

Maria Paula Diogo and Tiago Saraiva, *Inventing a European Nation: Engineers for Portugal, from Baroque to Fascism*, San Rafael, CA, Morgan & Claypool Publishers, 2021, 159 pages



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*Inventing a European Nation: Engineers for Portugal, from Baroque to Fascism* is the most recent (and the sixth) volume of Morgan & Claypool Publishers (San Rafael, California, USA) *Synthesis Lectures on Global Engineering*, which aims at presenting “short manuscripts” of “high-quality scholarship,” “making visible the experiences of engineers and engineering students (...) to help them improve engineering work through critical self-analysis and listening” (p. ii). It reaches these goals well, by being a synthesis of high-quality work, written with clarity and in an appealing way, making compelling arguments, namely arguing through case studies presented chronologically that ways of being an engineer and nation building are intertwined and transnational processes. By incorporating this book series on Global Engineering, it aims at bringing to the forefront the diversity of engineering identities, reflecting also on the commonalities across borders, and particularly “a sense of common heritage, a sort of transnational ‘Republic of Engineers’ that prevails over borders and centuries” (p. 2). Furthermore, by focusing on a European *peripheral* country (Portugal) and dialoguing with the historiography of research agendas and networks such as Science and Technology in the European Periphery (STEP) and Tensions of Europe (ToE), this book offers a perspective of a less “canonical” European case (p. 3), focusing on the circulation and appropriation of knowledge as active and creative processes. Thus, while explaining in the introduction the relevance of writing a history of “Engineers for Portugal,” the authors argue that the history of engineering sheds light into the history of making the nation and its national culture, in the measure that “the very same ability of collectively imagining a nation relied in large measure on engineers and their practices” (p. 1). Following local actors and portraying local sites, this book also sheds light into the history of the peripheries and how they are part of transnational processes.

As a synthesis, it is not surprising that this book draws on previous work of both authors and other historians of technology and science working on Portugal, being based mostly on secondary sources. The authors' current and previous works constitute important references for the History of Technology and Science in Portugal (to which development and internationalisation they greatly contributed to) and beyond (namely the research networks STEP, ToE, Society for the History of Technology [SHOT], or in journals such as *History and Technology* and *HoST – Journal of History of Science and Technology*). The recognition of their relevant track record is visible, for instance, by the prizes awarded by the two most important scholarly organisations in the field: the SHOT Leonardo da Vinci Medal (career award) awarded to Maria Paula Diogo (2020) and the History of Science Society (HSS) Pfizer Prize for best scholarly book to Tiago Saraiva (2017). The task of writing this book on “Engineers for Portugal” was thus delivered in good hands.

Using case studies focusing on “specific engineers, institutions and technologies” (p. 5) and organised chronologically, the authors argue how engineers contributed to the making of the nation, and vice-versa: what it meant to be an engineer and how engineers' agenda contributed to the making of Portugal as a nation in each chronological period analysed. It covers Portuguese history from c. 1640 until 1974, reaching beyond this time frame to more recent times, in the conclusion. It covers and uses a periodization criterion based on political regimes: “absolutist (1640-1807), liberal (1820-1910), republican (1910-1926), and authoritarian (1926-1974) governments” (p. 5). Chapter 2 starts in 1640 to underline the (more than a) coincidence of the beginning of formal training of Portuguese engineers with the recovery of Portuguese independence from sixty years of Spanish rule. The authors argue that the establishment of a Class of Artillery and Geometry in 1641, and the textbooks published in the 17<sup>th</sup> and 18<sup>th</sup> centuries, such as *Portuguese Method for drawing Fortifications* (1680) by the mathematician Luís Serrão Pimentel (the first director of the Class), were fundamental to that formal training and to build the profile of Portuguese engineers, whose knowledge was put at the service of building military fortresses in mainland Portugal and in its empire, and to enact the “baroque visions” of the Portuguese crown, materialised into the architectural buildings. Chapter 3 focuses on the creation of new institutions during the first half of the 19<sup>th</sup> century for engineers' training: the Polytechnic School and the Army School. This chapter and the following can be of

