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*Ciência, Tecnologia e Medicina na Construção de Portugal, Volume 4: Inovação e Contestação [Science Technology and Medicine in the Construction of Portugal, Volume 4: Innovation and Contestation]*, Lisboa, Tinta-da-China, 2021, pp. 704

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*Ciência, Tecnologia e Medicina na Construção de Portugal, Volume 4: Inovação e Contestação [Science Technology and Medicine in the Construction of Portugal, Volume 4: Innovation and Contestation]* aims to use science, technology, and medicine as lenses to look over the 20<sup>th</sup> century of the Portuguese history and examine their role in building the 20<sup>th</sup> century of the Portuguese society.

The book broadly covers this period of time, going over the four regimes in the recent history of the country – the last decade of the Monarchy (1900-1910, with some chapters going back to the last quarter of the 19th century), the First Republic (1910-1926), the military dictatorship and the Estado Novo authoritarian regime (1928-1974) and, finally, the contemporary democracy started with 1974's Carnation Revolution and marked by the integration into the European Union (then European Economic Community) in 1986.

The book is an edited volume that brings together 25 chapters by leading scholars in History of Science and Science and Technology Studies in Portugal. It is the last book in a four-volume collection entitled *Science, Technology and Medicine in the construction of Portugal*, edited by Maria Paula Diogo and Ana Simões. These volumes are part of an effort by researchers from the CIUHCT (Centro Universitário de História das Ciências e da Tecnologia) to increase the public visibility of these disciplines and to highlight the role of science, medicine, and technology in the history of Portugal.

The chapters are independent and cover a broad diversity of topics such as the emergence of scientific disciplines in Portugal, the development of scientific and higher education institutions, the relationship between science and political regimes, the technological development of some economic sectors (for example concrete, uranium extraction), the relationship between Portuguese science and colonialism, and science communication.

The chapters are organised in chronological order and, although the division between the political regimes of this period widely influence some of the chapters, the lack of further organisation was a deliberate editorial choice as stated in the introduction. The book aims to highlight how using

science as a lens to scrutinize the 20<sup>th</sup> century can help to emphasise the continuities between different regimes. Some chapters do focus on one of these political regimes (e.g. Chapter 1, on higher education during the First Republic or Chapter 13, on the concrete industry during the Estado Novo). However, many span over several periods like Chapter 13 analysing the relationship between tropical medicine and colonialism and chapter 19's account of the history of racial anthropology: both range from the late monarchy (starting from mid 19<sup>th</sup> century), through the 1<sup>st</sup> Republic, and into the Estado Novo regime, highlighting some of the continuities between the three political regimes of the period.

Nevertheless, the chapters tend to cluster around some key themes for each period. The initial chapters, broadly covering the first quarter of the 20th century, mainly focus on the role of science in the construction and consolidation of the Republican regime (Chapters 1, 2, 3, 4) and the role of science in the Portuguese colonial project (Chapters 5, 6). The central section explores how key scientific institutions operated within the Estado Novo regime (Chapters 7, 8, 9, 10), the role of the regime in developing key industrial sectors like concrete, plastics, or road construction (Chapters 12, 13, 14, 16, 17), and colonial science during the same regime (Chapters 18, 19). The last chapters analyse the dynamics of the "opening" of the Portuguese scientific system to the new democratic regime, both towards greater integration at the international level (Chapters 20, 24, 25) and new forms of public engagement with science and technology (Chapters 21, 22, 23).

