



**Iwan Rhys Morus, ed..** *The Oxford Illustrated History of Science*. Oxford: Oxford University Press, 2017. Illustrations. x + 436 pp. \$39.95, cloth, ISBN 978-0-19-966327-9.

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The contributors to *The Oxford Illustrated History of Science* set out to provide an updated version of a “comprehensive history of science through the ages,” not attempted since the 1970s or 1980s (p. 2). Editor Iwan Rhys Morus concedes that, for the most part, this edited volume follows the traditional narrative. Part 1 begins in ancient Egypt, Mesopotamia, and Greece, is followed by Islam and the medieval West, and ends with the Scientific Revolution, Enlightenment, and modern scientific developments. The historiographical inroads thus occur through a more nuanced definition of science. “At its broadest level,” argues Morus, “science sums up the ways we make sense of the world around us. It’s the set of ways we interact with the world—to understand it and to change it.” This emphasis on humanity results in a cultural history of science rather than a history of science “assumed to progress by its own momentum as discovery piles upon discovery” (p. 1). The focus is on people and knowledge—individual discoveries and collaborations—within the context of societal morals and values. Glossy photographs, art, maps, and diagrams throughout, combined with the authors’ reinterpretation of the definition of science, result in a fascinating and modern overview of history at the intersection of science and material culture.

The first six chapters are chronological and span from ancient Mesopotamia to the Enlightenment. Two examine China (Donald Harper’s on ancient China and Dagmar Schaefer’s on premodern China) and two study Europe and North America (John Henry’s on the Scientific Revolution and Jan Golinski’s on the Enlightenment). The most compelling chapters of part 1 are those that are comparative in nature: James Evans’s “Science in the Ancient Mediterranean World” and Steven J. Livesey and Sonja Brentjes’s “Science in the Medieval Christian and Islamic Worlds.” Evans details the dual roles of theology and “practical” science in ancient Egypt, Babylon, Greece, and Rome. Livesey and Brentjes include science in Latin, Arabic, and Persian in their chapter, which demonstrates the commonalities that may be found in diverse cultures: “the desire to know, to explore, to explain, to discuss, and to reject what we consider false or improper” (p. 72). In space and time, these essays cover a great deal of ground (literally), and this necessarily means that choices had to be made about what not to include. Nevertheless, it is regrettable that South America is not included in this geographical portion of the volume. The Mayans, with their astronomical discoveries, concept of zero, vulcanization and use of rubber, and technology to build temples, as well as the Incas who created the first successful suspension

bridges, would have added to the traditional narrative of the development of science.

Part 2 is composed of six thematic chapters detailing nineteenth- and twentieth-century experimental cultures, field science, exploration of the meaning of life, astronomy and cosmology, theoretical physics, and communication of science to the public. These focus overwhelmingly on the Western world: America and Europe. Geographical caveat aside, the thematic essays are the highlights of this volume. The authors do a masterful job of injecting people, environment, society, world events, and material culture so desperately needed in the oft-teleological history of science and knowledge. Morus explains the difference between experimental cultures—measurement and calculation versus seeing and feeling—and how they influenced the evolution of laboratory science. Amanda Rees reminds the reader of physical and psychological turmoil that field scientists encountered outside the laboratory. They faced dangerous elements, foreign peoples and localities, along with financial strains tied into investments and the expectation of success. Peter Bowler's chapter explains how the theories of phrenology, electricity, evolution, biology, and genetics threatened traditional values and caused friction between science and religion, reductionists and vitalists. Robert Smith's chapter on cosmology and space exploration highlights the role of state support and world events (such as the Cold War "Space Race") in shaping the focus of astronomers as they explored our galaxy and beyond. Similarly, Matthew Stanley's chapter on theoretical physics considers the role of abstract thought, debate, and human fallacy in science. Furthermore, Stanley emphasizes the role of world events—the Second World War in particular—on theoretical science, as "abstraction and speculation were seen as inherently Jewish and therefore un-Aryan" (p. 369). The final chapter, Charlotte Sleight's "Communicating Science," is an impactful conclusion, as it pinpoints the liminal space between scientific knowledge and its con-

veyance to the public. Sleight explains the evolution of science from the specialty of a closed group of people to its use by the public for entertainment, industry, and education. Moreover, conceptions of science were shaped through the means of its display.

*The Oxford Illustrated History of Science* is itself a means of communicating science to the reader, and Morus is successful in this endeavor. The illustrations are equal parts fascinating and stunning, and an important part of visual culture. As Morus posits, "making knowledge about nature has always been concerned with trying to make visible the otherwise hidden relationship between objects and processes in the natural world" (p. 4). From the photograph of a Pompeian vaginal speculum and an ancient Chinese iron and gold ruler, to a portrait of Margaret Bryan with her daughters and scientific instruments and a painting of a nineteenth-century vivisection experiment, the illustrated history illuminates the very core of the authors' sociocultural definition of science. Science did not move forward in paradigmatic steps within a vacuum. Instead, science progressed through human theory, interaction, and debate, while simultaneously affected by cultural values, the environment, and politics.

And human theory, interaction, and debate must include women. Yet, with the exception of Smith's chapter, the book contains more photographs and illustrations of women than textual mentions. There are three and a half pages dedicated to women scientists in chapter 7 and a page and a half in chapter 8, but otherwise women are overwhelmingly absent from this volume. Scientific fields were certainly dominated by men, but women did contribute, whether directly or indirectly. In preparing a lecture on the Scientific Revolution, I read chapter 5 only to wonder, "where is Margaret Cavendish? Anne Conway? Maria Sybilla Merian?"

Furthermore, eight of the twelve chapters are dedicated to Western civilization. As a volume

covering the entire geographical history of science is impossible, we may forgive the Western-centric thematic chapters for their aforementioned merits. The work in its entirety is effective in emphasizing “the ways in which the search for understanding of the natural world was intertwined with the other aspects of human culture,” a point that is enhanced by fitting illustrations (p. 6). Excepting the lack of women, Morus’s collaborative volume is an important contribution to the history of science for those introducing themselves to the topic as well as the seasoned scholar.

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