

# Desiderio di Montecassino Abbey. Survey: the Logic of Measure and Proportion

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## Abstract

*Being an architect today, in the presence of the great masters of history, raises questions about the objective existence of a measurable and replicable cosmic harmony. In essence, this is a theme of remote origins, in which man questions the existence of Beauty as an objective value: whether it is inspired by the transcendence of the Platonic idea or by the immanence of the Aristotelian universal. In this paper we analyze some works that have stood the test of time: they are products of a culture different from ours but they have developed a universal language that goes beyond the conventions codified by those who produced them and by those who admire them today.*

*In this context, we present the case study of the Desiderio Abbey of Montecassino, a medieval building that has been lost. Today, on its site stands a modern building whose features reflect the project of the 17th-18th century. The majesty of the original building comes to us from the chronicles of the time and somehow it still reverberates in the current layout of the abbey. The aim of this study is to trace the original design model which inspired Abbot Desiderio to create his work. The survey uses the tools and methods of drawing, surveying and analyzing the graphic documents received by us thanks to the cataloging and conservation of historical archives.*

*Keywords: Montecassino, Desiderio, metrology, survey, mystagogy.*

## Introduction

The theme we present offers a particular interpretation of a lost monument. The study is based on the cross-analysis of some important documents such as: the design description of the Desiderio's project of 1071 and reported by Marsicano in his *Cronaca Monastero Cassinese*; the survey of the architectural complex carried out by Antonio da Sangallo and his brother Giovanni Battista almost 500 years after the dedication and surveys of the building complex published by Erasmo Gattola in 1733 to accompany its history of the abbey up to the archaeological surveys made by Pantone between the destruction of 1944 and the modern reconstruction. This comparison made it possible to recognize in the description of Marsicano the compositional characters represented in the sixteenth-century surveys deposited at

the Cabinet of Prints and Drawings of the Uffizi Galleries in Florence. In a concatenated way, it has been possible, through metrological speculations, to explain the metric value of the cubit they desire and to put forward some considerations on the proportional logics underlying the original work.

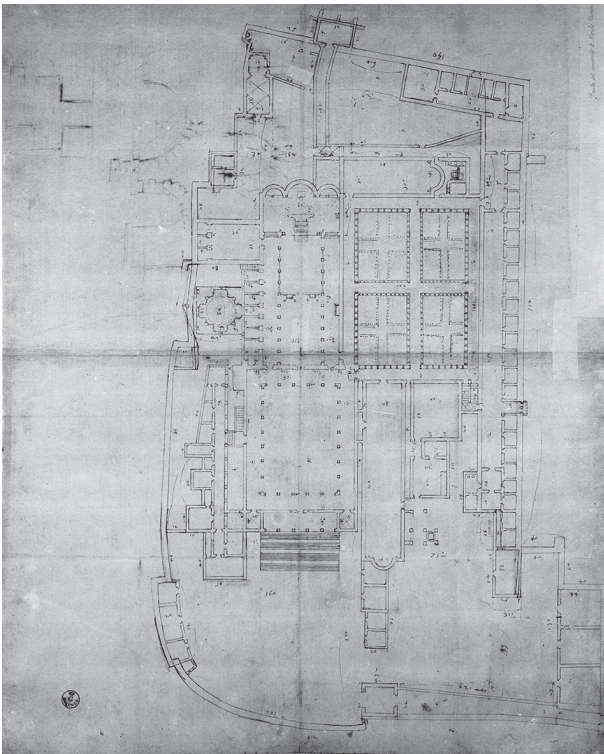
## Cronaca Monastero Cassinese

The description of the works of Abbot Desiderio of Montecassino, future Pope Victor III, comes to us thanks to his biographer Leone Marsicano who begins the drafting of the *Cronaca Monastero Cassinese* on commission of Abbot

Oderisio, who succeeded the great Desiderio as abbot. The work includes the events from the origins of the monastery, with its foundation by Benedetto da Norcia in 529, up to the year 1075 (Abbot Desiderio), offering extensive historical documentation of the arrival of the Lombards and Normans in Italy. The chronicle is divided into 4 books, the last of which is written by Pietro Diacono a few years after the death of Leone Marsicano, who will expand the discussion to the events of the empire and the church until 1138.

The figure of Desiderius is described in the third Book, presented as a monk, ascetic, abbot and pope, supporter of the reform of the church of Gregory VII. Desiderio embodies the image of the builder abbot and patron of the arts, recognized today as a key image of the syncretism of Lombard and Norman art, as well as an authoritative counterpoint to Cluniac architecture across the Alps [1].

Fig. 1. A. da Sangallo il Giovane, drawing of the Abbey of Montecassino, Gabinetto fotografico Uffizi, 1276Ar.



Particularly interesting for our study appears the accurate description of the reconstruction of Desiderio's abbey. According to the chronicler, after some architectural works aimed at improving the housing status of the community, the abbot decides to undertake a major reconstruction work. He has all the old buildings demolished, that were now dilapidated and insufficient for the community that has become numerous; He has the old church demolished and he built a basilica so majestic that it marks a chapter in the history of sacred architecture.

The building is carefully described, reporting its shape and size. The same workers are brought in from Constantinople. Given the exceptional nature of the event, a craft school was set up aimed at preserving the construction art of mosaics. The chronicle reports that in 1071, Desiderio went to the supreme pontiff and he invited him to attend the dedication. Ten archbishops, 44 bishops and magnates from all over the world were present at this solemn celebration, whose number was not thought of. Such solemnity was celebrated for eight continuous days, and the fortune of this monastery grew to the point that in two years the number of monks of the monastic family grew to two hundred [Marsicano, Diacono 2016, pp. 389-395].

