

REPRESENTATION AS SPACE FOR EXPERIMENTATION AND ARCHITECTURAL KNOWLEDGE

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Abstract

New surveys on the convent of St. Francis of Paola (Paola-Cosenza) confirm that for architectural knowledge, neither accurate acquisitions nor realistic photographic renderings are sufficient. Furthermore, they confirm that in surveying, both attention and images which are gradually defined through figurative rendering and that allow for analysis of the architecture and its components in a coherent field of study have greater value.

Keywords

Representation, architectural analysis, figurative devices, 3D modelling

1. *Formativity of architectural representation*

In surveys and in architectural projects, representation never has the simple role of a means of communicating an already defined solution; instead it has the more important role of promoting ideas and formalising them through the creation of increasingly more determined and convincing drawings. To underline its formative role, Vittorio Gregotti recalls that the “means” to represent is never indifferent to the result, “*it is never a means: it indicates and is part of the design intention*”; and creates the “*design conversation which we institute, as well as with the subject of architecture, with the same representation*”¹. A conversation which occurs through representation work and which belongs to each type of process, whether it be design or surveying.

In these terms, representation – with the whole digital fruition system and the consequent ways of rendering – should be understood as a study opportunity which is manifested for linguistic attitudes (formative, generative, etc.) of the same representation, due to the attentions of analysis which are determined through “doing” and the support of coherence (projective rules, scalar values, etc.) that the prechosen figurative system brings. And yet, it manifests for the

figurative version which from time to time the representation, digital or traditional, offers realities, or rather due to the translation in images and graphic schemes, that almost oblige us to see it and know it according to the figurative modalities that the representation proposes; ways which, as stated in the title of these notes, become a place for architectural experimentation and true and genuine occasions² of knowledge.

In preferring one figurative system over another (a method or a graphic mediation technique) we predetermine the possibilities “to see” the architecture and to consider it with the aim of a result to be attained; thus, the cultural environment, as well as the operative environment in which the result must occur, is predetermined.

Representation modes do not follow an established path, therefore once the starting data are selected it is certain that the result will be produced; there are no preestablished procedures, but rather architectural situations on which it is possible to experiment figuratively, situations where even fortuitous aspects can have a role: a repeated image – varying the representation methods, scalar relations, or graphic mediation techniques – can produce

¹ For both citations see Gregotti (1977), pp. 21-22.

² On the use of representation as an occasion for analysis and knowledge cfr. Docci and Chiavoni (2017), p. 6 onwards. See also: Purini (2000, 2016), De Sanctis (2015) and Cervellini (2012).

significant differences, even unforeseen ones, due to the *selection/emphasis* of the signs which each method (scalar relation or graphic mediation technique) brings. The passage from one scheme to a completed image or from analogue graphic mediation techniques to symbolic techniques implies verification of each architectural component and not immediate choices for his figurative translation. Furthermore, passing from synthetic drawings to analytical drawings (or vice versa) is equivalent to triggering different logical procedures (whole/detail, concrete/abstract, discrete/continuous, etc.) with a broad possibility of individual reactions. In a similar operative research process – where mainly what is of value is that which occurs elaborating, with the formal relations that are gradually shown – each author can make comparisons, see analogies, select parts and ultimately can calibrate their own architectural sensitivity on the work to be analysed and to “negotiate” the contents to be shown with the same work.

In another way to know, examine or conceive architecture, it is necessary to represent it on different scales with different methods and graphic mediation techniques. It is necessary to disaggregate³ by means of dedicated figurative devices, bases and forms in order to understand the composite, function or technical-constructive role of each part and of the whole. Adolfo Natalini recalls that in his work as a designer, he did not expect “*illumination nor inspiration*”; on the contrary, it is expected that drawings progressively mature, offering suggestions and merging forming a study path towards the solution “*The drawing produces other drawings and these others still and so slowly configure a labyrinthian path in which the project blossoms*”⁴.

The generative opportunities of representation – which “*produces other drawings and these others*” – that in the traditional representation are given by the use of different methods, scales and graphic mediation techniques, in the digital one are extended by the direct interaction with and on the 3D model and for the opportunities to see and “manipulate” the reality that new techniques can easily offer (optical techniques of 3D measurement, virtual reality systems and augmented reality, etc.).

