge as the king's engineer, which reinforces the questioning of these professional frontiers constructed *a posteriori* by historiography. Finally, in the line of this argument, when Juan Agustín Ceán Bermúdez, an erudite expert who would mark the guidelines in the construction of the history of Spanish art, in the prologue to his *Diccionario de los más ilustres profesores de las Bellas Artes en España*, explained that he had opted not to include architects in his work, he reasoned as follows: «¿cómo me atrevería yo á excluir de ella los arquitectos militares, los hidráulicos, los de puentes y calzadas, y otros semejantes, ni tampoco á incluir á los meros maestros de obras, aparejadores y albañiles?» [How would I dare to exclude from it the military, hydrological, bridge and road engineers, and other similar professionals, nor to include the mere master builders, master craftsmen and masons?]. With time Spanish historiography gradually included these master builders or master craftsmen in the history of architecture, but it did not do so in the same way with the military, hydrological, bridges and road engineers, at times stripped of their engineering profession when they entered into the history of architecture. Going back to Ceán, if this was being considered in 1800, we could ask ourselves what he would have written nowadays, when the history of war, geography and science seems to complicate even more the professional definition of the architect engineers to whom he refers.

Among the research activities which we carried out from 2013 to 2015 are seminars and courses to which were invited researchers who were not involved in the R+D project, and who have been invited to participate in this book. Thanks to all the authors the final result is that we have made progress in the consideration of how engineers' drawings explain questions which affect the history of architecture, of the city or of the territory, as well as the history of a profession which was greatly transformed over these centuries, using drawing for many different ends. Other topics presented include how the experience of the French monarchy introduces a point of comparison with the Spanish monarchy, the relation of these drawings with the history of science, the development of the representation systems used and scientific instruments, the role of the academies, or the use of these drawings in dealing with the fortified heritage. Stories of power, the education of the prince, the secret character of these images, war, engineering, science and the codification of knowledge, resound in its pages. Finally, the possibility offered for access via the Internet to the digitization of data on the drawings conserved in the archives, has meant that this project has been a pioneer in the field of the Digital Humanities, with the creation of a web application which incorporates the data and the semantic structure, which may favour progress in the investigation of engineers' drawings.

The interdisciplinary character of the project, in the frame work of which this book was created, reflects the changes which have for some time now been occurring in the study of images. This break with a specialization which we have inherited, leads us to trust that these pages will serve as a starting point for future research.

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# Defending a Border. Piedmont and Lombardy Cities in the First Half of the Seventeenth Century

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Translation: MULLER WORLDWIDE LINKS S.R.L.

## ABSTRACT

In the first half of the seventeenth century the clash between France and Spain is reflected in the north of the Italian peninsula: in the past allies, now enemies, the Duchy of Savoy and the State of Milan must necessarily strengthen the border that divides them. Sieges follow one another in a vain attempt by the French to come to Milan, and the Spaniards to drop Turin. The cities walls closest to the border are constantly monitored, estimated, enhanced. Military engineers at the service of the two countries are engaged to relief, project maintenance. Busca, Clarici, Lechuga, Baldovino, Prestino, Camassa, Beretta are alternated at the service of Milan's governors, with others of the most prepared engineers of that time: they wonder constantly about changes, enhancements and adjustments to new strategic and defensive needs. The drawings, the «paper cities», now kept in European archives, tell us the many states, too many and ephemeral boundaries, the difficult defence of the many and never quiet borders.

## KEYWORDS

Sabaudian Piedmont, Lombardy, State of Milan, military engineers, seventeenth century.



FIG. 1 GIOVANNI STEFANO CANTONI. *Citta di Turino*, 1660. BNBMI, AE, XII, 28.

In 1666, Stefano Cantoni drew an atlas<sup>2</sup> that re-united on paper what was cleft by politics: the cities of the north of the Italian peninsula, still divided at that time between the State of Milan (within the orbit of Spain) and Sabaudian Piedmont<sup>3</sup> which, from the sixteenth century, were in some periods often hostile allies. On the constantly-shifting border, embroiled in the vicissitudes of an uneasy peace and tumultuous war, in an uninterrupted succession of sieges, conquests and re-conquests, the fortifications of the cities were continually monitored, surveyed and reinforced. The military engineers in the service of the two states were constantly engaged in surveying, design and maintenance works and, last but not least, in spying missions directed towards stealing the secrets of the enemy and identifying any potential vulnerability. [FIG. 1]

The Spanish monarchy considered the acquisition of drawings and maps to be a top priority in order to gather knowledge of the territory and of the design of fortifications and systems of defence. These drawings and maps were commissioned by the «illuminated» Governors and produced by military engineers professionally trained to carry out this task. In many cases, the drawings of cities and maps of the territories, once used as working instruments by the military and administrators, became sought-after items of the scholarly collectors' movement that characterised the seventeenth and eighteenth centuries and, in particular, the Court of Madrid.

Drawing was the main instrument: a figurative account that, today, still illustrates the war between Piedmont and Lombardy, transformed at that time into permanent battlefields and the scene of a series of sieges in a vain attempt by the French to reach Milan and by the Spanish to seize Turin (besieged, partially occupied but never definitively captured). These «paper cities» populate atlases and loose sheets, highlighting the many

states, the too many ephemeral boundaries, the difficulty of defending the many, never completely untroubled borders. To counter the risk of a possible attack, the area of Milan, strategic for the Spanish Government, had to be protected by reorganizing a complex, modern and solid territorial system of defence. As already mentioned, it was considered that the western border could withstand a hypothetical but not improbable attack only if a set of fortified cities were prepared to cooperate.

#### «QUASI ANELLI DI UNA CATENA»

In the early seventeenth century, for Spain, the State of Milan together with the Netherlands became one of the main theatres of the war intended to gain supremacy in Europe, with a consequent urgent need to control the borders with the Duchy of Savoy and the Republic of Venice and also to maintain supremacy on the two different routes to Flanders<sup>4</sup>. Ceaseless work on the modernisation and reinforcement of fortifications and strongholds and continuous routine maintenance was accompanied by the fervent activity of the engineers of the State of Milan and Duchy of Savoy, still allies in the early years of the century, directed towards reinforcing the borders. The activity of fortification could not be interrupted and no ally could be trusted; coalitions could be overthrown very rapidly and no frontier could be left unguarded or vulnerable. Until the closing years of the sixteenth century, the State of Milan had not invested significantly in defending its western border, trusting in its alliance with the Duchy of Savoy and preferring to protect itself to the east against the threat of the Republic of Venice<sup>5</sup>. As the military situation gradually deteriorated, investments were diverted towards sustaining reinforcement of the western border: Charles Emmanuel I of Savoy, an ally of Spain, first of all clashed with the French, thereby undermining the safety of the western border, subsequently sealing an alliance with France and forcing the people of Milan to reinforce the defences towards Piedmont.

In September 1600, Pedro Henriquez d'Azevedo y Alvarez de Toledo, Count of Fuentes de Valdepero was appointed Governor of Milan. Sustained by experience acquired during the war of Flanders, Fuentes immediately grasped the problematic situation of the obsolete and cumbersome artillery<sup>6</sup> and the still late-Medieval style fortifications. The Governor was accompanied by Cristóbal Lechuga «*de los hombres más inteligentes de la nación y de mayor servicio*»<sup>7</sup> having had the occasion to personally verify his abilities during the years spent in the Netherlands, granting him the rank of captain and command of a company of arquebusiers. The aim was to reinforce the defences of the entire state, modernising the fortifications of the many strongholds and reinforcing the territorial system of defence, if necessary constructing new forts and fortresses. The Flanders war, in which they had both participated, had confirmed the importance of the bastion system of fortification<sup>8</sup>.

Over a period of ten years, the Governor enlisted the cooperation of expert military engineers including, in addition to Lechuga, Gabrio Busca and Gaspare Baldovino. The need to obtain funds, the desire to involve the local communities and their subsequent refusal, generated an intense exchange of correspondence between Milan, Spain and the various cities involved, between Fuentes, Philip III and the local Governors; documents that, in certain case studies, have made it possible to verify the dynamics and problems,



FIG. 2 GABRIO BUSCA. *Alessandria. Borgo* [1602]. BCBPv, ms. II, 59.

timing and stage of completion of the works undertaken<sup>9</sup>. A series of competencies crystallised around Count Fuentes and the service of the state which resulted in the drawing up of treaties<sup>10</sup>, in the setting up of an artillery school<sup>11</sup>, in addition to a set of surveys and projects of the most important cities.

