

A provocative thesis unproven

Gordon Fraser: *The quantum exodus: Jewish fugitives, the atomic bomb, and the Holocaust*. New York: Oxford University Press, 2012, viii+267pp, \$45 HB

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Despite its tantalizing title and provocative premise, *The Quantum Exodus* fails “to compare and contrast the history of the Atomic Bomb with that of the Holocaust,” as the publisher’s press release assures would-be readers it will. Author Gordon Fraser would seem on the surface to be just the man to fulfill that goal, armed not only with a doctorate in theoretical particle physics but also with a journalism background, having served for many years as the in-house editor at the European Organization for Nuclear Research (CERN) in Geneva. In addition, one of Fraser’s previous books, *Cosmic Anger: Abdus Salam, the First Muslim Nobel Scientist*, deals with a theme related to that of the book under consideration here. Among the topics *The Quantum Exodus* explores is the Nazis’ willingness to sacrifice German science in the name of purifying it of what they considered to be Jewish taint, encapsulated in Hitler’s astounding remark that “If the dismissal of Jewish scientists means the annihilation of German science, then we shall do without science for a few years.” Similarly, in his biography of Salam, Fraser describes that scientist’s shame at the decline of science in the Muslim world, once a trailblazer in scientific discovery, with Salam’s attempts to restore science to its former heights in his ancestral culture leading only to his excommunication and failure. Yet, though Fraser clearly knows his stuff and has done a lot of research, *The Quantum Exodus* is a frustrating book for many reasons. It intimates a central thesis that is mainly ignored; the writing calls attention to itself in ways no author would wish for; and it is sloppy in the presentation of facts.

Fraser clearly makes the case that the April 1933 “Law for the Restoration of the Civil Service,” passed shortly after Hitler seized power, led to the departure from Germany of many of its best scientists, mainly but not exclusively those of Jewish ancestry—Fraser’s “quantum exiles”—and thus to the transfer of scientific primacy from Europe to the United States. Clearly, this is a point that hardly needs proving.

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Fraser does not succeed, however, in establishing what a reader might be excused for thinking is the book's main theme. In his first chapter, "Neutrons and Nazis," he asserts that "As these quantum exiles scattered, they realized that they held the key to a new weapon of unimaginable power"; having come to that realization themselves without too great an "intellectual leap," they concluded that "their gentile counterparts in Nazi Germany had come to the same conclusion," a conclusion that made it imperative that the Allied Powers "get to the Atomic Bomb first." Again, this assertion has been repeatedly made and documented in the literature on the making of the atomic bomb. What is provocative about Fraser's argument, however, is his assertion that "the Nazis had chosen not to follow this road" to the atom bomb because of their prioritizing "another objective, equally inconceivable, and to them more important," namely, the elimination of the Jews. Fraser argues but never proves that the Nazis lacked the "logistics and resources on a massive scale" to carry out both objectives simultaneously. In fact, he drops the subject entirely for about 165 pages, when he concludes chapter nine by reminding us that although by 1942 "the Germans too had realized the fission potential of plutonium," they did not follow this realization by implementing an effort comparable to the Manhattan Project because they had "other priorities—annihilating the Jews, and developing 'vengeance' missiles." (Note that the development of these missiles, introduced here, is another topic that Fraser fails to develop thoroughly.) Nearly 20 pages later, in the book's penultimate chapter, he aptly juxtaposes two dates (although he is not the first researcher to do so): 19 January 1942, when US President Franklin D. Roosevelt "became finally convinced that the big effort to develop a fission bomb should be given special priority," and 20 January 1942, when the Wannsee conference determined that "the 'final solution' to the 'Jewish problem'" should be carried out through a program of extermination. He repeats here that the Allied effort and the Axis effort toward their respective goals "each [sucked] off huge quantities of resources" and that both decisions were "channelled by the level of resources available."