2. Analysis by complex figurative devices

Representation has always been used in architecture to see, to analyse and to know architecture and the reality that surrounds us: graphical sketches, 2D drawings, images that simulate the third dimension, plastics in scale etc. others are no more than possible expressions of ideative thought, that uses the concepts of “analogy” and of “simulation” to control, to predict and to formulate hypotheses both for analytical and design aims. Traditionally, that is, one considers the research opportunities that *figurative reformulation* can offer, to look at unknown architectural contexts, to formalize conjecture, to highlight connections between the parts, and, more generally, to construct a “manipulatable” version of real assets capable of advancing the study process. A version that does not exclusively aim for resemblance, but rather to highlight typical architectural relationships (between form and constructive characters, between form and function, etc.), which for brevity can be summed up in those contained in the Vitruvian terna.

Incidentally, we can observe that a similar involvement in traditional practices also concerns today’s digital modeling, which must be considered the most up-to-date form of the discipline’s response to architecture and the cognitive accessibility problems it normally presents. It is a form of response that is at the same time a reaction to architectural complexity and a study to determine its meaning: the 3D digital model as a substitute for the real situation that is to be analyzed, in many ways more “efficient” than the same reality, but also as a new fruition system and an *intermediate structure* (Gioseffi, 2000) which can be partialised to isolate problems – formalizing only some of the architectural determinants – and to conduct tests which are literally impossible in reality; tests that the same digital model, through the language it uses and the figurative options it makes available, helps to solicit and validate.

Therefore, it is legitimate to talk about a creative “dialogue” that is established between the digital model and the surveyor: the virtual environment (hardware and software for modelling, the 3D model, the navigation into virtual space and the interrogation of model) becomes an efficient analysis context, in which to develop comparisons between the surveyor and

³ On the concept of architectural analysis through the decomposition of elements cfr. Venturi (1980), pp. 12-33.

⁴ For the two citations, cfr. Natalini (2016).

