

geometry taken from *Géométrie Descriptive. Leçons données aux Écoles Normales, l'an 3 de la République, par Gaspard Monge de l'Institut National*.

Cardone's book is very relevant today, since many nations, including Italy, have started a reform of engineering studies in the last decade of the XX century, driven by a request from the business world that pressed for a first level training of the engineer aimed at strengthening professional practice. This has led to an inevitable impoverishment of basic scientific knowledge in

the provision of university courses. At the conclusion of this book, Vito Cardone, having followed these problems very closely as President of the Conference of Deans of Engineering Faculties, expresses a certain confidence in the possibility of absorbing the damage caused by the reform of the Engineering Faculties, hoping for a reformulation of the training courses based on historical knowledge and starting from the origins, i.e. the foundation of the first organic study plan for engineer training that Gaspard Monge deli-

neated within the École Polytechnique of Paris.

The book by Vito Cardone is therefore particularly valuable, not only because it provides a complete, 'all-round' profile, of the French scientist but also because it deals with stringent and current problems, for which this book is a convincing tool for identifying a valid solution. Indeed, it is essential to provide the engineering students with a precise identity starting from their roots.

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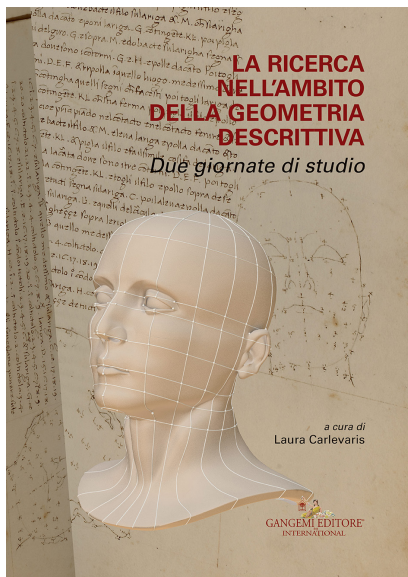
References List

Jomard E. F. (1853), *Souvenirs Sur Gaspard Monge Et Ses Rapports Avec Napoleon*, Paris: E.Thunot

Reviews

Laura Carlevaris (a cura di)
**La ricerca nell'ambito della
 geometria descrittiva. Due
 giornate di studio**

Gangemi Editore, Roma 2017
 pp. 190
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The book, edited by Laura Carlevalis and published by Gangemi Editore in 2017, includes the reports presented during the two days of study held on February 18 and 25 in the Ph.D. program in History, Design and Restoration of Architecture organized by the DSDRA of Sapienza University of Rome, and dedicated to the history and innovation of research in the area of Descriptive Geometry.

The contributions, signed by Riccardo Migliari, Vito Cardone, Agostino De Rosa, Maura Boffito, Maria Teresa Bartoli, Nevena Radojevic, Camillo Trevisan and Roberto Ciaroni, deal with the theme of the symposium with different dissertations where the common denominator resides in the close relationship that binds the search for tradition, as Laura Carlevalis emphasizes.

This relationship is thus clarified by Riccardo Migliari: "what is included in History is, of necessity, new (otherwise it would not appear). And what appears, today as new, is only in comparison with the past, remote or recent" [p. 14]. Migliari also describes some aspects related to the 'research', in order to distinguish it based on the results achieved, identify the activities included in it and the related methods of investigation, and deal with the central issue of collaboration of competences, concluding with a reflection on the excessive use of digital technology by researchers in the area. In fact, the current possibility of developing models using automatic

devices (software) has attenuated the interest of researchers for the in-depth learning of geometric issues, the knowledge of which is instead essential for the control of the procedures and results developed by the computer. Most often this indifference derives from an incorrect assessment of the study opportunities inherent in a discipline considered exhausted and surpassed by the most recent digital representation procedures.

Instead, the contribution of Vito Cardone [pp. 23-44] highlights the importance of the study of the discipline, starting from a synoptic historical digression. From the effective report it emerges that today's attitude towards the descriptive, in the past, had already repeatedly shown itself in relation to the whole geometry, although it has risen every time studies have been undertaken on ancient situations and problems considered resolved or unsolvable. And since the corpus of the descriptive is still incomplete, a re-examination of the issues that have been resolved or rectified, carried out with the aid of the most up-to-date tools, could give new impetus to the discipline. But if research through a new exegesis can give a further development to what has been achieved in the past, only history can attribute value to that innovation.

