

What can we learn from the introductions of mathematics textbooks by Jewish authors in the 12th-16th centuries?

Stela Segev – Herzog College, Israel

During the last decade, many works in Hebrew (manuscripts and printed books) from the 12th-16th centuries on scientific and especially mathematical topics have been deciphered.

In these works, one can find mainly topics like arithmetic and geometry. Apart from the mathematical content, however, we can sometimes find (especially in each introduction but not only there), more information about other topics:

- The reasons for writing these works.
- The goals in writing the works.
- Details about the author's life and his social and cultural environment.
- The author's view on the discipline of mathematics in general (is it theoretical or rather practical?)
- The author's opinions on didactic issues (Why study mathematics? How should mathematics be taught?)

In this contribution, I will present examples of the diverse information that can be found in the introductions to mathematical works written in Hebrew during the 12th-16th centuries.

I will focus specifically on information that allows us to learn about the didactic views of the authors of these works. We will get to know what different authors have written about didactic topics and try to deduce their views on issues of mathematics education.

As research in teaching in general and research in mathematics education are relatively new research disciplines, these views are particularly interesting. Here we find evidence of didactic thinking long before the subject of mathematics teaching became a canonical university discipline.

It is not surprising that many teachers throughout history have thought about didactic issues. The problem is that there is little evidence of this. Mathematics textbooks have always been very focused on the material itself and less on the author's thoughts on the way of teaching that material. Scholars and students studying mathematics education will be interested in discovering that didactic issues in mathematics teaching are as old as mathematics itself.

Special attention will be paid to Elijah Mizrahi's *Book of the Number* (posthumous print in 1533).

I believe that Elijah Mizrahi, who lived in Constantinople (~1450–1526), is a unique figure among the authors of mathematical books in Hebrew from the 12th–16th centuries. In his introduction to *The Book of the Number*, he writes extensively about his views and one can find many didactic notes incorporated within the mathematical text.

References

Primary sources

Abraham bar Hiyya, *Hibbur ha-Meshihah ve-ha-Tishboret* (Treatise on Measurement and Calculation), *Lehrbuch der Geometrie des Abraham bar Chija*; translated and commented in German by Michael Guttman (Berlin 1912–13).

Abraham bar Hiyya, *La obra enciclopédica Yesodé ha-tebuná u-migdal ha-emuná / de Avraham bar Hiyya ha-Bargeloni*; edición crítica con traducción, prólogo y notas por José M. Millás Vallicrosa (Madrid 1952).

Elija Mizrahi, *Sefer ha-Mispar*; Constantinople 1533.

Levi ben Gershom, *Sefer Maassei Chosheb – Die Praxis des Rechners, Ein hebraeisch-arithmetisches Werk des Levi ben Gerschom aus dem Jahre 1321*; translated and commented in German by Gerson Lange (Frankfurt am Main 1909).

Secondary Sources

Feistner, Edith 2016. *Vorreden und andere Paratexte in frühneuzeitlichen Rechenbüchern*, in E. Feistner, A. Holl (ed.), *Erzählen und Rechnen in der frühen Neuzeit. Interdisziplinäre Blicke auf Regensburger Rechenbücher (= Regensburger Studien zur Literatur und Kultur des Mittelalters 1)*, Berlin: Lit-Verlag, pp. 119–152.

Freudenthal, Gad 1993. *Les sciences dans les communautés juives médiévales de Provence: Leur appropriation, leur rôle*, *Revue des études juives* 152, pp. 29–136.

Lévy, Tony 1996. *La littérature mathématique hébraïque en Europe (du XV^e au XVI^e siècle)*, in C. Goldstein, J. Gray, J. Ritter (éd.), *L'Europe mathématique*, Paris, pp. 83–99.

Segev, Stela. 2010. *The Book of the Number by Elijah Mizrahi: a Mathematical Textbook from the 15th Century* (Hebrew), PhD thesis, Hebrew University of Jerusalem.

Steinschneider, Moritz 1964. *Mathematik bei den Juden*, Hildesheim: G. Olms.

Wartenberg I. 2007. *The Epistle of the Number by Isaac ben Solomon ben al-Ahdab (Sicily, 14th century): An Episode of Hebrew Algebra*, PhD thesis, Tel Aviv University and Université de Paris 7.

Mispar - an open access MediaWiki research platform for the study of medieval Hebrew arithmetic
https://mispar.ethz.ch/wiki/Main_Page