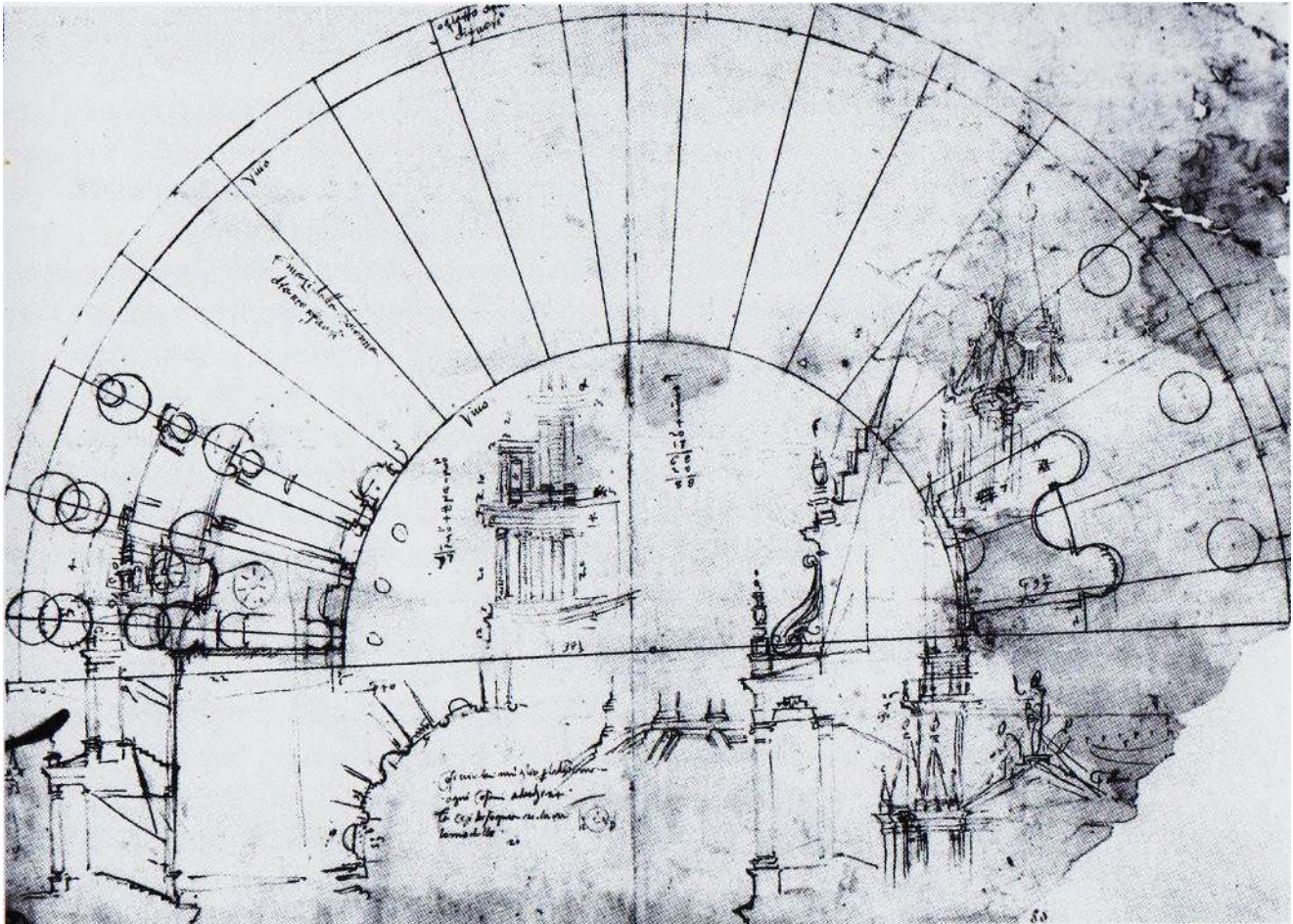


Fig. 1: A. da Sangallo the Younger, study for the lantern of St. Peter in the Vatican, first half of the 16th century; figurative device consisting of written notes and close drawings near and almost overlapping between them.

the model, to stimulate useful insights and to conduct every recovery or enhancement operation of the analyzed architecture.

Leon B. Alberti, in the mid-1400s, recommended studying past works with maximum attention; only who “will make the drawing, will measure its proportions, will build models to keep it near, and thus will study them, including the order, placement, genres and proportions of the individual parts” (Alberti, 1989, p. 474); recommended acting through representation, measurements and plastics on a scale to fully know the “single parts” and “ordering” of a work. All authors, without exception, will follow the recommendation to represent in different ways (schemes, projections, scale plastics, etc.) to understand the architecture and the reasons of quality contained:

- Antonio da Sangallo the Younger, for example, in order to define his solution to the St. Peter lantern (first half of the sixteenth century) developed a complex figurative device, consisting of written

notes and close drawing notes, almost superimposed between them, in which it is possible to see the logical succession followed and the need – sometimes analytical, at times descriptive – of each single image. The device consists of a schematic plant and a vertical profile, a horizontal profile, two sections, three exterior views and one interior view, some writings and two operations for verification of the measurements. There is no interference between the different images, nor does their organization create confusion. The diversity of the projections and the way they are realized provide each chart with all the necessary autonomy (Fig.1). The reciprocal influence given by the immediate comparison of the different drawings gives a clear indication of the individual problems and obvious study opportunities. Each single drawing, even the smallest, juxtaposes the previous one – it may be said that is suggested by the former – to play the role of varying the point of observation, of describing briefly or in detail, checking