Today Desiderio's building is no more visible, but we can guess its majesty from the chronicle of Marsicano. It was in fact destroyed and rebuilt several times over the centuries. The first substantial transformation had to take place in the earthquake of 9 September 1349 [Scaccia Scarafoni 1936, p. 98]. From the chronicles of the time we can deduce that the damage suffered by the structure was enormous. In this regard Gattola [Gattola 1733, p. 736] reports the annotations of an anonymous Cassinese in which we read that in the whole monastery not even a building had remained erected and that this state had to last until 1370, the year in which he reports a bull of Urban V, in which the pontiff makes appeal to all the houses of the order to help support the community in the reconstruction of the building "*super suis fundamentis quae illaesa consistunt*" [Gattola 1733, p. 520] "*unde (...) constructionis aliorum monasteriorum forma processit*" [Gattola 1733, p. 736].

From what is reported, it's evident the actual state of instability suffered by the structure, but at the same time those verses let us understand that the Desiderio's project had to remain in the traces of the foundations and rise again with new elevations.

It cannot be said that the entire complex retained the same medieval imprint (especially as regards the minor buildings)

but in agreement with Scaccia Scarafoni [Scaccia Scarafoni 1932, p. 98] almost 500 years later, the survey of the abbey carried out by the brothers Sangallo still seemed to reflect the description of the Marsicano chronicle, or at least in the location of the main buildings.

### The Sangallo brothers' drawings

There is a series of graphic works preserved in the Cabinet of Prints and Drawings of the Uffizi Gallery in Florence, already published by Gattola in 1733 and extensively com-

mented by Giovannoni in 1929 [Cfr: also, Scaccia Scarafoni 1932, Cigola 1997] in which the two brothers document an accurate survey of the complex and plan some architectural interventions.

Briefly presenting these documents, starting from the critical comment published on the *Progetto Euploos* portal. The sheet 182Ar (fig. 2) is a survey work signed by Giovan Battista Cordini da Sangallo called il Gobbo. All the others (172A, 180A, 181A, 1276A *recto* and *verso*, 1316A *recto* and *verso*), cataloged as drawings by his brother Antonio Cordini, known as Antonio da Sangallo il Giovane, are instead Design drawings of the Pietro dei Medici's Chapel, to be inserted

Fig. 2. G. B. da Sangallo il Gobbo, drawing of the Abbey of Montecassino, Gabinetto Fotografico Uffizi, 182Ar.

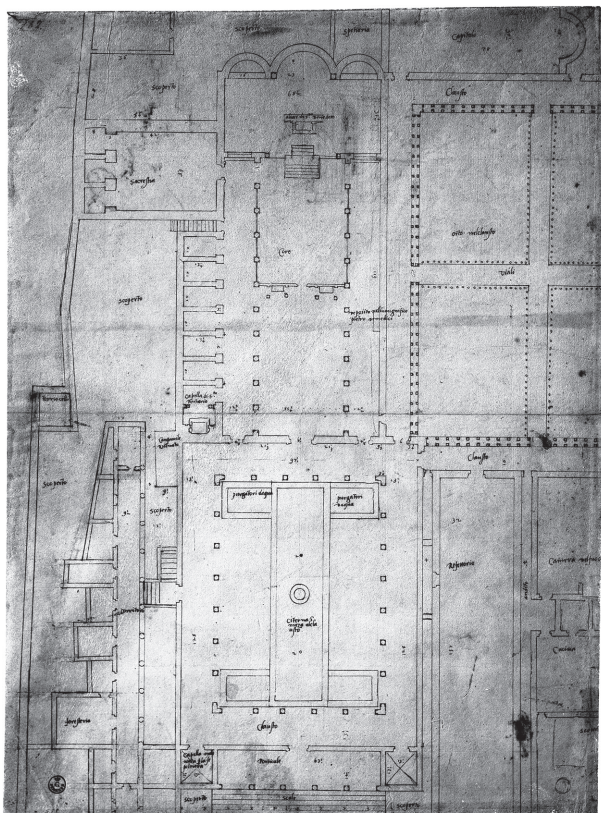
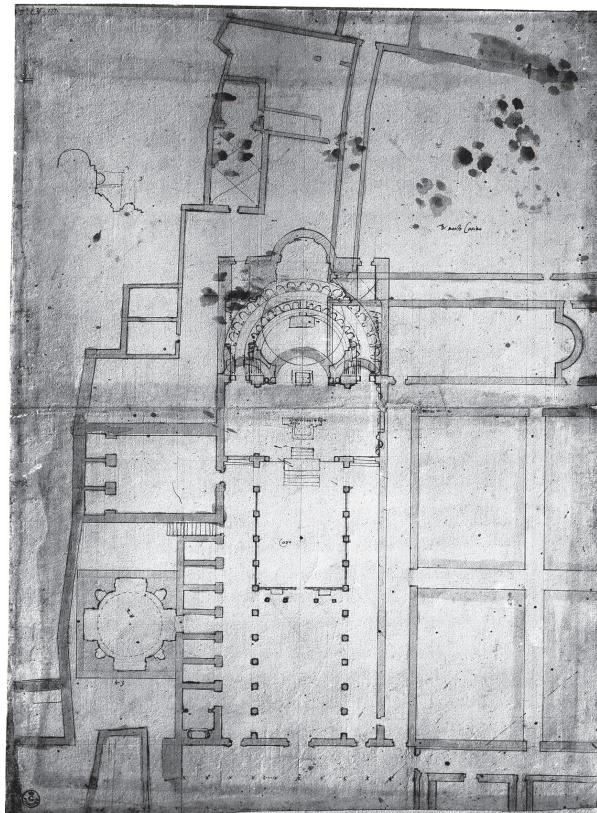


Fig. 3. A. da Sangallo il Giovane, detail of the drawing of the Abbey of Montecassino, Gabinetto fotografico Uffizi, 181A.



in the left aisle, and of the a new large semicircular choir to replace the three medieval apses.

In particular; the document 181A contains both proposals in an overlaid representation of the survey status (182Ar) and of the project status. The 180A seems to be a reworking on the same scale in which only the project status of the new choir is identified, therefore without overlapping.

