

Francesco G. Sacco. *Real, Mechanical, Experimental: Robert Hooke's Natural Philosophy*.

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Idées, 231.) xiv + 201 pp., illus., app. Cham: Springer International, 2020.

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This book offers a concise analysis of the natural philosophy of Robert Hooke (1635–1703). Francesco G. Sacco, the author, creates a rich tapestry for Hooke's thought by studying a range of treatises from his contemporaries as well Hooke's own writings and manuscripts. In an appendix, Sacco publishes eight manuscripts that he has carefully edited and transcribed. The selection includes lectures by Hooke on topics ranging from natural history to algebra and should be most welcome to scholars unable to access the archives in person, in this case the London Metropolitan Archives, the Royal Society Archives, and the British Library.

Sacco diligently dissects Hooke's ideas about the human faculties (Ch. 1), the senses (Ch. 2), philosophical algebra (Ch. 3), matter (Ch. 4), ether (Ch. 5), motion (Ch. 6), and fossils (Ch. 7). Notable is how the author treats each theme in turn by interweaving Hooke's statements from the 1660s, 1670s, 1680s, and 1690s. Sacco argues that these formed a single philosophical program, continually evolving but always coherent. More specifically, he argues that a matter theory, based on the principle of congruity, provided "a foundation for the entire construction of Hooke's natural philosophy" (p. 88). This narrative follows an inner logic: the opening chapters lay out Hooke's methodological pronouncements; then the formulation of a theory of matter; and, finally, the latter's application to areas like mechanics and the history of the Earth. In the last chapter (Ch. 8) the author revisits the dispute between Hooke and Isaac Newton over the inverse square law, urging us to abandon priority as a framework while maintaining that Hooke decisively influenced Newton.

Methodologically, the book makes a compelling case for questioning a strict separation between matters of fact and hypotheses, a "post-Newtonian" (p. 40) distinction that sought to rid Baconianism of its speculative elements; this is a finding that is both illuminating and fruitful. Sacco also provides several novel analyses. For example, he reconstructs Hooke's ideas about the scale of nature and how this conception was influenced by his anatomical work as an assistant to Thomas Willis (pp. 8–12, 79–80). Sacco also illustrates how Hooke's engagement with the work of French mathematicians like Pierre Hérigone and François Viète influenced his notion that algebraic notation could be a model for an artificial language (pp. 57–63). A chapter-length study of Hooke's "aerial niter" theory (pp. 93–117), finally, reveals unexpected connections between speculative chemistry and experiments (often cruel) on animal respiration.

If there are any flaws in this book, they are to be found in its presentation. The study begins by conjuring an old trope: Hooke is a "marginal" and "neglected" figure (p. vii), standing in the shadow of Newton and his scholarly advocates. But I am unsure whether I find this convincing in 2021. Over the last couple of decades Hooke has become the subject of several biographies and edited volumes; hundreds of articles analyze his achievements. Sacco himself deftly engages—and cites—the senior scholars in this literature. Given the plethora of work, a new study of Hooke must begin from the opposite assumption: What does this work contribute?

In its conclusion the book offers up its analyses to arbitrate a dispute within the literature. "Who was Robert Hooke?" was a question Steven Shapin raised in 1989. While Shapin argued that Hooke was a "philosophical servant" and Mordechai Feingold riposted he was a "gentleman of science," Sacco sees his own labor as supporting the latter case: Hooke was savant rather than servant. Sacco qualifies this conclusion by noting that Hooke inhabited a "hybrid status" (p. 187): he was a gentleman philosopher who worked and collaborated with artisans. In the final two pages (pp. 195–196) *Real, Mechanical, Experimental* briefly points toward Hooke's attempts to open up the more exclusive arena of experimental philosophy to craftspeople and merchants. Yet, ultimately, the book's argument is that Robert Hooke was a natural

philosopher in a traditional sense: a thinker who investigated matter, motion, and the principles governing their action.

Jeremy Robin Schneider

*Jeremy Robin Schneider is a Ph.D. candidate in history of science at Princeton University. His dissertation is a biography of the fossil ammonite from the sixteenth through the eighteenth centuries, tracing how an odd assortment of “stones” were turned into the remains of a lost world, absent from written records and vanished off the face of the Earth.*

**Anna Marie Roos.** *Martin Lister and His Remarkable Daughters: The Art of Science in the Seventeenth Century.* 224 pp., illus. Chicago/London: University of Chicago Press, 2019. \$40 (cloth); ISBN 9781851244898.

Anna and Susanna, the daughters of the English naturalist and Royal Physician Martin Lister, famously designed and cut the copperplates for his groundbreaking study of conchology, the *Historiae conchyliorum* [History of Molluscs], which was put together between 1685 and 1692. In 2010, a descendant of Lister informed Anna Marie Roos that he had seen Anna and Susanna’s engraved copperplates for the *Historiae* in several “tea chests” in Oxford. Roos subsequently tracked down the copperplates and presented them at an exhibition in 2012 in Oxford’s Bodleian Library. In *Martin Lister and His Remarkable Daughters: The Art of Science in the Seventeenth Century*, Roos fleshes out the historical context of these overlooked materials to clarify the genesis and reception of the *Historiae* as well as the characteristics of early modern natural history images and collections more generally.

The book opens with a presentation of biographical details on Martin Lister. In addition to founding the disciplines of conchology and arachnology, Lister was one of the earliest natural historians to discuss species extinction. Those curious to learn more about this innovative figure would do well to explore Roos’s more extensive biography, *Web of Nature* (Brill, 2011). In *Martin Lister and His Remarkable Daughters*, Roos details the frustrations endemic to Lister’s collaborations with artists prior to his training of Anna and Susanna. William Lodge, for instance, was unreliable in his submission of prints. Nevertheless, Lister appreciated Lodge’s skills as an image-maker, as is apparent in the following remark written by the conchologist in a letter to Henry Oldenburg from 1673: “Words are but the arbitrary symboles of things. . . . Good Design (and such is that I send you, done by that ingenious young Gentleman & excellent Artist, my very good friend Mr William Lodge), or the things themselves, which I have all by me, would make these particulars much more intelligible and plain to you” (p. 69). This passage also offers a glimmer of insight into Lister’s thinking about representation.

Having recounted Lister’s biography, Roos delves into the making of the *Historiae*. With careful attention to detail, she describes how Lister obtained a knowledge of shells through his collecting habits, by visiting other collections in person, and by writing letters and corresponding with natural historians who offered details on shells from faraway places. Lister’s resourcefulness enabled him and his daughters to include specimens in the *Historiae* from not only England but also the Mediterranean, the Adriatic, Africa, Jamaica, Virginia and the Carolinas in North America, the Indian Ocean, the North Sea, Mauritius, France, and Ascension Island. By 1692, the *Historiae* featured 1,073 prints showing shells, slugs, and the anatomy of molluscs. Roos stresses that by investing in the beauty of his visual representations Lister could counter popular preconceptions concerning the frivolousness of focusing on such “inferior” creatures as molluscs.

This study challenges prior assessments of Anna and Susanna’s work by such scholars as Barbara Stafford who have dismissed their contributions to the *Historiae* as merely decorative in nature. In the most fascinating sections of her book, Roos explores the ways in which Lister trained his daughters to develop not only proficiency in drawing and printmaking but also the visual expertise to recognize critical surface features or minute distinctions that permitted correct classification. Moreover, Roos demonstrates that Anna and Susanna used microscopes in producing their visual representations, and she suggests that the sisters may have been among the earliest women to create natural history images using this instrument.