To this thesis comes also the essay by Agostino De Rosa [pp. 45-76] who, starting from the Platonic cave, explores the procedures adopted by the au-

thors of images to channel the attention of the observer on representations born of projective or natural processes. In examining the works that impose visual difficulties on the viewer, Agostino De Rosa notes how these procedures involve all the senses and observes that in perception, visual negation generates in the subject a sensorial contamination capable of increasing his perceptive faculties. Paradoxically, therefore, the viewer sees better when he is deprived of sight, a revelation that emerges precisely from a careful re-examination of history.

The story of Maura Boffito [pp. 77-106] also takes place in history, where together with an oneiric personification of the Perspective, spans two centuries to recall the events that led to the discovery of projective geometry from the outset of perspective. The itinerary, which begun in Florence in the fifteenth century, proposes the same informative path that at the time made known the prospective method in Europe. At each stage of this ideal journey in space and time, the author and her partner attend to the main events or contemplate the work of those who concur to the development of the discipline.

The contribution of Maria Teresa Bartoli [pp. 107-122] demonstrates how the reexamination of the geometrical peculiarities of some well-known works in perspective can still lead to unprecedented attestations. The well-known experiments performed by Brunelleschi on the famous tablets did not intend to demonstrate the visual effectiveness of the representation but rather to show a means by which to prove the rule that interpreted the vision. The intuition, perhaps inspired by the perspective value of the bacula, was revived to his students by means of a synthetic scheme based on a square mesh, which was

used to correctly portray the depth of an environment according to a vision in line with the prescription of the unique and immobile eye. The same decking is also present in a panel of the Ghiberti's *Paradise Gate* (the *Scene of Solomon* and the *Queen of Saba*) and in the Piero della Francesca's *Brera Altarpiece*. But the monocular static does not seem to have been a necessary condition in the construction of much more relevant works, from which we can hypothesize meanings and purposes attributed to perspective at the time: it is the case of the *Flagellation* of Piero della Francesca or the *School of Athens* of Raphael whose geometric analysis has revealed an intentional renunciation of the uniqueness of the point of view. In both, the transgression to the rule seems to make explicit the aims of an applied science that the authors examine by making paintings to be taken as reference models.

Geometric verification conducted with the latest technological tools by Nevena Radojevic [pp. 123-138] on the vault of the Pazzi Chapel in Florence revolutionizes the certainties inherent in its traditional attribution. Taking into consideration the shape of the sails included in the umbrella vault of the chapel, Radojevic formulates the hypothesis that this cover was designed by Filippo Brunelleschi and that its conformation can be considered as the physical representation of an astronomical interpretation. Considering the result of the survey carried out with a laser scanner on the structure under investigation, Radojevic assumes that it provides an internal sail (conchoidal) and an external one (toric), and that the first derives from a transformation of the second performed according to the laws that allow Nicomede's conchoide to be obtained in the plan. This thesis has been veri-

fied in the digital environment by the almost absolute coincidence between the geometric model of the conchoidal surface and the mesh of the point cloud acquired with the scan. Since the conchoidal shape of the sail vault is similar to a solid perspective of the torus from the oculus of the dome assumed as a point of view, from that position the points of the conchoid coincide with those of torus. Therefore, if the observer's eye managed to reach such a location, he could perceive the reified view of a constrained movement, the same from which the astronomical theories of the sixteenth century originated. The evident prospective foundation of this work suggests the opinion that it was conceived by Brunelleschi.

If in the Radojevic thesis the use of an existing technological instrumentation is an indispensable prerequisite, the use of such means becomes even more essential in a perspective inversion operation. In this process, in fact, the choice of both the point of view and the geometric conformation to be assigned to the real model assumes fundamental importance, since there may be countless variations of both, all attributable to the representation object of investigation, which often also presents problems intentionally or accidentally related to its execution.

The report by Camillo Trevisan [pp. 139-158] describes the characteristics and the functioning of a software, Euclid, conceived to elaborate a perspective restitution starting from all the possible hypotheses connected to it. The program operates through the continuous verification of the compositional rules of a real model in constant transformation, which is compared with a perspective representation of the same also generated by a progressive motion of the projection center in

the space: when all the compositional laws of the model are verified (with the exception of a certain margin deemed acceptable), the configured sample is taken as originated from the perspective produced, at that precise moment, based on the position occupied by the center of projection.

Usually in the elaboration of a real model the correct geometric interpretation of the elements that compose it is

complex, because it is subject to multiple possible decodifications. Roberto Ciaroni's [pp. 159-183] contribution exposes some parameters of discernment, based on the mathematical properties of the forms and on the logic of the three-dimensional design tools, useful for selecting the options with greater awareness.

Through different approaches the reports collected in this book show that,

although it has not been adequately considered in recent decades, the descriptive geometry constitutes a disciplinary area with margins still to be investigated, and that through it the reconnaissance accomplished with the support of information technology on some works often leads to unpublished and far from negligible results.

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