The chapel of Pietro dei Medici, on the other hand, becomes the privileged subject of the detailed drawings 172A and 1316A (front and back), in which plans and sections of the monument are developed; and it is reproduced on a large scale in the drawing 1276Ar (fig. 1).

Specifically, the present study focused on this last drawing which, although representing a design phase of the Pietro dei Medici chapel, it collects the greatest number of measure references and it allows to appreciate the whole abbey plant on

a larger scale, including the cloister and the perimeter rooms of the complex.

In 1932, Scaccia Scarafoni, in one of his well-motivated essays, made various observations on the notations of the drawings, which led him to contest the dating proposed by Giovanni [Giovannoni 1929] who dated the projects between 1531 and 1559. He goes on to establish between 1507 and 1512 the time frame within which to place the drawings' realization. Temporally, he frames them in the years in which the surveys are carried out for the design of the tomb of Pietro dei Medici, who died in 1503, more precisely after the lightning of 1507 that will ruin one of the towers (the wording "campanile ruinato" is in fact present on the drawing), and immediately before the renovation works by Squarcialupi (who in 1512 will carry out the works for the insertion of a new monumental entrance cloister of which there is no trace in the Sangallo).

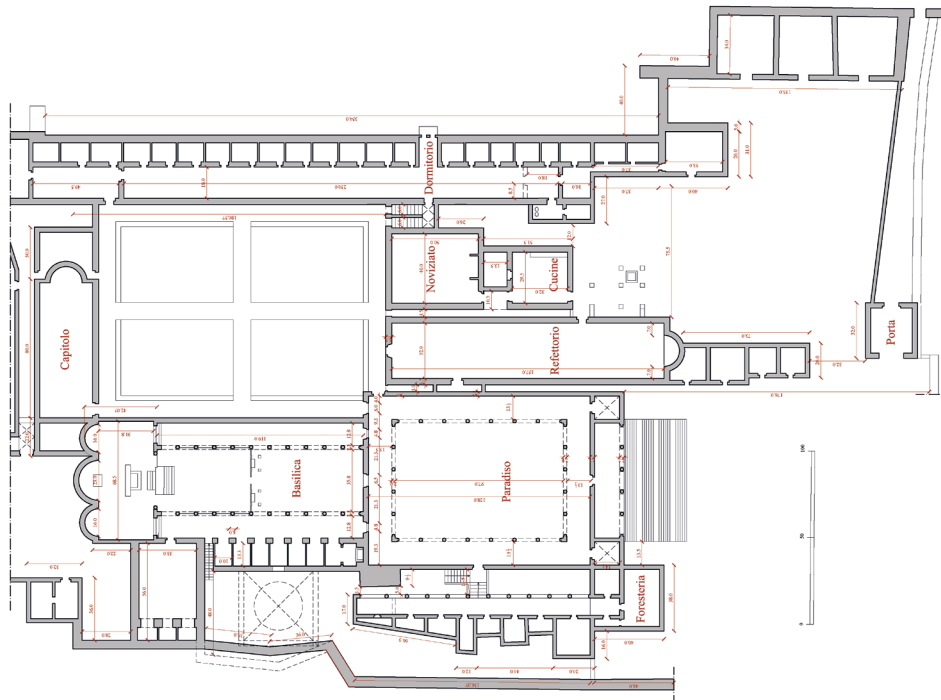


Fig. 4. Vector reconstruction of the abbey of Montecassino performed on the basis of the relief drawings of the Sangallo brothers (graphic elaboration by L. Aiello).

## Marsicano and Sangallo in comparison

The correspondence between Marsicano's description and the Sangallo survey immediately appears plausible thanks to the direct comparison of the documents. Extrapolating some passages, Desiderio's project is described in this way: A basilica building with three naves with 10 columns on one side and 10 on the opposite side "*columnas desuper decem a latere uno totidemque ex altero*" [Marsicano, Diacono 2016, p. 384], ending with an apsed transept. In front of the church he builds an atrium "*quod nos Romana consuetudine paradysum vocitatur*" [Marsicano, Diacono 2016, p. 384] which with Roman usage we call it paradise (in the drawing of Sangallo it is named the cloister of benefactors) with four columns on each front and eight on each side, and in front of the entrance to the basilica he builds arches "*quo vulgo spiculus dicimus*" [Marsicano, Diacono 2016, p. 384], a description that surprisingly places the construction of the pointed arch at the beginning of the second millennium [Luschi 2015, pp. 181, 182]. Speaking about the count of the columns, it should be noted that both in the nave and on the short side of the paradise only the free columns are counted. Regarding the long side of paradise, we actually have 6 free columns to which two corner semi-columns can be added. It's a detail that opens up a doubt about the descriptive license or the actual modification of the angular solution after the 1349 earthquake. In both cases, the description still seems to reflect the spatial scans of sixteenth-century drawings. Among the scrupulous descriptions it is still possible to recognize the position of the apsidal refectory, built in adherence to paradise. The chapter "on the eastern side, sideways, so that the internal corner of its frontispiece matches the external corner of the basilica and its apse seems to approach the dormitory" [Marsicano, Diacono 2016, p. 403]; the long and narrow dormitory located south of the complex, the kitchens and the novitiate between the dormitory and the refectory. Compared to the constructions on the perimeter, Marsicano describes also the construction of a turreted door served by a slope with a double protective wall; the guesthouse for pilgrims on the southern side, and on the northern side of paradise the guest house, near a mill which is placed not far from the entrance hall's steps (in the Sangallo drawings these architectures are indicated as a guesthouse). The recognition of these environments therefore comforts us in affirming that the reconstruction and consolidation interventions that took place after the earthquake of 1349

must not have upset the medieval structure that still largely responds to the description of Marsicano.