A series of reports on surveys, projects and construction sites intended to reinforce the strongholds of the state were drawn up from the closing months of 1600 and throughout the following decade (Fuentes died in 1610). In particular, the mainstay of the system of defence of the western border was the solidity and reciprocal cooperation of the strongholds of Novara, Mortara, Pavia, Tortona, Valenza, Alessandria<sup>12</sup>; many of the engineers in the employ of Lombardy and Spain who directed their studies to this area between the end of the sixteenth and the first half of the seventeenth century focussed attention on these cities, drawing up descriptions of their current condition and related reinforcement projects.

At the beginning of the seventeenth century, military engineer Gabrio Busca drew up a report firmly stressing the importance of this territorial system of defence of the possessions of Milan: a «chain» in which the single strongholds were to be designed in such a way as to cooperate and provide each other with mutual support. Gabrio Busca described the ter-

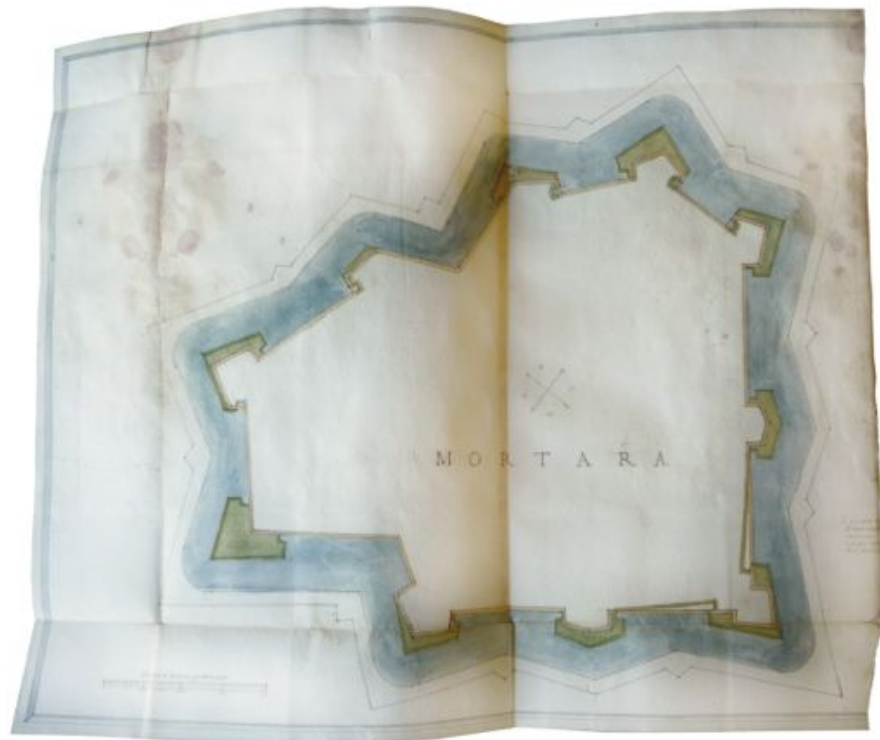


FIG. 3 GABRIO  
BUSCA. *Mortara* [1602].  
BCBPv, ms. II, 59.

ritories, highlighting their critical points and the natural features that, if necessary, could play a leading role in defence; he also focussed on what had been accomplished in past decades and, in some cases, proposed interventions to be completed in the short term at reduced cost. This did not, however, avert the possibility of an enemy attack as, if only one link in the chain were to fail, the entire state might capitulate before the assault of the French. At the turn of the century, the fortified towns modernised only fifty years earlier already showed the signs of time, revealing the unsuitability of the materials used [FIG. 2].

«Per far fronte al Piemonte et Monferrato, che si stima la parte più pericolosa di tutte, per rispetto dei Francesi, s'è fatto capo di Tortona, Alessandria, Valenza, Mortara et Novara. Le quali se altre volte tenivano nome di fortezze come fabricate di terra, et secondo la maniera di quei tempi, hora sono tutte guaste, et consumate dalle ingiurie delle stagioni, et del tempo tengono grandissima necessità di essere restaurate et rinnovate in migliore maniera. [...] Tutti i quali luoghi quasi anelli di una catena si vanno incatenando et collegando l'uno all'altro et rinchiudendo la più parte dei confini dello stato [...] perché Lecco può dar mano a Como, Como ad Angera, et questa ad Arona et Arona a Domodossola che se ne resta molto lontana ma principalmente corrisponde a Novara, Novara a Mortara, Mortara a Valenza, Valenza ad Alessandria, Alessandria a Tortona, Tortona a Voghera, et a Pavia. Pavia a Cremona, Cremona a Pizzighettone, Pizzighettone a Lodi, Lodi a Trezzo, et Trezzo a Lecco onde si cominciò. Da Pavia fino a Cremona è un lungo tratto senza fortezza però il Po ci serve come muro [...] La maggior fortezza di questo stato consiste nei fiumi»<sup>13</sup>.

Busca's report was accompanied by drawings, some drafted by Giovanni Battista Clarici<sup>14</sup> and others by Busca [FIG. 3]<sup>15</sup>. Clarici probably accompanied Busca in visiting the



FIG. 4 GIOVANNI BATTISTA CLARICI. *Novara* [1602]. BCBPv, ms. II, 59.



FIG. 5 GIOVANNI BATTISTA CLARICI. *Tortona* [1602]. BCBPv, ms. II, 59.

fortresses of the Duchy: in 1576, Antonio de Guzmán, Governor of Milan had already ordered him in the name of Philip II to draw up: «*a description of the entire State of Milan with the plans of certain particular places*»<sup>16</sup>. This commitment certainly lasted for years and, in a letter of 1580, the same engineer refers to surveys carried out in certain cities (Alessandria, Novara, Valenza, Mortara) [FIGS. 4 and 5].

The new political context, forbearer of possible wars, and the sensitivity demonstrated by Fuentes with regard to reinforcement of the military structures of the state resulted in an inevitable reconfiguration of the systems of defence of Milan. Following the peace treaty of Lyon (March 1601) between France and Savoy, the Privy Council ordered Fuentes to visit the Lombard fortresses in order to verify their potential and any shortcomings<sup>17</sup>. Between 1601 and 1610, Cristóbal Lechuga was engaged to make more than twenty «secret journeys» to inspect the fortifications, in some cases accompanied by Gabrio Busca and Gaspare Baldovino<sup>18</sup>. Lechuga cooperated with Busca from 1603 onwards in the design and construction of the fort of Fuentes at the entrance to the Valtellina<sup>19</sup>.

To offset the risk of a possible attack, the area of Milan, strategic for the Spanish Government, was to be protected by reorganizing a complex, modern and sturdy territorial system of defence. As already mentioned, it was considered that the western border could withstand a hypothetical but not improbable attack only if a set of fortified cities were prepared to cooperate; unfortunately, despite the works carried out fairly recently on some of these, these were in a serious state of disrepair, as stressed by Busca. In May 1604, Fuentes requested two hundred thousand scudi from Philip III to strengthen the fortifications at Cremona, Alessandria, Pavia and Novara<sup>20</sup>. By the summer, half of the sum requested had been received in Milan, accompanied by an exhortation to start the works as soon as possible. In November of the same year, Fuentes set off to inspect the cities and fortresses of the state, accompanied by military engineers and persons «*de ciencia y experiencia*». On November 1, the Governor left the capital for Como and the fort of Fuentes, still under construction. Lecco, Trezzo, the canal on the Adda, Soncino, Cremona were the next stages of the journey. Fuentes decided to construct a new citadel at Cremona, and also at Alessandria, thereby reiterating Fratino's considerations in the previous century<sup>21</sup>. It was concluded that, in the case of war, the city of Mortara could be fortified in the short term, and the Governor finally arrived in Novara where it was decided not to construct a citadel due to the presence of the Cathedral, which was not to be demolished, but to broaden the ring of the walls<sup>22</sup>.

