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Conservation of Architectural Heritage

A Culmination of Selected Research Papers from
the Second International Conference on Conservation
of Architectural Heritage (CAH-2), Egypt 2018



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Foreword

Conserving our heritage is a challenge that faces the world as we know it. With technology and the spread of urbanism, modernism erases the past's complexions with its rich taste and prevailing presence. The remaining traces of culture are subjected to the threat of fading away amidst the present's call for simplicity and surreal human drives.

Before beginning to read this book, readers should be aware that architecture is a reflection of the cultivated nature of its era; it is a form of art that should be preserved for generations to come. Inner-generational equity is a concept that should be taught to people of all ages and adopted by leaders. The relationship between the citizens and their surroundings can tell the story of nations better than history books; thus, the restoration of aging buildings can preserve the uprising of a nation or its downfall.

This book discusses researchers' conscious efforts to maintain what is left from the past. Variety of contentions occur as the consequences of the poor preservation of architecture; the design of public transportation vehicles is one of the issues that are discoursed throughout the course of the book. Proposing educational methodologies in order to raise awareness and cultivate people on the importance of upgrading local laws is an essential step that is also taking a vast portion of the dialog in the research papers.

Being a culmination of the best, selected research papers submitted to the international conferences on "Conservation of Architectural Heritage (CAH)," the authors of this book were given the chance to converse, debate, and learn from some of the largest names in the field of architecture who helped them develop their research papers into what they are today.

Having gone through a meticulous peer-review process, each chapter in this book is innovative and has been regarded as a distinguished piece of literature submitted to the aforementioned conferences.

Cairo, Egypt

Mourad Amer

Preface

For centuries, history has been humankind's guide to the wonders of the past that ultimately shape our present and our future. History is portrayed in many shapes and forms including books, music, clothes and materials, pottery, fossils, old pictures or movies, and many more. One of the very influential ways we have learned about our history is through architectural heritage as architecture has been a witness of some of the greatest civilizations this world has ever seen. In the form of buildings, towers, statues, and monuments, architecture has delivered historical information from one generation to another.

This book sheds light on the importance of protecting the built environment and conserving local traditions by providing the reader with a multitude of ways to achieve this goal. It provides a number of educational methodologies that are valuable to academics who are looking to update their knowledge and to practitioners who are constantly seeking improved techniques to handle architectural heritage.

The book is made of a group of the highest quality research papers submitted to an international conference named "Conservation of Architectural Heritage," which makes it a culmination of important sources that are needed in the field of research in development. Scholars, academics, students, professors, and researchers are encouraged to take advantage of this book in terms of learning from and building on all the information available.

A special mention should be made to the editors of this book and to all the authors and co-authors of the chapters who collectively provided the academic community with unique and increasingly valuable literature.

Acknowledgements We would like to thank the authors of the research papers that were chosen to be added to this book. We would also like to thank the scientific committee of reviewers who helped us select these papers and the editors of this book. Lastly, special thanks go to the IEREK team for supporting the publication of the best research papers submitted to the conference.

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An Architectural Project of Giovanni Maria Falconetto Discovered During the Restoration of the Alvise Cornaro House

Maurizio Berti

Abstract

The restoration of the courtyard of the house of Alvise Cornaro was carried out between 1983 and 2000. During this long period, the author produced several studies and projects, regularly debated with a high-profile international scientific commission. The house of Alvise Cornaro, in Padua, was reformed between 1524 and 1560 ca. and is one of the first architectures of the Roman Renaissance according to the Vitruvius canons built in northern Italy. This architecture has long established its reputation as a place for comedies and small concerts due to the presence of two buildings of great architectural quality: the Loggia and the Odeo. Based on observations and measurements, however, the restoration programme allowed us to recognize that architecture corresponds to a unitary project inspired by a kind of the domus canonized in the Vitruvius architecture treatise. *The paper presents arguments and conclusions of this case study.*

Keywords

Giovanni Maria Falconetto • Alvise Cornaro • Frons Scaenae • Theatre • Domus • Vitruvius

1 Frons Scaenae of Classical Theatre

There is the idea that the humanist Alvise Cornaro had built a theatre, or part of it, the *frons scaenae*, in his house in Padua to represent the comedies of Angelo Beolco called Ruzante. The idea of a theatre building, inspired by the classic Roman model, was born from the interpretation of the *Elogio* (Cornaro and Milani 1983), a short writing by Alvise Cornaro that was read during his funeral. According to the most widespread opinion, this part of the theatre

coincides with the beautiful Loggia in the humanist's house and would be one of the first examples of a theatrical architecture realized in Italy in the Renaissance, to the design of the architect Giovanni Maria Falconetto.