## Reconstruction of the Sangallo brothers' survey

We want to highlight here that the exceptional correspondence between descriptive documentation and graphic documentation represents a case of great value for the study of medieval architecture. We are in fact convinced that this union must have been one of the main proponents of the rich literature of merit concerning the historical reconstruction of the image of the Desiderian basilica. Among all the study, we mention the exemplary interpretative ones of Kenneth J. Conant [Willard 1935, pp. 144-146] and of Scaccia Scarafoni [Scaccia Scarafoni 1944, pp. 137-183] who faithfully trace the proportions of the buildings represented in the Sangallo drawings.

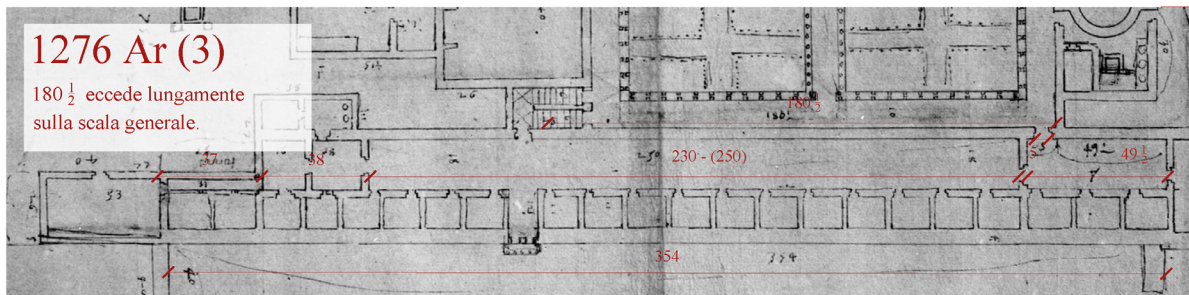
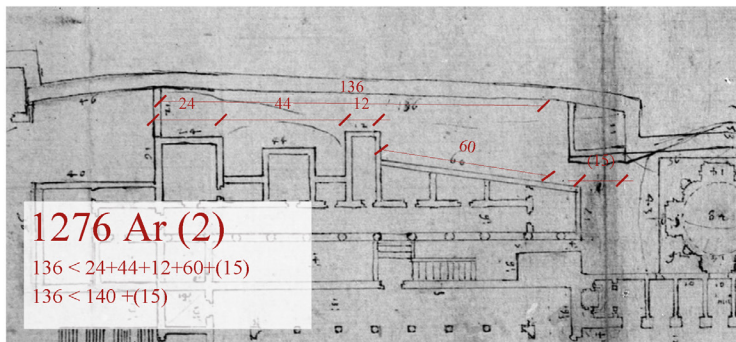
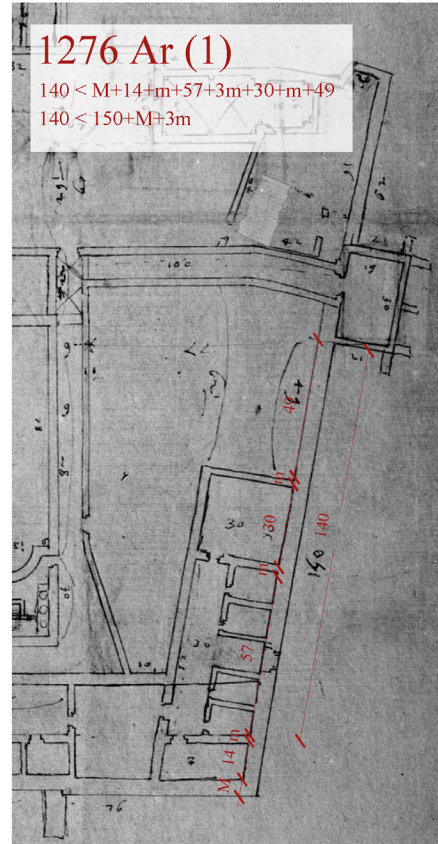
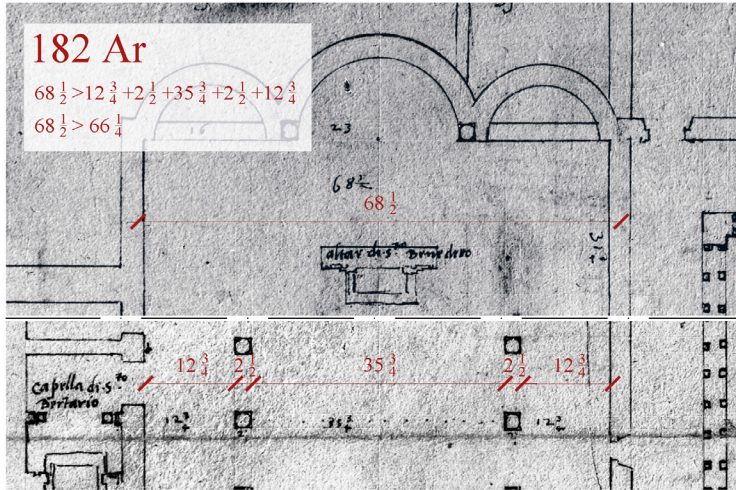
Analyzing the sixteenth-century drawings, we highlight that some of them have measures notations reported in correspondence with the main architectural elements. This made it possible, starting from drawing 1276Ar (fig. 1), and through appropriate comparisons with the measures indications present in the detailed drawings, to operate in a vectorial methodology a reconstruction of the abbey system on an absolute scale (fig. 4), postponing to a later work step the coding of the metric unit of reference adopted. Where possible, the survey has been re-drawn using the positions and inclinations already graphed in the original drawings. This operation let us verify the exact proportional correspondence between measurement and graphic elaboration, allowing us to check any deformation phenomena of the original paper support, or derived from digital scanning and eliminate the natural error inherent in scaling reductions.

It should be noted that the sixteenth-century drawings are the expression of a simplified representation. All the rooms show orthogonal positions, and the overall composition does not show any deviations from this orthogonality.

This is very evident in drawing 181A (fig. 3) in which the high resolution of the scan allows you to appreciate the grain of the sheet and the slight grooves engraved with a thin point to form a sort of reference squared paper.