Various outline projects were drawn up on the basis of the surveys and decisions taken by Fuentes and his collaborators and the problem immediately become of a financial nature: how to allocate the cost between the Sovereign and the State and which citizens were to be involved. Starting from the previous century, the cost of fortifying the cities was paid one third by the Sovereign and two thirds by the State, whereas works on the citadels were traditionally paid entirely by the Sovereign<sup>23</sup>. For the two completely new citadels of Cremona and Alessandria, direct participation of the cities involved was requested considering that the soldiers would be housed in the two structures. The long-standing problem of financing delayed the start of works at the sites: only part of the sum requested for the works planned at Novara, Alessandria, Cremona and Soncino (basically

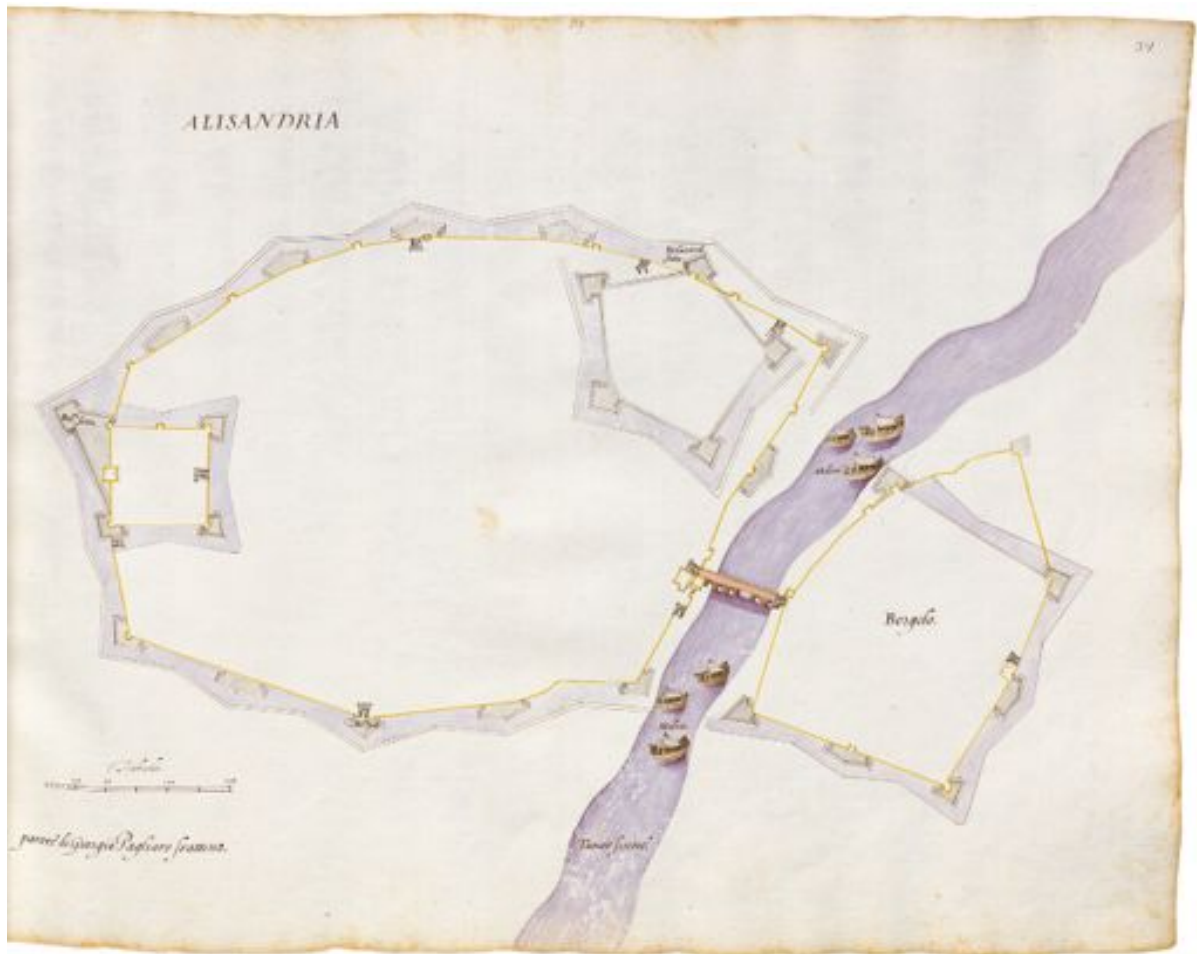


FIG. 6 GIORGIO PALEARI FRATINO. *Alisandria*, n.d. [1560 circa]. BSMon, *Piante di Forte[zze] d'Italia*, fol. 34r.

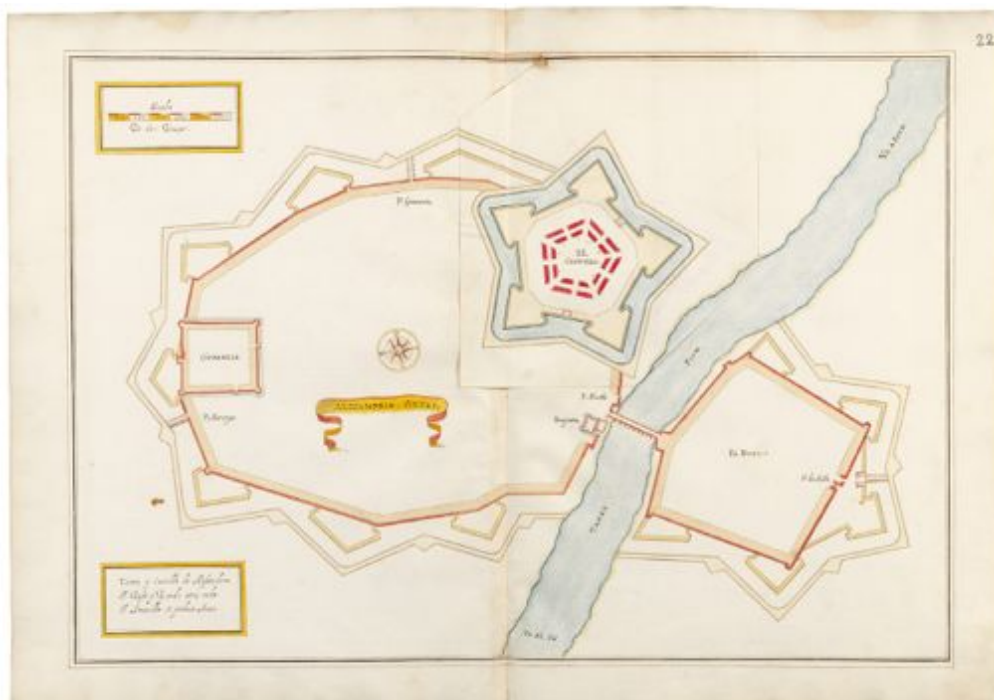


FIG. 7 Anonymous. *Alexandria Ciudad*, n.d. [1604-1608]. BNE, ms. 12678, c. 22.

to contrast the Republic of Venice) was received. The works were initiated only at Novara<sup>24</sup>. As regards the citadels planned at Cremona and Alessandria, nothing was done and was ever to be done. Due to problems such as how to obtain the money required, the hostility of the citizens and clergy, the outbreak of war following the alliance between the Duchy of Savoy and France, together with the death of Governor Fuentes, the projects remained as such. One of the last operations decided by the Governor in 1608 was the demolition of the old fortifications of Novara following completion of the new bastion fortifications.

Busca's maps and drawings precede, by a few years, an atlas of drawings of the city preserved at the National Library of Spain which, for certain cities, illustrates surveys of their current condition overlapped with ambitious projects, most of which were to remain on paper. Although, on the one hand, suggestions already present in Giorgio Paleari Fratino's sixteenth century drawings are reiterated, subsequent decisions were to be influenced by other proposals and ideas. The atlas<sup>25</sup>, which is not dated or signed and was formerly dated to the reign of Philip III<sup>26</sup>, can, in the opinion of the author, be ascribed to the years immediately after 1604 but no later than 1608 and it is considered that it may represent a trace of what was proposed on the basis of the inspections and surveys made during Fuentes' journey [FIGS. 6 and 7].

For certain cities, the reiteration of certain already proposed design suggestions is clear; two large pentagonal citadels were planned in particular for Alessandria and Cremona<sup>27</sup>: the drawing of Alessandria preserved in Madrid reflects and improves, not only from a graphical point of view, the indications formulated by Fratino in around 1560 and not shared by Busca<sup>28</sup>. The anonymous military engineer has focused attention on construction of a bastion system of fortification to strengthen the existing, now obsolete fortifications, with reinforcement of the sixteenth century citadel and fortification to protect the entrance. Reduction of the perimeter of the borough of Borgoglio, already proposed

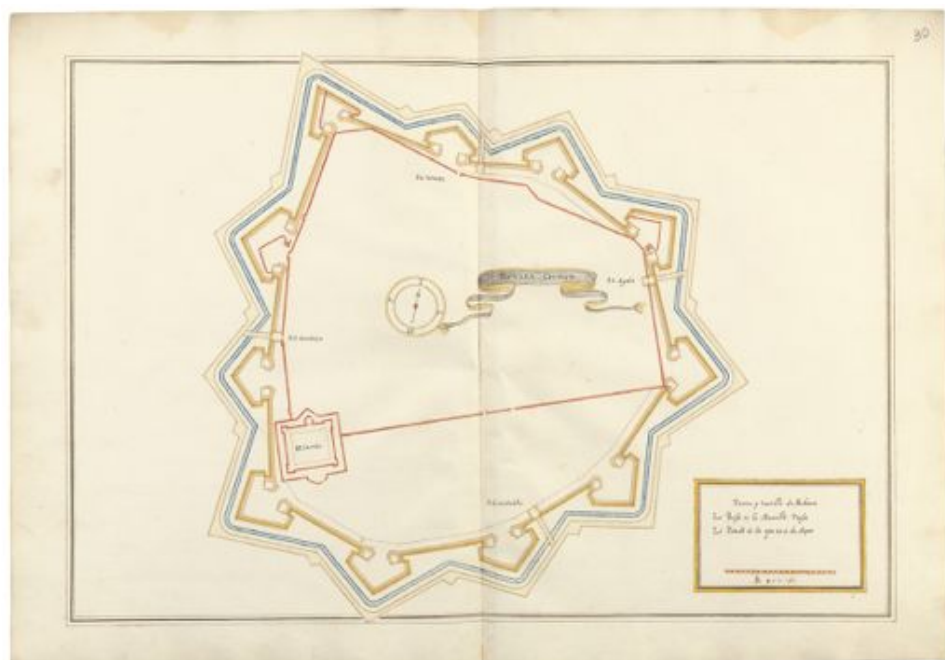


FIG. 8  
Anonymous. *Novara Ciudad*, n.d.  
[1604-1608].  
BNE, ms.  
12678, c. 30.

