

## HERO OF ALEXANDRIA AND HIS AFTERLIFE

ROBY (C.A.) *The Mechanical Tradition of Hero of Alexandria. Strategies of Reading from Antiquity to the Early Modern Period*. Pp. viii + 299, b/w & colour ill. Cambridge: Cambridge University Press, 2023. Cased, £85, US\$110. ISBN: 978-1-316-51623-2.

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R.'s recent book is an impressive work of scholarship and a pleasure to read. Describing Hero's oeuvre, she notes (p. 145): 'there is no indication that Hero's works ever bore any but the most straightforward names. *Pneumatica*, *Belopoeica*, *Dioptra*: exactly what it says on the tin'. Readers coming to the current volume anticipating a book about Hero need to go back and re-read the label and – especially – the subtitle: *Strategies of Reading from Antiquity to the Early Modern Period*. This is not simply a book about Hero of Alexandria, but an innovative study of the textual corpus associated with him. Even so, the title does not adequately signal the rich contents of the volume. R. interrogates numerous activities linked to the corpus, not only reading, but composing, editing, interpreting, commenting, translating and enacting instructions for experiments. Issues relating to authorial intention and the engagement of readers and interpreters underpin R.'s account, which spans many centuries.

Hero is often portrayed as an 'engineer' and features prominently in histories of technology. R. does an excellent job of explaining Hero's mechanical and mathematical work, but this volume is not only about that. R. demonstrates that we can learn a great deal from studying Hero as an author. However, crucially, 'Hero' features here not only as an author, but also as the marker of a textual corpus shaped and repurposed by numerous others.

R.'s approach to studying Hero is original, bringing new insights to the texts associated with him, their motivations and organising principles, as well as their content. Much of the book is focused on the contexts in which Hero may have worked, and various situations in which his work was later used. R. discusses ancient and early modern technical readerships, the relationship between mathematics and mechanics, the materiality of manuscript and printed texts, and shifting cultural contexts of scientific and technical literature.

The volume is organised into five chapters. The first, the introduction, identifies the thread that runs through the volume. While R. is interested in the historical Hero (Chapter 3 is devoted to an imaginative exploration of who that person may have been), she is principally concerned with the Heronian Corpus, comprised of mathematical as well as technical works, some works reliably attributed to Hero (for example, the *Pneumatica*, the *Automata* and the *Belopoeica*) and others variously associated with him. R. identifies a 'core' of authentic works and a 'cloud' of interpolations, revisions and fabrications (p. 17). Studying these together, she argues, enables us to appreciate the recombinatory spirit of the "'Heronian" project' (p. 18).

R. carefully reviews issues relating to dating Hero, either to the Hellenistic period, the first century CE or the later empire. Throughout the book, it is not always clear what the name 'Hero' refers to, an actual person or a placeholder for the textual tradition. R. confronts this problem head-on, explaining that "'Hero" embraces the historical Hero along with his reception' (p. 18). R. implies – to a degree – the existence of a cohesive 'Heronian' project; it may be that it is the name 'Hero' that imparts the sense of relatedness. Part of the argument for the vitality of the Heronian tradition was the liability of the corpus to repackaging and repurposing.

In Chapter 2, 'Systems of Explanation', R. characterises Hero's self-presentation as an author. He is an arbiter of information coming from others, practitioners as well as philosophers and historians, which he has carefully reformulated for his readers (p. 21). R. argues that the Heronian corpus is distinguished by efforts to facilitate readers' journeys from one discipline to another, enabling progression from the simple to the complex, with texts designed for different levels of understanding and expertise (p. 72). Hero is compared to Strabo; these two individuals are not just authors but organisers and presenters of information, using strategies they deem appropriate to the material (p. 73). Significantly, in his discussions Hero does not rely only on philosophical demonstration; he incorporates demonstrations (*apodeixeis*) that are based on the senses, including experiments. For example, in the *Pneumatica* he explains that whether void inheres in matter is demonstrated through phenomena (p. 31).

R. argues persuasively, particularly in Chapter 3, 'Theorizing the World', that one of Hero's 'most distinctive features as an author is his systematic reorganization of a body of past technical knowledge into an accessible and orderly group of new texts', restructuring how readers negotiate between textual and material domains (p. 140). R. highlights Hero's concerns that readers will be able to understand what he has written; for this reason, he often provides vivid accounts of engagement with the technologies he describes. She argues that, while Hero's texts often have a simple structure and rhetoric, they shed light on material complexities. Looking again at the *Pneumatica*, Hero uses diagrams and constructed objects to create ways for readers to 'see' physical phenomena not normally perceptible. R. portrays Hero as creating a sort of spectacle through the drama of his narrative, displaying physics in action. The performative character of the presentation involves the reader, even when the experiment is carried out in thought.

In Chapter 4, 'Hero in Context', R. considers the 'Hero(s) of Alexandria', in three historical periods and places, Hellenistic Alexandria, first-century CE Rome and the later empire, using J. König and G. Woolf's concept of 'bookworlds' to imagine the distinct cultural contexts in which 'Hero' may have worked. R. investigates knowledge transmission, forms of texts and possible reflections in the Heronian corpus (p. 141). The depiction of Hero as 'bookish' is powerful and persuasive (p. 154), and his use of letter-labelled diagrams and narrative engages readers actively. The comparisons to Strabo and Vitruvius – with their stated ambitions to produce useful texts – are insightful, as is the highlighting of similarities between Hero and Claudius Ptolemy, particularly with regard to their discussions of instruments and experiment.

The final chapter (5), 'Hero in the Age of Print', focuses on the reception of the corpus and on various transformations and repurposings of individual works. Reviewing the period of translation and the creation of texts for elite readerships, including the Urbino court, R. engages closely with the work of historians of science. She is keenly interested in the materiality of the texts and the ways in which materiality frames reception. This concern reflects Hero's commitment to paying attention to physical things.

The book is attractively produced, with care for the diagrams and images, which usefully support the discussion. The cover illustration (also on p. 3) reproduces a colourful advertisement for Liebig's meat extract, with a visual depiction and potted history of Hero's 'steam engine', reminding us of his popular appeal. Visual traditions related to Hero's work and reputation are discussed and illustrated in the chapter on the age of print, an age often also celebrated for scientific experimentation. Physical recreations of Hero's instruments are outside of the scope of the consideration of print objects; however, museums have objects that they associate with Hero, crediting him with their description, if not their invention (see, e.g., the Smithsonian Institution's catalogue, which describes the aeolipile and 'Hero's fountain', 'a classic demonstration of fluid pressure',

[https://www.si.edu/object/heros-fountain:nmah\\_1167167](https://www.si.edu/object/heros-fountain:nmah_1167167)). Such objects, used in teaching, are another part of the 'Heronian project'.

I cannot do justice to the full richness of the book here. R. has engaged critically and generously with the extensive scholarly literature, incorporating approaches from different disciplines. As an author, R. has apparently modelled herself on Hero, curating a vast corpus, considering the historical contexts in which it operated and was operated upon, and providing a synoptic overview of the whole. Readers interested in Hero of Alexandria (whoever he was), textual traditions, history of mathematics and mechanics will find much to engage them.

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