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# L'Histoire de la construction / Construction History

Relevé d'un chantier européen /  
Survey of a European Building Site

Tome II

Sous la direction d'Antonio Becchi,  
Robert Carvais et Joël Sakarovitch



CLASSIQUES  
GARNIER

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PARIS  
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## DEUXIÈME PARTIE

### UNE ANTHOLOGIE DE RÉFLEXION (1985-2014) / CONSTRUCTION HISTORY : AN ANTHOLOGY (1985-2014)

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Robert Carvais est directeur de recherches au CNRS (CTAD – université Paris – Nanterre). Historien du droit, il confronte sa discipline avec l'histoire des sciences et des techniques. Il a publié en ligne les *Cours* d'Antoine Desgodets. Récemment il a coédité *Penser la technique autrement* (Paris, 2017). Il dirige un projet ANR sur « les experts et les expertises parisiennes du bâtiment (1690-1790) ».

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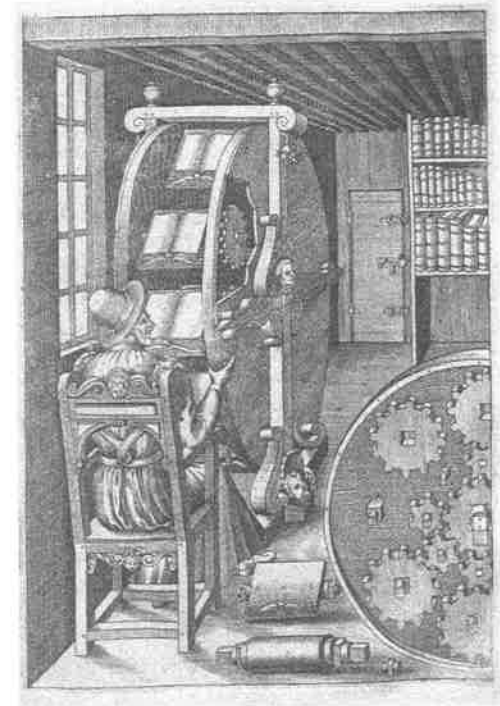
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Agostino Ramelli,  
*Le diverse et artificiose machine*,  
Paris 1588, fol. 317r.

## AN EXCITING INVESTIGATION<sup>1</sup>

The SIXXI (Twentieth Century Structural Engineering: the Italian Contribution) research is designed to trace and tell the tale of structural engineering in Italy. It has been an enthralling, sometimes stunning and undeniably unique, tale of progress. Italy had always lagged behind other industrialized nations; yet, in the early Twentieth century it was able to start a new trend that would be up to the most advanced European standards: Italian structural engineering. Under the autarchic regime, Italian structural engineering created its own unique identity, and then in the enthusiastic second post-war reconstruction period and the economic booming years it produced high-quality works, and made a name for itself as one of the most prominent schools in the world. In the following years, it faded into oblivion as quickly as it had risen on the international scene.

The fact that the era of the Italian school of engineering was soon forgotten, even from a historic point of view, as soon as the downward trend came to an end, is the reason why the need for tracing its history is so strong. And that is what makes the SIXXI research so exciting: the past we are unveiling day by day is virtually unknown to the general public and unbelievably also to architects and engineers. If, on the one hand, some personalities are very famous (Nervi, for instance, became a real trendsetter), on the other hand, structural works have actually been studied, but they are random surveys, analytical reviews, papers aimed at classifying the different structural categories.

On the contrary, the SIXXI research is designed to collect historical data on the Italian school of engineering in order to establish its origin, development and decline on historical perspective: against the background

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<sup>1</sup> This text was previously published as Tullia Iori and Sergio Poretti, "An exciting investigation". In *SIXXI 1. Storia dell'ingegneria strutturale in Italia*. Edited by Tullia Iori and Sergio Poretti, 156-157. Roma: Gangemi, 2014. It is republished here with the permission of the authors and of Gangemi.

of modern engineering internationally, on the relevant interactions with the history of Italy, in relation to the better known history of Italian 20th-century architecture.

The fact that this history has not been traced, yet, is not without reason. Even the world history of structural engineering seems to be quite scanty as compared to the history of architecture. The reason for such a fragmented development is to be seen in the little sympathy engineers have for history. An engineer, conventionally meant as the professional who designs the future, cannot be expected to care for history, even if it is his own history. On the other hand, the more accepted architecture historiography has always been intrigued by modern structures (think about the attention Giedion gives Eiffel and Maillart), but it is not prepared to push for investigation into scientific implications, which play a key role in structural design.