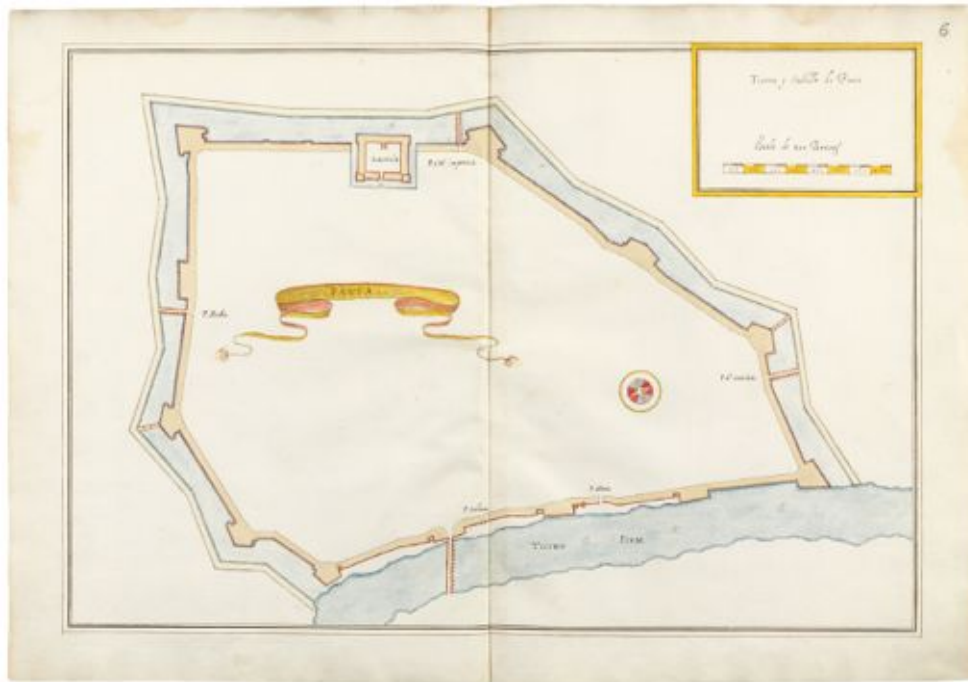


FIG. 9 Anonymous. *Pavia*, n.d. [1604-1608]. BNE, ms. 12678, c. 6.

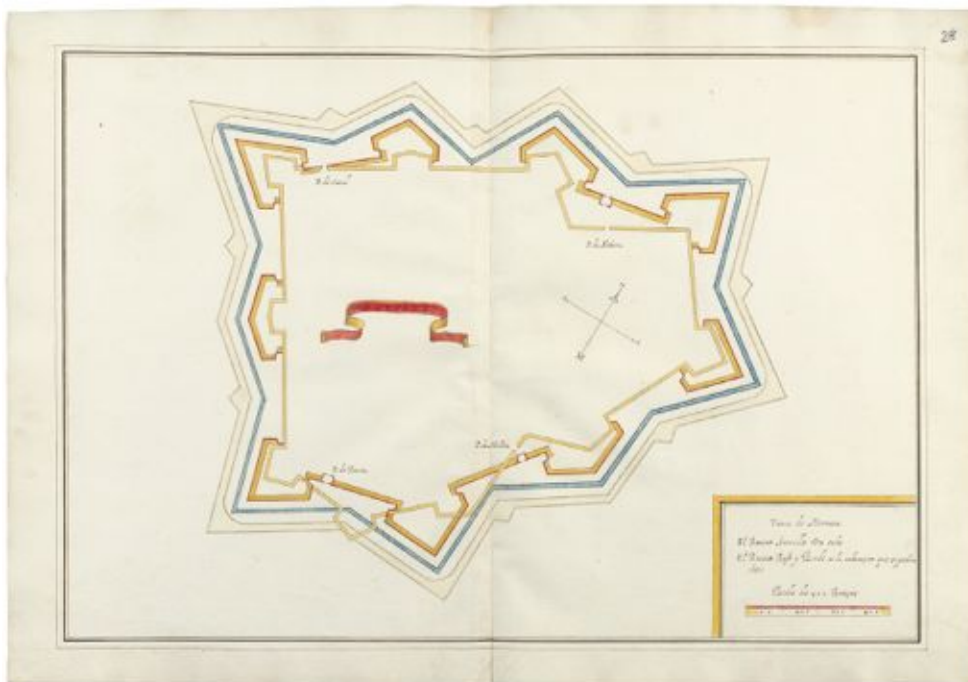


FIG. 10 Anonymous. *Mortara*, n.d. [1604-1608]. BNE, ms. 12678, c. 28.

by Fratino and stressed by Busca, was envisaged<sup>29</sup>. A pentagonal citadel on the banks of the river Tanaro, opposite Borgoglio, desired by Fuentes and Lechuga, is drawn on a transparency. This was never constructed but, from that moment until construction of the Savoy citadel more than a hundred years later, the point identified by the anonymous Spanish draughtsman was continuously and constantly modified: control of the river and

defence of the city could be assured only by reinforcing and equipping this particular section of the fortifications [FIGS. 8-10]<sup>30</sup>.

The plate dedicated to Valenza is a survey similarly to that of Tortona with its castle, one of the most ancient drawings identified today as referring to the city walls. In the plate dedicated to Mortara, the design of a new bastion system of fortification, already envisaged partly by Busca, that modifies the entire perimeter also with far-reaching demolition, is superimposed on the survey. Only short sections of the curtain wall of the ancient fortifications have been re-used while the dimensions and plan of all the bastions have been reconfigured: this project was also to remain only on paper. The drawing dedicated to Novara has been taken from a project by Fratino for broadening of the sixteenth century bastion fortifications: the de facto situation is indicated in red and the extension of the fortifications starts from the fourth bastion. The existing bastions were broadened and reinforced, adding eight and reducing the length of the curtain walls.

Busca report, Clarici's drawings (also preserved in other archives), the atlas of drawings preserved in Madrid and the various expert appraisals reflect the fortification surveys and projects that started to be adopted at the start of the seventeenth century. In most cases, the works of adaptation and reinforcement undertaken in the previous century were still in course. The financial problems that afflicted the State of Milano prevented construction with the necessary rapidity; the military engineers constantly discussed modifications, reinforcements and adaptations to cater to new strategic-defensive requirements. In this contradictory context marked by decisions, often revoked, an extremely unstable and unpredictable political situation, the aim was to reinforce and modernise the fortifications of the city still, for the most part, of late-Medieval design.

