at the time and the hardships explorers had to endure when making quantitative and qualitative observations. This aspect of Bessels's account might have been of even greater value to historians of science if Barr had included a translation of an appendix summarizing scientific results, including Bessels's interpretation of the tidal data he collected—though Barr rightly points out that these results had already been published in English in contemporary literature.

Barr's translation of Bessels's several-hundred-page work is diligent. He has managed to retain much of the feel of the original, while also ensuring smooth readability in English. Barr's comprehensive knowledge of the history of arctic exploration becomes palpable in the extensive and helpful footnotes he has added. Sometimes, however, the detail they contain can be overwhelming to the reader less familiar with polar exploration and its history. All the images included in the original publication are reproduced in high quality in this sturdy paperback. The entire work is also available through an open-access scheme, although its sheer length will make this relevant primarily to those hoping to use a search function to find very specific details within Bessels's account.

In sum, this translation is of great value to anyone interested in the history of polar science and exploration and should be included in any library devoted to these topics. Moreover, *Polaris: The Chief Scientist's Recollections of the American North Pole Expedition, 1871–73*, breaks down a major language barrier at a time when historians are increasingly turning toward an international, comparative narrative for the history of the engagement with the polar regions.

Martin P. M. Weiss

Martin P. M. Weiss is a postdoctoral researcher at the German Maritime Museum in Bremerhaven. In his current work he takes research vessels as a point of departure for an analysis of the marine and polar sciences in Cold War Germany.

Claudia E. Graf-Grossmann. *Marcel Grossmann: For the Love of Mathematics.* Translated by **William D. Brewer.** (Springer Biographies.) xviii + 261 pp., bibl., illus., index. Cham, Switzerland: Springer, 2018. £24.99 (cloth). ISBN 9783319900766.

Contemporary theoretical physics is so tightly bound to mathematics that it is unthinkable to pursue it as a career without a solid background in higher mathematics. This was not true at the turn of the twentieth century, when the subdiscipline was in its infancy and Albert Einstein was a student at the Polytechnikum in Zurich (now the Eidgenössische Technische Hochschule [ETH]). The mathematical curriculum at the Polytechnikum was irreproachable in Einstein's day, and its teaching staff included two of the world's finest mathematicians, Adolf Hurwitz and Hermann Minkowski. Studying alongside Einstein at the Polytechnikum were several bright students, including his future wife, Mileva Marić, and the future mathematicians Louis Kollros, Marcel Grossmann, Jacob Ehrat, and Louis-Gustave du Pasquier. The young Einstein was inspired in particular by Minkowski's lectures on capillarity; at the time, Minkowski, like Einstein, was reading the masterworks of theoretical physics, a predilection that would soon lead him to abandon Zurich for Göttingen. He was disappointed by Einstein's performance in class and was said to have referred to him once as a "richtiger Faulpelz" who paid no attention to mathematics (Carl Seelig, *Albert Einstein: Leben und Werk eines Genies unserer Zeit* [Europa, 1960], p. 45). By Einstein's own account, he was a middling student whose high grades in mathematics owed much to the lecture notes loaned him by Grossmann.

After graduation, Grossmann (1878–1936) went on to become a high school math teacher, a position for which Einstein was passed over. Einstein later found work at the Patent Bureau in Bern, on the strength of a recommendation from Marcel's father Jules, a businessman acquainted with the bureau's director. In his spare time, Einstein rolled out a series of discoveries that rocked the world of physics, including the theory of relativity. Minkowski, now in Göttingen, took note of Einstein's theory and seized on the idea of the world as a four-dimensional spacetime manifold, thereby demonstrating the potential for

pure mathematics to restructure the scientific worldview. Upon further formal elaboration by Arnold Sommerfeld, Einstein and others came to see the beauty and utility of Minkowski's approach for a "generalized" theory of relativity that would include gravitational phenomena.

By 1911, Einstein occupied the chair of theoretical physics in Prague, while Grossmann, now a professor of descriptive geometry at the ETH, went about securing his brilliant friend a position on the faculty there. Reunited in Zurich in the summer of 1912, the two men pursued the generalized theory of relativity, cosigning the two papers that are Grossmann's claim to fame—as Einstein subsequently moved to Berlin and discovered the foundational field equations of general relativity.

Grossmann's precise contribution to this discovery is better known, thanks to the preservation of a notebook kept by Einstein, referred to by Einstein scholars as the "Zurich notebook." In a crucial step, Grossmann, following a literature search, introduced Einstein to Gregorio Ricci and Tullio Levi-Civita's absolute tensor calculus (1901), a work known both to applied mathematicians and to physicists more attentive to the mathematical literature than Einstein, including Max Abraham and Friedrich Kottler.

Historical interest in Grossmann's contribution to general relativity reflects a broader scholarly interest in Einstein and his sociointellectual milieu dating from the 1980s, when the Einstein Studies series and the vast edition project, the *Collected Papers of Albert Einstein* (*CPAE*), were launched. The book under review is an English translation by the physicist William D. Brewer of the biography in German (Römerhof, 2015) by Grossmann's granddaughter, Claudia Graf-Grossmann. Occasionally, biographical portraits by descendants bring to light not only family history and genealogy, but archival documents, private correspondence, photos, diaries, notebooks, oral history, and more. In the case at hand, while there are numerous photos of Grossmann's family and friends, and of various residences, the novelties are few. Grossmann's granddaughter was born a generation after his death, and consequently she has no personal memories to pass on. Instead, she draws on the diaries of her father, Marcel Hans Grossmann, as well as the transcribed recollections of her aunt Elsbeth. The correspondence with Einstein, cited generously from the *CPAE* and the Einstein Archives, is a delight to read, comprising six letters from Grossmann, one of which is reproduced in facsimile, and eleven from Einstein. The historical setting of the exchange is sketched by one of the senior editors of the Einstein Papers, Tilman Sauer, in a much-abridged version of an earlier work, although, surprisingly, he is not credited on the title page.

From the book's subtitle—"For the Love of Mathematics"—I had expected Grossmann's life in mathematics to get a little biographical love, but in this I was disappointed, as Sauer's sketch (pp. 171–193) alone engages with Grossmann's training and career. Apart from his collaboration with Einstein, Grossmann published a handful of papers on non-Euclidean geometry and several college textbooks on descriptive and analytic geometry. His scientific productivity was hindered by debilitating illness beginning in 1915, and he made no further significant contributions to mathematics. Readers with no mathematics will have no difficulty following *Marcel Grossmann: For the Love of Mathematics*, which should appeal to those with an interest in the Grossmann family history.

Scott A. Walter

Scott Walter (Scott.Walter@univ-nantes.fr) is a member of the Faculty of Science and Technology, University of Nantes. He is the founder and editor of the website Henri Poincaré Papers (http://henripoincarepapers.univ-nantes.fr).

Purabi Mukherji; Atri Mukhopadhyay. *History of the Calcutta School of Physical Sciences.* xix + 170 pp., bibl. Singapore: Springer, 2018. $119.99 (cloth). ISBN 9789811302947.

As we read in the preface, "Through this book, an attempt has been made to highlight the role of Sir Asutosh Mookerjee, the eminent multifaceted intellectual and one of India's foremost educationists, as the builder of the Calcutta School of Physical Sciences." After detailing Mookerjee's life and scientific activities