

## Book reviews

Andrew Hicks, <i>Composing the World Harmony in the Medieval Platonic Cosmos</i> . By Penelope Gouk	545
Miri Shefer-Mossensohn, <i>Science among the Ottomans: The Cultural Creation and Exchange of Knowledge</i> . By M. Alper Yalcinkaya	547
Donald L. Opitz, Staffan Bergwik and Brigitte van Tiggelen (eds.), <i>Domesticity in the Making of Modern Science</i> . By Melanie Keene	548
Tom Kennett, <i>The Lord Treasurer of Botany: Sir James Edward Smith and the Linnaean Collections</i> . By Geoff Bil	549
Sarah K. Gillespie, <i>The Early American Daguerreotype: Cross-currents in Art and Technology</i> . By Geoffrey Belknap	551
Peter Hobbins, <i>Venomous Encounters: Snakes, Vivisection and Scientific Medicine in Colonial Australia</i> . By James R. Hall	552
Rob Boddice, <i>The Science of Sympathy: Morality, Evolution and Victorian Civilization</i> . By Ian Miller	554
Raymond G. Stokes and Ralf Banken, <i>Building on Air: The International Industrial Gases Industry, 1886–2006</i> . By Peter Reed	555
David Aubin and Catherine Goldstein (eds.), <i>The War of Guns and Mathematics: Mathematical Practice and Communities in France and Its Western Allies around World War I</i> . By Henrik Kragh Sørensen	557
Hermione Giffard, <i>Making Jet Engines in World War II: Britain, Germany, and the United States</i> . By Tom Kelsey	558
Thomas W. Pateson, <i>Instruments for New Music: Sound, Technology, and Modernism</i> and Andrew J. Nelson, <i>The Sound of Innovation: Stanford and the Computer Music Revolution</i> . By Tim Boon	560
Robert J. Richards and Lorraine Daston (eds.), <i>Kuhn's Structure of Scientific Revolutions at Fifty: Reflections on a Science Classic</i> . By Gregory Radick	562
Thomas J. Misa and Jeffrey R. Yost, <i>FastLane: Managing Science in the Internet World</i> . By Devin Kennedy	563

ANDREW HICKS, **Composing the World Harmony in the Medieval Platonic Cosmos**. New York: Oxford University Press, 2017. Pp. xviii + 321. ISBN 978-0-19-065820-5. £29.99 (hardback). doi:10.1017/S000708741700067X

This book is the first in a new series devoted to Critical Conjectures in Music and Sound, one of the series' aims being to question the relationship of music studies with other forms of knowledge production. Andrew Hicks's monograph constitutes a splendid start to the series as he introduces it with the strong claim that (musical) sound has always been an integral part of the history of studying the cosmos, the hope being to attract a wide readership from diverse fields, including sound studies, music studies, medieval studies and also the history of science. This interdisciplinary work overturns the commonly held belief that music theory was essentially absent from the 'twelfth-century Renaissance' that is familiar to intellectual historians and historians of science.

As part of rewriting this chapter of medieval history, Hicks has synthesized material from domains usually treated separately (e.g. music theory, philosophy, cosmology) in order to create a new history of the fundamental role of harmony in twelfth-century cosmological discourse. Specifically, he has looked at the reception and development of ancient Platonism by twelfth-century philosophers such as Bernard of Chartres and William of Conches, who engaged in dialogue with a core set of texts mostly dating from the late fifth and early sixth centuries. These include Plato's *Timaeus*, Macrobius' *Commentary on the Dream of Scipio*, and Boethius' *Fundamentals of Music*. Modern scholars have studied these sources and their fortunes independently from each other, rather than looking at them together over a given period. The synchronic approach favoured by Hicks reveals music theory's 'foundational and often normative role within the development of medieval cosmological models' (p. 5).

The book is in two main parts: the first two chapters offer a 'Framework', the second three chapters deal with 'Particulars', but to finish there are also a couple of appendices containing material from two highly relevant but little-known Latin sources that Hicks has edited. (For those whose Latin is rusty or non-existent there is a website from which it is possible to download English translations.) Whereas most texts dealing with cosmic harmony look to Pythagoras first, the opening chapter does not start with the mathematics of music, but instead begins with physics, demonstrating the idea of nature 'as a carefully ordered and harmonized set of principles governing the created world' (p. 32). Chapter 2 maps out the divisions of philosophy that supported this idea, an exercise that reveals how Boethius' influential scheme making music a branch of theoretical mathematics (the *quadrivium*) further divided into *musica mundana*, *humana* and *instrumentalis* was not found in one place but was rather a synthesis based on several texts. In fact there were other divisions in circulation to which twelfth-century readers had access, allowing for the creation of new taxonomies, as shown, for example, in the fourfold division of philosophy by Hugo of St Victor (c.1120).

