

Hermeneutics of Historical Mathematics Textbooks

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Historical mathematics textbooks provide important tools for research into mathematics education. They can vividly inform about processes how mathematical achievements entered into the domain of school knowledge. They can evidence epistemological conceptions underlying mathematical notions as practiced in different cultures. They can show methodical approaches in teaching mathematics, which might be useful to be studied for adapted adoptions in nowadays teaching – actually, not all what claims today to be new needs to be better! On the other hand, it constitutes quite a challenge to succeed to significant results of historical analysis. In fact, what can be an adapted approach to achieve such results? Evidently, analysing just one textbook cannot yield pertinent results. An example of misleading results of studying just one textbook in an isolated manner is given by the frequent allusions to Alexis-Claude Clairaut's textbook "éléments de géométrie" from 1741, where Clairaut's speaking of an alleged approach to detect geometrical truths is misinterpreted as a method of genetic teaching. Apparently, one needs to compare a chosen textbook with others. But what can be the "yardstick", the "gauge" for the assessment? In an earlier paper on the dominant French textbook author Sylvestre-François Lacroix (1765-1843) I have proposed a three-dimensional approach to achieve pertinent results in textbook analysis:

- the first dimension consists in analysing the changes within the various editions of one textbook chosen as the starting-point, say an algebra textbook, or an arithmetic one;
- the next dimension consists in finding corresponding changes in other textbooks belonging to the same oeuvre, by studying those parts dealing with related conceptual fields, say geometrical algebra, trigonometry, etc.
- the third dimension relates the changes in the textbooks to changes in the context: changes in the syllabus, ministerial decrees, didactical debates, evolution of mathematics, developments in epistemology, etc.

Later on, I have adapted the conception of objective hermeneutics, going back to Schleiermacher, to strive for an interpretation of an historical text, approaching the best the meaning as intended by the historical author. This is a much more promising undertaking as current manners to give just a subjective interpretation. Applying these approaches to a growing number of mathematics textbooks from various cultures and epochs will enrich considerable the theoretical foundations of mathematics teaching.