### «EL CORAÇÓN Y EL CENTRO DE LA MONARCHIA»<sup>31</sup>

The death of Philip III (1621) and the ascension to the throne of the «rey planeta» did not divert attention from the strongholds of Milan and, in particular, from the problematic western border. In 1622, Gaspare Baldovino<sup>32</sup>, realizing their potential, drafted a number of survey and project drawings for reinforcement of the fortifications of some of the most strategically important strongholds of Milan. It is highly probable that Baldovino knew what Gabrio Busca had written and advocated years earlier: dedicate attention to strongholds on the borders and consequently money and materials for reinforcement of the fortifications is a strategic operation to guarantee optimal resistance to any possible enemy assault<sup>33</sup>. Baldovino describes the cities in detail, identifying their strong points and also weaknesses to be remedied. «*La ciudad de Alexandria conviene mucho poner muy endefensa porq. es la Plaza mas Importante que VMS tiene en aquellos estados*»<sup>34</sup>. The perimeter of the fortifications is surrounded by a vast plain; the bastions, of small size, are in urgent need of reinforcement. Attention is focussed on construction of bastions in order to reinforce the fortifications of the city, adopting two different solutions. The first (indicated with the letter G) is the most expensive (between 150,000 and 286,000 scudi) and envisages the construction of articulated fortification works to replace the not easily defensible earth-filled bastions. The long curtain walls are an easy target in the case of

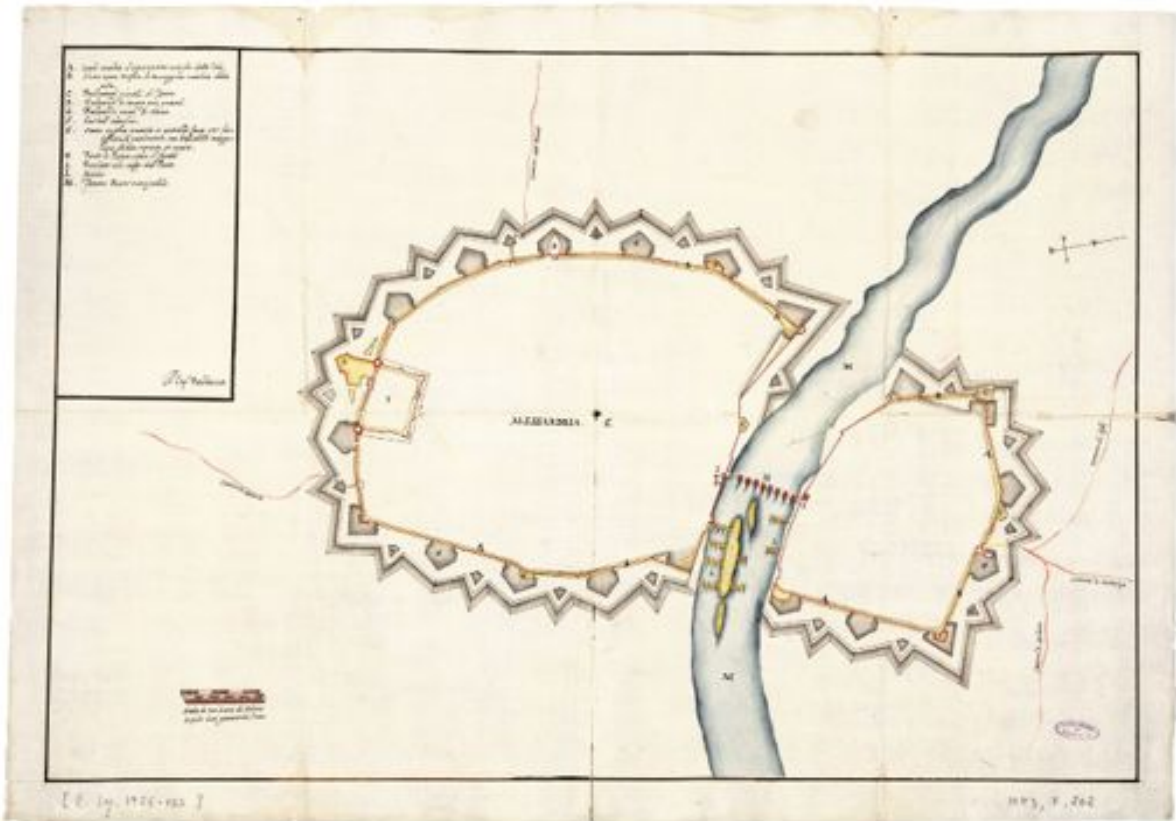


FIG. 11 GASPARE BALDOVINO. *Alessandria G*, 1622. España. Ministerio de Educación, Cultura y Deporte. Archivo General de Simancas. MPD, 7, 202.

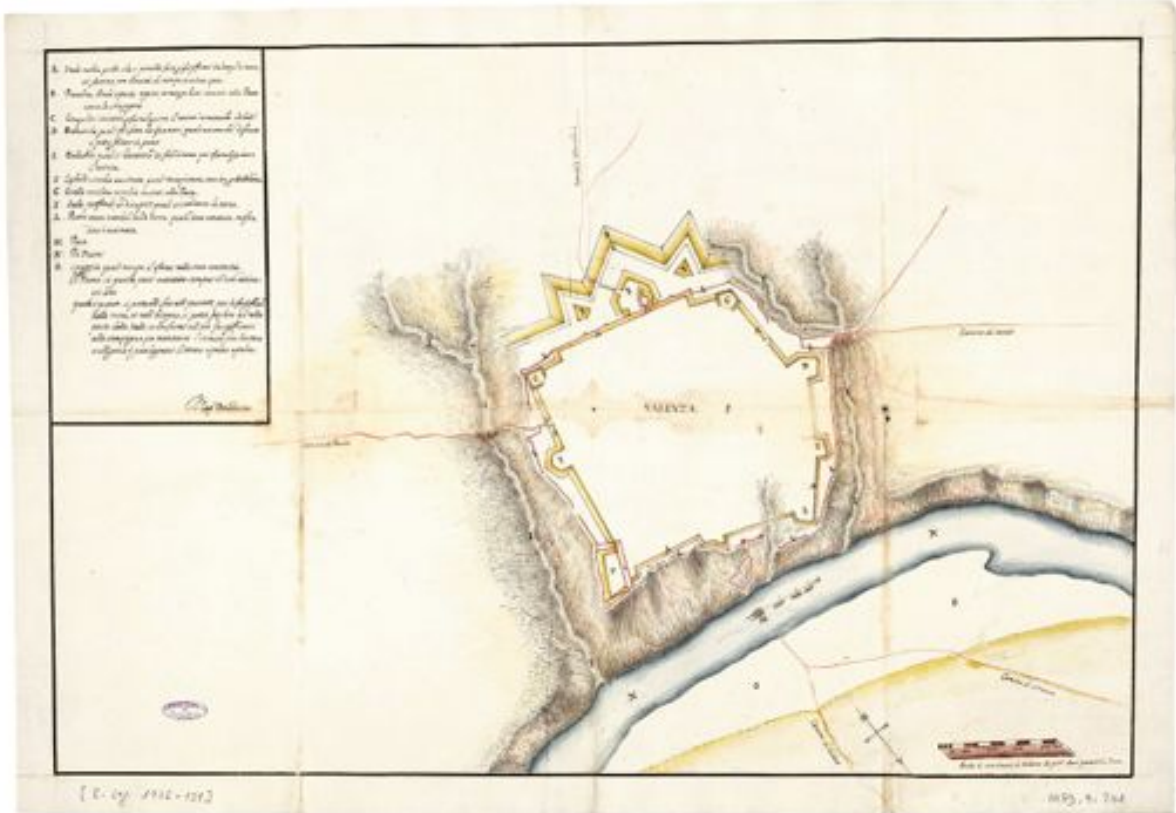


FIG. 12 GASPARE BALDOVINO. *Valenza*, 1622. España. Ministerio de Educación, Cultura y Deporte. Archivo General de Simancas. MPD, 7, 201.

