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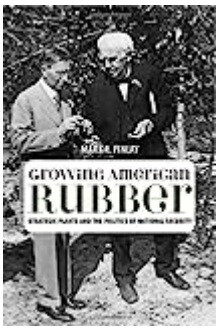

Mark R. Finlay. *Growing American Rubber: Strategic Plants and the Politics of National Security.* Studies in Modern Science, Technology, and the Environment Series. New Brunswick: Rutgers University Press, 2009. xiii + 317 pp. $49.95 (cloth), ISBN 978-0-8135-4483-0.

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Rubber and Empire

âWe could recover from the blowing up of New York City and all the big cities of the eastern seaboard,â declared Harvey S. Firestone in 1926, âmore quickly ... than we could recover from the loss of our rubberâ (p. 63). Firestone, of course, relied on rubber for his tire empire; his explosive example was no less true for that. Rubber was a crucial input for most twentieth-century technologies: it contributed insulation for telegraph wires as well as tires for automobiles, bicycles, trucks, and airplanes. It also made rubber gloves and medical tubing, condoms, and tennis shoes. From hospitals to auto repair shops, rubber went into every industry–both Henry Ford and Thomas Edison counted it an input. In 1942, the United States consumed 60 percent of the worldâs rubber but produced almost none; 97 percent was produced in the Pacific, in regions that had fallen to the Japanese after Pearl Harbor. The U.S. government rationed gasoline during World War II–primarily to protect the supplies of rubber that would otherwise be used in tires, by motorists. In the end, victory in World War II depended on technical achievements, among them the production of synthetic rubber from petroleum. In the twentieth century and ever since, rubber has mattered a great deal to the U.S. economy and to its security. And the United States depends almost entirely on outside suppliers for its raw material.

The commodityâs situation is even more surprising when one notes that rubber can be grown on trees–or rather, in trees, shrubs, and even dandelions. Mark R. Finlayâs study, *Growing American Rubber*, the 2009 winner of the Theodore Saloutos Memorial Award for the best book in Agricultural History, examines decades of efforts by multiple actors to produce rubber on American soil. Many, many species of plants produce some version of rubber in a milky latex. With considerable effort, humans can process and vulcanize the liquid into the strong hard rubber needed for so many goods. In Finlayâs analysis, the United States focused on four main species: guayule, cryptostegia, goldenrod, and kok-sagyz or Russian dandelion. Each had its ardent supporters and its seasons in the sun. Each held out the promise, at one time or another, of providing a renewable supply of one

of industrial societyâs most vital inputs. Each offered technological and economic challenges along with hopes and dreams. All cost more than the available alternatives at crucial moments, and the expense of production diminished the support crucial to the development of the crop.

American attempts to grow rubber before World War II intended to relieve the nationâs dependence on foreign imports, a prewar version of âenergy independence.â Finlay begins this story in 1911, during the Mexican Revolution, with the numerous rebel attacks on the Mexican holdings of the American firm Intercontinental Rubber Company (IRC) and its subsidiaries. Within the next decade, World War I demonstrated to all combatants the vulnerability of relying on supplies produced in other nations. In Europe, this lesson of the postcolonial world propelled nationalists toward autarky and eventually fascism. In the United States, the message of the First World War had much more mixed results. In the boom and bust of the interwar decades, interest in domestic rubber cultivation rose and fell. At first, in 1922, British rubber producers established the Stevenson Plan âto restrict rubber exports and raise rubber pricesâ (p. 45). This threatened U.S. supply, even as demand increased. It inspired U.S. efforts to cultivate the crop both at home and abroad, in places like Haiti (occupied by U.S. forces) and Central America (in the plantations of U.S. firms, such as United Fruit). Yet, while the Stevenson Plan became a significant issue in American foreign and trade policy, the American preference for free markets prevented effective response. Edison himself worked hard to domesticate rubber cultivation on his Florida estate during his retirement in the late 1920s. His death in 1931 cut short his âimpressive and systematic study of the problemâ (p. 74). In the next decade, unsurprisingly, the Great Depression curtailed new investments and investigations.

The Great Depression ended with a bang on December 7, 1941, and, with it, easy American access to Pacific rubber supplies. As Edison had predicted, after Pearl Harbor, the Japanese worked to cut off American rubber supplies, while supplying Nazi Germany. Research that had been desultory became crucial to government interests and the war effort. In spring 1942, therefore, the Emergency Rubber Project (ERP) became one of the characteristic big-science projects of the era. It bailed out the IRC and acquired for the government all the IRC holdings, its patents, and seed stocks. In addition, the emerging military-industrial-academic complex generated multiple rubber supply projects at, for example, Cornell, Clemson, and the University of Minnesota. Caltech employed Japanese scientists and nurserymen incarcerated at Manzanar and other internment camps. New crops rose to prominence in these efforts, including the Russian dandelion kok-sagyz, while the more established guayule, goldenrod, and cryptostegia plants experienced renewed interest in their production potential. Alas, commitment to synthetic rubber–made from petroleum–overtook both natural rubber sources and those synthetics made from renewable plant sources, such as grains. Synthetic rubber has dominated domestic production since 1945, diminishing American interests in sustainable or renewable sources of a commodity so crucial for domestic success.