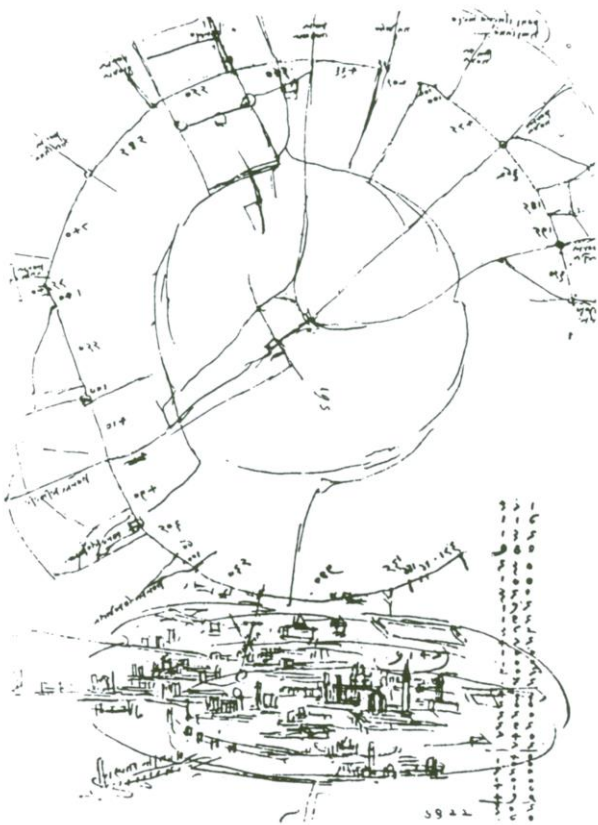


Fig. 2: Leonardo, study for the city of Milan (about 1500); analysis device created with the complementary use of different projections: a view and a planimetric scheme.

arrangements, etc. but above all to realize an

active intervention area and a study tension that can evolve and validate (or eventually undo) the idea that is being formed.

- Leonardo's study for Milan (around 1500) is little more than a graphic note and appears as the initial exposure of an urban analysis. Executed with a few lines and with the complementary use of different projections – a view and planimetric scheme together – is revealed as a formidable figurative device to appreciate both the urban set and the dislocation of its parts, with the perceptual effect that they produce in the city's configuration (Fig. 2).

- In examining St. Peter's Square, an anonymous author of the second half of the 17th century criticized the off-scale of the Bernini's Colonnade and elaborated a (so-called) counterproject to evaluate the visual impact of the new work on existing volumes in the Vatican area. In the received images, there are clearly visible lines for the perceptual control of the new construction on the new palace, the Basilica and the surrounding buildings (Fig. 3). These are drawings that are compiled with little-known figurative modes, but were will soon spread – enriching the survey discipline – for the need to have more up-to-date opportunities to see and control the impact of new works on contermini buildings.

- Sandro Benedetti, in order to analyse the monumental fountain of the Caprarola Garden,