The idea of a special architecture for the theatre in the house of Alvise Cornaro was elaborated by historians during the second half of the twentieth century, with research on written sources and in Venetian areas, where Cornaro and his protected Ruzante and Falconetto lived and operated. Among those who did research on the stone theatre mentioned in the *Elogio* were Mortier (1925), Lovarini (1965), Menegazzo (1964), Fiocco and Cornaro (1965), Zorzi (1967), Alvarez (1980a, b), Milani (1983), Calendoli (1985, 1995). But archive studies and the explorations made in the area between the hills of Este and the valleys of Polesine revealed no traces of stone scenes for a building suitable for theatrical performances.

The theatre in the Cornaro house seems to be a topic considered especially by scholars of theatrical literature interested in Ruzante's work. However, Ferguson (2000), more than any other, questioned the existence of an architectural connection between the Cornaro Loggia and Ruzante's representations, as some scholars before him considered, including Zorzi (Zorzi 1967, 1982).

Ludovico Zorzi, a fundamental reference for studies on Italian theatre, wrote a lot about the topic of the Loggia in the courtyard of Cornaro's house. Zorzi tried to prove that it was a proof of Renaissance reconstruction of the *frons scaenae* of classical theatre. So Zorzi (1982, pp. 9–10) writes:

It is difficult to say when the upper floor is added over the loggia. Above all it is hard to determine whether the monument has been designed from the appearance in its present form and executed in two successive times, or if it has been elevated (with the elegant windows and statues) under the influence of the Vitruvian theories, whose progressive diffusion and interpretation occupy in Veneto a period comprising three generations of artists, from Fra Giocondo to Falconetto, from Serlio to Barbaro, and from Palladio to

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Scamozzi. The answer to this question may depend on a more accurate description of the monument, dimensions (about 18 m long and 5 m wide) seem to approximate to the Vitruvian model; where the porch with five arches and the overlying facade, punctuated by the row of the horizontal frieze with clipei and bucrania and the vertical lesenes surmounted by Doric and Ionic capitals, is configured as the recovery, still high in time, of the scene of the classic theatre, erected in the two regulatory orders (Vitruvius, *De Architectura*, V, 9), and harmoniously compared, in its frontal and volumetric aspect, to the reduced proportion of the site.¹

The passage was quoted in full because it contains an explicit invitation to make an accurate survey of the monument. Moreover, in 1989 a Scientific Commission was set up to guide the restoration of the Cornaro house that took about ten years. Members of the Commission were professors Giovanni Calendoli, Manfredo Tafuri, Arnaldo Bruschi, Wolfgang Wolters, Giovanni Carbonara, Laura Tabasso, Guido Biscontin and ministry officials. The Scientific Commission has also repeatedly been called on to make a careful survey of the monument to carry out a critical architectural restoration, respecting all existing historical, artistic and functional properties (Carbonara and Berti 1997) (Fig. 12.1).

The study presented here is a partial response to these authoritative invitations. However, it also responds to a question maintained during the drafting of the various projects from 1989 to 2000: the restoration programme must proceed from the idea that the monument was conceived as architecture for a theatre or as a house for a humanist?

¹*Quando alla loggia sia stato aggiunto il piano superiore è difficile dire; e soprattutto è arduo stabilire se il monumento sia stato progettato fin dall'inizio nel suo aspetto attuale ed eseguito, per così dire, in due momenti successivi, oppure se esso sia stato completato con la sopraelevazione (comprendente l'elegante frequenza delle finestre e delle statue) sull'influsso delle teorie vitruviane, la cui progressiva diffusione e interpretazione occupa nel Veneto un arco di tempo comprendente tre generazioni di artisti, da Fra Giocondo a Falconetto, dal Serlio al Barbaro, e dal Palladio allo Scamozzi. La soluzione del quesito può dipendere da un più accurato rilievo del monumento, le cui misure in pianta (circa 18 metri di lunghezza per 5 metri di profondità) sembrano già approssimarsi a un ricalco del modello vitruviano; onde l'insieme del portico a cinque archi e della soprastante facciata, scandito dal tracciato del fregio orizzontale a clipei e a bucrani e dalle lesene verticali sormontate dai capitelli dorici e ionicì si configura come il recupero, ancora alto nel tempo, della scena fronte del teatro classico, eretta nei due ordini regolamentari (Vitruvio, *De Architectura*, V, 9.), e armoniosamente rapportata, nel suo aspetto frontale e volumetrico, alle ridotte proporzioni dell'ambiente. [Transl. by Maurizio Berti] (Zorzi et al. 1982, pp. 9–10).*

