

**Lino Camprubí Bueno. Los ingenieros de Franco. Ciencia, catolicismo y Guerra Fría en el Estado franquista.** Barcelona: Crítica; 2017, 320 p. ISBN 9788416771752. €21,90.

This is the most historically ambitious book written on Francoism and science and deserves wide readership. We knew already that the popular myth of a reactionary dictatorship invested in hindering or even eliminating scientific research in Spain had no historical basis. The distinctively violent fascist seizure of power in the country did mean the killing and exile of scientists in a scale unknown in other regimes of the same ideological family. But not only were the vacant places promptly filled up by supporters of the victorious side of the Spanish Civil War, as the regime also actively supported new institutional formations such as the Spanish National Research Council (CSIC), the Board of Nuclear Energy (JEN) or the National Institute of Aerospace Technology (INTA). The work of Spanish historians of science, on which the present book builds upon—namely that of Antoni Malet, Ana Romero de Pablos, José Manuel Sánchez Ron, Albert Presas, Nestor Herran, Xavier Roqué, and María Jesús Santesmases—has put away any pretensions of looking at Franco's dictatorship as a scientific void. It has become clear that while some research endeavors suffered under Franco, others were generously sponsored expanding the overall dimensions of the Spanish scientific system.

Camprubí's *Los Ingenieros de Franco*, the much extended version of the *Engineers and the Making of the Francoist Regime* (MIT Press, 2014), also confirms such findings but takes the argument a step further. The author is not invested in understanding what happened to scientists and engineers under Franco, preferring instead to investigate how scientific practices and technologies became constitutive elements of Franco's regime from the first moments of the civil war until its latest stages in the 1970s. Camprubí doesn't take the political regime and its ideological commitments as a pre-given historical context to which scientists and engineers react. He takes the more difficult path, but also much more rewarding, of considering how such historical context cannot be properly understood without accounting for the activities of scientists and engineers. More than addressing the concerns of those readers intrigued by the faith of scientific research under the dictatorship, Camprubí suggests a renewed understanding of Francoism. After reading Camprubí's account, any historian describing the autarky phase of the 1940s now knows that she/he must be familiarized with the activities undertaken inside the walls of Eduardo Torroja's

Technical Institute for Construction and Cement; as for the historian willing to explain later phases of the regime, she/he now must include in their stories how oceanography and ecology contributed to integrate Spain in the capitalist block during the Cold War years.

The historical actor through which Camprubí weaves his story is the «political engineer», the expert who was able to place his «discipline at the center of the new state». The soil scientist José María Albareda, the engineer Eduardo Torroja, the agronomist Álvaro de Ansorena, the ecologist José Antonio Valverde, the oceanographer Edmundo Seco Serrano, the geologist Manuel Alía Medina are some of the experts that populate the narrative. And even when most of them didn't hold the title of engineer, they are all placed under the «political engineer» category, since, as the book details, they all contributed to engineer the Francoist state. The concept of «political engineer» is directly inspired by the influential notion of technopolitics coined by Gabrielle Hecht and Timothy Mitchell, authors abundantly quoted in the text. But I would like to suggest that Camprubí's accomplished more than those two deservedly praised authors through his deep engagement with the political economy of Franco's regime. For this reviewer, technopolitics has a tendency to point at well-defined political goals materialized in the world through technology. That is not what the reader is faced with in Camprubí's narrative. The political goals, the ideologies and their meanings, were defined by the «political engineers» themselves. Many times, due to the context of material scarcity, Spanish post civil war experts had to be more explicit about the political goals of their endeavors. As the book aptly demonstrates, Spanish «political engineers» were main historical actors in filling up with meaning the Francoist ideology of national redemption.

