
ZMATH 2016f.01107**Shell-Gellasch, Amy; Thoo, J. B.****Algebra in context. Introductory algebra from origins to applications.**

Baltimore, MD: Johns Hopkins University Press (ISBN 978-1-4214-1728-8/hbk; 978-1-4214-1729-5/ebook). xvi, 536 p. (2015).

Although the mathematicians at the Schools of Education in Germany never get tired of promoting the use of history of mathematics in class rooms, the books currently used in the formation of future teachers treat history at best as a collection of apocryphal anecdotes. This decline of substance is dramatic given that there are excellent sources on the history of elementary mathematics in German, in particular Tropfke's collection on the history of elementary mathematics ([Zbl 0419.01001] etc.) or the excellent series of textbooks for Bavarian schools edited by Barth et al. (Algebra, Anschauliche Geometrie, Anschauliche Analysis), not to mention the Hildesheim series on the history of mathematics in the last 6000 years [Zbl 1167.01012; Zbl 1318.01014; Zbl 1177.01004; Zbl 1318.01014; Zbl 1225.01002]. The book by Amy Shell-Gellasch and John Thoo discusses the history of elementary high school algebra and proceeds from number systems to irrational numbers, quadratic and cubic equations to logarithms. It is meant to be read by high school and college teachers as well as by students in general education courses. The historical claims are remarkably exact, which is easily explained by quickly browsing the bibliography: there you find references to quite a few editions of original sources (Apollonius, Euclid, Fibonacci, Bombelli, Descartes) as well as of a very broad selection of more recent books on the history of mathematics such as *D. M. Burton* [The history of mathematics: an introduction. 3rd ed. New York, NY: McGraw-Hill (1997; Zbl 0913.01001)], *V. J. Katz* [A history of mathematics. An introduction. 2nd ed. Reading, MA: Addison-Wesley (1998; Zbl 1066.01500)], *K. Plofker* [Mathematics in India. Princeton, NJ: Princeton University Press (2009; Zbl 1175.01004)], *E. Robson* [Mathematics in ancient Iraq. A social history. Princeton, NJ: Princeton University Press (2008; Zbl 1183.01002)] and many more. In the last two chapters on the rule of the three and logarithms, the authors included many "real life problems" that have become so fashionable in recent years: this was an unfortunate decision in my opinion, because the appearance of miles, gallons, ounces and dollars and problems about buying motorcycles do not mix well with studying e.g. a Babylonian cuneiform tablet or trying to understand Euclid. It is probably no coincidence that one of the last examples in this book is also by far the worst: the authors use logarithms to show that the 1906 earthquake in San Francisco with magnitude 8.3 was 199,526,232 times as intense as a standard earthquake, rounded to the nearest one (!). Another problematic aspect is the decision to concentrate on algebra alone, because it is difficult to separate algebra from geometry during the long evolution from Babylonian mathematics to Descartes. Coordinate systems appear when having to represent complex numbers geometrically, but the history of coordinates is not properly addressed even though Descartes' geometry is mentioned in various places. Although the book is not the answer to all of our prayers, it is a step in the right direction, and I recommend it to all teachers of mathematics. Teachers in Germany will be pleased to hear that there is a section on addition and subtraction of numbers.

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