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Middle Ages and Renaissance

Dag Nikolaus Hasse; Amos Bertolacci (Editors). *The Arabic, Hebrew and Latin Reception of Avicenna's Physics and Cosmology*. (Scientia Graeco-Arabica, 23.) viii + 549 pp., notes, bibl., index. Berlin: De Gruyter, 2018. €119.95 (cloth); ISBN 9781614517740.

Historians of science usually link the name of Ibn Sīnā (or Avicenna, to use his Latinized name) to his immense role in the history of medicine. Less widely known and appreciated is Avicenna's role in other branches of the history of science. As a polymath, Avicenna was engaged with an impressive number of speculative interests, writing extensively on features like physical change, elemental composition, and the role of experience in natural science. Needless to say, these aspects are central to the history of science in both the Islamicate and Latinate traditions. Recent publications have stressed the central relevance of medieval natural philosophy for the history of science. This is particularly the case with Avicenna. In the past decade alone, Jon McGinnis's monograph for the Oxford University Press series Great Medieval Thinkers (2010) and the volume edited by Peter Adamson (*Interpreting Avicenna* [Cambridge, 2013]) presented Avicenna's refined thought to a large interdisciplinary audience. More recently, Andreas Lammer's book on Avicenna's natural philosophy, *The Elements of Avicenna's Physics: Greek Sources and Arabic Innovations* (De Gruyter, 2018) has displayed the interconnectedness of Avicenna's scientific interests and his philosophical reflection.

The Arabic, Hebrew and Latin Reception of Avicenna's Physics and Cosmology, edited by Dag Nikolaus Hasse and Amos Bertolacci, sheds new light on Avicenna's intertwining of science and philosophy, the natural and supernatural, and elements and spheres. The volume follows a previous publication that Hasse and Bertolacci dedicated to Avicenna's metaphysics: *The Arabic, Hebrew and Latin Reception of Avicenna's Metaphysics* (De Gruyter, 2012). Using a similar approach, the editors take the readers on a compelling journey through three cultural communities defined by their languages: Arabic, Hebrew, and Latin. During the Middle Ages and well into the Renaissance, Avicenna played a key role in the formation of the scientific traditions in these three communities. The thirteen chapters included in the volume dive into the specificities of the reception of his works.

The first six chapters focus on the role of Avicenna's physical doctrines in the Islamicate tradition, including contributions by some of the most influential historians of Islamic philosophy. Each sheds light on the outstanding success of Avicenna's physics in the later Islamicate tradition in different ways. The chapters authored by Jon McGinnis and Dimitri Gutas examine the interpretative challenges that arose during the reception of Avicenna's works. In turn, the chapters by Jules Jannsens, Peter Adamson, and Andreas Lammer focus on two thinkers whose studies were particularly influenced by Avicenna: Faḫr al-Dīn al-Rāzī and Sayf al-Dīn al-Āmidī. While Jannsens examines al-Rāzī's doctrine of place, both Adamson's and Lammer's contributions delve into the problematic reception of Avicenna's theory of time. In her chapter, Cristina Cerami offers a remarkably thorough investigation of Averroes's criticism of Avicenna's physical works (a critique that would be crucial for the Latinate tradition). The resulting picture shows how Islamicate scientists and philosophers constantly incorporated Avicenna's works by using and criticizing, developing, and sometimes refuting the central tenets of Avicenna's physics.

The next two contributions are dedicated to the Hebrew reception of Avicenna's works on natural philosophy. Resianne Fontaine discusses the influence of these texts on a very important Jewish thinker: Abraham ibn Daud. The relevance of Fontaine's contribution is twofold, considering both the role of Ibn Daud as reader and Latin translator of Avicenna. In turn, Gad Freudenthal's chapter focuses on the intriguing theory about the formation of dry land elaborated by Avicenna, detailing its reception by later Hebrew philosophers.

The final five chapters are focused on Latin natural philosophy, beginning chronologically and thematically with the paper that Hasse and Andreas Büttner dedicate to medieval translation. They present a scrupulous (and highly consequential) analysis of the authorship of anonymous Arabic-to-Latin translations made in the Middle Ages. Next, Katrin Fischer's chapter examines how one of the first Latin thinkers to approach Avicenna's works, William of Auvergne, treated his theory of natural causation. Bertolacci's contribution discusses how Albert the Great interacted with Averroes's criticism of Avicenna and was influenced by it in his own interpretation of Avicenna. In turn, Cecilia Trifogli thoroughly examines the impact that Avicenna's natural philosophy exerted on another medieval philosopher and scientist, Roger Bacon. Finally, Jean-Marc Mandosio discusses Avicenna's development of and detachment from Aristotle's *Meteorology* and the intricate reception of his stances in the Latin Middle Ages.

Among the many merits of this excellent volume, one is particularly important for historians of science. The volume eminently displays how the medieval encounter with nature was marked by a structural intertwining and interdependence of science and philosophy. By reducing the history of medieval science to a history of its objects, instruments, actors, and manuscripts, a crucial point would inevitably be missed. And its absence would inexorably thwart our reconstruction of the past.

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Hanif Ghalandari. *ʿAbd al-Jabbār al-Kharaqī's Muntaha al-Idrāk fī Taqāsīm al-Aflāk (Ultimate Comprehension of the Subdivision of Celestial Spheres: The First Comprehensive hay'a Work on Ptolemaic Cosmology).* Tehran: Miras-e Maktoob, 2020. $36.81 (cloth); ISBN: 9786002031907.

ʿAbd al-Jabbār al-Kharaqī (1084–1158) is a key figure in the history of astronomy in Islamicate societies. He made a significant contribution in a very important genre of Arabic astronomical writings known as books of *hay'at al-aflāk* (configuration of orbs). This genre was dedicated to presenting a physical interpretation of Ptolemaic planetary models as a geometrical cosmology. Kharaqī's *Ultimate Comprehension of the Subdivision of Celestial Spheres* (*Muntahā al-idrāk fī taqāsīm al-aflāk* [A.D. 1131]) is divided into four main chapters: (1) some preliminaries from geometry and natural philosophy, (2) planetary models of celestial orbs, (3) mathematical geography, and (4) sizes and distances of the heavenly bodies. This structure is generalized and standardized by almost all the *hay'a* books after Kharaqī. Nevertheless Kharaqī's contribution in this genre is more significant. He writes about the authors of *hay'a* books before him as follows: "they left their books without mentioning any demonstration and any of the reasons which led them to what they have imagined of the position of the spheres in relation to the others and any of the anomalies of the planetary motions . . . so I decided to compile a book for my friends including the most of what is needed . . . adding explanations and reasons . . . to liberate the reader from mere imitation" (pp. 2–3, paragraphs 3–4). Thus Kharaqī fills this gap, and his book includes the geometrical demonstrations and reasons behind the Ptolemaic models. He also adds his criticisms or new ideas in detail. We may consider his book the first in a new scholarly tradition of more comprehensive books on *hay'a*.

Many of the leading figures of this new tradition, including Muʾayyad al-Dīn al-ʿUrḍī (1200–1266), Naṣīr al-Dīn al-Ṭūsī (1201–1274), and Quṭb al-Dīn al-Shīrāzī (1236–1311), spent a period of their life in the Marāgha observatory, which was built at the court of the Ilkhanid dynasty in northwestern Iran. It is referred to in modern literature as the "Maragha School." They covered almost all of the topics and problems of the