

Bookshelf

The Quantum Exodus: Jewish Fugitives, the Atomic Bomb, and the Holocaust

By Gordon Fraser

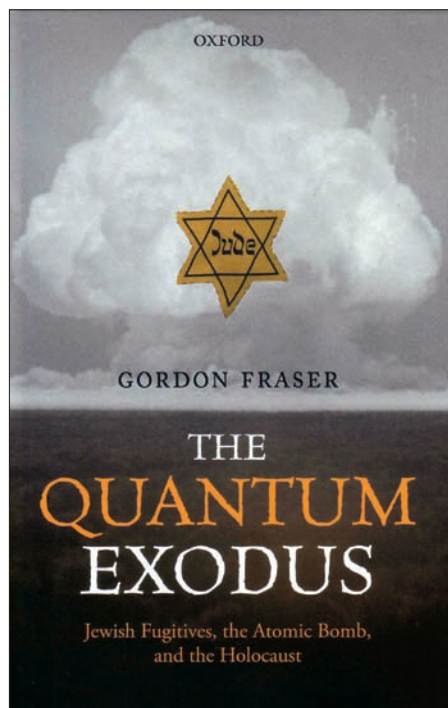
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Don't be misled by the title of this book. It contains a surprising amount of information, much more than focusing on the exodus of Jewish scientists from Germany after the rise of the Nazi Party. The book puts anti-Semitism into a broad historical perspective, starting with the destruction of the Temple in Jerusalem, the expelling of the Jews all across Europe and the growth of a mild and sometimes hidden anti-Semitism. This existed in Germany in the 19th century and even to some extent under the Nazis, when the initial objective was to cleanse German culture of all non-Aryan influences. However, various phases led eventually to the Holocaust. A political spark was ignited when the parliamentary building in Berlin went up in flames in February 1933 and Adolf Hitler became Chancellor. The Civil Service Law was soon introduced that forbade Jews from being employed by the state, followed by the burning of books and the *Kristallnacht*, during which Jewish shops were destroyed – all of which were further steps towards the “final solution”.

In parallel to these political developments, *Quantum Exodus* describes the rise of quantum physics in Germany during the 19th century, with protagonists such as Alexander von Humboldt, Wilhelm Röntgen, Hermann von Helmholtz, Max Planck, Walther Nernst and Arnold Sommerfeld. They attracted many Jewish scientists from all over Europe, among them Hans Bethe, Max Born, Peter Debye, Albert Einstein, Lise Meitner, Leó Szilárd, Edward Teller and Eugene Wigner, who went on to become key players in 20th-century physics. Most of them left Germany, some at an early time, others escaping at the last moment and most of them going to the UK or US, often via Denmark, with Niels Bohr's institute as a temporary shelter. An exodus also started from other countries such as Austria and Italy. The book recounts the adventurous and disheartening fates of many of these physicists. Arriving as refugees, they were initially often considered aliens and during the war sometimes even as spies. The author gives some spice to his narrative by adding amusing details from the private lives of some of the protagonists.

A detailed account is given of the Manhattan Project and how the



famous letter by Einstein to President Franklin Roosevelt initiated the building of the fission bomb. It was written as a result of pressure by Szilárd, the main mover behind the scenes. What is less known is the primordial importance of a paper by Otto Frisch and Rudolf Peierls in the UK, which already contained the detailed ideas of the fission bomb. Robert Oppenheimer, an American Jew, became scientific director of the Manhattan Project after his studies in Europe, bringing the European mindset to the US. He attracted many émigrés to the project, such as Bethe, Teller, Felix Bloch and Victor Weisskopf. The book relates vividly how Teller, because of his stubborn character, could not be well integrated into this project; rather, he pushed in parallel for the H-bomb.

The author implies, although somewhat indirectly, that the rise of Nazism and the development of the nuclear bomb have a deeper correlation, without giving convincing details. However, the interaction of science (its stars) and politics is well described. Bohr's influence, although at the centre of nuclear physics, was limited – partly because of his mumbling and bad English (something that I witnessed at the Geneva Atoms for Peace Conference in 1957, where his allocution in English had to be translated simultaneously into English.)

Many of the exiled physicists who

worked on the Manhattan Project developed considerable remorse after the events of Hiroshima and Nagasaki. When I invited Isidor Rabi to speak at the 30th anniversary of CERN he considered his involvement in the foundation of CERN as a kind of recompense for his wartime activities.

The descriptive account of science in the US and Europe after the Second World War is interesting. In the US, politicians' interest in science decreased substantially and a change was introduced only when the shock of Sputnik led eventually to the “space race”. Basic science also benefited from this change, leading for example to the foundation of various national laboratories such as Fermilab. In Europe, a new stage for science emerged when a pan-European centre to provide resources on a continental rather than a national scale was proposed and CERN was founded in 1954.

The book benefits from the fact that the author is competent in physics, which he sometimes describes poetically, but never wrongly. He has done extremely careful research, giving many references and a long list of Jewish emigrants. I found few points to criticise. Minor objections concern passages about CERN, although the author knows the organization so well. For example, the response of CERN towards the Superconducting Super Collider was the final choice of the circumference of the LEP tunnel (27 km) in view of the possibility of a later proton–proton or proton–electron collider in the same tunnel, while the definite LHC proposal came only in 1987; and the LHC magnets are superconducting to achieve the necessary high magnetic fields and not so much to save electricity.

The various chapters are not written in chronological order, and political or scientific developments are integrated with human destinies. This assures easy and entertaining reading. Like me, older readers who have known many of the protagonists, will not avoid poignant emotions. For young readers, the book is recommended because they will learn many historical facts that should not be forgotten.

One intriguing question (probably unanswerable) that was not considered, is: what would have happened to US science without the contribution of Jewish immigrants?

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