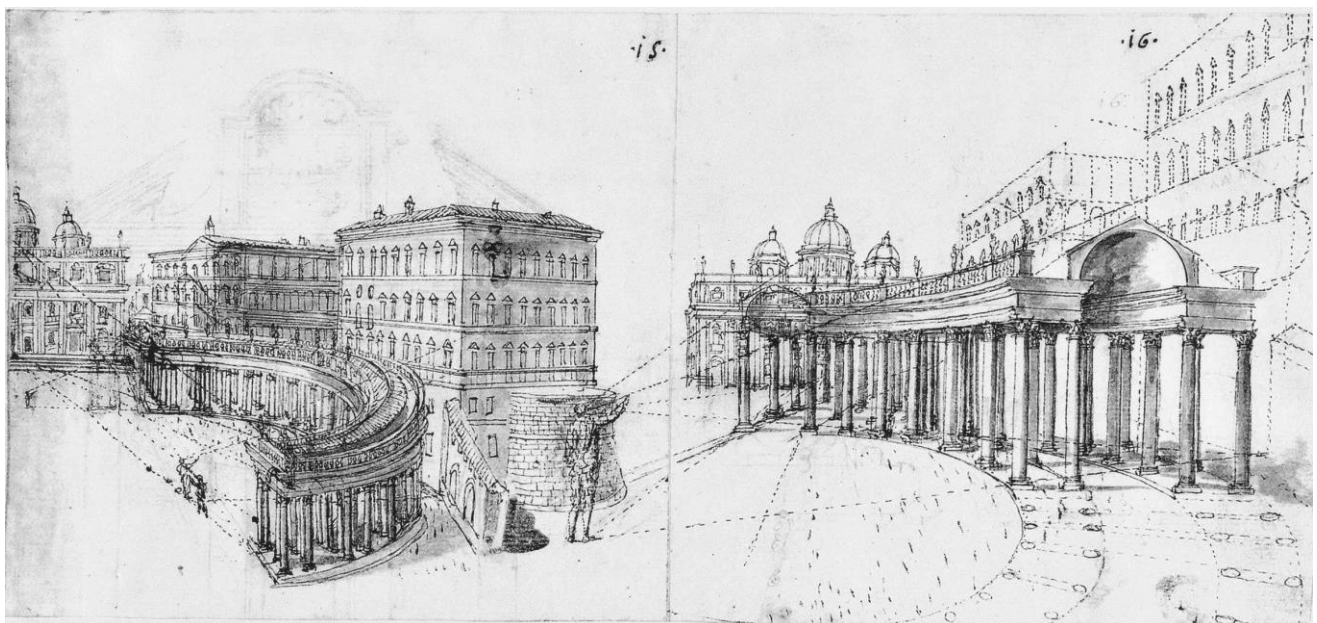


Fig. 3: Anonymous, counterproject for the colonnade of St. Peter, the second half of the seventeenth century; overall and detailed perspectives in which the lines for the perceptual control of the new construction on the New palace, the Basilica and the surrounding buildings are distinctly visible.