Moving into the second part of the book, Hicks has organized its three chapters to deal successively with the harmonies of the microcosm, particularly focusing on the soul being or having a harmony; with the materiality of the voice and hearing and the nature of sound; and with the harmony of the spheres. This chapter in particular demonstrates Hicks's mission to show that, far from being the final end of musical speculation, the planetary strains 'are a symptom, not a cause, of the broader commitment to a well-composed world' (p. 191). Moreover, instead of offering a unified and unchanging view, the twelfth-century accounts of cosmic harmony differed strongly from each other and also changed over time, a complexity that is well captured in Hicks's nuanced interpretation of his chosen texts. Here, as in other chapters, there are plentiful occasions where the sources are allowed to 'speak for themselves' in the form of extracts presented both in the original Latin (sometimes Greek) and in English translations beneath. The picture that emerges is one where the music of the spheres ultimately falls silent, but this is in dialogue with the Platonic sources that had hitherto grounded its reality rather than with reference to Aristotle's rejection of its existence.

This ambitious book opens a new window onto twelfth-century philosophical thought, and successfully shows how deeply Platonic conceptions of harmony were embedded within it. As well as becoming essential reading for medievalists who want to develop their knowledge of speculative music theory, it is also worth the attention of early modernists and scholars who focus on present-day philosophical and scientific thought. For while it enriches our understanding of twelfth-century philosophy, it also raises the question of what happens to the doctrine of the harmony of the spheres in later centuries. For example, we find Marsilio Ficino in the late fifteenth century believing cosmic harmony to be real, his goal being to make this Pythagorean music come alive again. With reference to Kepler in the seventeenth century, and to Gilles Deleuze in the twentieth, Hicks points to the enduring legacy of cosmic music, 'which has continually changed its tune

to harmonize with the prevailing musical aesthetics of its aspirational auditors' (p. 253). As it says on the cover, his book encourages us to rethink the role of music and sound within our greater understanding of the universe.

PENELOPE GOUK  
University of Manchester

MIRI SHEFER-MOSSENSOHN, *Science among the Ottomans: The Cultural Creation and Exchange of Knowledge*. Austin: University of Texas Press, 2015. Pp. 262. ISBN 978-1-4773-0359-7. \$55.00 (hardback).

doi:10.1017/S0007087417000681

Is it possible to state that the history of Ottoman science has by now become a mature field of research? While Miri Shefer-Mossensohn's meticulous *Science among the Ottomans* does not exactly allow us to answer this question in the affirmative, it does demonstrate that much distance has been covered, and we are closer to leaving some unproductive approaches behind. Shefer-Mossensohn is overt about her intention to challenge earlier views that represented science in the Ottoman Empire essentially as non-existent, especially after the sixteenth century, and the cultural transformations of the nineteenth century as entirely due to European influence. Similarly, in line with the general tendency in contemporary Ottoman studies, she is critical of the 'decline' narrative, noting that science remained vibrant in Ottoman society throughout its history. The main question concerns where to look to find Ottoman science, and, as the title of the book implies, Shefer-Mossensohn suggests exploring Ottoman culture itself. Understanding the specifically Ottoman ways of understanding, producing, assessing and disseminating knowledge is essential, in her view, in order to discover not 'science' as a supposedly universal phenomenon, but a 'uniquely Ottoman' science (p. viii).

*Science among the Ottomans* is organized around some of the popular themes in recent history and sociology of science, rather than chronologically. Chapter 1 explores Islamic perspectives on the meaning and sources of credible knowledge, also dwelling on the status of philosophy in Muslim societies. A key argument of the book is also made clearly in this section: to Shefer-Mossensohn, Ottomans were particularly skilful at adopting and adapting ideas and tools from different knowledge traditions. Next, a chapter on the transmission of knowledge analyses the ways in which educational institutions operated in the Ottoman Empire, as well as the efforts to systematize and reform education in the nineteenth century. Chapter 3 looks at processes of knowledge transfer, with discussions on reading, writing, translation and the role of travellers in the 'transfer of knowledge to, from, and within' (p. 87) the empire. The final substantive section focuses on the patronage of scholars, as well as the nineteenth-century developments that entailed significant involvement by the state in infrastructural work, with the emergence of a new governmentality. The introduction and the conclusion provide helpful discussions on recent theoretical approaches in science and technology studies, and on the special qualities of Ottoman science.

This thematic approach is a strength of *Science among the Ottomans*, offering insights about aspects of the Ottoman case that researchers may utilize in comparative studies. Shefer-Mossensohn's use of biographies is also helpful, as the colourful biographies she presents support her emphasis on the complex and eclectic nature of scientific practice and practitioners in the Ottoman Empire. Similarly, it is commendable that the account is not Istanbul-centric, consistently reminding the reader that the Ottoman Empire was, indeed, an empire. In these respects, it would be appropriate to see *Science among the Ottomans* as a first-rate overview of the existing research on Ottoman science, providing helpful ideas for framing and integrating findings on disparate issues. Readers relatively unfamiliar with the topic would benefit considerably from this book, and Shefer-Mossensohn's accessible and engaging style is certainly an asset.