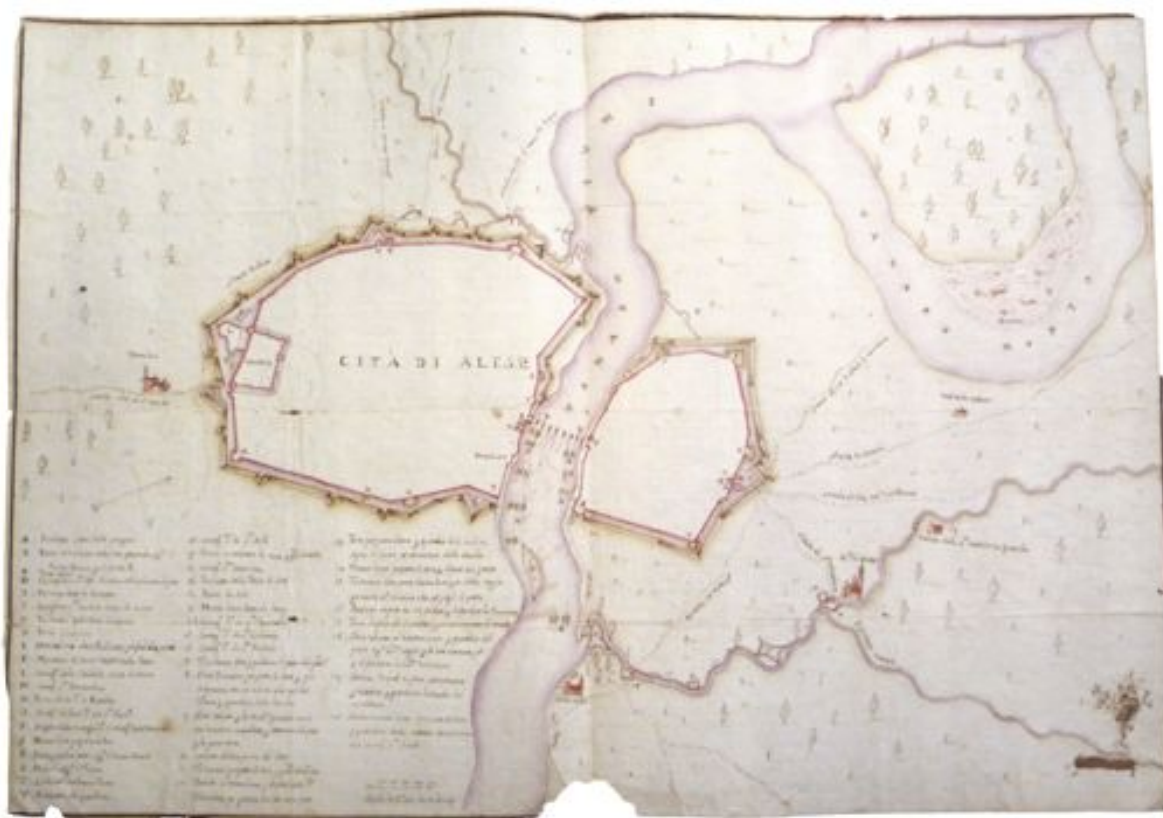


FIG. 13 FRANCESCO PRESTINO. *Cità de Aless<sup>a</sup>*, 1635. AST, Corte, Monferrato, Feudi, ad v. *Alessandria*, m. 5, n. 1.

siege; therefore it is necessary to construct a bastion system of fortification with advanced works: bastions, ravelins and a covered roadway would have guaranteed defence, thanks to cross-fire, in the case of attack [FIGS. 11 and 12].

Also in 1626 Carlo Coloma, soldier and diplomat and for a short period captain of the light cavalry of the «Milanesado», firmly declared his attention: «[...] *el Estado de Milán puede iustíssimamente llamarse el corazón y el centro de la Monarchia de V.M., por lo menos de todos los Reynos y estados contenidos en este emispherio: [...] lo que conviene conservar y corroborar esta parte tan noble y de que el parecer se ha tenido tan poco cuydado por los ministros inferiores [...]*»<sup>35</sup>. Once again, attention is focussed on the troubled western border and, starting from Lake Maggiore and descending to the South as far as Valenza, Alessandria, Serravalle, Tortona, the various cities and fortresses are described, also prescribing their continuous reinforcement: «*sigue luego Alexandría que, después del castillo de Milán, es hoy la plaça mas importante del Estado; estaba casi desmantelada del todo el año passado, mas el duque de Feria, [...] la puso de suerte con medias lunas y contraescarpas de tierra y de faxina, que pudiera aguardar un largo sitio: conviene mucho acabar lo començado y proveer aquella ciudad de manera que se pueda defender de dos exércitos [...]*»<sup>36</sup>.

With a letter dated October 13, 1633, Philip IV ordered «*con ogni prestezza possibile*» an atlas of all the fortresses and castles of the State of Milan from Francesco Prestino<sup>37</sup>, court and military engineer working in this period in Novara, Valenza Po, Alessandria, Mortara, Tortona and Fontaneto d'Agogna [FIG. 13]. Defence of the western border, which

once again proved to be strategic in the imminent conflict between the Savoy, now pro-French, and the Spanish was one of his main tasks. Prestino's activity was interlaced with that of court engineer Francesco Maria Ricchino<sup>38</sup> who worked with him at many of the construction sites on the borders with Piedmont: in particular, Ricchino focused on those fortresses that guarantee access by the Spanish troops to the road to Flanders through the area of Asti, Alesandria and Tortona (Rocca d'Arazzo, Annone, Alessandria, Valenza, Tortona, Pontecurone) and also worked in Vercelli and Pavia.

**THE «NOTABLE CAMPAÑA»** [FIGS. 14-17]

At the end of the 1630s, the conflict between Spain and France, never completely settled, continued to have repercussions on the North of the peninsula, with the Savoy Duchy on the one hand and the State of Milan on the other. The conflict was further exacerbated by the outbreak of civil war in Piedmont affected, after the death of Victor Amadeus 1, by hostility between the Regent Christine of France, ally of the French and her brothers-in-law, Prince Tommaso and Cardinal Maurizio, supported by the Spanish. The attempt to occupy Piedmont, successful only for a few years, by the Marquis of Leganés, Governor of the State of Milan, is documented not only by a series of letters sent to Philip IV, to the Count Duke of Olivares and to other officials but also by an atlas without



FIG. 14 Anonymous. *Brem, Guzman*, in *Plantas de las plazas que redimió, fortificó, yganó, [...] el Ex.mo S.or Marques de Leganes* [...], n.d. [post 1640]. BNE, ms. 12726, c. 7.

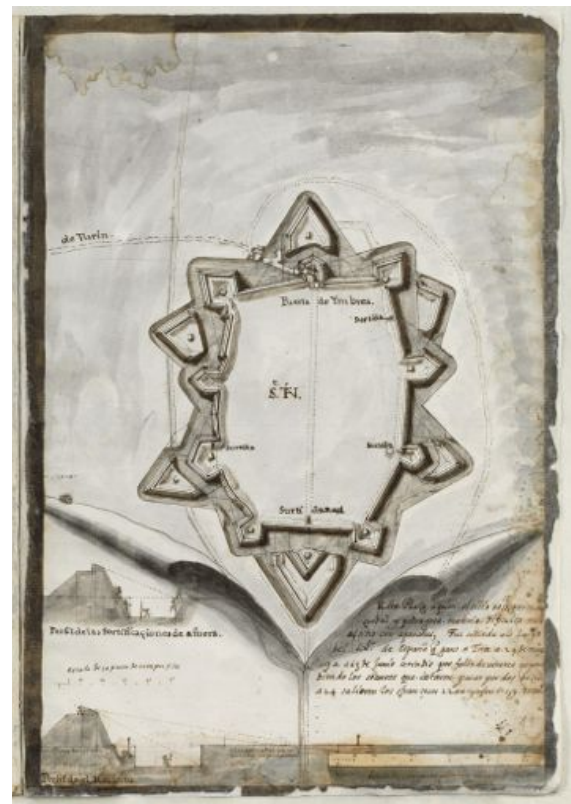


FIG. 15 Anonymous. *Santhia*, in *Plantas de las plazas que redimió, fortificó, yganó, [...] el Ex.mo S.or Marques de Leganes* [...], n.d. [post 1640]. BNE, ms. 12726, c. 19.



FIG. 16 Anonymous. *Vercelli*, in *Plantas de las plazas que redimió, fortificó, y ganó, [...] el Ex.mo S.or Marques de Legánes [...]*, n.d. [post 1640]. BNE, ms. 12726, c. 8.

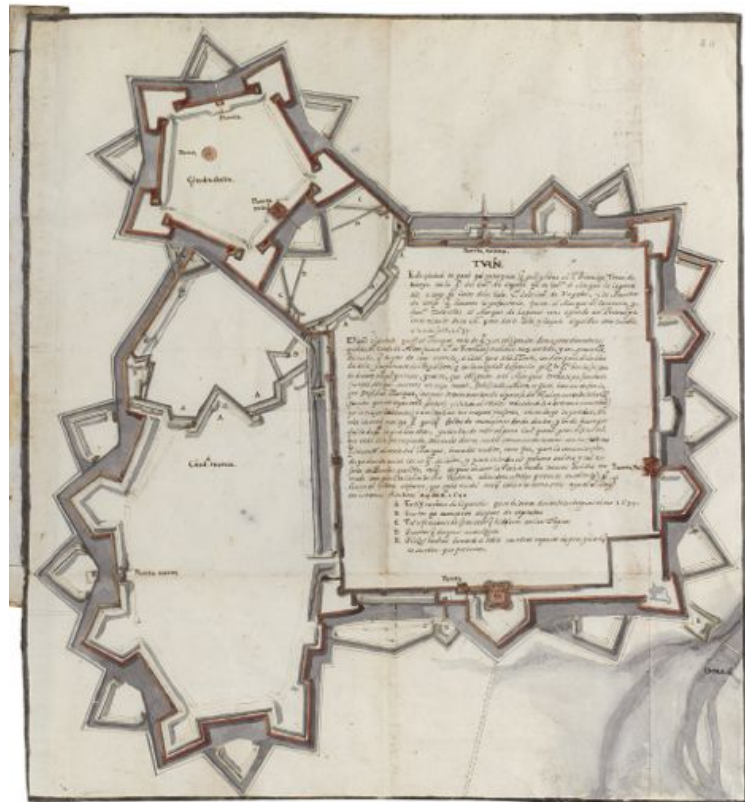


FIG. 17 Anonymous. *Turin*, in *Plantas de las plazas que redimió, fortificó, y ganó, [...] el Ex.mo S.or Marques de Legánes [...]*, n.d. [post 1640]. BNE, ms. 12726, c. 20.

signature now preserved in Madrid<sup>39</sup>. The twenty plates illustrate surveys and designs for the fortifications of the towns occupied by Leganés and Prince Tommaso as they advanced towards Turin. In some cases, the works, carried out in a few months, to fortify what had been easily conquered, were to permanently modify the urban configuration of the cities. Prestino was certainly in the service of Leganés and it has now been demonstrated that the Governor enlisted as consultant the Jesuit Father Francisco Antonio Camassa, his confessor and professor of military art at the Imperial College of Madrid<sup>40</sup>.