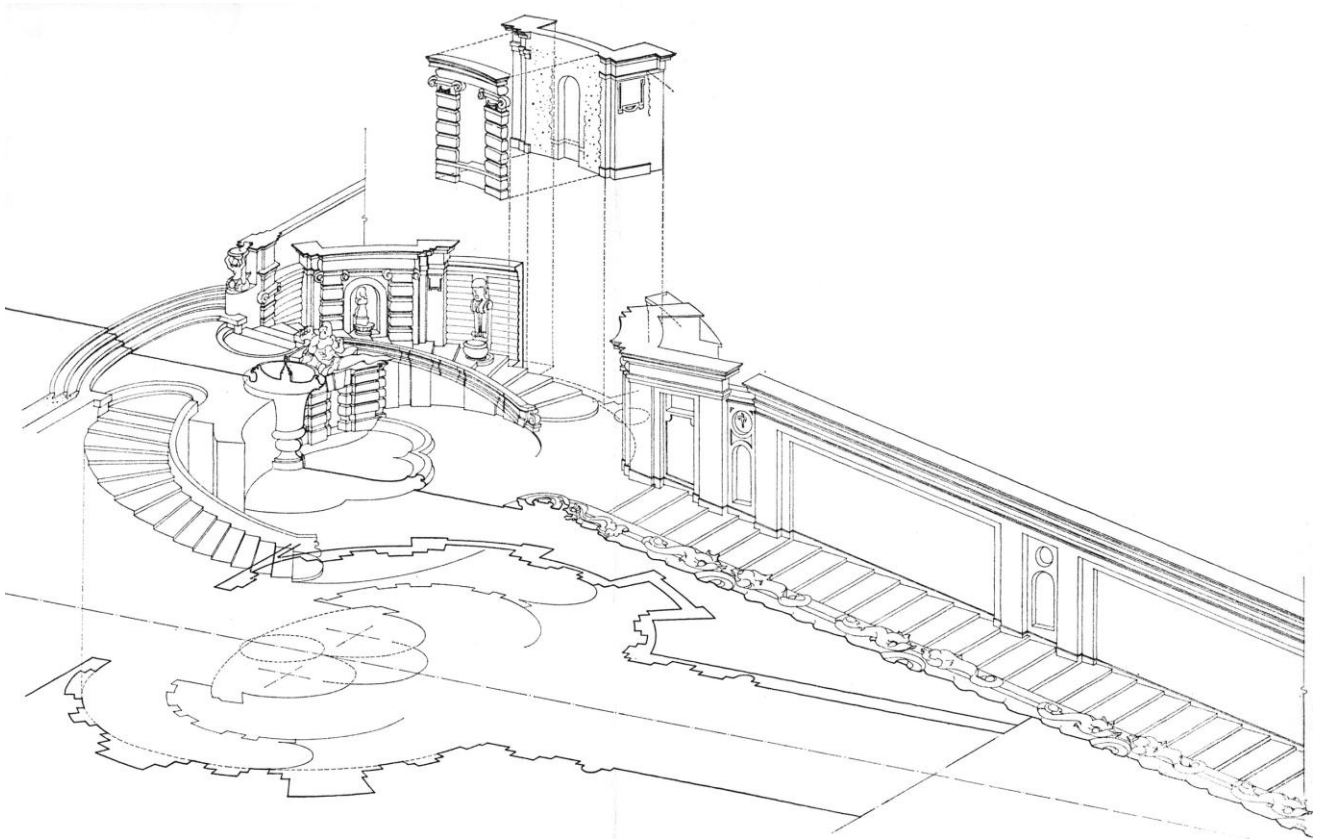


Fig. 4: S. Benedetti, analysis of “water spaces” in the Great Garden of Caprarola, 1973; a figurative device formed by a general axonometry, with an exploded view drawing at the bottom of the plan, an exploded view of one of the component elements and an epidermal section along the major axis of the entire work.

created a figurative device – which telescopically defines – formed by a whole axonometry, with an explosion view at the bottom of the plan, an explosion view at the top of one of the constituent elements and a section along the major axis of the architectural construction. It is a complex device that describes the architecture whilst analyzing it, separating the different research themes: the axonometric explosion below shows both the half plan layout and the geometric base on which the whole is constructed. An epidermal section cuts along the entire axis of the whole work, highlighting the water path (monumental fountain, pool and drainage channel). The upper axonometric explosion isolates one of the components (with the decorative feature that characterizes it) to show the additive logic that regulates it and serves to form the whole. The presence of more drawings is certainly favored – even in this case, it would be suggested – from the chosen project method and S. Benedetti the use not for figurative virtuosity, but rather to render visible two characters that determine the project: that relative to the geometries of the whole that

regulate the organization of the work and that relating to the combination or addition of the individual parts (Fig. 4).

3. *Complex figurative devices for the reading of the 17th century atrium of the Convent of St. Francis of Paola*

Today, it is remarkable to note how all the options that digital modeling can make available if you only widely use a single one, that relative to verisimilitude, and we make less use of the opportunities to break down and simplify the components that elaboration activities can offer. The wealth of images from the past – from Fra’ Giocondo to Letarouilly, freely recalling the first names that come to mind – no longer seem to be valid (or worth less) as a qualitative reference of the analysis choices.

On the contrary, new surveys⁵ on the convent of St. Francis of Paola (Paola-Cosenza) confirm

⁵ The survey campaign – conducted with a laser scanner ToF, digital photogrammetry and traditional instruments – took place in three phases in 2012-2015.

that for the study of architecture, neither accurate acquisitions nor renderings truer than the original are sufficient.

As indicated at the beginning of these notes, a survey is especially valuable for the images that it gives and the analytical attentions that can be produced for the same images. Through the rendering mode – or rather, through the *representation work* that each rendering involves – the survey allows determination of the operating *environment* most useful to act for the purpose of architectural knowledge; not only the real environment of the buildings around the work being studied, but that of the study choices needed to conduct research operations properly dedicated to architecture, be it ancient or modern. Research operations normally involve separation of elements of a work, the conceptual distance and the figurative re-formulation of its parts; thus, they implicate an observation from several viewpoints and drawings on space conformation, functional distribution, and technical-constructive design, which even the most realistic acquisitions alone are unable to show.

In 1625, despite its renaissance design, the new atrium of the convent⁶ of St. Francis of Paola was still under construction; the extraordinary works, necessary for consolidation of the ground towards the Isca creek, lead to delays in the construction both of the atrium and the access road, which faced the town of Paola.

To define the functional role, the formal articulation and the compositional value of the new work in the context of the religious complex, we have developed two rendering devices. As in the examples seen above, these are *figurative devices* that bring several drawings together to offer different points of view and different evaluation possibilities (synthesis drawings, plans, realistic images, etc.) with the aim of architecturally knowing the work being studied, with the forms and spaces that identify it:

- the first device presents a complete set of designs and uses the numeric model directly, with some integrations created in a CAD environment. It consists of two main drawings to show both the architectural reference environment (the atrium with the volumes of the library and of the bridge)

and the extraordinary supporting works, built to expand the base of the same atrium and of the entrance road to the convent.

