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BOOK REVIEW

Thorben Pelzer. *Engineering Trouble: US-Chinese Experiences of Professional Discontent, 1905-1945*. China Studies, volume 52. Leiden, Boston: Brill, 2023, Pp. XVI + 239.

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Thorben Pelzer's *Engineering Trouble*, based on his 2022 PhD dissertation in Chinese Studies, seeks to understand the process of professionalization in China between 1905 and 1945, focusing on Chinese civil engineers who studied abroad in the United States. Working from the perspective of the history of professionalization or the history of professions, in dialogue with anthropology and other social sciences, the book analyses the trajectories of these actors, from training to professional experiences, to uncover how the meaning of their profession was constructed. In doing so, Pelzer, a researcher at Leipzig University who has long been interested in the history of modern China, reveals the deep connection between the construction of infrastructures and the establishment of the role of civil engineers. Ultimately, the author examines how engineering, the territory and the political entity of China were simultaneously (re)constructed.

Engineering Trouble draws on a variety of sources, including student scorecards, correspondences, autobiographies, memoirs, diaries, essays, newspaper columns, speeches, as well as internal

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and official project reports consulted predominantly in archives in the United States, such as the Hoover Institution, Yale University and Harvard University, but also in the Modern History Archive of the Academia Sinica in Taiwan. The actors were selected based on their experiences with international training, and they are divided into three distinct generations of civil engineers. The author examines specific aspects of their trajectories while also exploring how these three generations collectively paved the way for the professionalization of civil engineering in China.

Throughout the seven chapters, Pelzer addresses themes such as nationalism, cosmopolitanism, financial constraints, political dependencies and China during wartime. In doing so, he provides an overview of the professionalization of engineering in China and how it was shaped by the interaction with transnational technologies and knowledge. Developing civil engineering in China also entailed constructing shared ideals among engineers, who, by maintaining spaces of sociability, sought to lay the foundations for their professionalization and to foster the global circulation of knowledge and values. This review will follow some of the chapters' themes to explore the author's reasoning and argumentative strategies.

Concerning nationalism and cosmopolitanism, Pelzer starts by analysing how the experiences of these Chinese students in the United States combined technical and political dimensions. Student organizations, for instance, were significant spaces for the training of these engineers. Understanding the trajectory of these actors, Pelzer argues, thus requires considering not only curricular but also socio-cultural dimensions. The latter, described as a hybrid environment shaped by Sino-American values, illustrates that notions of nationalism, republicanism and cosmopolitanism were not merely imported by students who had studied in the United States and then returned to China. Instead, they resulted from the intersection of distinct sociocultural paradigms affecting these actors.

The author delves very eloquently into a detailed prosopography of these actors, understanding their trajectories, training, connections and obstacles they met with. The relationship between expertise, politics and economics are explored in echoes of different temporalities throughout the trajectory of these actors. And it is from the analysis of very concrete projects, such as the Canal Board and railways, that Pelzer seeks to understand how these actors built transnational cooperation networks to overcome discontent.

Some examples of the discontent highlighted in the book include issues related to insufficient project funding, the tense relationships between engineers and state decision-makers, the lack of expertise on part of the authorities managing and administering engineering facilities, among others. The author analyses the resulting frustrations and seeks to understand how these drove the engineers to build an agenda to affirm the authority of their field by associating it with the project of constructing a modern society. The book thoroughly presents all this by

analysing the relationships between different commissions, infrastructure services, ministries and individual actors. The author argues that the experiences of discontent in the trajectories of these actors added up and built a sense of unity, even among those who did not work in the same specializations or projects. This scrutiny is the result of Pelzer's previous collaborative work on a database of Chinese engineers (Pelzer et al, *Chinese Engineers Relational Database (CERD)*, 2022).

To understand how these actors participated in a network of transnational collaboration, the author investigates the Association of Chinese & American Engineers (ACAE) and highlights the importance of its annual conferences and journal for the organization of the field of civil engineering. The conferences and the journal became places of production, diffusion and debate on engineering, but also fashioned these actors' identities.

Importantly for the present book review, Pelzer explicitly acknowledges that his work only shares an object of interest with the History of Science and Technology (HST) but that it does not share its theoretical-methodological approach. Some dimensions of *Engineering Trouble* could however have benefitted from a dialogue with HST approaches, for example the analysis of the concepts embraced by young engineers during their training, such as cosmopolitanism, republicanism and others. Did these concepts transform and gain new meanings during the trajectories of these actors? Are the concepts just imported? The viewpoint of circulation, which is central to HST, could have enabled Pelzer to display these resignifications and their respective roles through the constructions of the identities and agendas of these actors. Circulation could also have been useful to better understand the role of the ACAE. Contrary to operating within a logic of diffusion and production, an HST perspective would have naturally included an examination of the internal disputes about the meanings of "being an engineer," of the aborted projects or the ideas that "lost." As a reader with an HST background one cannot help thinking about what circulates, how it circulates and what does not circulate (Kapil Raj, "Circulação não é fluidez" – Interview by Matheus Duarte, *Boletim da Sociedade Brasileira de História da Ciência*, June 2016). The multifaceted and curious trajectories of the actors explored by Pelzer are outstanding examples of circulation.

Nevertheless, Pelzer successfully frames the history of engineering from a global point of view, investigating networks of collaboration and formation of a field that was not only one of knowledge and skill, but also of values and ideals that circulated among different actors. Pelzer considers the various instances of discontent not only as a shared feeling, but also as a catalyst for the professionalization of these engineers. A shared experience and perspective, exchanged in particular spaces of sociability, served to build the basis of common ethical notions about the profession and the consensus that professional practice went beyond technical knowledge. This book, as a whole, convincingly argues that knowledge is not just the content of textbooks,

but the result of a community of actors actively building their practices and their values while exposed to the tensions experienced in their lives.