FIG. 18 *Sitio y defensa de la ciudad de Pavía*. KAS, *Handritade Kartverk*, vol. 25, tav. 96.

Prestino signed a report regarding Vercelli when the city, after being conquered by Leganés, became and remained until 1659<sup>41</sup> the extreme outpost of Spanish domination. A connection was to be created with the major systems of territorial control that, from the State of Milan, furnished arms, provisions and troops using the fort of Sandoval as intermediate stage. The Spanish wanted to insert Vercelli in the «chain» of fortified cities already stressed by Busca.

#### **THE PAPER CITIES** [FIGS. 18 and 19]

In the mid-century period, a few years prior to signing the Treaty of the Pyrenees, a scholarly patron, Don Gaspar Mendez de Haro y Guzmán VII Marquis of Carpio and Heliche, appointed the Bolognese artist Leonardo De Ferrari to make water-colour copies of many city drawings<sup>42</sup>. The cartographic project did not hide the patron's ambitions: depict the Kingdom of Spain in the era of Philip IV, with a certain degree of poetic licence, emphasizing the territories aspired to but never conquered on a long-term basis, in a sort of ex-traniation from reality, intended to exalt the power of the King and to deny a truth difficult to accept: the inexorable end of a hegemony. The atlas he commissioned reflects his main interests: art, politics, knowledge of the territory for the purpose of drafting military strategies. It was in this cultural milieu that Don Gaspar's «project» took shape: incorporate the many drawings owned or perhaps consultable at Court in an atlas, entrusting



FIG. 19 *Planta de Trin*. KAS, *Handritade Kartverk*, vol. 25, tav. 118.

copying of these to the hand of a single artist. The attention dedicated to the drawings of cities intended to acquire military knowledge of the territory, for defence and attack, omitting peculiarly strategic elements and amplifying others for intimidatory purposes, is also justified by the fact that, between 1655 and 1657, at the end of the Franco-Spanish war, Don Gaspar was part of the Spanish army in Italy. Through purchases and vast legacies, he was in possession of maps and sketches from different cultural environments: he was seized by the desire to form a single «theatrum», a uniform collection, a sort of virtual story.

Unlike others produced in the same period, the Heliche atlas is not conceived by an engineer, architect, geographer or cosmographer but commissioned from an artist who reproduces and recopies plans and maps of different origin. The painted tables reflect the different originals reproduced, of heterogeneous design, origin, dimensions and purposes. The artist harmonises and refines a substantial set of plans, views and descriptions of sieges and battles. The method of work is specified in the plate dedicated to Pavia<sup>43</sup>, depicted at a crucial moment, the siege of July 24 and September 14 1655, the year in which the work was delivered to Heliche: this bears the phrase «*traducido y reducido de grande a pequeño, por Don Leonardo de Ferrari*». The result is an eclectic atlas, probably completed in great haste, conditioned by the material made available or, on the contrary, made inaccessible. Imperfect or incomplete, the atlas is the key to understanding the use of urban and territorial plans for military, strategic and propagandistic purposes in seventeenth century Europe.

The impressive legend that accompanies the drawing of Pavia indicates another detail that throws greater light on the method of creation of the atlas: «*todo delineado por el Cap.no Gaspar Barreta Yngeniero Regio cameral y del Ex.to*». The original, subsequently copied and reduced in size, is by Gaspare Beretta. At this point, it is easier to understand the precision of the indications provided by one of the most important seventeenth century military engineers who served in the Spanish army for 64 years (1639-1703) in the service of Spain in Lombardy, chief engineer of the State of Milan, expert in fortifications<sup>44</sup>. Beretta commanded the siege of Trino, and was also present at Crescentino and Casale Monferrato in the same year. He was subsequently present at «Rocchetta on the river Tanaro», in the defence of Vicolongo in the area of Novara and at Pavia in 1655. Don Gaspar's father, Luis, was certainly an admirer of Beretta's military expertise, having in 1661, as «valido» of Philip IV, summoned the Milan engineer to the court of Madrid «*para servir en esta guerra de España*»<sup>45</sup>, as written by de Haro to the Governor of Milan; his opinion is asked regarding the proposal (never implemented) to exchange the Cremonese with the Monferrato. The Lombard engineer, a man of unequalled experience, could help to understand positive and negative aspects, insofar as informed of the real essence of the fortified structures of territory

## THE EPILOGUE [FIG. 20]

The siege of Alessandria in 1657<sup>46</sup>, immortalised by an unknown hand, was one of the last clashes in the North of the peninsula prior to signing of the treaty on the Isola dei Fagiani that was to temporarily restore peace on the continent. In this case, the drawing was not intended for military purposes but to commemorate the frenetic activities of the battalions that occupied the plain around the city. The siege in the summer of 1657 was to see, on opposite sides, the Spanish-Lombard army, sent to rescue the besieged citizens of Alessandria, in agreement with the Swiss of Canton Grisons, with the Austrians and the Duke of Mantua. On the other hand, the Franco-Savoyard army could rely on the alliance with the Duke of Modena. At the end of an epic battle, the unconquered city was to remain within the orbit of Lombardy for around fifty years<sup>47</sup>. The city was surrounded by the Franco-Savoyard troops who built two pontoon bridges. To enclose a broad strip of territory already conquered, the French constructed a set of fortresses and structures for attack with a battery of canon aimed towards the city and towards the Spanish army sent to relieve the city. The Swiss troops were the first to cross the Bormida and the Spanish batteries were deployed along the bank, fortifying this. Figures who distinguished themselves during the siege included Pompeo Robutti, in the service of Alessandria, and Gaspare Beretta under the orders of the relieving Lombard-Spanish army, the first in the city and the second near the Bormida, in a coalition to free the city from the siege.

The drawings, designs or surveys of the many military engineers who were to follow each other in the service of Spain and Lombardy, with the aim of strengthening the defences, relate a history not only of sieges, battles and rapid permanent or temporary fortification works but also of years of peace marked by ceaseless construction works



FIG. 20 G. P. PERT. *Alessandria assediata li XVII luglio et abbandonata li XVIII agosto MDCLVII*, n.d. [second half of the seventeenth century, post 1657]. ASAI, ASCAL, s. III, cart 2262/2.

directed towards extending and modernising the bastion fortifications in the fear of a clash: cities and territories are continually shaped and reshaped by the «needs of war» (and of the long-awaited peace). Military cartography remained, for the most part, secret and in the hands of the client or of the designer who carried out in-field surveys using updated instruments. Production was perhaps discontinuous, strongly conditioned by wars and sieges or fears of possible attack, and also heterogeneous: surveys made to acquire knowledge of the conditions of the places, modernisation or reinforcement projects, drawings covered by military secret and often concealed for long periods. Commemorations of battles, showing how the armies were deployed, populate the loose sheets and give life to atlases through reprocessing of confidential but no longer topical material, harmonising their format and representation technique. The atlases of cities and theatres of war cater to a taste for the contemplation of art, the desire for a virtual journey, the passion for collecting, the exaltation and celebration of military power. However, the unchallenged protagonist of the many drawings is always and in any case the city, a *Sancta Sanctorum* to be defended, the Holy Grail to be conquered.

