

## A textured portrait of Max Planck for English-speaking readers

**Brandon R. Brown: Planck: Driven by vision, broken by war.**  
**New York: Oxford University Press, 2015. xvix+258pp, US\$29.95**  
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Published online: 27 June 2016  
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From its unusual organization, made visible at the outset in the table of contents, through its sixteen chapters, followed by a coda and a technical appendix, I loved every aspect of this engaging portrait of Max Planck, primarily remembered today for fathering (rather reluctantly) the idea of the quantum. Hard-pressed to choose the most important things to share with readers of *Metascience*, I will limit myself to these: (1) the author's decision to take time away from his research at the University of San Francisco to prepare this biography, (2) two unusual biographical strategies used to surprisingly great effect by a first-time biographer, and, most importantly, (3) his nuanced assessments not only of Planck's scientific work but also of his political stance during the Nazi era. I make these choices bearing in mind a remark Planck made in 1909. At the end of his eighth lecture at Columbia University, where he—the preeminent theoretical physicist in the world, and the most respected scientist from the most prestigious scientific nation—had been invited to share his thoughts on the state of theoretical physics, Planck said somewhat apologetically: “I have endeavoured to bring before you in bold outline those [matters] which in my opinion are the most important. Another in my place would perhaps have made another and better choice” (195).

*Why write about Planck?* In the preface, Brown tells the reader that having been fascinated as a physicist by Planck's black-body radiation work that gave birth to the quantum, as well as “haunted by those sad eyes” (xiii–xiv), he discovered that Planck's story is not well known, especially in the English-speaking world. He offers as reasons for this gap the destruction of most of Planck's manuscripts and letters during the bombing of Berlin during World War II and the difficulty would-be researchers would have in trying to decode the surviving correspondence, often handwritten in an old-fashioned form of German shorthand. Although not a

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historian of science by training, in order to undertake the project, Brown secured a sabbatical from his university, along with funding for travel and translating fees. Planck's legacy could not have fallen into more competent hands.

*Two unusual approaches to the presentation of a life-story* Myself a biographer, I usually open my narrative with a “hook”—a gripping scene from some point in my subject's career that sheds light on personality aspects in a meaningful way. Instead of opening Planck's story with such a scene, chosen from an event during Planck's 89 years in Germany (1858–1947), Brown begins with a scene in New Jersey in 1964, with radio astronomers Arno Penzias and Robert Wilson cleaning bird droppings out of a 20-foot-long radio receiver. Readers of *Metascience* will remember that what the two scientists accidentally stumbled upon was the cosmic background radiation—radiation left over from an early stage in the development of the universe. For their discovery, considered a landmark test of the Big Bang model of the universe, Penzias and Wilson won the 1978 Nobel Prize for Physics. Further observations and analysis showed that the spectrum of the cosmic background radiation perfectly fit the black-body spectrum set out in Max Planck's 1900 equation describing the radiation emitted by any object at any temperature. Brown then fast-forwards to the 2009 launching of the Planck space telescope, which during its 5-year lifetime was the source of much new information about the cosmos, including the average densities of ordinary matter and of dark matter in the universe.

With this unusual introduction, Brown then moves into Max Planck's moving story, determined to make it readable not only by physicists but also by “any interested reader, since we are bathed one and all, from every direction, in the glow of his law” (xiv). Some biographies are arranged strictly chronologically, moving forward through the subject's life, while others are arranged thematically. Never before, however, have I read a biography whose chapter titles are dates within such a narrow range, from 1943 through 1947. The first chapter is set in October 1944, when Max Planck learned that Erwin Planck, his only surviving child from his first marriage, had been condemned to death for his alleged participation in the July 20, 1944, plot by senior-level military officials to murder Hitler and take over the government. Not until the outset of Chapter 14 (of 16) do we learn that Erwin, despite Planck's personal pleas to both Himmler and Hitler for commutation of the sentence to life in prison, is not spared. Though skeptical as I began reading that Brown would manage to cover a whole life's story within such a restricted time frame, I quickly understood the method to this seeming madness. The jumping-off point in the 1940s he chooses for each chapter provides a *segué* to a significant amount of background information. By the end of the book, we have learned a lot about all periods of Planck's life, through flashbacks from 1944 to 1947. Some chapters transition more naturally than others, but overall the approach is very effective. Chapter 5, “January 1944,” particularly impressed me. Although I usually resent biographers who speculate on the unknown by saying things like “He must have thought,” I found Brown's speculations here very informative. The event that triggers the chapter is a visit that month to Max Planck and his second wife, Marga, by the younger physicist Max von Laue and his wife, to the town of Rogätz, where the Plancks had moved in 1943 to escape the bombing in their hometown, Berlin.