2 Did Falconetto Know the Roman Theatre?

In modern times, the path leading to the creation of an exclusive architecture for theatre is long and complex. It was identified by historians at the end of the fifteenth and early sixteenth centuries in Mantua, Ferrara, Urbino, Florence, Rome. At the end of the fifteenth century, theatrical performances were still occasional and did not have deputy buildings. Otherwise, new monumental architectures inspired by classical models were built for houses.

The composition of theatrical text is already a mature literary form when the place of representation has not yet defined an architectural character. We read in Calendoli (1985, 42):

The comedians write for an ideal theatre. The comedies are performed in festivals, courtyards, squares, banqueting halls, with rich decorations or with few scenic elements, according to the possibilities. There is a considerable distance between the writing of the theatrical text and its representation. The theatrical text is governed by the precepts of classical literature, conversely, the representation of the text ignores the precepts of classical architecture.²

What could be the knowledge of the Roman theatre in Padua in the early sixteenth century? An archaeological notion of the scene began to spread among the humanists in the second half of the fifteenth century, between Rome and Venice. In a collection of theatrical architecture studies in the *Bollettino del Centro Internazionale di Studi di Architettura Andrea Palladio* (XVI, 1974 and XVII, 1975), the art historian Wolfgang Lotz wrote briefly (Lotz 1974) that the ideal reconstructions of the ancient theatre by the Renaissance architects were based on the finding of the ruins. The *frons scaenae* was difficult to recognize, so hypothetically the architects referred at the text of Vitruvius.

Lotz also hypothesized that Leon Battista Alberti's *De Re Aedificatoria* could have been a source of archaeological orientations. This treatise was printed for the first time in 1485 in Florence, but it was printed in Venice just in 1546. Classical theatre could most probably be known in Padua in the second decade of the sixteenth century, through the *Vitruvius* of Giovanni Giocondo, printed in Venice in 1511 (*M. Vitruvius per Jocundum solito castigatior factus cum figuris et tabula ut iam legi et intelligi possit*), where, in the *liber quintus*, are imprinted the tables of a classical theatre, rebuilt with great complexity of arguments.

²*I commediografi scrivono per un teatro ideale. Le commedie sono recitate nelle sale delle feste, nei cortili, nelle piazze, nelle sale dei banchetti, con ricchi addobbi o con pochi elementi scenici, secondo le possibilità. Corre una notevole distanza tra la scrittura del testo teatrale e la sua rappresentazione. Il testo teatrale è governato dai precetti della letteratura classica, viceversa la rappresentazione del testo ignora i precetti dell'architettura classica. [Transl. by Maurizio Berti] (Calendoli 1985, 42).*



Fig. 12.1 Courtyard of the Alvise Cornaro House, today. *Source* Maurizio Berti

Giorgio Vasari connects Falconetto to Giocondo on the matter of ancient monuments, saying that this cognition was greatly aided by Giocondo (Vasari 1568, III, 270), while expressly declaring that Cornaro was a great friend of Giocondo (Vasari 1568, III, p. 247). He writes that Falconetto's archaeological studies continued throughout twelve years of life in Rome, where he returned with Cornaro. *And he was the first to draw theatres and amphitheatres and find their ground-plans; and those visible, and most of all that of Verona, came from him and were printed by others on his drawings* (Vasari 1568, III, 269).³

We have the drawings of the Marcello theatre in Rome to testify that Falconetto had understood the architecture of a classical theatre. We have also the Roman theatre in Verona and the architectures of Pola where, in addition to the amphitheatre, there were two Roman theatres. Unfortunately, these drawings cannot be used to support the topics discussed here. The *corpus* of antiquity drawings attributed to Andrea Palladio, and other architects of the first half of the

sixteenth century, including Falconetto, was the subject of a long and in-depth critical examination by historians. In this critical path, the writings of Zorzi et al. (1958), Lotz (1962), Schweikhart (1980a, b) and Burns (1973, 1980) still direct the most recent studies. For the considerations gathered in this text, it is useful to refer to the assumption of Burns. He believes that some drawings of the *corpus* have been inspired by Falconetto, while he doubts that these drawings were drawn by Falconetto's hand (as it had been believed by Zorzi). Burns also accredits the testimony of Vasari describing Falconetto as an early Renaissance draftsman of the antiquities of Verona, Rome and Pola (Burns 1980, p. 84).

