Method, Structure, and Development in al-Fārābī's Cosmology, by Damien Janos (Islamic Philosophy, Theology and Science, Texts and Studies: 85) (Leiden & Boston: Brill, 2012), xiv + 433 pp., ISBN: 978-90-04-20615-1, €161.00 / $221.00 (hb)

The present book is Janos' revised PhD thesis and consists of four chapters. The first chapter serves as an introduction and surveys in three sections followed by a fourth one reserved for conclusions (pp. 111-113) broad themes, namely (1) "cosmology, the sciences, and the scientific method" (pp. 11-43), (2) "astronomy and its place in the philosophical curriculum" (pp. 43-84), (3) "demonstration and analogy: a tension in al-Fārābī's method" (pp. 84-111). The second chapter, titled "the architecture of the heavens: intellects, souls, and orbs," treats in four sections followed by conclusions (pp. 201-203) (1) "the celestial bodies" (pp. 115-142), (2) "the separate intellects" (pp. 142-180), (3) "the first (*al-awwal*)" (pp. 180-189), and (4) "unity and multiplicity" (pp. 190-201). The third chapter under the header "matter and creation: a shift in paradigms?" follows the same basic structure as the two preceding ones and the subsequent chapter. It discusses (1) "the nature of celestial matter" (pp. 203-235), (2) "the origin of matter: from creationism to eternal causation" (pp. 235-311), (3) "strengthening the developmentalist hypothesis" (pp. 312-325) and closes with (4) "conclusion(s)" (pp. 325-332). Chapter 4 on "the aporia of celestial motion" studies (1) "the various motions of the heavenly bodies" (pp. 333-339), (2) "the causes of celestial motion" (pp. 339-355), and (3) "the problem of the particular motions of the planets" (pp. 355-376), wrapped up by (4) "conclusion(s)" (pp. 376-377). After these four chapters follows a brief presentation (4 pp.) of general conclusions, two appendices (pp. 383-402), the bibliography and an index.

Janos tries to combine in his research both history of philosophy and history of science in so far as they concern Islamicate societies and antiquity. This is an admirable effort, given that it is all too rarely undertaken by other researchers, despite the fact that both parts actually formed one whole for authors like al-Fārābī. Another feature of his research that impressed me is the substantial number of texts that he analyzed, both by al-Fārābī and other authors. The attribution of some of these to al-Fārābī has been contested by other researchers

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and in one case, Janos provides an argument that they may be mistaken in their evaluation (pp. 258-260). The broad range of texts exploited in this study assures a substantially improved access to al-Fārābī's thinking. In Janos' view it even allows one to trace changes in the philosopher's thoughts. This claim is argued for in Chapter 3. I consider this part as the most fascinating one of the whole book, although I think that 'creationism' is an inappropriate choice of term.

Given this number of texts and their individual problems, it would have been helpful for the reader if Janos had added a section presenting each of these texts, perhaps even with a brief survey of their respective content, and the issues raised about them in previous research. Janos' decision to discuss three of these works in Appendix 1 and others in a scattered manner in different parts of his book creates a substantial obstacle for the general reader. Furthermore, his preference for displaying previous research mostly in the footnotes makes it difficult for the non-specialist to understand in which points the author differs from his predecessors and presents new insights. A case in point is Chapter 2 about al-Fārābī's views on the composition of the universe and the emergences of its various intellects, soul, and bodies. Here, I was lost in the sensation of having read about this theory a long time ago in English as well as in Russian and found it impossible to see clearly Janos' new contribution, except for a greater emphasis on Proclus than Plotinus. Additionally, in earlier remarks in Chapter 1, Janos pointed to Aristotelian commentators such as Alexander and Simplicius as possible sources of inspiration for al-Fārābī's Neoplatonic bent (pp. 25-26), although one would like to have seen Janos present evidence for al-Fārābī's direct access to these and other ancient Greek texts in Arabic translation (see p. 23).

In contrast, the already mentioned Chapter 3 shows that al-Fārābī read Neoplatonic works differently in his mature age than he did as a novice. To have uncovered this is one of the major new results of Janos' studies. Other attractive parts of the book deal with al-Fārābī's epistemology in Chapter 1 (pp. 57-63), in particular his concept of experience (*tajriba*), or al-Fārābī's use of and departure from Aristotle's *Metaphysics*, Book Lambda in Chapters 2 and 4 (pp. 144-167; 352-355) in his emanationist theories in combination with Neoplatonica and, as Janos argues, texts by three Aristotelian commentators (Alexander, Themistius, and Simplicius).

For a historian of science, the choice of "cosmology," as Janos calls the main theme of his thesis, implies the necessity to discuss also

astronomy and astrology. For historians of philosophy this may not be a necessary consequence. They might prefer to rather focus on metaphysics or psychology. Both might be inclined to include parts of natural philosophy. Janos' decision to include all five of these disciplines is to be applauded and constitutes one of the strong points of his book.