Von Laue's mission was to bring selected precious volumes from Planck's endangered home library. Which books he actually brought is not known, but by conjecturing what the top ten might be, Brown gives us an intellectual history of Planck in a nutshell. In Chapter 7, we learn that the only books to survive from Planck's personal library were those von Laue brought him in January 1944.

*Assessing Planck's scientific career* Among Planck's scientific contributions, Brown includes his early recognition of Einstein's brilliance. As the editor at the prestigious *Annalen der Physik* in charge of "the more theoretical and mathematical submissions" (55), Planck saw the significance of the *annus mirabilis* launching of the special theory of relativity. Even while the majority of established physicists of the day had difficulty accepting the theory, Planck embraced it immediately. He even wrote the first paper that followed up on it, demonstrating that one of his favorite topics—entropy—was preserved in the context of special relativity.

The focus of Chapter 10, "July 1944—A Celebration," is the event organized by Werner Heisenberg in honor of the semi-centennial of Planck's induction into the Prussian Academy of Sciences. Although by then Heisenberg was not only director of the Reich's atomic research program but also its top physicist, this event was an opportunity for the assembled scientists, friends, and family to celebrate an *eminence grise* of the profession. Brown asks an interesting question about Planck: "How had the young student showing great aptitude for everything but superlative ability in nothing, risen to such influence?" Brown asserts that in assessing Planck's half-century of physics output, his colleagues would have identified his introduction of the quantum as his crowning achievement, "even if he had only reluctantly played along after his first inspiration" (130). But Brown is quick to point out that even if Planck had not done the black-body work, he would be remembered for his trailblazing contributions to thermodynamics. Looking ahead to questions from our own time, Brown also points out that the mystery of dark energy in the universe may well be related to Planck's 1911 notion of a zero-point energy. I found particularly moving Brown's quotation of Planck's homage to Kepler in his 1932 *Where Is Science Going*: "what rendered him so energetic and tireless and productive was the profound faith he had in his own science." Brown, who sees Kepler as "a compelling analogue for Planck," sums up the relationship: "Just as Kepler had an astonishing ability to see the mathematical form in confounding planetary data, Planck had the same when looking at the black-body radiation curves." Planck, however, lived long enough to enjoy recognition, while Kepler did not.

*Assessing Planck's temporizing with the Nazi regime* I am giving very short shrift to this topic, which is a central one in this compelling book, extending to the fraught but ultimately mutually respectful and emotionally committed one between Einstein and Planck. I will allow Brown to sum up for himself his nuanced assessment: "While he would never openly challenge the government, he never fully aligned either; he continued to make statements between the lines and to defy them in quiet ways. He saluted the Nazi flag and signed official letters 'Heil Hitler' but he also preached international cooperation and pursued amnesty for his Jewish colleagues" (156). Brown notes more than once in the book Planck's meeting in May 1933 with the new Chancellor, though his hopes to be able to influence Hitler were very short-lived, and Planck's failure to join the Nazi party led him to be called a "white Jew"

too. And though the Plancks received an official letter in January 1945 saying that Erwin's pardon was imminent, the execution by hanging took place toward month's end. Planck never knew for sure if it was Hitler himself who ordered the execution—so much for gratitude to a scientist who had contributed so much to the prestige of German science.

One of the more interesting things I learned from this book is that in May 1945, Dutch-American astronomer Gerard Kuiper, part of the top-secret Alsos Mission to round up German scientists suspected of nuclear weapons research before the Russians could do so, searched for and found Max Planck and his wife in a farmer's home near Rogätz. Arriving just hours before the Soviets did, Kuiper delivered the Plancks to Göttingen, in the American zone, where Planck died 2<sup>1</sup>/<sub>2</sub> years later. Planck lived to see the Kaiser Wilhelm Society renamed the Max Planck Society for the Advancement of Science. The Allies, seeing Nazism as an outgrowth of earlier German bellicose patterns, "didn't want a rebuilt Germany to look with pride on the Kaiser's name, so they forced a sort of rebranding" (208).

If your own interest in Planck has been whetted by this review, do yourself a favor, and read Brown's fascinating 200+-page volume. It may be short, but it contains multitudes.