The building of the new atrium is taken from afar and is proposed as a monumental entrance; to highlight the surrounding buildings and the progress of the base, an epidermal profile together with the volume of the library, the entrance road and the slope towards the creek. Following the Leonardesque example, a plane placed in the background repeats – with different projection modes and different reading evidence – the situation described in perspective.

From afar, it adds another – taken from a smaller distance – to show more clearly the volume of the new atrium and the underlying supporting works (Fig. 5).

- The second figurative device looks more directly at architectural themes (formal, functional, etc.); it is constructed with a simplified 3D model, deduced from numerical acquisitions, and simultaneously displays the organization of the vaults (first and second level) and the spaces they configure. Furthermore, it analyzes the same uses of the polygonal model: meshes, level curves, and longitudinal contours render the surfaces, highlighting unusual structural shapes, suggesting the presence of a lathwork, “hung” on stone arches.

A bottom-right diagram summarizes, finally, the functional solution adopted to connect the access road to the convent with both the new atrium and the existing religious constructions (old atrium, church and cloister). In other words, by means of more drawings created with methods, scales and different graphic mediation techniques, we seek to give account both for the functional role of the new 17th century atrium and the spatiality it created (Fig. 6).

4. Conclusions

The figurative devices proposed for the reading of the new atrium of the convent of St. Francis of Paola, if in some ways they seem at least in part to replicate established figurative (and knowledge) modalities, for others they allow the development of innovative perceptive and analytical opportunities.

Modelling actions (manipulation, navigation, etc.) give rise to perceptive feedback between the operator and the virtual environment that predispose to the in-depth knowledge of dimensions, shapes and volumes; space is also

⁶ N. Roillart's view, engraved by V. Regnart in 1625, presents a new atrium still under construction; the lower part will be finished in 1626. The works for the building that will host the library will end in 1779 1779. The building above the bridge, destined to be an infirmary, started to be built after 1655.