As for history of philosophy, Janos demonstrates the great importance of Aristotle's *Metaphysics*, Book Lambda in particular for the changes in al-Fārābī's understanding of the cosmos. Regarding history of science, he sees in two of Geminus' works the basis for al-Fārābī's views about the relationship between astronomy, astrology, and natural philosophy (pp. 70-73). He abstains, however, from mentioning that we know only of one of the two having been translated into Arabic (thanks to an extant Latin translation by Gerard of Cremona). This Arabic translation (or perhaps more than one) circulated not as a work by Geminus, but as a text either by Ptolemy or by Proclus. Janos was not, perhaps, aware of this information given in Berggren's and Evan's introduction to their edition of Geminus' *Introduction to the Phainomena* (2006, pp. 102-103) and seems to see no issue with this shift of attribution for interpreting al-Fārābī (p. 71).

In other contexts, Janos describes al-Fārābī's insistence on the importance of experience and observation for forming new astronomical theories. Janos suggests that the philosopher might have been informed about the latest astronomical research among his contemporaries (pp. 26, 61, 63; see also p. 334 for a related claim). These two positions illustrate the double methodological approach that Janos intended to adopt: considering al-Fārābī as part of "the Greek commentatorial tradition" (p. 4) and the investigation of al-Fārābī's contemporary "cultural and intellectual milieu" (p. 1). While he proceeded well on the first trajectory, the second remains largely in the background. In my view, this is a general problem of contemporary research, at least in the history of science in Islamicate societies.

Appreciating thus honestly and seriously Janos' engagement with two major historical disciplines and a broad range of texts and themes, I also see two methodological problems in the execution and rhetorical presentation of his study. One problem seems to be of his own creation, which he could have easily avoided. Subsuming the different ideas, theories, and methods from these disciplines under the neologism "cosmology" (early 18th c) is anachronistic, as he himself signals (see p. 11, n. 1). Moreover, this rhetorical choice contains

the potential for a lack of clarity or even misunderstandings (see for instance the terms "proofs of a cosmological nature," p. 85, "cosmological demonstration," pp. 88, 90). Its continuous application as a noun and an adjective brings with it the suggestion that these various theories, problems, and methods indeed formed some unified disciplinary study, suitably called "cosmological inquiry" (p. 91). This certainly means to take things too far.

The second set of methodological and interpretive problems that impacted Janos' discussion is not exclusively or even predominantly his own doing. It rather reflects the general shortcomings of methodology in history of science in Islamicate societies. Janos' survey in Chapter 1 illustrates this point nicely. The positions summarized there represent a macro-historical, long-term approach that fails to appreciate the complexity of the details on the ground. This approach results from the preference of a vertical over a horizontal history, which situates scholars, texts, and instruments in a long chain of results, instead of trying to study each one of them in their specific local and temporal contexts. A most explicit statement of this long-term view that treasures continuity over difference is found in the following sentences:

> This makes al-Fārābī a link in the long chain that goes from Geminus, Ptolemy, and Simplicius, through al-Bīrūnī and Ibn Sīnā, to al-Ṭūsī, al-ʿUrḍī, and the Marāgha School of the thirteenth and fourteenth centuries. More specifically, there are obvious similarities between the astronomical outlook of Geminus, al-Fārābī, Ibn Sīnā, and al-Ṭūsī, which enable one to perceive some continuity in the way these thinkers conceived of this discipline. If al-Fārābī did not belong to the *hayʾa* tradition proper, he may nevertheless be said to have anticipated and adopted some of the essential features that characterized its later development. (p. 84)

This kind of statement goes to the heart of the methodological debates that I have been engaged in with friends and colleagues for years. It is impossible to anticipate a later development, unless we believe in the second sight. Only later generations create change. Scholars pick and choose from works of their predecessors what appeals to them and what they find useful for their own work, reformulating and transforming previous achievements. Readers and bibliophiles decide which books to buy and collect. Teachers select treatises suitable for the classroom. And students do or don't read them.

For understanding al-Fārābī's works, we can dispense with all later scholars, except when they offer traces of lost works. We need to study his immediate contemporaries, the debates in which they were engaged, the libraries they owned, and the interests of their patrons and readers, in addition to al-Fārābī's works proper. In the case of al-Fārābī's involvement with astronomical activities and astrological debates of his period as well as epistemological attitudes in regard to these two disciplines, a study of texts of the ninth and the first half of the tenth centuries by, for instance, the Bānū Mūsā, Thābit ibn Qurra, al-Nayrīzī, or al-Battānī, to offer only a few possible names, would have been perhaps better suited for determining al-Fārābī's access to actual research literature than any of the ancient and later scholars. Maybe, even the *Rasāʾil Ikhwān al-ṣafāʾ*, with their Neoplatonic leanings, might be a potentially suitable source. Not being a specialist on al-Fārābī though, I must admit that these suggested texts and authors may not contribute much, once they were investigated. Yet, a contextual approach taken seriously demands such a study of the presence and immediate past of a scholar. It is an approach that needs to be pursued with greater rigor if we want to come closer to an understanding of the development of a scholar's views and his working practices within his own time and places of living.