Exceptions to this orthogonality are the perimeter constructions which somehow perform the function of defining the composition of the rooms and can absorb any reconstructive errors. Facing an analysis of the measure data reported on the documents, it is highlighted that the main dif-

Fig. 5. Details of drawings 182Ar and 1276Ar highlighting the main algebraic discrepancies of the measurements detected (graphic elaboration by L.Aiello).



ferences between the indicated measurement and the one represented are recorded on the perimeter walls (fig. 5). In fact, it seems that in the face of a graphic simplification, the editor has however maintained documentary honesty in the measures numerically indicated.

However, some macro critical areas are highlighted in the report:

1. the perimeter wall to the east;
  2. the guest buildings to the north of paradise;
  3. the area of the chapter cloister and the adjacent dormitories.
- To these ones we add a fourth case relating to the measurements of the internal width of the basilica.

In each of these sectors there are some algebraic incompatibilities which denounce drafting errors that cannot be resolved unless substantial corrections are evaluated.

In the first three cases, the sum of the partial measurements exceeds the total measurement reported on the outermost front. In the case of the width of the basilica, however, the partial sums are lower than the total measure indicated in the presbytery.

In detail: in the first case the sum of the internal spaces ( $M+14+m+57+m+30+m$ , in which  $M$  indicates the thickness of the perimeter wall, and  $m$  the thickness of the dividing wall between two internal spaces) and cloister (49 units) exceeds all wall thicknesses plus 10 units compared to the reported total of 140 units.

In the second case, the sum of the individual buildings, indicated gross of the external walls ( $24+44+12+60=140$ ) even excluding the passageway (estimated on a graphical basis 15 units) already exceeds the total length of 136 units of the external wall.

In the third case, concerning the dormitory, the measures indicated exceed the graphed measures for a long time. In particular: the length of the cloister represented is more than 40 units shorter than the reported length of 180 and  $1/2$  units, a discrepancy that can only be solved by assuming a drafting error or a graphic reconstruction that admits a trapezoidal deformation of the cloister.

Only in the reconstruction of the width of the nave the sum of the partial measurements is lower than the total measurement reported near the presbytery (error which we will recall later in the phase of recognition of the reference module).

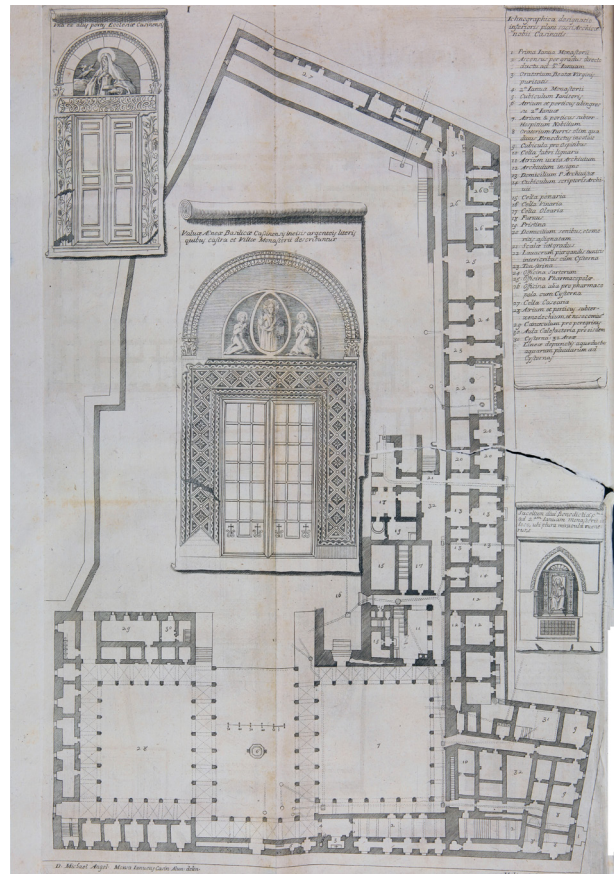
All these cases have ensured that the measured rewriting operation has focused on the reconstruction of the central elements, focusing on the abbey church and the main buildings, remaining faithful to the representative technique

adopted by the Sangallo brothers in which the reciprocal rotations of structures have not been considered.

### From the survey of Gattola and Pantoni to the Roman foot

On the basis of the reconstructions carried out on an absolute scale, the recognition of the metric unit adopted by the Sangallo brothers and the correct conversion into the metric system remains as a further step.

Fig. 6. A. Maliar, survey of the lower floor of the abbey of Montecassino [Gattola 1733]. By permission of MiBACT, BNCF ©.

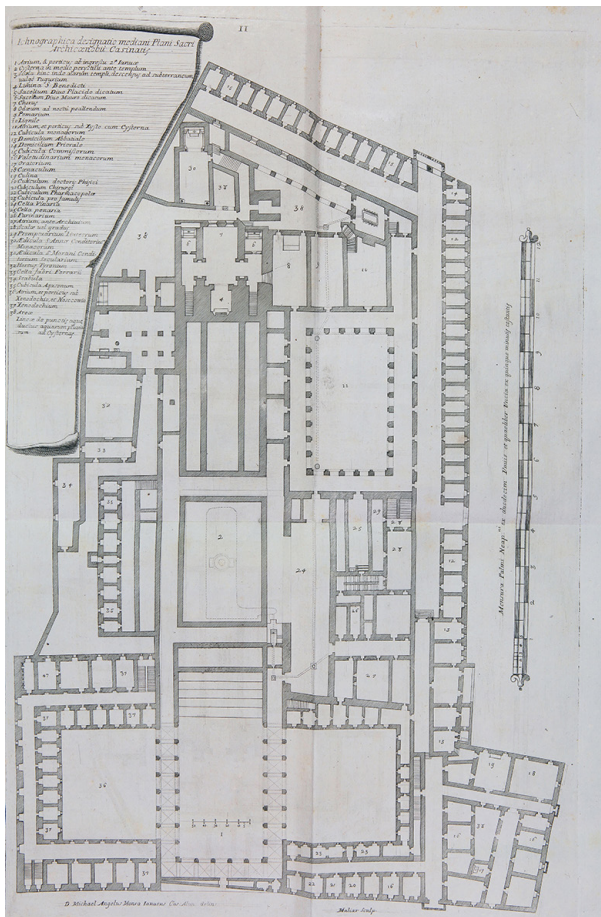


The two works *Historia abbatiæ Cassinensis* by Gattola [Gattola 1733] and *Le vicende della basilica di Montecassino* [Pantoni 1973] represent a great value for this phase of the study.