In other words, there is an objective difficulty to see the history of structural engineering against a specific disciplinary context. However, a structure requires a radically trans-disciplinary approach. To promote the development of the Italian school, the theoretical contribution made by scientists like Menabrea, Castigliano, Danusso, Colonnetti is no less important than the work of designers like Nervi, Morandi, Zorzi and Musmeci. If we wanted to get the secret of the originality of the great post-War achievements – from the viaducts to the Autostrada del Sole, the Olympic stadiums, the works made for the Centenary of Italian unity – we should reconstruct accurately the close collaboration between scientists and designers on which the whole activity of the relevant building sites was based. An operator or a theoretician, the protagonist of the Italian school is a multi-faceted figure that is at the same time a scientist, an entrepreneur and a craftsman, a reincarnation of the 19th-century engineer that in a pioneer's spirit prefers the use of concrete instead of steel in the construction of major public works. Based on that strange combination, he finds the conditions for a short, anachronistic survival in the unique setting of Italian (belated and constantly proto-industrial) modernization.

His heterogeneous innate characteristics cannot be decoded by conventional interdisciplinary instruments, but require a different strategy that is not based on a specialists' team. The challenge faced by the SIXXI research is to discover the history of structural engineering

by applying the approach that is used by the history of construction. Being this a 'material history', it is prepared to recreate the design and construction phases as practices: definite moments of a material culture. Since any practice is heterogeneous, but essentially unitary, a historian wishing to bring it back to life cannot use an interdisciplinary approach but has to get ready to take transversal paths on his own. The creator of a major structural work passes easily through the great epistemological areas, from sciences to techniques and arts. The investigator wishing to trace his works has to go the same way.

In order to carry out the research, a SIXXI team has been set up, whose membership includes some young and very young researchers. This has been a first step toward the ambitious, primary goal of the project: to start a new, independent course in research in Italy, that be dedicated to history of engineering, and be borderline between history of science, history of technique (just a belated) and history of architecture.

To this end, the study has begun from previous works and continues in different directions. The most challenging task is to follow new clues to find the various events that have not been investigated, yet. This is the most exciting part of the research: to investigate vast and unexplored territories, be the first to lay our hands on never-consulted documents, recover whole buried bibliographies and discover every day a long-forgotten personality, an unknown work, an issue that has never been dealt with, perceive a whole neglected historical phase. At the same time, the new data that are acquired and collected into an ad-hoc database are used to create a 'puzzle', to which new tiles are added every day. That is the time when, in a continuous final interpretation, facilitated by close cooperation and monthly SIXXI seminars, transversal links between heterogeneous factors are established: scientific contributions, designers' works, stories of building sites and firms.

However, history tracing is only one area of the research: in the investigators' opinion, disseminating the results is just as essential. In order to achieve the strategic objectives of the project, knowledge of the events that contributed to Italian engineering has to be disclosed extensively. This means getting into universities to fill the gap in architects and engineers' curricula, a true example of specialist illiteracy; being

spread among non-insiders in order to make the general public aware that paradoxically “cementification”, marked as a negative, speculative and anti-environmentalist phenomenon, has produced also some masterpieces that are among the most striking examples of the made-in-Italy style. It means also to draw the institutions’ attention to the need to protect and bring up the value of the numerous works that are part of the Italian school’s heritage, which is still unknown to many, even though it unfolds before everyone’s eyes and can be used by everyone.

For this reason, we are going to tell the story step by step as we disclose it, through a series of SIXXI lectures and also a final SIXXI exhibition. Furthermore, we are going to publish a small collection of SIXXI books. We will cover the results of on-going investigations, episodes of a different nature, that have had an impact on the overall development of the Italian school of engineering: the scientific contribution that at a certain time facilitated structure calculations, the invention of equipment that is peculiar to the Italian building site, the activity of a specialist laboratory, the creation and development of a journal (so different from architecture journals), an author’s production, the micro-story of a single work.

The fragments reconstructed by the team’s individual members are preceded by a serial overview of the whole history as we trace it step by step. It is a photostory (it was no coincidence that this literary genre was invented in Italy more or less at the same time as the engineering prosperous years). We expect that the progression of images showing events and major works flows smoothly, figure after figure, over the pages to bring back to life lost images of modern engineering: non-existing structures, faces of unknown personalities, disused graphics, epic atmospheres like the one reigning in the artisanal construction site of a major public work, which was the photographers’ preferred subject, leading figures of a parallel, artisanal alike, specialist alike, typically Italian history.

However, telling the tale of Italian engineering as it is unveiled is not sufficient, either: we have to make it listened. The result of our intention is not to be taken for granted. The events leading to the construction of major works are most often exciting, but they are so even for their complex scientific implications. To limit their understanding to those who, for example, are familiar with the theory of elasticity would mean to miss the research objective to disseminate knowledge.

This is one of the most challenging daily tasks the SIXXI team has to face: improving readability of the story. Borges reminds us that in Shakespeare’s time the role of history was not considered to bring the past back to life but to turn it into comic legends. The assumption that history means knowledge has long prevailed, strengthened by the more and more extensive use of scientific evaluations. However, keeping in mind that reconstructing is closely related also to the imagination and that a certain amount of drama is consubstantial to historical tale can help us preserve its charm, especially when the subject is as complex and specialist as structural engineering.



FIG. 1 – Italia '61, Palavela.  
Archivio Fotografico Farabola di Vaiano Cremasco (Italia).