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Philip Ball, *Serving the Reich: The Struggle for the Soul of Physics under Hitler*. Chicago: Univ. of Chicago Press, 2014. Pp. ix, 303. ISBN 978-0-226-20457-4.

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When President Franklin Delano Roosevelt authorized the creation of an atomic bomb in January 1942, no one could have imagined that it would be dropped on Hiroshima and Nagasaki. FDR was first urged to make the bomb in August 1939 in a letter by physicist Leo Szilard, signed by Albert Einstein as well. The letter warned that Nazi Germany might well be working on a nuclear weapon and the United States must beat it to the punch. After all, as Einstein and Szilard well knew, Germany possessed the most impressive physics establishment in the world in 1939.

In March 1945, when the Alsos Mission—the part of the Manhattan Project devoted to assessing Axis progress in making nuclear weapons—began rounding up German physicists, the Allied scientists quickly learned how small the Nazi effort had been, and how meager its results. The Germans had never even made a functioning nuclear reactor, much less begun serious work on a bomb. *Serving the Reich* concerns the political and moral failure of the Third Reich's physicists. Author Philip Ball focuses on three men, all of them Nobel laureates and prominent in the physics community when Hitler became chancellor in 1933. Two are well known. Max Planck, for whom the present German system of independent scientific institutes—the Max Planck Gesellschaft—is named, was already an old man when the Nazis came to power. He cuts a pathetic figure in Ball's story. Werner Heisenberg, on the other hand, then in the prime of his career, was the scientific leader of wartime Nazi nuclear research.

The third man, Peter Debye, is an anomaly. He was the head of the Max Planck Institute of Physics in Berlin in 1940 when he suddenly bolted, traveling through Italy to the United States. Despite his prewar prominence and a long career at Cornell University, he is almost unknown today outside his native Netherlands. Debye's life exemplifies the complex choices faced by non-Jewish scientists in Nazi Germany. A Dutchman living in Germany, he steadfastly refused to accept German citizenship, even under considerable pressure. He won the Nobel Prize in chemistry in 1936 for his research into the behavior of atoms and molecules, but did no work in the area of radioactivity.

As a top scientific official (director of the Kaiser Wilhelm Institute for Physics [KWIP]), Debye reluctantly acceded to the Nazi authorities' demands that all the Jews in the German Physical Society must resign. Many years after his death in 1966, he was criticized¹ as an anti-Semite who went along with Nazi abuses. On the other hand, Debye—like so many others mentioned in *Serving the Reich*—worked to protect Jewish colleagues and find them positions outside of Germany. Most crucially, he was part of a tiny conspiracy that smuggled Lise Meitner out of Germany; this Austrian Jew was the first physicist to understand nuclear fission, the prerequisite for building an atomic bomb. Incredibly, Meitner had continued to work in her Berlin lab till late 1938. Ball carefully points out the ambiguities of Debye's actions in the 1930s:

Debye never made any suggestion that he was leaving Germany because of moral scruples about the regime. He undoubtedly disapproved of the military takeover of the KWIP, but there was never an indication that he left because of the *nature* of the work that would be undertaken there. Indeed he probably shared the view of the German physicists that uranium research raised a host of interesting scientific challenges. Debye was invited to the first meeting of the *Uranverein*, and might well have joined the club if the Nazis had been less intransigent about the issues of nationality and autonomy. Since he was a more able experimentalist than either [Kurt] Diebner or Heisenberg (who later led much of the research), it is quite conceivable that the German uranium work would have progressed faster if he had been put in charge. However, Debye's departure from Germany later came to be

1. By Sybe Rispens in a chapter on Albert Einstein's relationship with Debye in *Einstein in Nederland: Een intellectuele biografie* (Amsterdam: Ambo, 2006). A summary of the controversy is available at *Wikipedia*, s.v. "Peter Debye."

seen as exemplifying his “resistance” to the Nazis. It was presented as a flight from the fascist regime, in fact almost as a mission to warn the Allies of the developing nuclear threat in Berlin. (167)

Almost all “Aryan” German scientists not only remained in Germany after Hitler came to power, but also collaborated with the regime. Ball mentions one exception—Fritz Strassmann, a young chemist who despised the Nazis and resigned from the Society of German Chemists when they took control of it. Black-listed and out of work, he survived the war and enjoyed a good career in postwar West Germany. Unfortunately, Ball devotes just two short paragraphs to this unusual scientist. To be fair, however, Strassmann played no part in nuclear weapons research and there is a dearth of published information about him.

The German atomic program ended with the Third Reich itself, but its postwar epilogue is the subject of the most interesting chapter of Ball’s book. The British-American Alsos mission interned ten leading German scientists² at a country estate (Farm Hall) in England for six months beginning in July 1945. The British surreptitiously recorded their wide-ranging discussions of the war, science, and politics. Those conversations became much more lively after 8 August, when news bulletins announced the attack on Hiroshima.

After the Germans had digested newspaper articles about the bomb and faced the fact that the Anglo-American scientists had beaten them in making one, two remarkable things happened. First, Heisenberg, whose overestimation of the quantity of enriched uranium needed to make a bomb had been proven wrong, rapidly redid his calculations to arrive at more realistic numbers. Second, the Germans claimed they had made a moral choice not to create a bomb. As Carl Weizsäcker put it, “I believe the reason we didn’t do it was because all the physicists didn’t want to do it, on principle. If we had all wanted Germany to win the war we would have succeeded” (200). This self-serving assertion set off a controversy that has lasted until today.³ Ball argues forcefully that the German physicists would certainly have made a bomb for Hitler if they had been able to.

Although Philip Ball’s primary interest is in the moral and political behavior of German physicists in the first half of the twentieth century, he does not neglect the hard science (he was for many years an editor at *Nature*, one of the world’s preeminent scientific journals). He had much to cover in *Serving the Reich*—from the discovery of radioactivity to quantum theory to harnessing nuclear fission—but he does so clearly and accurately. The result is an excellent, concise account of the German side of the most dramatic era in the history of physics.

2. Werner Heisenberg, Max von Laue, Otto Hahn, Walther Gerlach, Paul Harteck, Kurt Diebner, C.F. von Weizsäcker, Karl Wirtz, Erich Bagge, Horst Korsching.

3. As Ball mentions, the issue was revived most recently by Michael Frayn’s Tony Award-winning play *Copenhagen* (NY: Random House, 2000). It premiered in London in 1998 and on Broadway in 2000 and was adapted as a TV film (dir. Howard Davies) by the BBC in 2002.