Finlay demonstrates a healthy regard for the requirements of the various plants that his actors considered as sources of rubber, but does not see nature, the world beyond human control, playing a definitive or deterministic role. Business strategy provides better explanations, even as it interacts with plant processes. This proves to be an effective antidote for essentialism: a belief in âessencesâ–some natural reality, outside human history and human control, the same in every time and place. Edisonâs interest in rubber cultivation dated, for example, from a sudden rise in the price of the raw material used in his products. His experiments always included calculations of the costs of production. Such efforts, from an astute businessman, do not surprise. But calculations of cost explain not only Edisonâs efforts but also those choices facing anyone who would grow the plant to make industrial products.

In fact, lacking the European ideology of autarky to support cultivation schemes, economic concerns usually defined whether or not efforts to grow rubber succeeded or failed. Several of the plants considered by Finlayâs actors require a number of years to produce useable latex; in some, the latex could be harvested only in ways that required hand labor–for example, if the milky goo could be found only in particular parts of the plant, or at specific moments in its growing cycle. Other constraints on cultivation included expensive or complicated processing to turn plant latex into industrial-grade rubber. In this book, Finlay notes that people seem to have assumed that growing American rubber required mechanized harvest and processing. Other crops used hand labor in the decades that his story covers, so why did these plantsâ promoters advocate such heavy machinery requirements? Finlay does not really address or question his actorsâ assumptions–even though the costs of mechanized harvesting and chemical processing became an important factor in making domestic rubber crops cost

prohibitive.[1]

Indeed, the low price of importing the commodity derailed many American plans for cultivating a domestic supply. It was simply cheaper most of the time to buy rubber produced outside the United States–and sometimes the United States expanded beyond its borders in order to secure its rubber supply. European nations built colonies in the Pacific and Indian oceans that produced a great deal of rubber relatively cheaply. The United States likewise sought colonial holdings, plantations on which to grow rubber-producing crops–in 1924, for example, the U.S. Department of Agriculture built a rubber plantation and testing station in Haiti. Most scholars know the role of botanic gardens and other scientific institutions in the spreading empire of modern Europe.[2] Finlayâs book conveys how, in the twentieth-century United States, both the state and private enterprise often drove similar processes. Edison, for example–partly inspired by the British Stevenson Plan to raise rubber prices–funded explorations and established correspondence with plant-cutting scientists as far afield as Puerto Rico and Cuba, both northern and southern Africa, Italy, and New Guinea. Firestone leased a million acres in âplantation-sized blocksâ in Liberia for ninety-nine years (p. 77). The IRC–one of Finlayâs principal actors–likewise straddled the borderlands into northern Mexico.

This point is not brought forward in the text, nor much analyzed–it is not Finlayâs principal goal to examine the American version of empire as it took shape in the twentieth century.[3] Indeed, the book is rife with themes that pique the curiosity, and warrant fuller exploration: the American culture of business celebrity, in which Ford, Edison, and Firestone mattered, even on topics about which they knew very little; business-government relations, which followed a torturous path even after the emergence of plant patents that protect corporate interests; and the adherence to mechanized production and extraction, despite the persistence of older ways in other crops. Focusing on these themes might have made the history of growing American rubber tell a larger history of the twentieth-century United States and its place in global processes. The efforts to grow rubber were intricate enough on their own, however, to require the verve, rigor, and understanding the author has brought to the task. It is to Finlayâs credit that his excellent book indicates just how central rubber has been to American history since the start of the twentieth century. Let other scholars continue to harvest the field Finlay has sown.

Notes

[1]. For an examination of the attitudes that drove mechanized and chemical-dependent agriculture, albeit in mid-century Iowa corn fields, see J. L. Anderson, *Industrializing the Corn Belt: Agriculture, Technology, and Environment, 1945-1972* (DeKalb: Northern Illinois University Press, 2008).

[2]. Daniel R. Headrick, *Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1940* (Oxford: Oxford University Press, 1988), 211â215, 219â229.

[3]. For a treatment of American agriculture in the context of empire, intercontinental trade relationships, and mutual dependency, see Sterling Evans, *Bound in Twine: The History and Ecology of the Henequen-Wheat Complex for Mexico and the American and Canadian Plains, 1880-1950* (College Station: TAMU Press, 2007).

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