

## Book Reviews

### Staatliche Technologiepolitik, und branchenübergreifender Wissenstransfer, Jahrbuch für Wirtschaftsgeschichte

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At the end of World War II, the German chemical and plastic industry was in a shambles since much of the German infrastructure and physical plant had been destroyed. The prospects for the industry looked more than bleak. The German economy was in a downward spiral, and the Allies were determined to break the dominant firm I.G. Farben apart and confiscate the industry's assets in foreign countries. Moreover, German chemical prowess was based on coal-based raw materials. But oil was rapidly replacing coal as dominant feedstock, potentially rendering much of the German chemical industry's technological competence obsolete and providing an opportunity for countries like Great Britain to catch up or even overtake it.

However, instead of permanently falling behind Great Britain and other leading countries such as the United States and France, Germany's chemical industry experienced a full-scale revitalization and again became the largest chemicals exporter in the world. How did the industry achieve this comeback? Ralph Landau and I (Johann Peter Murmann and Ralph Landau, 'On the Making of Competitive Advantage: The Development of the Chemical Industries in Britain and Germany since 1850'. In A. Arora, R. Landau and N. Rosenberg (eds.), *Chemicals and Long-Term Economic Growth: Insights from the Chemical Industry*. New York: John Wiley & Sons, 1998: 27–70) tried to provide a preliminary answer in a comparative essay on the history of the British and German chemical industries from 1850 to 1996. We argued that the German chemical industry in comparison to

Britain benefited from an economy that was growing faster, from relatively free access to many foreign markets, from co-operative labour relations, and above all from superior firm capabilities that were again fully unlocked when the Allies broke I.G. Farben up into the original companies (Bayer, BASF, and Hoechst, etc.) that had initially formed the colossal enterprise in 1925. The capabilities in research and development, marketing, manufacturing and management that German firms had built up since the 1860s (in particular marketing networks) proved to be a decisive competitive advantage in the post-war era.

Landau and I could only provide a preliminary answer because, unlike the period before World War II, postwar historiography on the chemical industry was too sparse to develop a more precise account. Jochen Streb's monograph promises to close at least part of this large gap by providing an analysis of an important branch of the industry: plastics (p.21). Along the way he also wants to develop a recipe for governments and firm managers to increase the innovation capability of German industry (back cover and p.15). Given my own longstanding interest in both subjects, I started reading Streb's monograph with great anticipation, hoping to gain a more detailed analysis of the German comeback both at the industry level and the level of an individual firm. Unfortunately Streb does not make significant progress in closing the gap in the literature.

What does Streb do in his study, whose title in English would be 'State Technology Policy and Industry Spanning Knowledge Transfer: On the Causes of Globally Successful Innovations in the German Plastics Industry of the Twentieth Century'? In Chapter 1 he introduces the theoretical question of how countries can achieve a long-lasting advantage in a particular industry. In Chapter 2 he provides an excellent review of theoretical ideas in the literature on the economics and sociology of technological innovation. I can heartily recommend Streb's nuanced treatment to any business historian unfamiliar with this literature.

In the second part of the monograph Streb turns to his empirical setting, the German plastics industry, that in his analysis comprises three vertical production stages: basic chemicals, plastics machinery makers, and plastics producers. Chapter 3 is an analysis of how government technology policy had an impact on the innovative capacity of the industry. In Chapter 4 the author argues that co-operation across the three production stages was responsible for the German success in the industry. Chapter 5 describes the development of the plastics maker Freudenberg. Chapter 6 is by far the shortest chapter with only six pages, in which the author draws conclusions from the study.

The empirical analysis offered in the second half of the book remains too superficial to become required reading on the subject. How could this happen given that so much effort went into the book? Apparently Streb's passions lay more in theoretical literature than in empirical analysis. Only 42 out of the 285 references of the book refer to the literature on chemicals and their industries. Eighty-five per cent of the references cite theoretical papers and books. Second, Streb seems to have stopped reading empirical literature on the industry around 1997, and hence was not able to build on what Landau and I (1998) and others had done. Third, an academic monograph is always written within a scholarly community. Streb's community failed to delay publication of his monograph for at least one more round of revisions that could have removed the obvious shortcomings, such as the tenuous connection between theory and empirical evidence. If the most important theoretical concept for understanding the success of the German plastics industry is the notion of 'innovation capital', then the reader expects an empirical analysis to systematically track how German firms in the plastics industry possessed more innovative capital than firms in other countries. But this book presents very little such evidence. In the concluding section Streb concedes that he did not come up with a foolproof recipe for governments and firm managers to increase the innovation capability of German industry (p.213). Why promise something you know you cannot deliver in the first place? To analyse with precision and document with detailed evidence how the German plastics industry rose from the ashes of World War II would itself have been a significant contribution. I hope someone will tackle this task, maybe even Streb himself.

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