

genealogy and national heritage, concern that the name Mendel might turn out to be of Jewish origin, and speculation about Mendel's views on evolution and religion.

The editors' introductions to both volumes, the sketch of Mendel's life by Bateson, and F. Schindler's letters to Bateson are in English, the rest is in German. Each volume also includes a name index, a bibliography of secondary literature and photographs.

SANDER GLIBOFF  
*Indiana University*

ANTHONY HEYWOOD, **Engineer of Revolutionary Russia: Iurii V. Lomonosov (1876–1952) and the Railways**. Farnham: Ashgate, 2011. Pp. xxvi+400. ISBN 978-0-7546-553908. £75.00 (hardback).

doi:10.1017/S0007087412000611

The historian who turns biographer is usually caught between the stools of historical objectivity and the need, if not quite the desire, 'to prove' to the readership the value of the life carefully researched and detailed in the work. For his part, Heywood has written a commendable work on an important, if largely too-long neglected, figure in the history of the development of the Russian railway system in the late nineteenth to early twentieth centuries, Iurii V. Lomonosov. He has managed to achieve this not only thanks to very careful and meticulous archival research in Britain, Europe and the USA, but also in being an objective and dispassionate reader of the voluminous diaries/correspondence left by Lomonosov, charting the many twists and turns in his professional as well as his personal life. The work, in the true spirit of good, non-sensationalist biographical writing, is a revealing and not unsympathetic portrait of a man and a career at a pivotal point in his country's history who, due to a variety of circumstances detailed throughout the work, found himself on the wrong side of both the non-Soviet and the Soviet establishments from the mid-1920s onwards.

Heywood has written the work in such a way as to give the subject ample opportunity to speak for himself – a feat rendered considerably easier by the fact that Lomonosov was a consummate diarist throughout his life and recorded many details, both about himself and about the various other figures involved in the pre- and post-Revolutionary development of the Russian rail network. The work also covers Lomonosov's attempts to secure meaningful employment during his period of enforced 'exile' in Germany, Britain and North America from the late 1920s to his death in Canada in 1952.

Born in the same decade as Lenin, Trotsky and Stalin (the 1870s), the work details how Lomonosov had not only already accumulated, before the First World War, important railway managerial experience in the south of the Russian Empire, but also been heavily involved in carrying out a series of experiments in locomotive road testing. These experiments were designed to better understand ways of making the railways a more efficient mode of transport, for both the carriage of freight and the movement of people.

Throughout the work, Heywood ensures that the reader is given sufficient background information to enable him/her to better understand the more technical points being discussed, as well as the requisite amount of historical detail, again allowing the reader to better place Lomonosov's achievements and travails in a wider context. Thus he successfully avoids the pitfalls of being too heavily involved in exploring the nature of the Russian political system both before and after the two revolutions of 1917 and, instead, simply reflects on how his subject interpreted the events of that tumultuous year, as well as the opportunities it opened up for Lomonosov, as the latter played his role in preventing the rail network in the empire – and the new Soviet republic – from becoming so badly damaged as to be effectively inoperable. This was very significant, as the rail network played a crucial role in ensuring eventual Bolshevik

victory in the Civil War. As the author points out, however, Lomonosov's importance was more than simply to the development of the Russian railway system; he also played a part in demonstrating the feasibility of the use of diesel engines to power mainline railway locomotives.

The author does not gloss over the many stops and starts in Lomonosov's career in a variety of countries, his personal and intimate relationships with the various women in his life, or his misinterpretation of the consequences of the changing Soviet attitude in using the old pre-1917 class of technical specialists, and so on. Balancing well chronological and thematic examination of the subject's life, the book comes complete with both a very impressive 'select' bibliography (running to over seventy-five pages) and a detailed index. Given the comprehensiveness of the work, its well-organized structure and the quality of the writing, this book can comfortably be adjudged not only to be the definitive work on its subject currently available, but also likely to remain so for many years to come.

STEVEN J. MAIN

*Defence Academy of the United Kingdom*

ROBERT H. SANDERS, *The Dark Matter Problem: A Historical Perspective*. Cambridge: Cambridge University Press, 2010. Pp. viii + 205. ISBN 978-0-521-11301. £35.00 (hardback). doi:10.1017/S0007087412000623

Robert H. Sanders's *The Dark Matter Problem: A Historical Perspective* is an attempt to present how the theory of dark matter has developed over the past seventy-five years, and to explain why it is now such an essential component of astronomy, astrophysics and cosmology. The book, although explicitly aimed at cosmologists, astronomers and particle physicists, would function better as a resource for undergraduate physics students. Mathematics is kept to a minimum so that non-specialists can appreciate the book. However, the book is unlikely to be of use to readers with some grounding in the history, sociology or philosophy of science.

Sanders essentially offers a traditional historical narrative of the concept of dark matter and its emergence as a physical entity in the twentieth century until the more recent experimental attempts to detect it. However, one thing that this work is lacking (despite its title) is an insightful historical perspective into the dark matter problem. Readers of *BJHS* may find the work interesting if they have limited knowledge of dark matter in modern physics. However, if they possess a basic understanding of the dark matter problem, the book will fail to impress.

This is not to say that the book has no value at all. For one, the appendix is thorough, yet concise, and allows readers with some understanding of physics to work through the content. Sanders's understanding of the physics and astronomy throughout is also impressive. His presentation of the history of dark matter experiments and research projects is commendable. This is where the book's strength lies.

The historical narrative covers many of the important developments in the history of dark matter. Sanders succinctly identifies the early work by Zwicky and the instantiation of the modern concept of dark matter. He clearly describes the discrepancies in the rotation curves of galaxies, discusses some early possible solutions to the problem, looks at the emergence of the dark halo hypothesis, discusses the important introduction of radio astronomy and its relevance to dark matter, and comprehensively covers the interpretation of astronomical data.

Cosmology and the birth of astroparticle physics is, again, a good introduction into the topic. However, a historical discussion into the value of the density parameter of the universe,  $\Omega$ , is strangely absent. Rather, the value  $\Omega = 1$  is presented without acknowledgement of the controversy surrounding the issue. This parameter, derived from the standard Big Bang model, has enormous implications for the amount of dark matter (both baryonic and non-baryonic) and dark energy in the universe. Sanders explains that the most recent experiments