In fact, both authors publish large format graphic tables containing the surveys of the abbey complex.

The eighteenth-century surveys published by Gattola in addition to offering a clear photograph of the state of the complex in 1733 (figs. 6-8), still allow today to reconstruct

Fig. 7. A. Maliar, survey of the intermediate floor of the abbey of Montecassino [Gattola 1733]. By permission of MiBACT. BNCF ©.



the original appearance of the medieval floor thanks to a valuable table representing the details (fig. 9).

Complementary to Gattola's work comes the work of Don Angelo Pantoni, a monk of the abbey who had to live through the terrible years of the Second World War seeing the great monumental complex of Montecassino razed to the ground by allied fires.

This misfortune has then become an opportunity to start an accurate and profound cognitive investigation of all the archaeological layers hidden under the floor layer of the basilica.

While the Gattola's surveys here allow us to add a piece to the documentation of the evolutionary phases of the abbey's architectures, the archaeological surveys by Pantoni have made it possible to re-weld together all the historical layers traced, allowing us today to carry out comparative studies also of a measure order.

The panel called *Antico pavimento della Basilica di Montecassino* [Pantoni 1973] clearly highlights the trace of the bases of the columns of the original Desiderian church and of the more modern eighteenth-century pillars already documented by Gattola's surveys, offering a graphic representation coded according to the metric decimal system accompanied by a graphic reference scale.

Once again, by operating in a vectorial system a proportional geometric comparison between the documents enunciated, it was possible to observe that the overall measurements detected by Pantoni seem to support the theoretical reconstruction obtained from the Sangallo surveys, offering us the opportunity to directly estimate the measurement used by the Sangallo brothers in a range between 29.5 cm and 30.6 cm.

Transcribing the comparison:

- From the algebraic comparison between the distance from the first and tenth column of the Pantoni equal to 2,815 cm (with a graphic error; on a scale of 1:50, estimated between + or - 1 cm) and the reconstruction of the Sangallo survey (95 1/3 feet), we can deduce that a foot is equal to 29.53-29.52 cm.

- Referring to the transversal distance measured between the two rows of columns 1,170 cm (+ or - 1 cm), compared with the Sangallo surveys (38 1/4 feet), we can deduce that a foot is 30.61-30.64 cm; or more probably the central nave is wider (this discrepancy has already been highlighted in the reconstruction of the sixteenth-century survey between the sum of the transversal measures of the aisles and the total measure of the presbytery).



All those uncertainty coefficients related to the state of the object to be measured must be further added to these calculations; the intrinsic uncertainty in the object itself; the procedure and measuring instrument used; in addition to any errors by the operator himself [Docci, Maestri 2009].

So, all things considered, a more than acceptable correspondence is evaluated between the conventional size of the Roman foot (29.6 cm) and the algebraic measurements obtained which in any case allow to exclude the use of the Neapolitan foot adopted by Gattola and estimated at 26.367 cm [Afan de Rivera 1840].

### Desiderio and the cubit

In this transversal process of comparisons, the discussion has to seek a backward conclusion, reaching a metrically coding of the oldest measure enunciated by Marsicano in 1159: the cubit.

In addition to the detailed distribution of all the rooms of the abbey, the chronicler reports the main dimensions of the rooms that compose it. In a similar way to what was done with the drawings of Sangallo brothers, a proportional reconstruction on an absolute scale of five project areas indicated in the description was carried out:

- the church "105 cubits long, 43 wide, 28 high" [Marsicano, Diacono 2016, p. 383];
- the Paradise "77 and a half cubits long, 57 and a half wide, 15 and a half high" [Marsicano, Diacono 2016, p. 385];
- the refectory "which extended 95 cubits in length, 23 in width, was 15" [Marsicano, Diacono 2016, p. 401];
- the dormitory "200 long, 30 cubits high and 24 cubits wide from the inner wall" [Marsicano, Diacono 2016, p. 401];
- the chapter "whose length was 53 cubits, the width of 20, the height of 18" [Marsicano, Diacono 2016, p. 403].

Appropriate operations of proportional comparison between the Sangallo survey and the reconstruction of Desiderio's design space, allowed to observe a good correspondence between the main geometries.

We point out that the overlapping operation of these areas appears coherent due to the proportionality demonstrated, but it still retains a degree of approximation because of the uncertainty, at first, of having to measure before or after the walls thickness, and then, of deciding if include the additional measure given by the foundations thickness. It was therefore decided to set the limits of this approximation (graphing a maximum perimeter and a minimum perimeter) in order to

visualize the interpretative limits of the reconstruction (fig. 10). This operation made it possible to observe that the size of the basilica had to include in addition to the extension of the presbytery and the nave, also the entrance vestibule, thus excluding the chapels placed in the left aisle, probably rebuilt in place of the chapel of Blessed Nicholas and of the oratory of Beato Bartolomeo described by Marsicano as autonomous rooms next to the church.

In a coherent way, the measures of paradise, including the thickness of the row of columns that conclude the church

Fig. 8.A. Malii, survey of the upper floor of the abbey of Montecassino [Gattola 1733]. By permission of MiBACT, BNCF ©.