The interest in antiquity in Padua was introduced neither by Cornaro nor by Falconetto, but by humanists and antiquarians, who were present in Venice area already during the second half of the fifteenth century. Consider that such humanists and antiquarians were present in the Cornaro circle, since they had determined a philological attitude for antiquities between the second and third decades of the sixteenth century. In the field of classical architecture, Falconetto offered models that he had composed by measuring directly the proportions of Roman ruins and finding confirmation from the reading of the Vitruvius treatise or, at least, by discussing some of the arguments contained in this treatise.

³*E fu questi il primo che disegnasse teatri et anfiteatri e trovasse le piante loro; e quelli che si veggono, e massimamente quel di Verona, vennero da lui e furono fatti stampare da altri sopra i suoi disegni.* [Transl. by Maurizio Berti] (Vasari 1568, III, p. 269).

3 Looking for a General Idea

The argument of a general plan for the arrangement of the Alvise Cornaro palace was defined for the first time by the medievalist Paolo Sambin. The historian, by reading the testaments of the Cornaro family, allows us to identify a collation of houses and gardens near to St. Anthony's Basilica that Cornaro inherited (Sambin, 1966, 303–321).

This whole unit was not fully perceived by some historians, when they turned attention to the architectural style of the facade along the street, or to the beauty of remains inside the palace. The progressive decay of the property, however, has lost the perception of the unitary urban set. Giannantonio Moschini in 1817 gave notice of the demolition of the loggia in front of the Odeo and part of the palace on the public street, as documented by a drawing by the public topographer Lorenzo Mazzi in 1735.

In the publication of Mazzi's drawing, the art historian Giuseppe Fiocco, through some stylistic considerations, introduced the topic of a general plan for a single large palace, reforming the set of medieval houses that Alvise Cornaro inherited from his uncle Alvise Angelieri. But the suspicions of the demolition of the palace on the street led his studies on the Loggia and the Odeo, continuing with an ancient appreciation and neglecting the verification of a general building of the palace (Fiocco and Cornaro 1965, pp. 34–40).

Vasari writes about the Loggia and the Cornaro house in Padua (Vasari 1568, III. p. 269):

He (Giovanmaria Falconetto) at that time did many things with messer Luigi; who desire to see the antiquities of Rome closely, as he had seen in the drawings of Giovanmaria, he went to Rome with him; where, having him always in his company, he wanted to see everything minutely. After back to Padua, he began to do the beautiful and ornate loggia which is in the Cornaro house close to Santo, according to the design and model of Falconetto, then he began the palace according to the model made by Messer Luigi himself.⁴

With this same quotation from Vasari, Sambin begins the meticulous review by noting and comparing contracts and notarial acts related to Alvise Cornaro's neighbours and tenants (Sambin 1966). It is a difficult reconstruction because property records of the past do not have that numerical order which facilitates the general reorganization of a map today. The interest of the scholar is limited to the urban area which

includes the various parcels of Cornaro. The result is a quadrilateral figure which is the limit assumed in this study.

Between 1518 and 1526, Cornaro performs a series of actions to obtain the availability of all the buildings along the street and the respective open areas inside, without any intermediate interruption. Even in the shape, the condition reached by the properties in 1526 corresponds perfectly to the idea of a general area reordering.

These changes in the leased areas probably correspond to the succession of the different construction sites for the new palace, both for the building on the street and for the inner gardens. The adjustment of the facade opposite the Loggia in the new courtyard can only take place when Cornaro gets the full availability of the building overlooking the public street. The construction of the arcades on the right side of the court and the construction of the Odeo can only begin in 1526 because until then the property was rented.

Examining the sequence of documents collected by Sambin, we find the difficult acquisition of a last portion of the property. It seems to us that this difficulty may have delayed the realization of the general plan to the point of compromising the perfect execution of the Renaissance courtyard.

