Reviews

Laura Farroni

L'arte del disegno a Palazzo Spada. L'Astrolabium Catoptrico-Gnomonicum di Emmanuel Maignan

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Laura Farroni's book entitled *L'arte del disegno a Palazzo Spada. L'Astrolabium Catoptrico-Gnomonicum di Emmanuel Maignan*, with contributions written by Maria Luisa Toscano, Matteo Flavio Mancini and Giulia Tarei, is a research promoted by the Council of State, housed in Rome, in palazzo Spada, whose knowledge and valorization the text is dedicated to. As already evident in the title, the investigation is not only limited to the architecture of this precious 16th century Roman building, but deepens one of its most valuable rooms, the long barrel-vaulted gallery, located on the 1st floor, whose surfaces house one of the most complex and refined instruments produced by the scientific knowledge of the time, the majestic catoptric sundial that measures the Sun's true time by means of the positions a small luminous ellipse produced by the reflection of sunlight, incident on a small mirror which is properly positioned near a window in the same room. Designed by Father Emmanuel Maignan and painted by Giovan Battista Magni in 1644, the *Astrolabium* is a masterpiece strongly desired by Cardinal Bernardino Spada in his palace as a representative work of the scientific culture achieved in the 17th century.
The author establishes from the very beginning of the book her methodological approach and the disciplinary field in which the research will move, i.e. the representation, declined according to its many peculiarities of both artistic and scientific discipline, but above all the key for an indispensable reading of this inestimable asset of our cultural heritage.
From the very first pages it is evident that the *Astrolabium*, but more generally the gnomonic discipline, are to be brought back to drawing and geometry, which made measurable on Earth what seemed immeasurable in heaven. Gnomonics still needs to be reinterpreted through the disciplines of its ancient roots, after about two centuries of analytical-mathematical specialisms and/or abstractionism that have led to its progressive dispersion. Drawing and geometry therefore claim their role as necessary and indispensable tools for interpreting and co-ordinating the numerous values coming from different fields of knowledge that converge in the design and realisation of a scientific instrument, but having a very high artistic value, such as the *Astrolabium*, a masterpiece representing the link between art and science in seventeenth-century culture. The author also denotes a research methodology totally embedded in the disciplines of the Drawing scientific, making use of modern integrated surveys of the building, compositional analysis of the image, study of ancient survey instruments and perspective methods used for the grid

of the lines of the catoptric solar dial, as well as 3D modeling to simulate and verify the projective processes described by Father Maignan himself in the treatise *Perspectiva Horaria sive de Horographia gnomonica tum theoretica, tum practica libri quatuor* retracing backwards the construction process from the first conception phases to the construction process, with particular attention to the instruments used to transpose the design geometries along the vast vaulted surfaces, supported also by the didactic experimentation with the students of the course of Mathematical Machines, who tested their actual functioning. The volume also deals with the study of the historical building, from the foundation to the transformations commissioned by Cardinal Bernardino Spada who, from 1632, employed Francesco Borromini and father Emmanuel Maignan. Of a large part of the building, the volume shows several points clouds and drawings obtained by means of an accurate integrated survey, which aims to read the building as the tangible result of a speculative act that could verify, and show, how perspective theories and astronomical sciences applied to architecture. The distribution criteria of the rooms are thus reread according to the reasons for a project that intended to make palazzo Spada the place of application of the knowledge that the church was acquiring and developing with its active participation in the cultural debate of the time, characterized by the "exaltation of mathematics to arrive at wonder, study of ways of observing, of looking […]" [p. 24]. During those years, the palazzo Spada took on an articulated configuration such in a game of continuous visual references between interior and exterior spaces. Visual cones and targets, painted architectures and illusory perspectives: of the latter are proposed some perspective returns and three-dimensional modeling of the virtual spaces painted in the quadraturism of the Great Hall. The integrated survey of the building also allows the author to proceed to a comparison between the current state and the data exposed by Maignan in his treatise, in order to verify what is theoretically stated in the geometrical methods for determining the astronomical alignments and what has then been done. The second chapter, by Maria Luisa Toscano, aims to frame the geometric and astronomical skills of the minimal Father Emmanuel Maignan, an esteemed French mathematician, who was the author of a catoptric astrolabe in the Roman Monastery of Trinità dei Monti, within the wider scientific panorama of the seventeenth century that inherited, from the previous century, one of the most historically important scientific revolutions, due to the innovative approach to natural phenomena according to the heliocentric cosmological system, introduced only a few decades earlier by the studies of Niccolò Copernico, Tico Brahe and Galileo Galilei. Chapter four, by Matteo Flavio Mancini, explores the geometry of the pictorial techniques related to the barrel vault morphology analyzing the processes described in the major perspective treatises of the sixteenth and seventeenth centuries, and then, supported by the graphics of specific three-dimensional models, deals with the scientific interpretation of each grids of curves detected in the *Astrolabium*, each pne identified as a gnomonic representation of a precise astronomical phenomenon. The fifth chapter, by Giulia Tarei, aims to analyze the geometry of the *Astrolabium*'s painted lines and their projective genesis as Maignan indicates the construction process, but not the original drawing, as the author herself states. By bringing back each grid of curves to the planes passing through the gnomonic centre of the whole system (that is the centre of the mirror reflecting the sun's rays), are thus highlighted the geometrical-projective processes and the relationships between the curves painted on the vault and their projection on the horizontal plane. The book, dealing with a subject closely related to positional astronomy, is provided at the end of a glossary and several illustrations to explain the numerous technical terms encountered by the reader in the volume. The book ends with the afterword by Agostino De Rosa, which involves the reader in the in-depth interpretative analysis of the drawing that, in Maignan's aforementioned treatise, supports the *Propositio LIV*. The image presents a perspective from the inside of the catoptric sundial gallery of palazzo Spada in which four characters are depicted while observing the grid of curves painted along the barrel vault surface. Through the distinctive features of the physiognomies and the clothing details, De Rosa formulates his hypothesis on the identity of the four observers, recognizing in them the main actors of this ambitious project that connects the sky with the earth through geometry, but we prefer to leave the reader discovering. In the appendix, there are some short pages about the experimental paths between teaching and research

undertaken by the author in deepening the case study of palazzo Spada with students and undergraduates, whose results are summarized. The book ends with an overview of all the events and initiatives for the valorization of the Astrolabe conducted by the authors of the volume on the occasion of the European Researchers' Night 2018.

Alessandra Pagliano

Author

Alessandra Pagliano, Department of Architecture, University of Napoli "Federico II", pagliano@unina.it