The sense that even Fraser does not think he has a real thesis comes through in both the final chapter, which focuses on the Cold War, and the epilogue, which focuses on the foundation of CERN, neither of which brings us convincingly back to what at least I assumed was the book's main point: that the Nazis did not make a race toward the bomb because they were fixated on eliminating the Jews. In the final paragraphs of the epilogue, Fraser makes a feeble attempt to remind us of the book's provocative title by talking about the participation of approximately 1600 American scientists at CERN and asserting that the "pendulum which had swung one way when Albert Einstein"—the most notable of the emigrés—"arrived in the USA in 1933 has now swung back" and that the "dot-com world of the 1990s was a distant internet echo of the Quantum Exodus." These comments do nothing, however, to sum up Fraser's putative thesis about the Nazis' prioritizing the elimination of the Jews over the development of the atomic bomb.

If for me *The Quantum Exodus* fails to present a novel or convincing central argument, it also fails on a writerly level. Most of the book is filled with mini-biographies of myriads of quantum exiles, an approach executed much more effectively in Richard Rhodes' classic and as yet unsurpassed *The Making of the*

Atomic Bomb. Fraser's background ensures that he knows about nuclear chain reactions, but nothing about his unfocused coverage of too many individuals convinces me that he understands that writing should not be a runaway chain reaction. An extreme example of his attempt to leave no name unmentioned occurs in chapter nine, where a warranted discussion of Austrian-born quantum exile Maurice Goldhaber goes amok with the following paragraph, whose enclosure within parentheses suggests that Fraser knows he is straying from what should be his main topic but cannot resist the diversion: "The Goldhabers were an itinerant tribe. After Maurice Goldhaber left for Cambridge, his family, with his younger brother Gerson, left Germany for Egypt. Gerson later studied physics at the Hebrew University of Jerusalem, where he met his wife Shulamit, another young Jewish emigrant, born in Vienna. Both went on to have distinguished careers at the University of California at Berkeley. After moving to the University of Illinois in 1938, Maurice Goldhaber married the talented Gertrude Scharff, born in Mannheim in 1911, whom he had first met during their studies in Berlin. After completing her doctorate at Munich in 1935 with Sommerfeld and Gerlach, Gertrude Scharff had moved to London." In a different but equally frustrating kind of digression, a section called "Göttingen" in chapter six ends up with a discussion of Enrico Fermi in the context of Mussolini's 1938 laws against the Jews.

The book is also sloppy in a variety of ways, including but not limited to some factual errors. A small sampling includes the following: Heisenberg's maternal grandfather, Nikolaus Wecklein, who had been in the same hiking club as Himmler's father, died in 1926, but Fraser asserts that Wecklein personally forwarded to Himmler Heisenberg's letter defending himself against charges published in 1937 that he was a White Jew. Fraser says that Pierre Curie was Marie's professor, which was never the case. He makes the unwarranted speculation that Bohr's grief over his eldest son's drowning death in a 1934 sailing accident "could have sublimated into concern for scientific refugees," even though he later notes that Bohr's efforts on behalf of the refugees predated that tragic accident. In his Appendix 1, "A list of emigrant scientists," Fraser includes composer Kurt Weill and philosopher Ludwig Wittgenstein. He misspells the names of Gershom Scholem, the famed scholar of Jewish mysticism (whose inclusion in this book shows just how far afield Fraser strays) and of Michael Frayn, author of the play *Copenhagen*, about Heisenberg's wartime visit to Bohr.

I am reluctant to close this review without finding something positive to say about the book, especially since in his March 2012 review of *The Quantum Exodus* in *The Wall Street Journal*, Jeremy Bernstein, whose work I admire, calls the book "fascinating." Even if Fraser's coverage of scientists is haphazard, I learned a number of intriguing things. For example, I had not known that Wolfgang Pauli remained ignorant of his Jewish roots until his student years at Munich, when lecturer Paul Ewald told him that "surely" he must be; that a letter of recommendation for Edward Teller, sent by authorities at George Washington University to their counterparts at the University of Chicago, claimed that Teller "helps everybody. ... He never gets into controversies or has trouble with anyone"; that Von Neumann not only knew the Budapest phone book by heart by the age of five but "could reverse-search it in his head: given any telephone number, he could

immediately say to whom it belonged”; or that Lise Meitner after the war made an effort to understand “what made the Germans do what they did by studying German philosophy and literature.” Nonetheless, instead of recommending that *Metascience* readers take the time to read *The Quantum Exodus*, I would encourage them to read, for the first time or again, Richard Rhodes’s *The Making of the Atomic Bomb*.