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Finding Fibonacci: The Quest to Rediscover the Forgotten Mathematical Genius Who Changed the World (Book Review)

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Abstract

Reviewed Title: *Finding Fibonacci: The Quest to Rediscover the Forgotten Mathematical Genius Who Changed the World* by Keith Devlin. Princeton, NJ: Princeton University Press, 2017. 256 pp. ISBN: 9780691174860.

Keywords

book review, Keith Devlin, Finding Fibonacci, mathematics, genius

Disciplines

Mathematics

Comments

Access book review from publisher's site:

<http://www.maa.org/press/maa-reviews/finding-fibonacci-the-quest-to-rediscover-the-forgotten-mathematical-genius-who-changed-the-world>

Finding Fibonacci: The Quest to Rediscover the Forgotten Mathematical Genius Who Changed the World

Keith Devlin's latest book tells a story about a story. After finishing his foray into the history of mathematics with [*The Man of Numbers: Fibonacci's Arithmetic Revolution*](#) (2011), Devlin found that he had interesting unused material regarding the years-long process of researching that book, along with some significant information on Leonardo Fibonacci that he had learned too late to incorporate into the history. Thinking his readers might find a story about the historical hunt fascinating, and wanting to expand his original claims for Leonardo's importance in shaping the modern world, Devlin has given us a companion work: *Finding Fibonacci: The Quest to Rediscover the Forgotten Mathematical Genius Who Changed the World*.

While *Finding Fibonacci* is a follow-up to *Man of Numbers*, readers need not be familiar with the first work in order to follow this new one. There are times when Devlin refers the reader to the earlier book for additional historical details and argumentation, but the new book contains sufficient data from the original story to explain what Devlin's research led to and how his quest arrived at the conclusions he did. Readers get a good sense of what the historical and cultural contexts were like in Italy around the start of the 13th century, with respect both to daily life and to the state of basic arithmetic and education for prospective merchants and financial operatives, and they learn how Leonardo's writings on commercial problem solving significantly contributed to modernizing that world.

While there is obvious and necessary overlap between the two books, *Finding Fibonacci* is not a rehash of *Man of Numbers*. The narrative in this book is fairly personal and looks more at Devlin's sleuthing pursuits than at the arguments supporting his conclusions about Fibonacci. As Devlin imaginatively places himself within Leonardo's world in Pisa, the reader accompanies him on his travels, experiencing some of the frustrations and set-backs of historical research as well as the thrills of success and awe at what Leonardo accomplished in introducing Italy and Western Europe to Hindu-Arabic numerals and arithmetic. In the process, the reader gains a good idea of what is involved in doing historical research on a person and a topic as elusive as Fibonacci and the role of thirteenth-century arithmetic in trade and finance.

Finding Fibonacci is a tale not just about Devlin's work on Leonardo of Pisa. It is also about the seminal contemporary efforts of others in making Leonardo's work better known. Devlin identifies four people whose labors made his own possible. The pioneering research done by historian of medieval mathematics Raffaella Franci provided Devlin with a firm grounding in the mathematics of the time period and gave him a (somewhat controversial) thesis to put forward about how the scholarly work done by Leonardo in *Liber Abbaci* made its impact on later commercial arithmetics.

Devlin's ability to read and understand Leonardo's *Liber Abbaci* was made much easier, he says, by the appearance in 2002 of Lawrence Sigler's English translation of the work, the first modern-

language version of the extant Latin text. This publication had its own episodic twists and turns. Sigler died before his work was able to be published, and the agreement with the original publisher eventually fell through. With some intervention and technical computer help from others, Sigler's widow managed to shepherd the work to press with Springer, recovering some lost passages and putting the book into a TeX format along the way.

The fourth person whose work Devlin draws upon is William Goetzmann, whose 2003 article on *Liber Abbaci*'s importance for the changing world of finance gave Devlin an expanded sense of Leonardo's significance for the modern world. This is the work that Devlin knew about before his first work on Fibonacci was published, though he had insufficient time to incorporate its ideas into his argument (it received only a brief mention there, along with a bibliographic citation). *Man of Numbers*, as the full title indicates, described Fibonacci as effecting an *arithmetic revolution*, helping Europe move from the medieval practice of using Roman numerals and abacus calculations to that of Hindu numerals and written calculations. Devlin naturally recognized that this shift had profound implications for how commercial and financial transactions took place, but he seemed to conceive of it more as a computational medium than as substantially affecting commercial practices.

In *Finding Fibonacci*, Devlin now characterizes Leonardo more grandly as the *mathematical genius who changed the world*. Goetzmann's investigation had identified certain sorts of financial calculations in *Liber Abbaci*, especially present-value calculations for comparing alternative money streams, as likely originating with Fibonacci. Given the significance of this sort of analysis to the modern world of finance, Goetzmann claimed that Fibonacci should be recognized as a ground-breaking contributor to the financial revolution that occurred in European circles. Devlin not only accepts this assessment; his entire fifteenth chapter, *Leonardo and the Birth of Modern Finance*, is given over to summarizing Goetzmann's views, and about half of it is a lengthy excerpt quoted verbatim from the article. This aspect of *Finding Fibonacci* goes substantially beyond describing Devlin's personal quest for the historical Fibonacci; it amplifies the original story itself. As such, it would be good to weave this thread in some way into any future edition of *Man of Numbers*.

The other part of *Finding Fibonacci* that ties in strongly with Devlin's assessment of Fibonacci's importance for the modern world is his crediting Fibonacci with being the motivating source behind the burgeoning commercial arithmetic tradition. This is a claim that draws strongly upon the research of Franci, mentioned above. A late 13th-century Italian abacus manuscript is identified as most likely being a near copy of a lost arithmetic text written by Leonardo himself in order to make the ideas and methods of *Liber Abbaci* more accessible to students and teachers of merchant arithmetic. This thesis is developed in some detail already toward the end of *Man of Numbers*, but it is strongly reaffirmed time and again in *Finding Fibonacci*, as if proved beyond a shred of doubt. While subsequent research may eventually establish some such connection to Fibonacci, not all historians agree that this work is based on a missing text by Leonardo, nor are they ready to credit Leonardo with being the primary source of the surge in commercial arithmetics. Jens Høyrup, a respected historian of mathematics familiar with Arabic and Latin works in this genre and who has closely examined the manuscript in question, thinks such a conclusion may be due more to our penchant to attribute revolutionary changes to well-known works. He sees Fibonacci rather as being an important contributor to an abacus tradition already

under way in some Arabic and European cultures. Regardless of how Fibonacci's role in all this is finally adjudicated by future historians, Devlin would have served his audience better by noting the controversy still surrounding this thesis, as he did in *The Man of Numbers*.

With this reservation about *Finding Fibonacci*, I think readers will find this latest book by Devlin to be as interesting and well-written as other things he has given us. His career as a premier expositor of mathematics is what drew him to Fibonacci as a subject of interest; those who want to learn more about mathematics and its history are the beneficiaries. Like his earlier work, *Man of Numbers*, this latest book can be appreciated by anyone with a modest background in mathematics and an interest in how mathematics helps shape the world we live in.