4 The Site for the Project

The observation of the wall in front of Odeo clarifies the incompleteness of the left side of the palace Cornaro courtyard and confirms the study of Sambin. The information, recognizable in the remains of this wall, corresponding to the historical documents, belonging to a period between 1511 and 1784, the date from which Cornaro inherited the property to the date of the *Veduta della loggia e rotonda in the Pianta di Padova* by Giovanni Valle (Fig. 12.2).

Observing this same wall in vertical projection, but at the level of the underground, we can be that it is the rectilinear extension of the wall separating part of the palace towards the street (here marked with numbers 5, 6, 7, Fig. 12.3). Such a wall is a boundary line that persists in historical and current maps. It has for extreme points a pillar of the portico to the south and, beyond the Loggia, the border of other properties to the north. The wall has an older historical value in relation to the time considered here. It is part of the so-called lotto medievale: a typological subdivision of medieval property parcels that still today model the urban buildings of the historic centre of Padua. The boundary wall is aligned to the first of the five underground walls of the building along the street that we see drawn in two historical surveys of 1727 and 1735.⁵

⁴*Il quale* (Giovanmaria Falconetto) *in detto tempo operò molte cose con detto messer Luigi; il quale desideroso di vedere l'anticaglie di Roma in fato, come l'aveva vedute nei disegni di Giovanmaria, menandolo seco, se n'andò a Roma; dove, avendo costui sempre in sua compagnia, volle vedere minutamente ogni cosa. Dopo, tornati a Padoa, si mise mano a fare col disegno e modello di Falconetto la bellissima e ornatissima loggia che è in casa Cornara, vicino al Santo, per far poi il palazzo secondo il modello fatto da messer Luigi stesso.* [Transl. by Maurizio Berti] (Vasari 1568, III. P. 269).

⁵Drawing of Giovanni Nardi. 1727, in: Archivio di Stato di Padova, Santa Maria della Misericordia, B. 67/7; Drawing of Lorenzo Mazzi. 1735, in: Archivio di Stato di Padova, Corporazioni soppresse, Monastero S. Antonio, T. 320 (Berti 1993, p. 176).