Beyond these two overarching methodological problems, there are several other issues caused partly by the author's too general language and by his occasional use of overly modernistic terms such as creationism or cosmopolitanism in addition to the already mentioned cosmology, partly by a seeming lack of familiarity with discussions within history of science at large and partly by his willingness to speculate. Some of his claims and conclusions, for instance, are so general as to become false or simply mere rhetoric. Two examples have to suffice here: (1) "Vast observational programs were patronized and implemented by some of the ʿAbbāsid caliphs, especially al-Maʾmūn, which resulted in the composition of new *zīj*es or astronomical tables." (p. 35); (2) "This overview of the Greek and early Arabic textual and historical contexts places al-Fārābī squarely at the confluence of various scientific, philosophical, and theological traditions, all of which, it may be surmised, left an imprint on the Second Teacher's method and thought." (p. 37). However, there was no other caliph of the ninth or tenth centuries who sponsored observations beyond having astrologers as clients. To call the two or three possible expeditions ordered by al-Maʾmūn and the various observations carried out

by people at his court or connected with it 'vast observational programs' is one of a number of extrapolations from slight evidence that appear in the book. The stories about the expeditions have been doubted with arguments of different credibility by King and Mercier (*Suhayl* 1 [2000], 207-241; *The History of Cartography: Volume 2, Book 1*, pp. 175-188). These supposedly 'vast programs' were of so little relevance for the court entourage that none of the ninth-century historians refers to them. Ignoring the issue of the underrepresented historical contexts, the claim of al-Fārābī's being at some confluence overstates even the broadly conceived discussions that follow later in the book, which nonetheless are carefully limited to a comparatively small number of texts by earlier writers. The claim that all of these traditions left an imprint is again too grandiose. A more cautious one can easily be approved of, because it is improbable that none of those traditions has left any imprint. It is not the general claim that needs proof, but, as Janos goes on to show, the specifics that need to be investigated carefully.

At times, Janos' conclusions baffled me as when he claims, for instance, that because the philosopher esteemed both Aristotle and Ptolemy as the foremost authorities in their fields he "would have felt the need to reconcile these two authorities." (p. 37, same idea on pp. 335-336) or that because he advised students to start their education in geometry from solids and move subsequently to surface, line, and point as the more abstract objects, "in geometry, analysis implies a shift from physical three-dimensional bodies to abstract mathematical entities" (p. 108). If al-Fārābī indeed tried to reconcile Aristotle and Ptolemy, something that Janos obviously believes, but does not discuss with the needed clarity, this could have had all kinds of reasons, not merely the fact that he may have considered them the leading scholars of their respective fields. So far, the arguments brought forward by historians of astronomy for the efforts of scholars in different centuries to strengthen the role of Aristotelian physics in Ptolemaic mathematical astronomy did not emphasize their respective standing as a motive nor reconciliation as the main or only goal. As for the second conclusion, I assume this is a misunderstanding of Freudenthal's arguments on which Janos relies here, since geometry deals with mathematical, not physical bodies. It would be in need of explanation if al-Fārābī believed otherwise. While these critiques may be considered minor, the lack of a thorough analysis of the concepts and terms of nature as used by al-Fārābī contributes substantially to

the unsatisfying discussion of celestial motion and its causes in Chapter 4. I do not understand why Janos abstained from discussing the various concepts of nature in antiquity and tracing the layers of the different Arabic translations of the concept in al-Fārābī's treatises in the same manner as he did with other terms and concepts (pp. 339-352).

Finally, a few claims or assumptions are simply mistaken, such as the statement that "from Ibn Sīnā onward, *ʿilm al-hayʾah* gradually replaced *ʿilm al-nujūm* in the mainstream philosophical and theological traditions and came to refer exclusively to mathematical astronomy" (p. 45), that Ptolemy's *Planetary Hypotheses* were a "popular" book in antiquity (p. 333) or the suggestion that *quwwa* in the quote from the *Siyāsa* "may simply consist of a mechanical force transmitted as a result of the proximity of the orbs" (p. 347). A cursory look into major post-classical Arabic biographical dictionaries as well as manuscripts could have clarified that a) the two terms continued to be in use, with some overlapping, and b) that texts identified as belonging to the former discipline included not rarely chapters on the latter. There is only a small number of medieval Greek copies of parts of *Planetary Hypotheses* extant, which all seem to be derived from a single ancestor, Vat. gr. 1594, and equally few secondary testimonies to the work in Greek literature (I thank Alexander Jones, New York for this information). Ignoring the thorny issue of whether there existed a concept of force, the definitions or descriptions of *quwwa* in mechanical texts are connected with weight, specific weight, and the passing of equal distances in equal time intervals and thus are not easily available for the suggested interpretation in regard to the first heaven, its motion, and the motions of all the following orbs, epicycles etc.

Despite these critical comments, Janos is to be congratulated for this work. It re-introduces al-Fārābī into the realm of historical analysis of medieval philosophical thought, rebuts the Straussian approach in the form of Mahdi's hypothesis regarding al-Fārābī's political writings (pp. 38-43) and introduces the reader to a dazzling array of philosophical terms, concepts, and positions. It is a work that needs to be read by any serious student of the history of Islamicate philosophy and science.

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