

BOOK REVIEW

Philip Beeley and Christopher D. Hollings (eds.), *Beyond the Learned Academy: The Practice of Mathematics, 1600–1850*

Oxford: Oxford University Press, 2024. Pp. 512. ISBN 978-0-19-886395-3. £35.00 (hardback).

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This book takes an expansive view of the ‘mathematical ecosystem’ (p. 10) as it aims to explore the practice of mathematics outwith universities and other traditional institutions of mathematical learning. Although the original idea for this edited volume emerged from a 2017 conference related to an interdisciplinary project on Mathematical Culture in Restoration England, the published title sets the date range as 1600–1850 and does not specify any geographical or geopolitical boundaries. The book nonetheless maintains a clear emphasis on mathematical culture in England during the seventeenth century.

The fifteen chapters are organized into four parts: Part I, ‘Navigation, seafaring, warfare’; Part II, ‘Professions, societies, and cultures of mathematics’; Part III, ‘Mathematical practitioners and their scientific milieus’; and Part IV, ‘The practice and teaching of mathematics’. This approach to presenting mathematical practice in a broad social context parallels choices made at the Science Museum in London in the design of Science City 1550–1800: The Linbury Gallery. Opened in 2019, the exhibit locates scientific activity at the heart of London’s rise to becoming a global city by 1800. Similarly, the earlier redesign of Mathematics: The Winton Gallery examines the wider roles of mathematics in shaping modern trade and commerce, life and death, architecture and transport. *Beyond the Learned Academy* fits in with this trend of investigating how, where and, in a few cases, what mathematics is practiced in a range of professions, including military engineers, mining and metallurgy, instrument makers, surveyors, teachers, actuaries, sailors and so on.

The book begins with an introduction that centres on well-known seventeenth-century hubs of British mathematical activity, such as Cambridge and the Royal Society, and explores connections between practical mathematicians and their academic counterparts. Though it provides a brief overview of each chapter, the introduction does not quite articulate a compelling intellectual argument that justifies the specified time frame and chosen topics. It presents a smorgasbord of chapters, a sample of mathematical practice appearing beyond academic institutions in various places during the period from the late Renaissance through to the mid-nineteenth century. The extension to 1850 allows the inclusion of the 1848 foundation of the Institute of Actuaries and discussion of James Thomson (father of Lord Kelvin).

Part I showcases three tightly coherent chapters on navigation; one featuring Elizabethan navigator John Davis, one on early modern navigation examinations for the

Dutch East India Company and one on eighteenth-century mathematical examiners for navigation in London. The fourth chapter swerves to discuss mathematics for military engineers in Portugal. From there, the parts become broader umbrellas. Part II again predominantly takes up a British context, in fact not really exploring professions, societies or cultures of mathematics much beyond England. This part includes an investigation of journal editors in north-west England, a complimentary chapter on mathematics in (again, British) literary and philosophical societies, a sweeping survey on actuarial science from John Graunt to the 1848 foundation of the Institute of Actuaries, and one chapter focused on the library of Charles Hutton as a snapshot of a mathematical culture. The last two of these are closely tied to recent books by the chapter authors, David Bellhouse's *Leases for Lives: Life Contingent Contracts and the Emergence of Actuarial Science in Eighteenth-Century England* (2017) and Benjamin Wardhaugh's *Gunpowder and Geometry: The Life of Charles Hutton, Pit Boy, Mathematician and Scientific Rebel* (2019).

Part III has the broadest range, including an examination of mathematical practitioners in sixteenth-century Italy, an investigation of mathematical businesses in seventeenth-century England and the subterranean geometry of the Deep George Tunnel built in central Germany, from 1771 to 1777. This last chapter is a case study from an excellent book by the same author, Thomas Morel, *Underground Mathematics: Craft Culture and Knowledge Production in Early Modern Europe* (2022).

That the title of the Part IV echoes the book title is somewhat perplexing as the entire volume explores the practice of mathematics. Likewise, the structural separation of the teaching of mathematics for navigation (in Part I) from what is presented in Part IV is not really explained. Part IV is a collection of chapters on various individuals involved in mathematics pedagogy: the seventeenth-century path of Johannes Faulhaber from Rechenmeister to engineer; the seventeenth-century Dutch geometrical author Sybrandt Hanszoon Cardinael; John and Euclid Speidell's use of instruments in pedagogy in Elizabethan London; and, almost as a post-script, James Thomson's nineteenth-century work at the Belfast Academical Institution. These chapters include examples of specific mathematical content that gives the reader a good sense of the technical levels involved.

This is a beautifully produced book with satisfying heft and excellent reproductions of relevant manuscript pages. It is also reasonably priced. Some readers will wish for more substantive mathematical content to accompany the in-depth explorations of people and contexts throughout the book. Abundant footnotes, a wide-ranging bibliography and a substantial index are valuable resources for both students and scholars, and the studies here invite an array of further investigations. While the chapters individually provide well-crafted and thought-provoking work from top scholars, the volume as a whole does not realize the comprehensive global picture promised in the title.