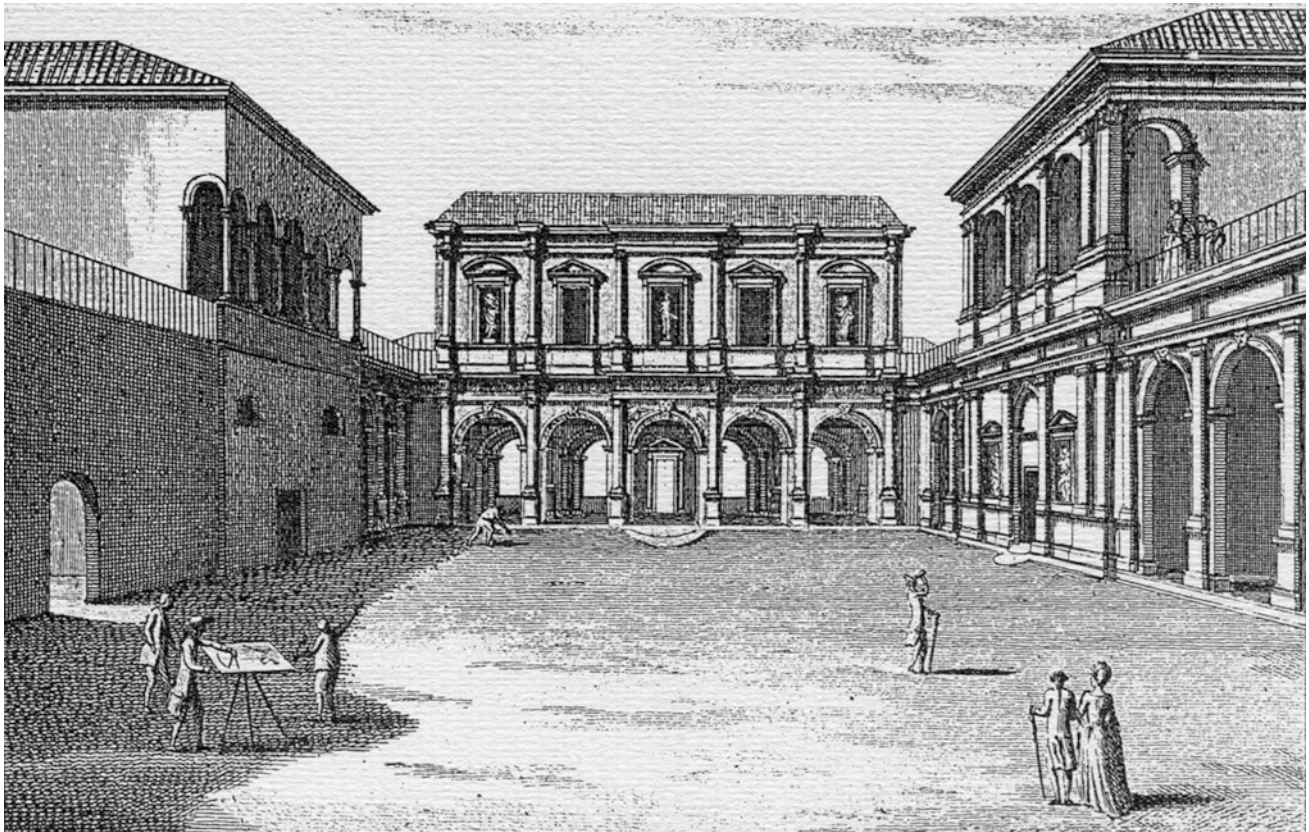


Fig. 12.2 *Veduta della loggia e rotonda in the Pianta di Padova* of Giovanni Valle, 1784 (part.). On the right: the loggia demolished before 1817; in the centre: the Loggia; on the left: the Odeo. *Source* From the copy owned by Maurizio Berti

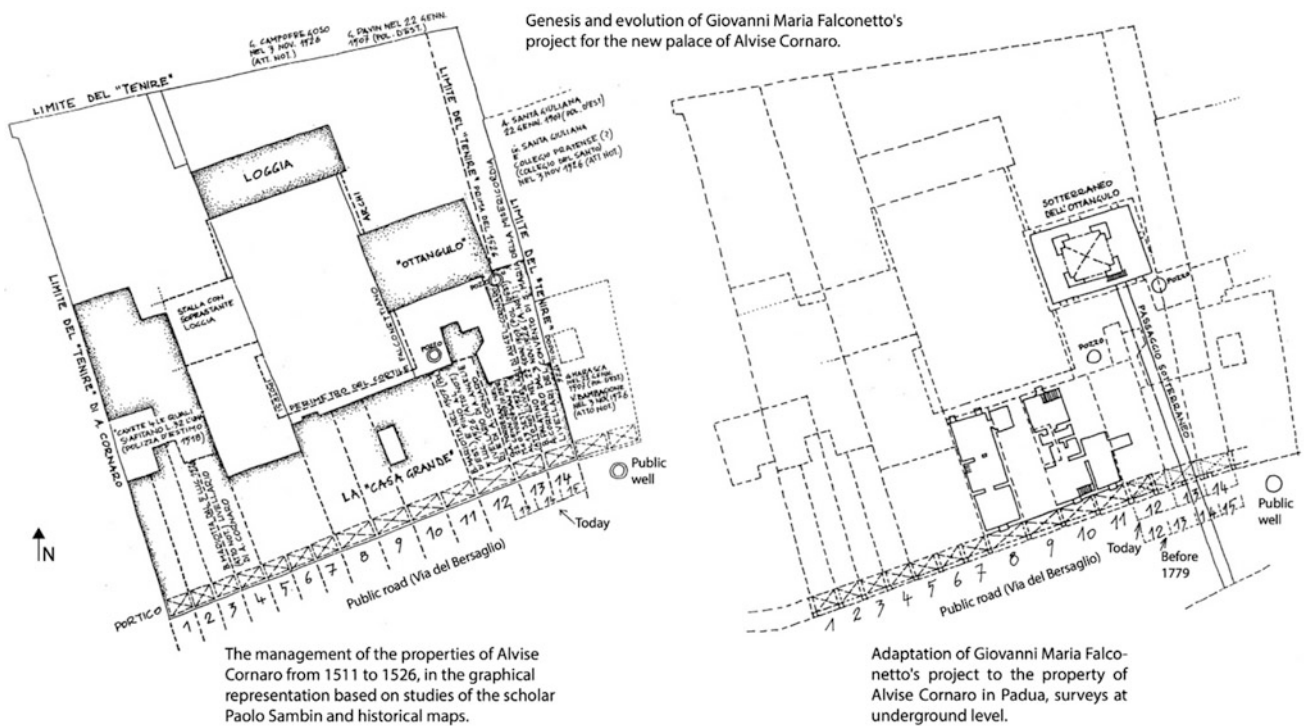


Fig. 12.3 Management of the properties of Alvise Cornaro from 1511 to 1526. *Source* Maurizio Berti

Capitoline foot, the Roman Architectural foot, the Verona foot, the Padua foot and the Venetian foot (Berti 1993).

