
Hermione Giffard. *Making Jet Engines in World War II: Britain, Germany, and the United States*. Chicago: University of Chicago Press, 2016. xii + 336 pp. ISBN 9780226388595, \$45.00 (cloth); 9780226388625, \$45.00 (e-book).

By the end of the 1950s, many commercial passenger airliners and military aircraft were powered by jet engines. This was a new technology; less than two decades before, at the beginning of World War II, even the fastest military aircraft still used piston engines. During the war, however, several of the combatant nations, including Germany, Britain, and the United States, started to produce jets. In this ambitious, well-researched book, Hermione Giffard offers a new history of those early production programs. This original study not only makes a valuable contribution to the literature on industry in World War II but also speaks to larger questions about the history of technology and invention.

Giffard urges readers to reconsider common assumptions about the comparative history of jet engine production during World War II. Previously, many historians emphasized the success of Germany, which managed to produce more than six thousand jet engines before the end of the war. Meanwhile, Britain and the United States together produced barely more than one thousand engines. These numbers, however, can be deceiving. Giffard argues that readers need to understand the German jet engines of the early 1940s as an “ersatz technology,” unsafe, fragile, and cheap. Giffard claims that these were truly “engines of desperation,” produced by a nation eager to experiment with a technology that promised to use fewer scarce materials and less skilled labor. The book does not say much about how the engines performed in combat, or much about the extent to which military reports on that performance may have influenced Germany’s remarkable embrace of jets during the latter part of the war. Nevertheless, Giffard’s new comparative assessment should alter traditional accounts of success and failure in the German and British programs.

The book’s second major argument is concerned with the history of invention. Here, Giffard argues against previous historians of the jet engine, including Edward Constant II (*Origins of the Turbojet Revolution*, Baltimore, MD: Johns Hopkins University Press, 1980), who emphasized the agency of individual inventors. Foremost among these heroic inventors, according to standard histories, were Frank Whittle, in Britain, and Hans von Ohain, in Germany. Both of these men figure prominently in Giffard’s account, but as players in a story that emphasizes the contributions of networks and “inventive institutions,” including industrial firms. In the book’s epilogue-style final chapter, Giffard describes how Whittle and von Ohain came

to be understood as the coinventors of the jet engines, in a postwar myth-making process involving governments, journalists, museums, and historians. Rejecting Constant's account of quick, revolutionary changes led by maverick innovators, Giffard describes a more incremental process, in which many of the very same firms involved in piston engine production became leaders in the making of the new jet engines.

Giffard's provocative conclusions are based on a major research project, which included the use of unique manuscript sources in archives located in all three of the nations under discussion. The fruits of this research are presented at length in the middle two chapters of the book, which describe the wartime activities of four German firms (Junkers Motoren, BMW, Daimler-Benz, and Ernst Heinkel Aircraft) and six British ones (Rolls-Royce, de Havilland, Armstrong Siddely Motors, Bristol Aircraft, D. Napier and Son, and Power Jets). The case of the United States is less fully described—perhaps with some justification, given that the Americans made very few jet engines before 1945. Military and civilian government actors do appear in the story, but the focus is on the private companies.

The book's detailed account of the wartime activities of so many firms supports its author's emphasis (shared by many of today's historians of technology) about the importance of institutions and broader contexts. However, the structure of the narrative, much of which presents brief accounts of specific companies, one after another, can make it difficult for the reader to assess the book's main arguments about the role of individual inventors and the relationships with industry and government. Clearly, it is easier to narrate stories of heroic inventors than it is to describe more complex dynamics of innovation. However, until the more complex stories are related with more compelling narratives, it may be difficult to wean general readers off of the simpler accounts.

Although parts of its narrative may challenge nonexpert readers, this book is a first-rate piece of scholarship. The author has managed to produce an eye-opening work of comparative history, which goes well beyond revising one fascinating piece of the history of industrial mobilization for World War II. By providing a new account of the development of jet engines, Giffard has made an important contribution to the broader project of explaining how new technologies get invented and produced.

Mark R. Wilson

University of North Carolina at Charlotte

E-mail: mrwilson@uncc.edu

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