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## NOTES

1. [annalisa.dameri@polito.it](mailto:annalisa.dameri@polito.it)
2. GIOVANNI STEFANO CANTONI, *Tavola delli disegni de tutto il Stato di Milano e parte di Piemonte et Monfe.o.* BNBMi, AE, XII, 28. VIGANÒ, 2003.
3. For the area of Milan: Pavia, Valenza, Alessandria, Tortona, Serravalle Scrivia, the fort of Breme, Novara, Mortara, Vigevano, Abbiategrasso, Fontaneto d'Agogna, Domodossola, Como, the Fuentes fort, Lecco, Ponte, Trezzo, Bobbio, Lodi, Pizzighettone, Gera, Moccastorna, Cremona, Sabbioneta, Milan, the castle of Milan, the Sandoval fort close to Vercelli. For Sabaudian Piedmont: Vercelli, San Germano Vercellese, Santhià, Trino Vercellese, Crescentino, Verrua, Asti, Villanova d'Asti, Chivasso, Ceva, Cuneo, Ivrea, Turin, Susa, Monmélian, the «Sencio» fort. Also represented: the «Milanese» *enclave* in the territory of Genoa, Finale; the Spanish *enclave* of the island of Elba, Porto Longone; the fortress of the Borromeo family, Arona; two strongholds of the Duke of Mantova, Casale and Nizza Monferrato; the French *enclave* in Piemonte, Pinerolo; a fortified city in Valtellina under the domination of the Grisons, Tirano; and Genoa.
4. COBOS GUERRA and DE CASTRO FERNÁNDEZ, 2005.
5. COPPA, 1999; VIGANÒ, 1998.
6. GIANNINI, 2000.
7. AGS, *Estado*, leg. 1293, 355, *Dispaccio del conte de Fuentes a Filippo III*, May 6, 1604, mentioned in Giannini, 2000, p. 493.
8. PARKER, 1996.
9. GIANNINI, 2004.
10. COPPA, 1999; COPPA, 2004; FIOR, 2007; LECHUGA, 1601; LECHUGA, 1611; BUSCA, 1601.
11. Bernardo Richino established a military and civil engineering school of which Cristobal Lechuga was one of the most renowned students. Lechuga himself proposed the creation of an academy for engineers at Court. In Lombardy, the artillery school was divided between Milan, Pavia, Alessandria and Cremona. CÁMARA, 2005; GIUSTINA, 2007a.
12. By 1615, this «chain» of strongholds also included the Sandoval fort at Bulgaro, now Borgo Vercelli, a pentagonal fort that took its name from Minister Francisco Gómez de Sandoval and Rojas Duke of Lerma, constructed at the behest of the Spanish Governor of Milan, Don Giovanni de Mendoza (Marquis of Hinojosa), close to the ford on the river Sesia in order to dominate the road leading from Novara to Vercelli.
13. *Relatione delle Fortezze di frontiera dello Stato di Milano* (BCBPv, ms. II, 59). *Relatione delle fortezze di frontiera dello Stato di Milano*, June 15, 1602 (BAMi, Ferrari collection, Military Manuscripts, part IV, S. 144 sup. No. CCCLXXXIV) is the copy transcribed, without signature, of Gabrio Busca's report now preserved in Pavia.
14. VIGANÒ, 2007b.
15. The drawings depict the castle of Milan, Alessandria, Mortara, Cremona, with two different plates, Correggio, Pizzighettone, Castellazzo, Cairo «delle Langhe», Novara (signature of Giovanni Battista Clarici), Valenza (signature of Giovanni Battista Clarici), Tortona (signature of Giovanni Battista Clarici), Voghera (the plate is damaged but can be ascribed to Giovanni Battista Clarici), Lecco (signature of Giovanni Battista Clarici), Domodossola (signature of Giovanni Battista Clarici).
16. ASMi, RCS, s. XXI, n. 10, c 300.
17. ASMi, RCS, s. XIV, book 4, minutes of the meeting of the Privy Council, Milan, April 2, 1601.
18. GIANNINI, 2000.
19. FIOR, BORGHI, SCARAMELLINI and OSIO. 2003.
20. GIANNINI cita AGS, *Estado*, leg. 1293, doc. 355.
21. GIORGIO PALEARI FRATINO, *Alisandria*, n.d. [1560 circa]. BSMon, *Piante di Forte[zze] d'Italia*, f. 34r. VIGANÒ, 2004; DAMERI, 2013.
22. GIANNINI, 2004, p. 307.
23. GIANNINI, 2004, p. 308. The portion to be paid by citizens was in turn divided between various persons. See also CÁMARA, 1998.
24. GIANNINI, 2004, p. 336 et seq.
25. BNE, ms. 12678. The drawings show the city of Milan and its castle (two drawings), Pavia, Lodi, Pizzighettone, Soncino, Cremona and its castle (due drawings), Tortona and its castle (due drawings), Alessandria (with a transparency depicting the design of the pentagonal citadel), Valenza, Vigevano, Mortara, Novara (with the ancient perimeter and the new broader bastion fortifications), the fort of Fuentes (the presence of this drawing makes it possible to date the atlas as post 1604), «fuerte que guarda el Rio Ada» (with every probability the fortino d'Adda aka Stallone in the territory of Gera Lario), the castle of Lecco, Finale, Monaco, and a map of the territories between Piedmont and Lombardy showing rivers and the main fortified towns and cities.
26. CÁMARA, 2005.
27. The drawing of Cremona preserved in Madrid envisages in addition to extension of the fortifications and the construction of a system of bastions, insertion of the existing castle within a pentagonal citadel to which a drawing is dedicated on a more detailed scale. Fratino, Clarici and Spannocchi had already put forward similar reinforcement proposals. CÁMARA, 1998.
28. BSMon, *Piante di forte[zze] d'Italia*. VIGANÒ, 2004.
29. DAMERI, 2013.
30. DAMERI and LIVRAGHI, 2009.
31. CARLOS COLOMA, *Discurso en que se representa quanto conviene a la Monarchía española la conservación del Estado de Milán, y lo que necesita para su defensa y mayor seguridad*, 1626. BNE, ms. 12931 (1), ff. 1-20.

32. VIGANÒ, 2007b.
33. AGS, *Estado*, leg. 1926, cc. 141-154. The drawings were made on the same days and concern the cities of Novara, Mortara, Alessandria and Valenza. The plates are identified by the letters A and B (Novara), C and D (Mortara), E and F (Valenza), G and H (Alessandria) and attached to descriptive reports.
34. AGS, *Estado*, leg. 1926, cc. 152-152v.
35. BNE, ms. 12931 (1), f 1.
36. BNE, ms. 12931 (1), ff. 18-19.
37. ASMi, *UTR*, p.a., cart. 745, fasc. Prestino. PERIN, 2007 (albeit with some incongruences).
38. GIUSTINA, 2007b.
39. ARROYO MARTÍN, 2002a and 2002b; PÉREZ PRECIADO, 2010. *Plantas de las plazas que redimió, fortificó, y ganó, [...] el Ex.mo S.or Marques de Leganes* [...], dated January 1, 1641 and not signed, BNE, ms. 12726. The atlas comprise the ground plans of *Fontane* (close to Novara, identifiable as Fontaneto), *Annone, Roca, Nizza de la Palia* (Nizza Monferrato), *Ayan* (Agliano near Asti), *Punzon, Brem Guzmán, Vercelli, Saliceto, Chivasso, Ivrea, Verrua, Crescentino, Villanova d'Asti, Pontestura, Asti, Moncalvo, Trino, Santhià, Turin*.
40. DAMERI, 2014 and in print.
41. IACOBONE, 2004.
42. DAMERI, 2013. The atlas was mentioned for the first time but with various errors in dating and attribution, by Josephson, 1982. The correct dating was established in SÁNCHEZ RUBIO, TESTÓN NÚÑEZ and SÁNCHEZ RUBIO (coords.) (2004), an essential text for analysis of the atlas. See also COBOS GUERRA and DE CASTRO FERNÁNDEZ, 2005; D'ASCENZO, 2010.
43. KAS, *Handritade Kartverk*, vol. 25, tav. 96.
44. VIGANÒ, 2001.
45. The main source is a collection of documents curated by Beretta: *Servicios del conde y maestre de campo Beretta, con breve noticia de sucessos empezando desde el ano 1639 hasta el de 1702*, Milan 1702; a copy without frontispiece and with the pages not numbered is preserved in the Biblioteca Braidense of Milan.
46. PERT, *Alessandria assediata li XVII luglio et abandonata li XVIII agosto MDCLVII*, n.d. [second half of the seventeenth century, post 1657] (ASAI, ASCAI, *series III*, 2262/2).
47. DAMERI and LIVRAGHI, 2009.

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## ABBREVIATIONS

AGS: Archivo General de Simancas  
 ASCAI: Archivo Storico Comune Alessandria  
 ASAI: Archivio di Stato Alessandria  
 ASMi: Archivio di Stato Milano  
 AST: Archivio di Stato Torino  
 BAMi: Biblioteca Ambrosiana Milano  
 BCBPv: Biblioteca Civica Bonetta Pavia  
 BNBMi: Biblioteca Nazionale Braidense Milano  
 BNE: Biblioteca Nacional de España  
 BSMon: Bayerische Staatsbibliothek München  
 KAS: Krigarkivet Stockholm  
 RCS: Registri Cancelleria Spagnola  
 UTR: Uffici e Tribunali Regi

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