The chapters are diverse in how they approach these topics. Some focus on particular institutions in the national context (Chapters 2, 7), while others on the development of a scientific discipline (Chapters 3, 6, 15, 19) or economic sector (Chapters 5, 12, 13, 14, 16, 17). One chapter examines the career of a prominent scientist, Egas Moniz, the only Portuguese granted a Nobel Prize in Medicine (Chapter 10) and another the history of a Portuguese science periodical, *Brotéria* (Chapter 11). A few chapters explore science policy and its impacts (Chapters 1, 9, 18, 20, 24, 25), science communication (Chapters 4, 18, 21, 22), and one focuses on the sociotechnical conflict around nuclear energy (Chapter 23). The volume also covers a diversity of disciplines but some are clearly more represented. There are several chapters on engineering or different engineering specialities. Chapter 2 explores the history of engineering education in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, Chapter 15 analyses the impact of the Marshall Plan on Portuguese engineering and some other chapters explore different engineering specialities (Chapters 12, 13, 14). Some chapters are on topics related to medicine: the influence of medicine in 20<sup>th</sup> century republican ideology (Chapters 3), the history of tropical medicine during the colonial period (Chapter 6), the research of the neurosurgeon Egas Moniz (Chapter 10) and agricultural science (Chapter 5). The remaining

discipline-focused chapters are on biology (Chapter 11), nuclear physics and engineering (Chapter 16), and anthropology (Chapter 19).

The authors come from a range of disciplinary backgrounds: social history, history of science, sociology, anthropology, geography, museology, and science communication. With such a diversity, the volume's cohesion comes not from a particular theoretical framing but mainly from its dialogue with the sources and previous Portuguese historiography in an attempt to reframe and expand the understanding of the role of science and technology in the Portuguese history. The chapters often draw from the authors' previous research and while they address topics covered beforehand, their reframing for this volume is nonetheless a valuable contribution to the scholarship on science and technology in Portugal.

It is nevertheless possible to identify some broad themes that are present throughout the book and give it a conceptual cohesion. One is, as mentioned by the editors, the role of science and technology in Portugal throughout the 20<sup>th</sup> century, pushing against the narrative that these areas were not a relevant force in shaping Portuguese society for most of this historical period. The volume contributes to highlighting, instead, how the role of science and technology changed according to the objectives of different political regimes and along with the evolution of the international context. For example, the chapters (e.g. 15, 16) on the *Estado Novo* period show how rather than isolationist, the regime had a pragmatist and selective approach towards scientific and technical development, which benefited from increased international involvement of the regime starting from the post-war period. Another important theme is the persistence of the semi-peripheral status of Portugal in the global science system, explored in previous work by other authors (Delicado 2014; Nunes 2001). Even though it is not a novel framing, the volume emphasises how this semi-peripheral status expressed itself in different periods of the 20<sup>th</sup> century. For example, Chapter 19, on the history of Portuguese Racial Anthropology, highlights the ambivalent relationship in the post-WWII period between Portuguese anthropology, aligned with the national colonial project, and "foreign science", that is, the foreign practice of anthropology that increasingly reflected the anti-colonial sentiment of the period. Similarly, Chapter 24 explores how the shifting patterns of mobility of Portuguese scientists flowed with changes in national science policy.

The volume follows from previous efforts of other scholars to highlight research on science and technology in 20<sup>th</sup>-century Portugal (see Nunes and Roque 2008; Saraiva and Macedo 2019). Importantly, it adds to a more nuanced understanding of the role of science, technology, and medicine in Portugal, often only perceived by its pattern of fragmentation, weak investment, lack of innovation, and dependence on political power. The book also explores how science, technology and medicine were mobilised throughout the 20<sup>th</sup> century with variable political enthusiasm to address

some of the country's challenges: from the need to educate the elites of the emerging Republican regime, to the Estado Novo's selective endorsement of technological modernisation, to the impetus to democratise science and higher education towards the end of the century.

The development of STS and History of Science in Portugal was shaped by the same historical pattern of weak political investment that affected Portuguese academia in general, exacerbated by the constraining influence of a traditionalist political regime that lasted for most of the 20<sup>th</sup> century and had a selective approach to modernization and general distrust towards the social sciences. However, the emergence of both disciplines quickly followed the political commitment to develop the national science and technology system, especially from the decade of the 2000s (see Chapter 20, 24). The improved status and increased social presence of science in Portuguese society (see also Chapters 21, 22) attracted a new generation of scholars that saw them as relevant objects of social and historical inquiry. This volume is also a valuable addition to scholarship on science and technology for gathering and highlighting some of the more prominent research from what are still fairly young, but nonetheless relevant, national STS and History of Science communities.

## References

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