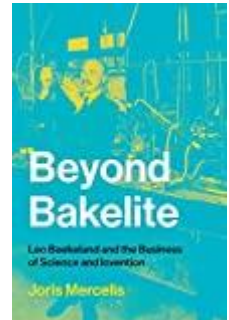


Joris Mercelis. *Beyond Bakelite: Leo Baekeland and the Business of Science and Invention.* Lemelson Center Studies in Invention and Innovation Series. Cambridge: MIT Press, 2020. 378 pp. \$55.00, paper, ISBN 978-0-262-53869-5.



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Since its introduction to the public in 1909, Bakelite, the world's first synthetic plastic, has accrued considerable cultural meaning as an emblem of scientific innovation, technological transformation, and economic abundance. Like its inventor and near-namesake, the Belgian American chemist Leo Baekeland, Bakelite became a household name around the middle of the twentieth century. Marketed as “the material of a thousand uses,” it quickly outpaced its original function as a substitute for shellac and its first technical applications in the electrical and automobile industries. Suitable for the fabrication of everything from radios and cameras to buttons and billiard balls, Bakelite was naturalized as a quintessentially modern material. And while many other scientists and entrepreneurs contributed to the meteoric rise of the plastics industry, it was Baekeland who, in the 1930s, earned the exaggerated and enduring epithet “father of plastics.” In *Beyond Bakelite*, Joris Mercelis works to denaturalize these myths of technological inevitability and innovative genius by retracing Bakelite's invention and commercial-

ization. In the process, he identifies interdependencies between scientists and businessmen, who increasingly worked together over the course of the twentieth century to produce, patent, and profit from new materials and productive technologies. These collaborations resulted in what Mercelis calls the “science-industry nexus,” a system of scientific entrepreneurship that redefined how societies support and use technological innovation.

In many respects, *Beyond Bakelite* runs counter to the core methodologies of material culture studies. Although it diligently charts the chemical synthesis and material properties of Bakelite, a synthetic resin formed from the reaction between phenol and formaldehyde, the material itself, and especially the objects made from it, are peripheral to Mercelis's story. Instead, as its title suggests, the book ventures *beyond* Bakelite to focus on Baekeland's boundary-crossing career as a scientist-entrepreneur. The entire first half of the book surveys the chemist's life before Bakelite, including his education in Belgium and immigra-

tion to the United States, his early entrepreneurial efforts in the production of photographic papers, and his consulting work as a chemical expert. The emphasis on biography and textual sources may seem counterintuitive to scholars trained in Prownian analysis and other object-centered modes of inquiry. Yet Mercelis effectively uses biography to revise the existing narrative of Baekeland as a heroic inventor by revealing the professional struggles, historical contingencies, and outside influences that contributed to the chemist's success. He subjects his sources to an admirable level of criticality, cross-referencing letters and journal entries against published papers, patent applications, and legal testimonies. Most important, the trajectory of Baekeland's career reveals a more entangled relationship between science, technology, and industry than scholars have shown previously. Mercelis thus contributes not only to existing Bakelite scholarship—such as Wiebe Bijker's *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change* and Jefferey L. Meikle's *American Plastic: A Cultural History* (both 1995)—but also to a growing body of literature by historians, including Henry Etzkowitz, Gabriel Galvez-Behar, Anna Guagnini, and Steven Shapin, which counters the notion of a “pure science” that spurned industrial and entrepreneurial activities.

The material Bakelite reemerges as a central topic in the second half of the book, which considers how issues of intellectual property, commercialization, scientific knowledge, and corporate culture dominated the concerns of Baekeland and the General Bakelite Company (later Bakelite Corporation). Through a meticulous investigation of Baekeland's papers, Mercelis examines how the scientist-entrepreneur employed technical knowledge and business acumen in an attempt to control the development not only of Bakelite but also of the entire phenolic resin industry. Mercelis challenges the interpretation offered by cultural historian Meikle in *American Plastic*, which recounts Baekeland's struggles to protect his inven-

tion (and his legacy) from competitors, patent infringers, and the vagaries of public opinion. “Bakelite, not Baekeland,” Meikle ultimately argues, “contributed to shaping the material parameters of the twentieth century.”[1] Yet Mercelis contends that Baekeland maintained considerable control over Bakelite (at least until the company's sale to Union Carbide in 1939) by marshaling his experience and expertise as a scientist-entrepreneur. He constrained, for instance, Bakelite's use in the manufacturing of fancy goods, which he described as “mere trifles” in comparison to the industrial goods created by “the electrical and mechanical arts” (pp. 173–74).

As scholars have since shown, the same decorative objects that Baekeland deplored have had an outsized influence on the cultural meaning of plastic, especially within the context of America's post-World War II culture of leisure and material abundance. *Beyond Bakelite* encourages us, however, to train a similarly analytical eye on plastic's use in the manufacture of technical and industrial products and to see these objects as generative of not only economic value but also cultural meaning. After all, Baekeland believed that science and industry contributed as much as the arts, if not more, to cultural and moral development. While Mercelis notes that Bakelite was primarily known in the interwar period for its use in automotive, telephone, and radio parts (rather than buttons and billiard balls), it will fall to other scholars to explicate exactly how these technical applications influenced the popular perception and meaning of materials such as Bakelite.

Despite its clear methodological differences from material culture studies, *Beyond Bakelite* nevertheless suggests exciting interpretive possibilities for that field. For instance, in his focus on Bakelite's transatlantic commercialization, Mercelis taps into an ongoing scholarly interest in the mechanisms of cross-cultural exchange and, particularly within the fields of anthropology and art history, the ways objects circulate between cul-

tures. Yet rather than focus on how physical goods crossed the Atlantic, Mercelis instead emphasizes how Baekeland's efforts to commercialize Bakelite and protect his intellectual property structured the development of the plastics industry in both Europe and the United States. In other words, Baekeland's immaterial knowledge work proved essential to the spread of Bakelite and other plastics and their now ubiquitous presence in the global marketplace.

Mercelis's other major contribution is his concept of the science-industry nexus, a forerunner, perhaps, of the Cold War military-industrial-academic complex. Evident in the boundary crossing activities of industrial research laboratories, independent science institutes, and professional scientific societies, this alliance of science and industry encourages us to see our material world as

the product of a systematic pursuit of scientific innovation and economic progress, twin imperatives that became even more powerful as they reinforced one another. As scholars of material culture, we might expand on Mercelis's formulation by envisioning and investigating the concept of a science-industry-design nexus, for it was precisely during this period at the turn of the twentieth century that industrial design emerged as a professional activity. Many of these industrial designers sought to master not only principles of design but also the technics of science and business, and they worked alongside scientist-entrepreneurs like Baekeland to shape our material surroundings.

Note

[1]. Jeffrey L. Meikle, *American Plastic: A Cultural History* (New Brunswick, NJ: Rutgers University Press, 1995), 46.

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