The Venetian foot is a unit of measure which has proved to be commensurable with foot multiples in general measurements and submultiples in architectural detail measurements. Having established that the Venetian foot was the unit of the mensural system used to build the courtyard, the survey was completed with that system.

Based on the first collected data, a comparison was made with the measures of the court in the copper engravings of Gio. Antonio Battisti, 1786 (Alvarez 1980a, b). The mensural scale attached to these engravings shows that the author has drawn some symmetry relationships that are not present in the courtyard. An example: Battisti measures the depth of the Loggia in 14 Venetian feet. This is not true. Otherwise, the true depth is in 20 ft. Battisti wanted to attribute to the depth of the Loggia a proportion that corresponds to the fourth part of the extension of the prospect that he measures 56 ft., as is clear for us as well.

The symmetrical progression of the courtyard, taken from the two remaining sides, is, therefore, given by two main ratios: the measure ratio *dupla* and the *sesquialtera* measure ratio. These are the formulations given in the ninth book of Leon Battista Alberti's *De Re Aedificatoria* (1565). It is not easy to understand what the canonical measures of a courtyard of the *domus* should be, referring to the sixth book of the treatise of Vitruvius. The verification was carried out both on the edition of Giocondo (1511) and on Cesariano's commentary (1521).

The measures of the court are corresponding to the second of the three types of *atrium* for private houses: *Alterum cum in tres partes dividat, duae partes latitudes tribuantur* (Giocondo 1511, p. 62). In fact, $84 : 3 = 28$; $28 \times 2 = 56$ (the length of the courtyard is 84 feet; the width measurement is 56 feet). Vitruvius refers specifically to the dimensions of the *atrium*, but the courtyard of Padua would be a *cavaedium*, and in both Giocondo and Cesariano, the two places have distinct and different connotations. On the other hand, the Cornaro