The book does this in some chapters more convincingly than in others. The connections between autarky and research on cement and structures by Torroja are especially solid and suggestive. The tools of the trade of the historian of science, the attention to concrete scientific practices and the place of production of knowledge, reveal their power for illuminating unexpected connections hard to grasp by general historians: the extraordinary space of Torroja's laboratory, concrete structures such as dams, and technical standards are all masterfully weaved together. The same goes for Ansorena and the co-production story of new rice varieties and new state structures - the vertical syndicates. But there is probably no more surprising co-production in the whole book than that of churches and laboratories. Camprubí describes how the scientific spaces of the CSIC in Madrid were designed as liturgical sites and with actual churches inside, how churches were designed in innovative ways, and how churches became part of a large social

experiment —churches as laboratories— in the new settlement towns of rural Spain. While the author shows here many of his historical talents in establishing these unexpected connections between science and national Catholicism, this reader would have welcomed more detail on what kind of research was undertaken inside the walls of the new scientific institutions: We learn a lot about Miguel Fisac architectural practices behind churches and laboratories, but we are not told much, for example, about Albareda's scientific practices as soil scientist. The book doesn't aim at exhaustiveness, but the gap concerning Albareda's work as scientist is puzzling when trying to make the case for understanding him as 'political engineer'. Albareda is indeed one of the most quoted scientists in the whole historiography on Francoism and science, but there is no detailed study of his scientific work. This is only more surprising when considering that his object of study —the soil— was one of the central elements of fascist ideology.

The Spanish reader was offered four chapters more than the American one, dealing with later periods of the regime. This is an important addition because it allows the author to delve into two crucial features of Francoism: its long duration and its international connections. In these last chapters the more material dimensions that had structured the narrative in the previous pages, tend to be replaced by a myriad of institutional acronyms and names. Yes, many of the historical characters Campubrí deals with are fascinating and that is certainly the case of the scientists, hunters and noblemen whose international connections were instrumental for the formation of Doñaña as National Park. Although mentioned in the text, the actual flamingos migrating across national boundaries are not granted much detail. A similar point should be made about the no less fascinating story of phosphates in the Western Sahara: the author underlines the historical importance of the more than 100 km conveyor belt connecting the mines in the interior with the port of El Aiún, but the actual infrastructure deserves only a few generic lines. These are nevertheless minor points when considering the reach of the argument being made in these additional chapters on how Spanish scientists and engineers were crucial historical actors in repositioning Spain in the Cold War years, namely in establishing stronger connections with the United States and NATO. Again, they were not reacting to a more favorable context offered by changes of the political regime, they were instead active makers of that new context weaving those connections through their concrete scientific practices in fields as disparate as ecology, oceanography or geology.

Importantly enough, the building of such argument demanded from the author painstaking work in international archives. The obvious point is that it is

hard to write good Spanish history exclusively from Spain. And the international sources not only allow for a better history of Spain as they enlarge as well the interest of the book for a growing international scholarship exploring the global dimensions of the Cold War. Those additional chapters, although exclusive of the Spanish version (but with English versions in international journals), thus make the book appealing for a wider audience beyond those interested in the history of Francoism. Unfortunately, this is less salient when Camprubí explores the context of the autarky years in the initial chapters of the book. He certainly makes it clear that autarky is not a Spanish exclusive and that it should be understood as an international phenomenon of the 1930s, but the specificity of the Spanish experience is stressed at the expense of the commonalities of other authoritarian experiences of the period, namely of other fascist regimes. There is a clear intention of trying to avoid the old debate on the inclusion of Francoism in the European family of fascist regimes that came into being in the interwar period, but fully bringing fascism into the discussion would have allowed the author to place his story in a more international setting, not only in the final chapters, but also in those parts of the book dealing with the initial stages of Francoism. Maybe unintentionally, the portrayal offered by the present book does make the regime more fascist, stressing its novel modernist dimensions. Catholicism is commonly invoked by scholars of fascism to demonstrate the traditional authoritarianism of Francoism and exclude it from other more radical political experiences. But National Catholicism, when studied through the lens of scientists and engineers who made laboratories into churches and churches into laboratories, becomes in Camprubí's book a major radical new social experiment. In this version, Francoism is not just a particular Spanish form of authoritarianism, but the form fascism assumed in Spain. And therefore, all those interested in the history of fascism, and not just those interested in the history of Francoism, should read this book ■

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