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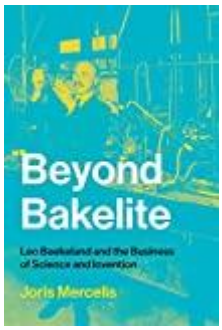
Joris Mercelis. *Beyond Bakelite: Leo Baekeland and the Business of Science and Invention.* Lemelson Center Studies in Invention and Innovation Series. Cambridge: MIT Press, 2020. 378 pp. $55.00, paper, ISBN 978-0-262-53869-5.



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I write this review across the street from a new startup incubator on the Berkeley campus, the "Bakar Bioenginuity Hub." Not far away is the Sutardja Center for Entrepreneurship and Technology, run by the College of Engineering. And while looking out my living room window at night, I see the Berkeley nightscape's brightest lights spelling out "Skydeck," the name of the university's in-house accelerator program for student startups. These centers connect university research to private investment and industry and are increasingly common in US higher education. They are present-day expressions of the links between university-based scientific research and industrial entrepreneurship.

Joris Mercelis's recent book, ***Beyond Bakelite: Leo Baekeland and the Business of Science and Invention***, enriches our historical understanding of these links—which he terms the "science-industry nexus"—at a crucial stage of American scientific and industrial development. He does so by interpreting the career of Belgian-born chemist Leo Baekeland, which roughly spanned the years 1870 to 1940. Baekeland is best known for inventing and commercializing Bakelite, a phenol-formaldehyde resin widely regarded as the first synthetic plastic. This story emphasizes the strategic decisions by which Baekeland achieved his ascent to both industrial wealth and scientific fame, rising to an honorary professorship at Columbia University, serving as president of his own General Bakelite Corporation, and receiving sundry medals, prizes, and presidencies of scientific and professional societies.

Roughly the book's first half is devoted to Baekeland's life prior to the invention of Bakelite, while the second analyzes his strategies for its commercialization. In early chapters, Mercelis discusses Baekeland's scientific and industrial education in Ghent, one doomed and one successful photochemical enterprise, his move to the United States, and his subsequent work as scientific consultant for American firms. Two key leitmotifs span these episodes and serve as Mercelis's core themes throughout the book: first, Baekeland's commitment to a personal ethos of disinterested

theoretical, university-based scientific inquiry was often in tension with his work conducted in the service of private, industrial enterprise. Mercelis's consideration of such tensions shows the reader how Baekeland's career—one small corner of the science-industry nexus—was successful by virtue of strategic negotiation between his multiple scientific and commercial commitments. For example, as controversy over chemical weapons intensified during and after World War I, Baekeland's modest pacifism and desire to defend the virtue of scientific research were revised, it seems, to accommodate his advocacy for the American Chemical Society and consultancies for chemical firms. The final and especially strong chapter shows how Baekeland's strong commitment to R&D investment and preference for hiring scientifically trained men—even for nontechnical positions in, say, marketing—were put under pressure in the early 1930s, as the Great Depression forced major corporate reorganization.

Second, the canny management of intellectual property in the form of patents, secrecy, and scientific credit was crucial to Baekeland's success. Mercelis is especially strong in his analysis of Baekeland's decision to forego patenting his Velox paper, eventually sold to Eastman Kodak for a hefty sum, and his reconstruction of how Baekeland pursued patent protection for Bakelite simultaneously in Europe and the United States. In several episodes, Mercelis's two core themes dovetail nicely. For example, scientific experts were often called to provide testimony in cases of patent litigation, and their performances were vulnerable to criticism as "mercenary" distortions of scientific truth. In one chapter, Mercelis discusses an oft-ignored phase of Baekeland's career during which he worked as a consultant for various industrial firms, a role that entailed providing just that sort of courtroom testimony. In *Gasse v. Development & Funding Co.* (1911), Baekeland defended a chemical firm accused of local environmental damage due to emissions of chlorine gas, while managing to avoid accusations of corporate mendacity. Protection of his own intellectual property posed similar commercial and reputational challenges: a later chapter shows how scientific publication was at once dangerous and valuable for establishing Baekeland's intellectual property claims.

Mercelis's analysis hews closely to the archival collections of Baekeland's papers, which is at once the book's strength and its weakness. First, the weaknesses: Mercelis rarely draws on complementary studies of the period in order to establish and specify the importance of his own contributions, for example his treatment of patent politics in a transatlantic frame. Nor does he position his archival findings in relation to other narratives or arguments that could explain, for example, in what ways and to what extent Baekeland's career was typical. When his exposition touches on its own historical and historiographical background, it does so lightly, and sometimes vaguely. On page 4, Mercelis suggests that the book aims to explain how Baekeland received so much credit for the establishment of a large and diversely populated industrial sector, yet he never returns explicitly to this theme. The book's strengths, however, are preponderant. Readers are given insight into Baekeland's private thoughts, judgments, and anxieties during crucial moments in his career, often expressed in correspondence with his wife, Céline Swarts. The story's scope allows the reader to discern important continuities between 1870 and 1940, Belgium and the United States. Mercelis's handling of a large body of primary material is clear and assured, and offers many valuable insights into the linked histories of scientific and industrial life.

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