particular interest to *TST* readers, as they deal with transport and communication infrastructures. Chapter 4 deals with the creation of another institution on the second half of the 19<sup>th</sup> century, the Industrial Institute, and its liaisons to the industrial world. In chapter 5, the authors discuss the late 19<sup>th</sup> century engineer's involvement in the promotion of public works in Portuguese African colonies, particularly Angola and Mozambique, naming it "the colonial face of Portuguese engineering." Public works would still play an important role in the Portuguese "civilizing mission" well into the 20<sup>th</sup> century, especially in the late colonial period (coinciding with a "second colonial occupation"), something which the book could have mentioned. Chapter 6 shows how the renaming of the Industrial Institute to Technical Superior Institute in 1911, becoming one of the most important engineering schools of the country, was part of the promotion of new engineering areas such as chemical and electrical engineering, put at the service of exploring national resources. Chapter 7 counteracts the views of Portuguese historiography that downplays the role of science and technology in the Portuguese dictatorial regime(s) from 1926 until 1974 by showing how engineers played a key role in the Portuguese New State (Estado Novo) regime. During this period, blueprints that were developed in the previous periods were implemented, and new blueprints were also drawn. Infrastructures, particularly transport, would still play an important role. In the last chapter, the Conclusion, the authors briefly deal with more recent times (the last three decades of the 20<sup>th</sup> century), when new engineering schools were created bringing new fields hitherto absent in the country's universities (such as information technology, industrial and environmental engineering, offered by the engineering schools of the NOVA University of Lisbon and the University of Aveiro) and how engineering identities developed along the transition to democracy after the 1974 revolution and the integration in the European Economic Community in 1986. The conclusion is also the chapter in which the authors point to some limitations of this work, namely the absence of an intersectional analysis (on gender, race, or disability), an analysis of the role of non-engineers, or other lower rank technicians. One might point to other limitations such as the choice of case studies. For instance, it is puzzling that the choice of the photograph of the front cover is the coastal road between Lisbon and Cascais, which is an excellent case to show how road engineers contributed to the making of Estado Novo's Portugal, and is not mentioned at all in the book's narrative (neither the authors explained why they have used this image).

The implication of engineers in nation building in previous centuries is recognised by the authors as both a national and transnational phenomenon, being this history parallel to many places, despite the importance of telling it from this local perspective. One might ask if the links (and de-links) made by engineers between their technical training and political agendas while in the role of politicians described in the book was also a transnational phenomenon. If so, this book could also bring the question on what it means for engineering education, curricula, knowledge, practice, and spheres of influence. The authors deal with this in the conclusion only. This choice, probably led by the need to make a synthesis – to fit the proposal of the book series – might be questionable. The more recent period (late 20<sup>th</sup> century) would merit itself to have a fully dedicated chapter of its own (even because the book series also covers contemporary cases), deepening the explanation on the changes and continuities that have been acted upon since the transition to democracy in Portugal and explicitly dialogue with the questions posed by the editors of the series “What is engineering now for? What are engineers now for?” (p. ii).

Of the audiences this Global Engineering book series might have, it explicitly aims to reach engineering students, faculty, working engineers, and the lay public. This focus on engineering education and on thinking and complexifying (although keeping it tangible) the narratives on the role of engineering and its identities in relation to societies and countries (within and beyond borders – ambitioning a “global engineering”), namely the books that deals with Science and Technology Studies, History of Technology (and Engineering), is of particular importance to show how humanities and social sciences are relevant for engineering practice. The U. S. based editors of the book series invite proposals coming from “distinct disciplinary, analytical, and geographical perspectives” (p. ii). Through the experience of the “other,” going out of the local known realities to know others, it contributes to critically rethink and innovate engineering back home (and this is not a novel phenomenon in itself), making clearer the hidden normativism and assumptions of local engineering knowledge and practices. And to understand how this knowledge and practices are deeply embedded in local dynamics, societal, political, economic contexts, and are never purely technical, I evoke here Melvin Kranzberg’s *laws* of history of technology, particularly the fourth, which states that “alt-

though technology might be a prime element in many public issues, non-technical factors take precedence in technology-policy decision”. It is never enough to remind ourselves of these laws, and particularly in engineering education contexts.

This book shows that technology and its makers, are important social, cultural and political actors that shape and are shaped by the society they live in, particularly stressing the role of engineers. I hope that this book is successful in the double movement of reaching both the audiences of engineering practice, education and learning, and historians. This book is also about symmetrical movements. In terms of object: it deals with the *making of engineers* (their identities and meanings of being an engineer) and of nations. In terms of audiences: it aims at reaching working engineers and students, contributing to their more comprehensive training and to a more reflexive engineering practice, as well as historians. For the latter, it would contribute to the acknowledgement of including the lenses of technology (and engineering) into historical interpretations. In this particular topic, this book parallels with a few of the series (*Engineers for Korea* – also with the nation as a problem) and differs from others, which do not cover so specifically the historical framework and audiences.

This is why I think that although versions of parts of this book have been published elsewhere, either in English, or in Portuguese, it would be very much worthwhile to have it translated into Portuguese, to make its outreach broader, reaching one of the audiences who would benefit from it: people who have interest in Portuguese history and engineering (particularly in issues regarding training of future engineers). Written in English, with the possibility of thus reaching wider audiences, it is also definitely of interest to other readers, for, as the book clearly states, making a nation as an interweaved process with the construction of engineering identities was (and is) a transnational process.

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