

The prime minister, his key science adviser, and the partnership that wasn't

Churchill's Bomb How the United States Overtook Britain in the First Nuclear Arms Race

Graham Farmelo
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Reviewed by Benjamin Wilson

In October of 1941, US president Franklin Roosevelt sent British prime minister Winston Churchill a vague proposal that the two countries' nuclear efforts "may be coordinated or even jointly conducted." Churchill waited almost two months to send his noncommittal reply. Britain would swiftly become a junior partner to the US in their joint wartime development of nuclear weapons. After the war, Britain was fated to take its own lonely road to the bomb.



Why didn't Britain join the Americans on more equal terms in pursuit of the first atomic weapons? That's the central question posed by Graham Farmelo, author of *Churchill's Bomb: How the United States Overtook Britain in the First Nuclear Arms Race*. Britain boasted some of the world's finest nuclear scientists; Britain set up the first nuclear advisory body—the MAUD (Military Application of Uranium Detonation) Committee—whose blockbuster report sparked the American effort; and Britain's own "Tube Alloys" nuclear program started months before the Manhattan Project.

In this entertaining book, Farmelo finds his answer in Churchill, especially in the man's approach to science advice. Farmelo is the author of the terrific biography, *The Strangest Man: The Hidden Life of Paul Dirac, Mystic of the Atom* (Basic Books, 2009); in *Churchill's Bomb*, he showcases his gifts as a writer and

portraiture, sensitive to the human side of technical subject matter. He builds on British historian Margaret Gowing's classic works on the subject, including *Britain and Atomic Energy* (Macmillan, 1964) and subsequent volumes. But Farmelo's style is more personal, his gaze trained on Churchill and his scientists.

The Quebec Agreement Churchill signed with Roosevelt in 1943—and brandished in later years as evidence of his nuclear forwardness—was an action too little too late, as Farmelo sees it. The Manhattan Project was already miles ahead of Tube Alloys. And after the war, the US government's McMahon Act of 1946, which forbade the sharing of American nuclear information with foreigners, dashed any lingering hope of further cross-Atlantic nuclear collaboration.

Farmelo pins substantial blame for Churchill's blunder on his narrow use of technical advising. On scientific and technological matters, one man had his ear: physicist Frederick Lindemann, known in establishment circles as "the Prof." Starting in the 1920s, Lindemann had summarized developments in modern science for Churchill. In 1931 he drafted a summary that contemplated the prospects of nuclear energy. The Prof had studied among the best physicists in Berlin, including Albert Einstein, before World War I. By the time of his appointment to the University of Oxford in 1919, he was "an admired experimentalist and theoretician," working on low-temperature physics and astrophysics.

Apparently, by the early 1930s, Lindemann was a hack whose best scientific work was long behind him, as evidenced by his garbling of the new quantum theory in a 1932 book. His personal traits were even less commendable. He was petty and vain, an aristocratic hanger-on, and a snob. In some ways *Churchill's Bomb* calls to mind C. P. Snow's take on Lindemann in *Science and Government* (Harvard University Press, 1961), which tells of the Prof's tempestuous rivalry with the respected military research administrator Henry Tizard. Snow called Lindemann "un-English" and "reactionary." Farmelo judges him "not a deep or imaginative thinker and certainly not an expert in nuclear science."

Some readers of *Churchill's Bomb* might be more reluctant than Farmelo to conclude that Roosevelt's overture to Churchill in 1941 really amounted to a proposal "that they embark on an equal-harness collaboration to develop the Bomb." Those readers may also be skeptical that the collaboration would have lasted long in the emerging Cold War—especially after British theoretical physicist Klaus Fuchs was unmasked as a Soviet spy in 1950. And even supposing that Churchill had capitalized on Britain's early nuclear advantage, it is still hard to imagine the postwar US-British nuclear relationship taking a radically different course. The curtain of American nuclear secrecy was bound to drop sooner or later.

The real strength of *Churchill's Bomb* rests with its lively sketches of British nuclear scientists and their world. Farmelo expertly draws their personalities and relationships, and their struggles with the Whitehall bureaucracy. We get a feel for, among others, James Chadwick, whose work on the bomb drove him to a steady diet of sleeping pills, and William Penney, an expert calculator of blast effects who went on to direct British bomb design at a new facility in Aldermaston and whom Farmelo memorably dubs "a curator of nuclear carnage."

Churchill's scientists eventually gave him the bomb, but not until 1952, during his second term. Soon after, Churchill was horrified to learn of the obscene power of thermonuclear weapons; he remarked in one of his final speeches to the House of Commons in 1955 that now the only possible policy was "defence through deterrence." The nuclear revolution had become real for him as he exited the political stage.

Introduction to Computational Materials Science Fundamentals to Applications

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Investigating the properties of solid-state matter with computational ap-