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On: 05 December 2011, At: 08:14

Publisher: Routledge

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Engineering Studies

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/test20>

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Available online: 02 Dec 2011

To cite this article: Irina Gouzévitch & Peter Jones (2011): Becoming an engineer in eighteenth-century Europe: the construction of a professional identity, *Engineering Studies*, 3:3, 149-152

To link to this article: <http://dx.doi.org/10.1080/19378629.2011.631271>

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EDITORIAL

Becoming an engineer in eighteenth-century Europe: the construction of a professional identity

Introduction

The history of engineering and of engineers as an occupational group is attracting increasing attention from scholars in a number of countries. A huge amount of research in this area has appeared in the last few decades. Yet despite the undoubted appeal of the subject to historians, much remains to be uncovered. While the history of technology, of science and of industry has made steady progress, we still do not possess a fully connected history of engineers and engineering. This observation holds for all periods although some, such as the Renaissance or the nineteenth and twentieth centuries,¹ are better documented than others. The eighteenth century on which this special issue of *Engineering Studies* is focused figures among the less well-documented periods. It is true of course that a number of important studies have embraced eighteenth-century developments. One need only think of the works of Hélène Vérin,² Antoine Picon, Bruno Belhoste, Ken Alder, Janis Langins or Patrice Bret relating to France, or those of Robert Angus Buchanan, Alec Westley Skempton, David Miller, Christine Macleod and Peter Jones relating to Great Britain. For the Czech lands we have the work of Marcela Efmertova and Karel Zeithammer, whilst Alfred Rieber, Dmitri Gouzévitch and Irina Gouzévitch have explored the history of engineers and of engineering in the Russian context. For the Italian states we might draw attention to the work done by Luigi Blanco, Renata De Lorenzo and Donata Brianta, and for Portugal by Maria Paula Diogo and Ana Cardoso de Matos.³

Some outstanding treatments of the emergence of the engineering profession do exist though, particularly for Spain.⁴ The most recent is the multi-volume work edited by Manuel Silva Suarez, *Técnica e Ingeniería en España*, whose second and third volumes are entirely given over to the history of engineering and engineers

¹For an important bibliography of the engineering in the nineteenth and twentieth centuries, see Gouzévitch and Grelon, 'Reflexion sobre el ingeniero europeo en el siglo XIX,' 2007; Ternier, 'Bibliographie,' 1984; 'Select Bibliography' in Fox and Guagnini, 1993.

²*La gloire des ingénieurs* by Hélène Vérin published in 1993 remains an outstanding example of a complex approach to the rise of the engineering profession during the modern period, from the beginning of the sixteenth century to the end of the eighteenth century.

³For a bibliography on engineering in various European countries in the eighteenth century, including the quoted authors, see: Vérin and Gouzévitch, 'Sobre la institución y el desarrollo de la ingeniería,' 2005, pp. 161–163. A very important body of references relating national historiographies is provided by the contributors to this volume.

⁴See the monographs written by Horacio Capel, Antonio Lafuente, Antoni Roca-Rosell, Carles Puig-Pla among others. All deal with different aspects of the history of engineering.

during the Spanish Enlightenment.⁵ Another example of a deeply researched study rooted in the eighteenth century is Darina Martykánová's investigation of the emergence to professional status of Ottoman engineers.⁶

Even so studies of engineers and of their gradual acquisition of a corporate identity in the course of the eighteenth century are still quite rare. Most scholars have opted to approach the emerging profession of the engineer via the study of administrations, scholarly institutions, individual businesses and industries, or else via a scrutiny of the implantation of specific technologies such as steam power. The classical tradition which privileges biographical studies and dwells all too often on the 'heroic' role of individual contributors to the onward march of engineering science still holds sway.⁷ Literature of this type tends inevitably to focus on national contexts. Study of engineering within an explicitly comparative frame involving two or more countries is not encountered very often.⁸

Of course this national point of reference makes it extremely difficult to produce an integrated history of engineers and engineering. Not only are national historiographies often poorly developed in themselves, they exhibit troubling discrepancies which are not easily transcended and synthesised. After all, the trajectories inscribed by engineers on route to full professional recognition tended to differ markedly from country to country. We should not underestimate the cultural conditioning of historians seeking to make sense of these trajectories either. German sociologically minded historians prefer to conduct their analysis within an administrative frame of reference informed by cameralism, whereas British and American researchers more often invoke the model of the liberal professions with its emphasis on individual skill and competence. The French on the other hand take a statist view of the engineer as a benevolent agent and dispenser of modernity. Such an approach attaches much less significance to the engineer as an actor in the marketplace who might also be an inventor and an entrepreneur in his own right.