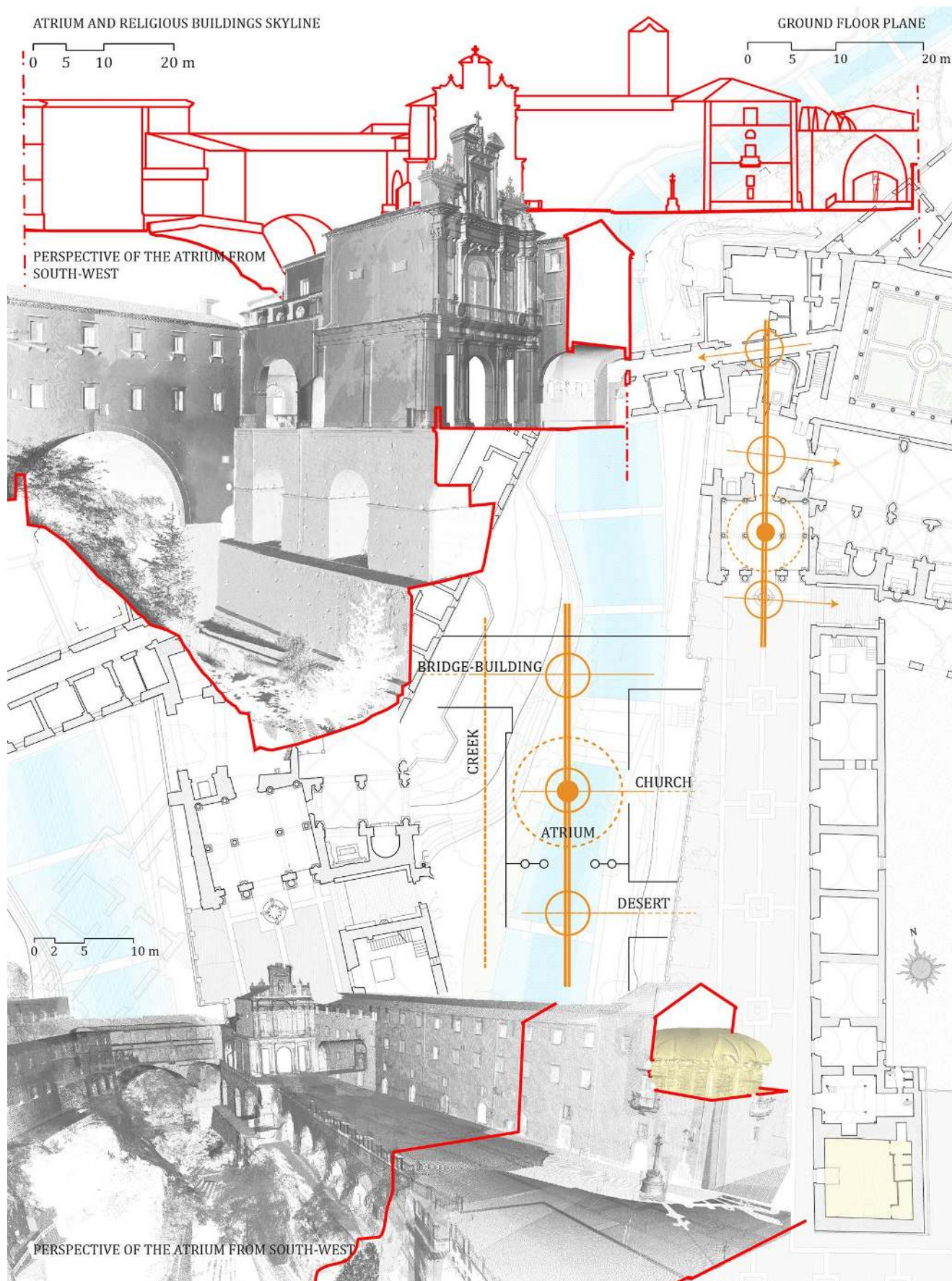


Fig. 5: Survey of the atrium of the convent of St. Francis of Paola; a figurative device consisting of drawings of sets – the atrium in the more general context of conventual constructions – derived from the point cloud.



Fig. 6: Survey of the atrium of the convent of St. Francis of Paola; figurative device constructed by a simplified 3D model and consisting of drawings dedicated to the architectural theme of the atrium and to the geometries of the vaults on the ground floor.

perceived in its emotional characteristics with the possibility of impossible actions to be implemented in the reality of the work.

The proposed devices also confirm the opportunity to use the survey and the representation in an unconventional manner in order to render the architecture with its characters (compositional, functional, etc.) and the variety of its forms. Furthermore, they also tell us about the exercise of the survey as a way – perhaps the only one we have – to conduct real analysis practices. Each figurative device must, in fact, be seen as the expression of a reading path and as a possibility to ask questions and obtain useful information about that being examined. The figurative “*complexity*” of such devices – consistent with the complexity of the work – is the result of a double operation: that of the *partialization* of the themes, with the consequent specialization of the images on certain aspects and that of the *complementarity* between the different representations; complementarity that comes to produce an accumulation of figures closely related to each other and an enrichment of the possibilities of seeing and knowing architecture.

Considering the “*mobility*” of the representation as eminently *formative*, this type of restitution seeks to vary the normal relationships that link the figures of the same analitic process and propose unusual applications compared to current practices; applications that can be described as typically operative, where it is not only verisimilitude that counts, but the figurative effectiveness that derives from the adaptation and study urges of the adopted graphic reformulations.

How to say that an architecture is known by figuratively elaborating it through representation and that its knowledge derives mainly from figurative experimentation, from the complementarity of the different representations, from the “*partiality*”⁷ and from the figurative evidence that the same representations, traditional or digital, allow to produce.

⁷ Partial representation of meaning in a twofold sense: representation as a tool chosen by authors for analytical expectations that it is capable of eliciting and as an opportunity to partially analyze the work being studied. On these issues cfr. Testa & De Sanctis (2003), pp. 9-37 e 66-70.

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