

Giuseppina Ferriello; Maurizio Gatto; Romano Gatto (Editors). *The “Baroukos” and the “Mechanics” of Heron*. (Biblioteca di Nuncius: Studi e Testi, 76.) 432 pp., figs., bibl., index. Florence: Leo S. Olschki, 2016. €49 (paper).

Students of Greco-Roman mechanics will be familiar with the unhappy fact that Hero of Alexandria’s *Mechanica*, one of the earliest known texts on mechanics, barely survives in Greek. Only fragments remain, cited in Pappus of Alexandria’s fourth-century *Synagōgē*. The work survives much more completely in Arabic, in the ninth-century translation by Qusṭā ibn Lūqā. For the reader without facility in classical Arabic, the work has thus far been accessible in the 1893 edition with French translation by Camille Carra de Vaux, the 1900 edition with German translation by Ludwig Leo Nix, and the 1963 edition with English explanatory notes on mechanical and textual questions by Aage Drachmann. Drachmann’s notes, including his reproductions of the manuscript diagrams, are included in the 1987 reissue of Carra de Vaux’s text and translation in the series “Les Belles Lettres,” which has since its publication been the most complete resource on the text of the *Mechanica*.

Now, thanks to Giuseppina Ferriello, Maurizio Gatto, and Romano Gatto, the work is available in English, including translations of the Greek fragments and a slightly updated version of Nix’s Arabic text with translation. The changes from Nix’s text are, as the editors note, based on clarifications of mechanical details rather than a new collation of the Arabic sources. Most importantly, the editors include for the first time an edition (with translation into English) of the Persian version of the text’s second book. They also include a considerable amount of explanatory material: the history of the text in its Greek, Arabic, and Persian versions (including some speculation that a Greek manuscript of the text might have been available to Leonardo da Vinci), a comparison between the text found in Pappus and its Arabic analogue, and a lengthy analysis of the likely relationship between the Heronian texts known as the *Mechanica* and the *Baroukos*. Footnotes throughout elucidate points of mechanical, terminological, textual, and historical interest or dispute.

The Persian text is based on the Paris “Supplément persan 369” (hereafter SP) with footnotes on differences in the Me’yār al-uqūl text (hereafter Me), which shares a textual ancestor with the Supplement Persan 369 in the stemma reconstructed by the editors. An *apparatus criticus* makes the manuscripts’ textual variants readily available. The editors include a detailed account of the manuscripts and how they obtained access to them, leading to the appearance of this work in a modern edition for the first time.

The editors exhibit an admirable concern for the transmission of the work’s diagrams. While they have certainly stopped short of the ideal of a complete critical edition of diagrams, the diagrams included in the main part of the text are for the most part not idealized pastiches of visual information from different manuscripts but, rather, reproductions of individual manuscript images. Cover-to-cover readers may be alarmed by the somewhat haphazard combination of manuscript images with modernized illustrations in the introductory essay but should be reassured to find that the Arabic and Persian texts are accompanied by reproductions of the diagrams more carefully annotated as to their sources.

For the Arabic version, the editors juxtapose versions of letter-labeled diagrams with Arabic and Greek labels, respectively, which makes it easy to correlate them with the Greek letters in the text. There is not much supplementary discussion of the tradition of these images, but for these Drachmann’s notes on the manuscript tradition of images are already available in English in the 1987 Carra de Vaux. The editors instead put their time into creating a new resource, parallel to Drachmann’s, for the tradition of diagrams from the Persian version of the text, including side-by-side comparisons of diagrams from the SP and Me versions of the work.

The English translation is certainly welcome and will surely make the text more widely accessible to scholars in the history of science (an increasingly monoglot-Anglophone readership). On the other hand, one might wish more care had been taken shaping in the English itself, which is often infelicitous and sometimes confusing. I (being without Arabic or Persian, like most of the target audience for this book) am in no position to judge the quality of the translation itself, but the somewhat inelegant English seems no reason to doubt the translation.

In short, Ferriello, Gatto, and Gatto have created a most useful new resource for scholars of ancient mechanics. Their collection of the existing Greek and Arabic texts into one volume is convenient, their addition of a brand-new resource in the form of the Persian version is invaluable, and their explanatory notes provide the whole with a coherent framework. While the translation is not without its flaws, those superficial shortcomings do not diminish the book's great value in providing a new readership access to a text of the greatest importance for the history of mechanics.

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Middle Ages & Renaissance

Angela Axworthy. *Le mathématicien renaissant et son savoir: Le statut des mathématiques selon Oronce Fine.* (Histoire et Philosophie des Sciences, 11.) 479 pp., apps., bibl., indexes. Paris: Classiques Garnier, 2016. €78 (paper).

In the past couple of decades, the Cinderella story of mathematical culture in early modern Europe has been more often assumed than examined by historians of science. Those who have looked—Peter Dear, Isabelle Pantin, Antonella Romano, and François Loget, to name a few—have found that the growing cultural dominance of mathematics owed not only to the discipline's promises but especially to the successive generations of university textbooks that expressed those promises. An early link in that chain is Oronce Fine (1494–1555), the first Royal Professor of Mathematics of François I's Collège Royal (est. 1530). A volume recently edited by Alexander Marr explored Fine's fertile production as a mathematical practitioner who made maps and instruments and adapted a range of practical and theoretical mathematical genres in edition after edition of textbooks that circulated throughout Europe. Here Angela Axworthy presents an account closely focused on Fine's portrayal of mathematics as knowledge.

The book is organized in a way early modern students would immediately recognize, first addressing Fine's view of objects long associated with the quadrivium: the numbers, points, lines, and surfaces considered as abstractions from the physical world, as Aristotle taught. Out of such assumptions, Fine elaborates a philosophy of mathematics that flexibly wends its way between practical and theoretical uses. Two choices define the first part of the book. First, Axworthy restricts herself to the various prefatory letters and poems of Fine's *oeuvre*, in which he allusively praises the worth of his chosen vocation. These prefaces are tremendously important, for they open up the contexts of patronage, the circles of friendship, and the social placement of an exemplary mathematical practitioner. But Axworthy's second choice is to focus on Fine's epistemic statements. The nature of the evidence is compressed and hardly systematic—Fine cites sources rarely and imprecisely—so Axworthy painstakingly reconstructs the philosophical quilt that he patched together out of the ancient and medieval traditions: Plato's *Timaeus*, Aristotle's *Posterior Analytics*, Boethius, Augustine's *De musica*, Proclus, and so on. Fine's exact sources are difficult to pin down, for these authors spawned commonplaces in textbook traditions, with key examples in the circle of Jacques Lefèvre d'Étaples in the generation before Fine.

The example of Proclus deserves particular note. Scholars have long traced the new Renaissance status of mathematics to the recovery of the ancient Neoplatonist's commentary on the first book of Euclid's *Elements*. Although available in Greek from 1533, the book had few readers until the Latin translation of 1560—except for large sections that the Venetian humanist Giorgio Valla translated in his *De expentendis et fugiendis rebus opus* (1501). In a bit of admirable sleuthing, Axworthy shows exactly where Fine lifted entire paragraphs from Proclus, and her evidence strongly suggests that he simply lightly reworded Valla, perhaps even unaware of its original source. Fine's account of mathematical certitude may owe something to Proclus.