A difficulty of a more general order arises when we try to situate the engineer on an evolutionary scale. For most historians of engineering doubt whether the eighteenth century constituted a period in which the engineer in his many incarnations across Europe became truly professionalised. Yet they all agree that an important transition was under way during this period. Engineers as an occupational group were not only becoming more widely recognised and better organised, they were also equipping themselves with a body of expert knowledge which was consolidated and transmitted via specialised teaching institutions.

The philosophy of the Enlightenment no doubt counted for a great deal in this process. For nearly everywhere in eighteenth-century Europe knowledge was being classified and codified, thus facilitating the rise to prominence of the 'expert' in possession of a body of specialised know-how. In their first incarnation these

⁵Silva Suarez, *Técnica e Ingeniería en España*, 2005.

⁶Martykánová, *Reconstructing Ottoman Engineers*, 2010.

⁷For a striking example of such an approach: Skempton, *Civil engineers and engineering in Britain*, 1996.

⁸For the latest studies on this theme, see Bret, Gouzévitch and Perez (eds.), *Les techniques et la technologie entre la France et la Grande-Bretagne*, 2010; Martykánová, 'Los ingenieros en España y en el Imperio Otomano,' 2010; Gouzévitch, 'Un siècle de politiques technico-scientifiques en Espagne et en Russie,' 2006; Gouzévitch, Grelon and Karvar (dir.), *La formation des ingénieurs en perspective*, 2004.

'experts' were often military engineers, but by the end of the century engineering 'expertise' could no longer be defined in purely military terms. That said, though, the efflorescence of engineering specialisms was largely a development of the nineteenth century.

In this special issue we can do little more than provide a general overview and suggest a few useful lines of enquiry in a sphere which is best described as work in progress. Whilst scarcely comprehensive in their coverage, the five papers gathered together here bring out in a complementary fashion the main lines of development which contributed in the course of the eighteenth century to the construction of a distinctive engineering identity.

The first paper, 'The rise of the engineering profession in eighteenth century Europe: an introductory overview' sets the tone and marks out the terrain to be reconnoitred as it were. Co-authored by two French historians, H el ene V er in and Irina Gouz evitch, the essay provides a synthetic vision of the rise of the engineering profession across Europe.

The paper by the Italian scholar, Renata de Lorenzo, 'Being an engineer and being an architect in eighteenth century Italy: professional identity as a reflection of political fragmentation' stresses two important themes that take us beyond the disunited Italian peninsula. The first is the gradual divergence during the period in question of two professions hitherto closely allied, and the construction of two separate identities – one for engineers and one for architects. The second theme in her paper addresses the impact of territorial fragmentation in a context of competing geo-political pressures on the process of identity formation.

The Franco-Russian historian, Dmitri Gouz evitch, focuses rather on the institutional emergence of state technical corps as Imperial Russia progressively centralised and bureaucratised its governing structures. He notes how west European models and practices relating to incorporation were adapted to the Russian context and draws attention to the important role played by the physical mobility of technical experts in the construction of an identity for engineers.

This trans-national emphasis is also encountered in the essay by Peter Jones, 'Becoming an engineer in industrialising Great Britain *circa* 1760–1820.' He depicts the emergent engineer as a 'self-made man' who functioned in a marketplace structured around inventive skill, enterprise and commercial opportunity. But he is also at pains to contextualise the British experience and to draw out the ways in which technical competence was traded and diffused on a broader, pan-European scale.

It should not be forgotten that the expansion of mathematical science as a knowledge resource underpinned the emergence of the profession of the engineer in eighteenth-century Europe as well. This is the theme which Antoni Roca-Rosell, Maria Rosa Massa-Esteve and Carles Puig-Pla address in their contribution to this volume, "'Mixed" mathematics in engineering education in Spain. Pedro Luce's course at the Royal Military Academy of Mathematics of Barcelona in the eighteenth century.' They explore the significant role played by the acquisition of mathematical knowledge in the training of Spanish engineers, notably at the Barcelona Royal Military Academy of Mathematics from 1739 onwards.

The contributors to this special edition have shown considerable goodwill and great stamina in rising to the challenge of exploring a theme about which comparatively little has been written. They deserve our thanks. The co-editors also

wish to thank the editorial team of *Engineering Studies* who provided the encouragement and the impetus to bring this volume to fruition.

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