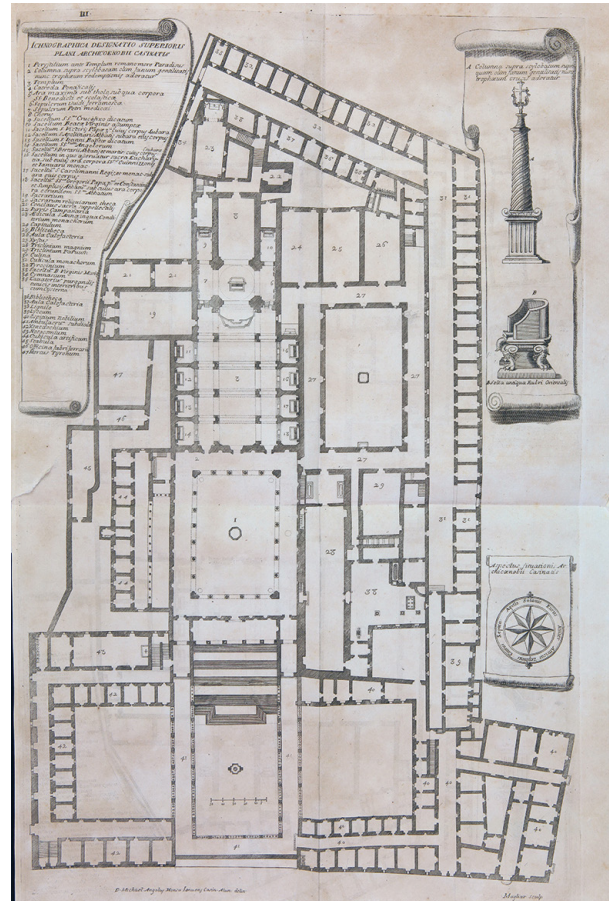
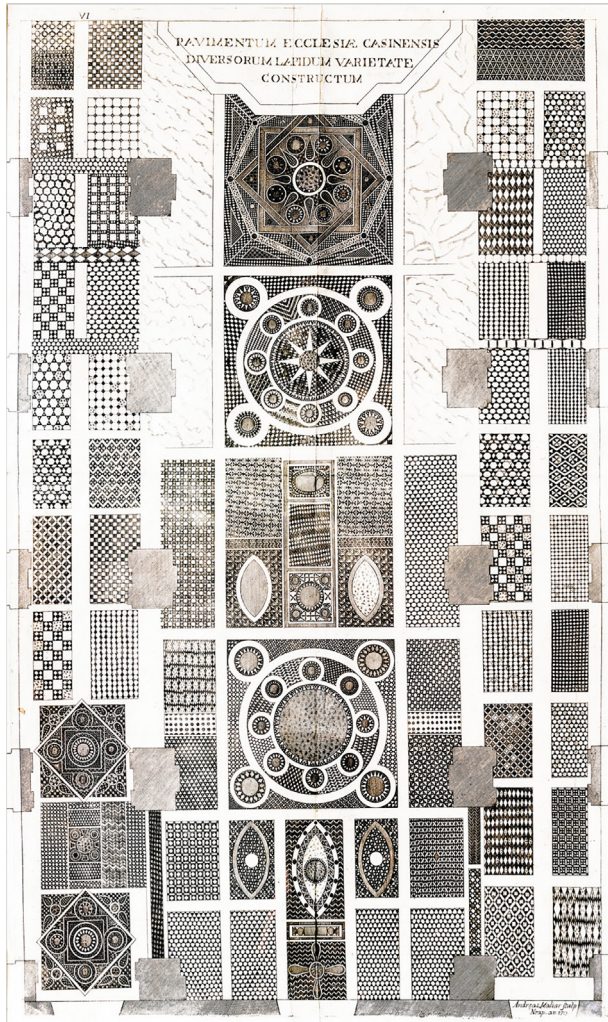


Fig. 9. A. Maliar, Floor of the Cassinese church [Gattola 1733]. <[http://www.museofacile.unicas.it/wp-content/uploads/2016/12/scheda-00\\_pianta-Gattola\\_book-postazione-Desiderio\\_wb1740.jpg](http://www.museofacile.unicas.it/wp-content/uploads/2016/12/scheda-00_pianta-Gattola_book-postazione-Desiderio_wb1740.jpg)> (accessed 2020, November 10).



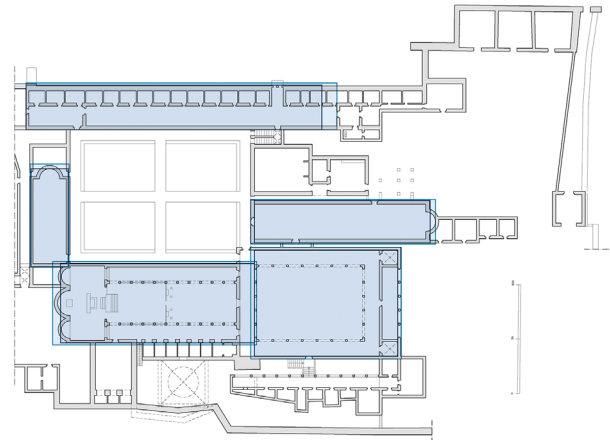
vestibule, extends to the external perimeter of the entrance vestibule at the beginning of the staircase.

In this overlap, the refectory and paradise faithfully maintain the narrow and long development of the two rooms while the dormitory seems to fit well into the sixteenth-century reconstruction, highlighting that the Sangallo's design reveals a larger construction easily justified by the addition of other structures built in continuity to the original block described by Marsicano.

In accordance with Scaccia Scarafoni, we must remember that "the political events of the Papacy and the Kingdom of Naples had to interrupt the fervor of works for the reconstruction of the Abbey, and so not a few buildings of the 11th century disappeared definitively and we look for them in vain the survey in the plans of the Sangallo" [Scaccia Scarafoni 1932, p. 98].

