

SPANISH NUCLEAR POLICY: THE CASE OF THE NUCLEAR REACTOR ARGOS

Francesc X. Barca Salom

A research nuclear reactor named the Argos was inaugurated at the School of Engineering in Barcelona on 11 June 1962. The reactor was reported in the newspapers as the first nuclear reactor to be built in Spain by the Spanish Nuclear Agency.

The idea to build the reactor was conceived seven years before when the Ferran Tallada chair of nuclear engineering was created. A number of problems had to be overcome before the reactor was finally constructed and installed.

This paper describes the difficulties encountered during the construction of the reactor. There can be little doubt that the construction of this reactor would not have been possible without the participation of the Industrial Chamber of Barcelona.

The construction of the Argos encouraged the Spanish Nuclear Agency to devise more ambitious projects. It may be stated, therefore, that the construction of the Argos represents the turning point of the autonomous nuclear policy of Spain, the aim of which was to have complete control over all nuclear activity.

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TECHNICIANS AND GAS TECHNOLOGY IN THE CATALONIA OF XIXth CENTURY

Mercedes Arroyo

The introduction of gas technology in the Catalan industrial cities was rapid, practically at the same time of most European cities; and, as in these, it was linked to degree of economic and existing industrialist development of the respective urban tissues. At the start, the gas technology entry was produced by two process: by means of the coming of foreign technicians or through studies trips of some Catalan scientists to various academic institutions out of country.

In the first case, this supposed that the origin of the technology and of the appliances was foreign; in the second, that the own Catalan scientist would be those which provided the acquired necessary knowledge to the country industries. As opposed to other Spanish cities, the Catalan gas industry enjoyed quite soon a certain degree of technical autonomy due to various circumstances; between other: the sufficient volume of capitals to obtain the first production elements and the necessary technology that permitted to begin a production process in constant growth. This growth, however, soon expressed a high degree of economic risk.

On the other hand, the lag in the creation of specialized schools that permitted to investigate new production technical and the lack of raw materials did not permit the development of a properly autochthonous technology. To all this, would be added the own limitations produced by a protectionist system that, paradoxically, favoured the indiscriminate copy of appliances but, on the other hand, it did not know -or it could not- to favour the creation of an industrial infrastructure in the rest of the State.

Some examples of the gas technology transfer in Catalonia will serve to show

the degree of technical development that would be reached in that field.

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THE 1861 REPORT BY AGUSTIN MONREAL ON INDUSTRIAL EDUCATION IN SPAIN AND EUROPE

José Manuel Cano Pavón

The most salient aspects of the report delivered in 1861 by Agustin Monreal, Professor of the Royal Industrial Institute of Madrid, following a visit to teaching institutions in Prussia, Belgium and France, and to factory facilities on the outskirts of Paris, are examined and commented on. The report describes the situation of teaching at such institutions and compares it to that of Spanish industrial engineering schools, which the author fiercely criticized. He felt that the number of industrial engineering schools operating in Spain at the time (four) was excessive and that the teaching of the craftsmen and skilled workers necessitated furthering; however, he firmly believed that higher education should be completely independent of vocational training. Monreal thought that the professional competence of industrial engineers in the public sector and private industry ought to be regulated. Finally, the paper compares the ideas expressed in the report with the opinions of other Spanish professionals of the time.

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FROM EXPERIMENTAL PHYSICS TO INDUSTRIAL PHYSICS. ANALYSIS OF A BARCELONA'S CHAIR (1814-1851)

Carles Puig-Pla

This paper tries to show a general vision of the Experimental Physics School of Barcelona, which was created by the Private Board of Commerce of the city in 1814. Along the first half of the XIXth century, the School of Physics contributed to introduce modern Physics to people belonging to different social classes, including artisans, through the teaching of Pere Vieta, Joan Agell, Joan de Zafont, Antoni Rave and Joaquim Balcells. The instruments of this Cabinet were used in several institutions including the Academy of Natural Sciences and Arts of Barcelona and the University of Cervera, the only one in Catalonia at that time. When the University was established in Barcelona in 1837, after an absence longer than a century, the School of Physics was transformed and focused to industrial applications. It became a part of the new Industrial School of Barcelona in 1851. Among its students there were important people who played a relevant role and influenced the Catalan and Spanish Society of the middle XIXth century.

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THE DIFFICULT CHALLENGES OF NO MAN'S LAND OR THE RUSSIAN ROAD TO THE PROFESSIONALIZATION OF WOMEN'S ENGINEERING (1850-1920)

Dmitri Gouzévitch, Irina Gouzévitch

The Petrograd Polytechnical Institute for Women, which was founded in 1906, crowned an arduous struggle carried on for half a century by the most progressive sector of Russian society for women's rights and free access to higher education and further professional integration. The very existence of this school was the product of a difficult consensus of actors representing diverse domains of the Russian social landscape. A number of factors converged to make this possible, i.e. the growing revolutionary movement, the rapid industrialization and the accumulated experience in the area of creating schools of higher education and professional schools for women. The only institutions that finally succeeded were those that resulted from private or public initiative given that the State educational system remained closed to women for many years to come. At the same time, the State engineers, despite their strong corporate spirit, proved to be much more sympathetic to women's demands than their male colleagues from other professions. The Polytechnical Institute for men (1901), which was free of any corporate attachment, served as a prototype of a new kind of engineering institution for women. Conceived outside the State system and sponsored by private and public associations, this Institute functioned as an autonomous technical university, which was able to benefit from the administrative experience of higher Courses for women and from the intellectual potential of the best State engineering schools. The initial results proved to be impressive enough to open up a road towards professional integration for its women graduates. However, given the unique historical circumstances, the female engineering student trained in the Russian Empire was to pursue her professional career in the quite different historical context of the Soviet State. This dichotomy represents, perhaps, the most difficult challenge to anybody wishing to delve into the complicated history of women-engineers in Russia.

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**THE COLLABORATION OF DR. SALVÀ I CAMPILLO WITH
THE *MEMORIAL LITERARIO* OF MADRID (1786-1790): A VIEW OF
THE SCIENTIFIC LANDSCAPE TOGETHER WITH ITS LEADING
FIGURES IN LATE EIGHTEEN-CENTURY CATALONIA**

Jesús Sánchez Miñana

Between 1786 and 1790 the Barcelona-born *ilustrado* (enlightened) Francesc Salvà i Campillo (1751-1828), a noted physician, inventor, and forerunner of telecommunications, was correspondent of the *Memorial Literario*, a magazine that appeared in Madrid in 1784. Salvà himself contributed a good number of articles on medicine, atmospheric electricity and meteorology, besides encouraging others to write on mechanics and the natural sciences and opening the journal to news from the Catalan scientific scene and reports of its prominent figures, particularly in the case of Barcelona. This paper presents an initial attempt to summarize this material, which is organized around several subject matters, in hope that it attracts the attention of specialists in the different fields, who may contribute to a better understanding of Salvà's scientific and human profile and the state of science and technology in late eighteenth-century Catalonia.