

VIETIAN SOURCES IN JOSEP SARAGOSSÀ'S *ARITHMETICA UNIVERSAL* (1669)

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The emergence of àlgebra in mathematics took place in the seventeenth century mainly to the circulation of the work *In Artem Analyticen Isagoge* (1591) of François Viète (1540-1603). In 1669, the Jesuit Josep Saragossà (1627–1679) published the *Arithmetica universal que comprende el Arte Mayor y Menor, Álgebra Vulgar y especiosa* (*Universal Arithmetic, containing the Greater and Lesser Arts, vulgar and speciosa Algebra*), a work that has been little studied so far. The aim of this paper is to contribute evidences of the introduction of Viète's algebra in Spain through the analysis of Saragossà's *Arithmetica*. The analysis of this work shows how Saragossà adapted this algebra and Viète's analytic path, in what manner he used the symbolic language and how he applied new rules and procedures to solve equations. Besides, this paper intends to emphasize the mathematical excellence of Saragossà.

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ADAPTATIONS AND RESISTANCES TO THE PARIS SYSTEM OF PUBLIC LIGHTING: THE DIFFERENT TRANSLATIONS IN BARCELONA AND MADRID

Benjamin Bothereau

Circulation of 18th century lighting technology between France and Spain is not a mere dissemination or a fluid flow of knowledge, materials, and practices, but a cross-cultural encounter, implying multi-layered processes of mediation and appropriation. The spaces of reconfiguration are indeed not passive: if Barcelona adapts the Parisian suspension mode of the lighting system, the city rejects the use of metallic reflectors and prefers the local oil combustible. Madrid does the opposite. This article will not deal with the voyages of technical enquiry nore with the go-betweens but focus on the transnational dynamics of adaptation, negotiation and integration or rejection of the lantern technology.

THE FIRST APPOINTEES TO THE *INSPECCIÓN DE CAMINOS Y CANALES*, A TECHNICAL BODY ESTABLISHED IN SPAIN IN 1799 TO DEAL WITH THE KINGDOM'S ROADS AND CANALS

Jesús Sánchez Miñana

An account of the creation and structure of the new organization is given, including the names of the first eight appointees to fill some of the posts provided in the upper three staff categories. They were architects José Larramendi and Manuel Martín Rodríguez and Navy engineer Francisco Javier Barra, commissioners; architect Manuel Turrillo, mathematician and Navy officer José Miguel Sarasa and cosmographic engineers Francisco Javier Baumberghen and Antonio Bolaño, assistant commissioners; and architect Francisco Javier Mariategui, curator of the royal sites roads. An attempt is made to sketch more or less comprehensive biographies of Barra, Sarasa, Baumberghen and Bolaños, the least known of them all, while giving some notes on the lives of Martín Rodríguez, Turrillo and Mariategui that hopefully will complement already existing studies. Nothing is said about Larramendi, about whom a book has been published recently.

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TECHNOLOGY AND ENTERPRISE IN THE SPANISH INDUSTRY OF ELECTRONICS, TELECOMMUNICATIONS AND DEFENSE: MARCONI ESPAÑOLA

Ángel Calvo

This article explores the mechanisms and factors of the conversion of a segment of the civil industry of a European country into a defence industry from the perspective of business history and through a case –Marconi Española–, lacking a historical monography. This chapter of the defence industry is taking place at the same time as Spain's integration into Europe. The text is structured in five main sections. The first traces the characteristics of the defence industry in Spain, the second refers to the reconversion of

Marconi Española under the North American multinational IT&T, the third to the entry on stage of the French multinational Alcatel, the fourth to the turn with new managers and the last to the integral remodelling of the Spanish defence industry. The work is substantially framed in the burning debate on world balances, European subordination or the role of national states (European Parliament, 2016, pp. 14-20). The whole rests on primary business and administrative sources, as well as on a newspaper library and secondary literature.

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THE THEORY AND HISTORY OF TECHNICAL SCIENCES, A RESEARCH SUBJECT DEVELOPED IN RUSSIA IN THE YEARS 1970-2000

Dmitri Gouzévitch

The article presents a subject of research aimed at exploring the history of engineering as an independent field in relation to the history of technology, industry, and science, a subject set in place in the USSR in the 1970s. Particular attention is given to the Leningradian School of Engineering History and its founders, creators of the concept of technical sciences, Boris Kozlov, Yaroslav Neujmin, and Alexei Mandryka. According to this concept, the technical sciences, which study the artificial world created by man, are not considered as applied, but in the image of the natural sciences (exploring the world which exists independently of the man), and the sciences on man can be as basic as applied. Everything depends on the relationship between the theoretical and experimental parts, components inherent in any developed science. The article summarizes the insights into the History of Technical Science, a five-part collective work based on this concept in the late 1980s by researchers from the Leningradian Antenna of the Institute of History of Science and Technology of the Academy of Sciences of the USSR and never published in full. As part of this work, the author of this article has had to cover the 350-year period - from the 1520s (the birth of modern technical science) to the 1870s (the advent of the electric revolution, either Parts 2, 3 and 4 of the Insights). These three parts were written in the years 1988-1990. First of all, the "early" technical sciences (outdoor ballistics, hydraulics, fortification, and

lower geodesy) are formed in the middle of the eighteenth century, followed by those put in place during the following period (completed in the 1820s), which include resistance of materials, ship mechanics, machine mechanics, binder chemistry, etc.; finally, those formed between the years 1820 and 1870, during which the technical sciences experienced a real boom.

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RESEARCH NOTES ABOUT HISTORY OF THE SOLAR ENERGY TECHNOLOGIES (XIX-XX): HERITAGE, ARCHIVES & MEMORY

Nelson Arellano-Escudero

A research about Solar Energy Technologies since 2009 has been developed as a History of Technology combining Environmental, and Economic History through cultural factors. One contribution of the results is the enlightenment of a large collection of cases, which must be studied and analysed under a theoretical point of view, because it reveals an anomaly for the progressive conception of the evolution of technology.

This perspective delineates a research frontier in which analyzing the combination of patrimonialisation, and the myths of energy. There are a number of cases for doing this, although it would be better to focus on stories from Europe and Atacama Desert, in South America, than to draw a review of the worldwide state of art.

The central question that raised from a heuristic trajectory would be: How did the technological fix and the social values interact producing discard, intermittency, and continuities in different solar energy technologies?

Our proposal is to re-unify the events or to have a geographically more comprehensive perspective, and to re-read borders and frontiers because the studies about solar energy landscapes and their obliterated heritage are an excellent opportunity to connect History of Technology, Industrial Archaeology and, beyond them, Humanities, Social Science, and Art.

We conclude that the sources indicate that is possible to re-shape the industrial landscape recovering discarded artefacts, objects, and technologies. As well as it is a necessary step to reconsider the obliterated heritage. The material culture should be catalogued, and exhibited.