According to this principle, the study does not want and cannot claim to definitively establish the perfect overlapping of the limits of the areas described by Marsicano on the reconstruction of the sixteenth-century surveys. However, a plausible range is identified in which to include all the possible errors accumulated during the treatment and to offer the coding of a reference interval between 52.74 and 50.19 cm. The first observation we have to make is that the variety of coded relationships exceeds the common Italic cubit of 6 palms, hypothesized by Scaccia Scarafoni and codified by

Fig. 10. Geometric estimate of the maximum extension and minimum extension of the project areas described by Marsicano in 1159 [Marsicano, Dacono 2016] (graphic elaboration by L. Aiello).



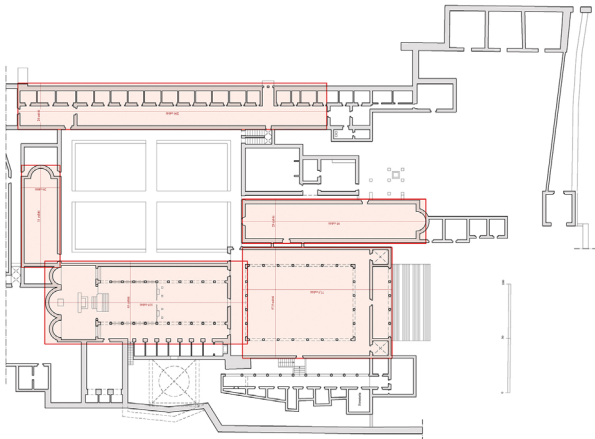
Segrè [Segrè 1928, pp. 140, 141] in 44.4 cm. It seems more properly similar to the royal cubit of 7 palms (52.5 cm), whose use seems to be proven by other studies on medieval architectures [Luschi, Aiello 2011].

We highlight that the genesis of the use of this canon in medieval times has not yet been clarified on a metrological level, however we take the view that the fortune of this unit stays in direct proportionality with the Roman foot. In fact, it is easy to verify that 7 feet correspond to 4 royal cubits and that 3 feet correspond to twice the submultiple of the royal cubit, known as a 'short cubit' of 6 palms, equal to 45 cm [Luschi 2011, p. 190].

We add that the use of royal cubit instead of natural cubit appears justified by other factors, among which we recall a theoretical motivation linked to the symbolism of a unity of divine origin (6 natural palms of man plus one given by God) [Segrè 1928, pp. 4-5] and a practical motivation according to which a unit of measurement divisible into 7 submultiples allows an agile management of irrational relations related to the diagonal of the square (root of 2) and to the circumference of the circle (Pi) [Aiello 2018, pp. 61-70].

Refining the advanced coding proposal and proceeding to an exact conversion of the measure units adopted, we can finally perform an exact scaling of all the areas described by Marsicano using a real cubit of 52.5 cm (fig. 11).

Fig. 11. Representation of the project areas described by Marsicano in 1159 [Marsicano, Diacono 2016] according to the real cubit of 52.5 cm (graphic elaboration by L. Aiello).



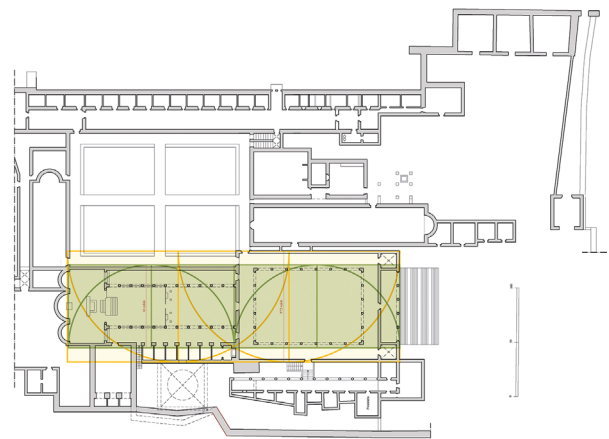
We observe in this case that the architectures indicated by Marsicano seem to include all the wall thicknesses, sometimes leaving a computable margin in the foundation scraps or attributable to small deviations that occurred in the reconstructions of the 1349 earthquake.

## Conclusions

We can say that we face some building site indications, that faithfully report the measures used in the construction phase since 1066, and an equally faithful survey (at least in general measures) to what should have been the shape of Desiderio's abbey plant in the 1071 (year of dedication). The exceptional nature of this coincidence represents a basis of study open to numerous in-depth studies. However, here the attention necessarily focuses on proportional and geometric connotations that guided the project of Abbot Desiderio. Without further deepening metrological considerations, the macro geometries inherent in the project are easily highlighted.

If we analyze the basilica in its complexity, church and paradise together, the first observation appears to refer to the possibility of inscribing the building within three perfect squares built on the basis of the longer side of the atrium

Fig. 12. Studies on the geometric proportions of the desire project described by Marsicano in 1159 [Marsicano, Diacono 2016] (graphic elaboration by L. Aiello).



(57 cubits and a half). The entire complexity of the building is therefore reduced to the simplicity of the ratio 1 to 3 (fig. 12). This composition certainly has an easy reference to the proportions of the mosaic temple designed by God in *Exodus* 27, and to the proportions of Solomon's temple described in *Kings* 1 and *Corinthians* 2 [Aiello 2018, pp. 17-28]. Using the smaller side of the basilica (43 cubits), and carrying out the same operation described above, the square obtained can be inscribed exactly 4 times in the total length (fig. 12). Such proportionality suggests the existence of a geometrical study not revealed in the description of the building but which certainly guided the abbot's project idea.

The mystagogy of architecture and symbolic intentionality thus become a tool for investigating that subtle border in which visible and invisible concur in the same reality, and participate in the truth like the full and empty spaces in sacred architecture, where the column and the intercolumniation are one single scan and one is in proportion to the other.

#### Notes

[1] To get a broader picture of the cultural climax and of the historical-architectural impact of the period, see: Carbonara 2014, Luschi 2015.

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