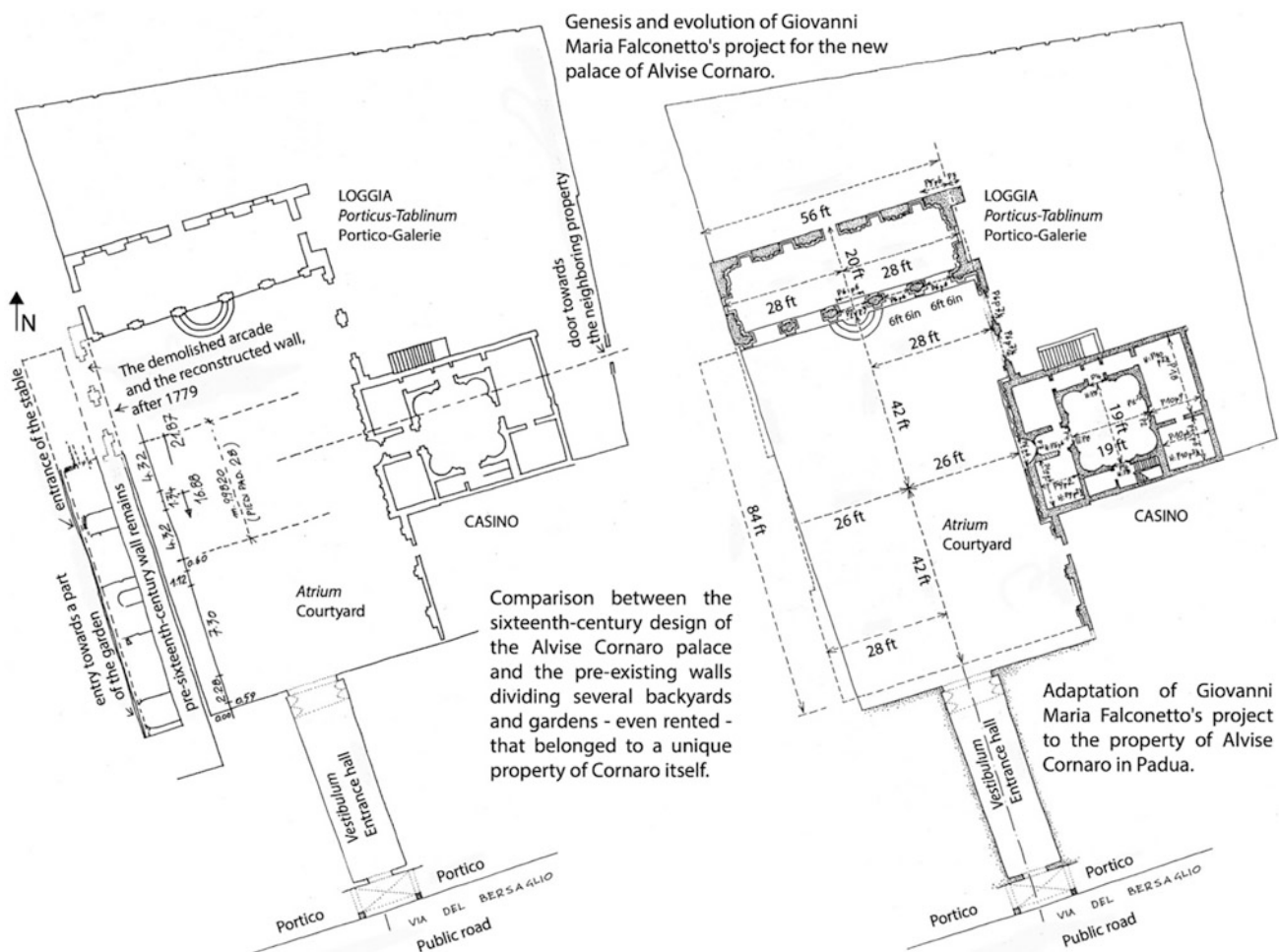


Fig. 12.5 Genesis and evolution of Giovanni Maria Falconetto's project. Source Maurizio Berti

palace may not be configured with any of the three types of *atrium* described in Vitruvius. Let us then go to Alberti, who in Chapter XVII of Book V of his treatise writes that the main part of all in the house is the *Cavedio* (cavaedium) or the *Atrio* (atrium) the one that you want, that we'll call it the *Cortile* (courtyard) with loggias (Alberti 1565, pp. 152–153).⁶ *Cavedio* and *Atrio* are the same as the *Cortile* (Fig. 12.5).

The height of the court's facade of 18 ft. and 8 in. determines half of the court's width in a *sesquialtera* measurement (multiplying by 3/2), according to Alberti's method. Half courtyard width measures 28 ft. Applying a *dupla* measurement (multiplying by 2), 56 ft. is twice the size of 28 ft: the width of the courtyard. This measure accords with the demolition of part of the fifteenth (or even older) wall facing the Odeo, mentioned above. Adding 56 ft., a *sesquialtera* ratio, we get the length of the court: 84 Venetian feet.

This quadrilateral of 56 Venetian feet of width and 84 ft. in length does not reach, however, the inner facade of the building on the street. We have still 139 cm. This measure corresponds to 4 Venetian feet that is the width of the elevated walkway, above the cornice of the arcade, that serves to walk all around the court and putting in communication the palace on the street with the Odeo and the upper room at the Loggia.

6 Conclusions

The measurements of the courtyard, the Odeo, and the Loggia carried out using the Venetian foot (m 0.3475) reveal the drawing of the project by Giovanni Maria Falconetto. The revealed project responds to the rules of Vitruvius, not referring to the classical theatre but to the symmetries of one of the three types of private *domus* courtyard.

Ludovico Zorzi had done some tests overlapping the Vitruvian theatre scheme upon the courtyard plan. Without finding convincing correspondence, he suggested a detailed survey. We tried to give an answer to this invitation but using the measurement system used during the construction of the new Renaissance house of Cornaro. The measures taken with the Venetian foot revealed a play of architectural symmetries and, consequently, the general project of Giovanni Maria Falconetto. A project would probably not have been recognized if the measurements of the monument had been made with the decimal metric system.

In conclusion, we have shown that the renovation of the Cornaro house corresponds to the model of the Roman

domus and not to a part of the classical theatre. The value of the aesthetic experience of Alvise Cornaro and Giovanni Maria Falconetto becomes, therefore, more relevant. However, the literary work of the great Ruzante, who was a good friend of Cornaro and Falconetto, is not diminished.

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⁶la principal parte di tutte è quella, la quale, o Cavedio, o Atrio che tu ti dica, noi lo chiameremo il Cortile con le logge. [Transl. by Maurizio Berti] (Alberti 1565, pp. 152–153).

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