

REVIEW

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Review of: FOSSA, John A. (org.) *Facetas do diamante*. Rio Claro: SBHMat, 2000, 272 p.

Brazilian academic production could use more deep works on the history and education of mathematics. *Facetas do Diamante - Facets of the Diamond* -, which is mainly written in Portuguese and published by the Brazilian Society for the History of Mathematics - SBHMat -, comes into our hands as a satisfactory and competent attempt to better the situation. Before getting on with the review, however, it is by no means unimportant to understand how a book with such a title is related to mathematics. The fact is that its title - *Facets of the Diamond* - is related to the idea according to which mathematics is said to be so austere and imperious that it can be compared with a diamond. Keeping this analogy in mind, it is said that, just like a diamond, mathematics has many facets. In order to approach some of them, as it is said in the introduction, it would be necessary to think of mathematics as a cultural product of society or, in a narrower sense, as a technique mankind uses to produce culture. It is also important to note that the scope of the book is not that wide because to consider mathematics in all its aspects would be to undertake a project to be undertaken in a single work. The book, thus, concerns only three facets: 1) Mathematics Education (p. 09-106), 2) History of Mathematics (p. 107-202) and 3) The Relations between Mathematics Education and History of Mathematics (p. 203-271).

Facet (1), as was just said, concerns mathematics education. It is subdivided into the following four articles: 1.a) "Etnomatemática na luta pela terra" (p. 11-30) - Ethnomathematics in the fight for land -, which is written by G. Knijnik and relates to a Brazilian social movement in pro-agrarian reform and shows how mathematics can be involved with the attempt to construct a fairer society; 1.b) "Proposiciones para un estudio dinamico de la medida" (31-58) - Propositions for a dynamic study of measure -, which is written in Spanish by C. S. Fernández and C. V. Castro and is concerned with the attempt to show how applying a problem-solving strategy mixed with historical information can be successful in getting students to be committed with pleasure to mathematics; 1.c) "Pesquisa-ação para formação de professores" (p. 59-98) - The teaching experiment and teacher-training - which is written by R. R. Baldino and others and shows how mathematics can be approached from a variety of perspectives; 1.d) "Funções e gráficos: alguns obstáculos cognitivos" (p. 99-106) - Functions and graphs: some cognitive obstacles - which is written by J. A. Fossa and M. G. S. S. Fossa, and shows, as its title suggests, the difficulties students have in dealing with functions and their graphs and proposes a methodology based on historical aspects in order to reduce some of the aforementioned obstacles.

What is important to say, however, is that all of the four articles in section (1) are in one way or another concerned with the attempt to facilitate the process of teaching and learning of mathematics. The way of approaching the problem, however, as it is said in the book, is quite different from those undertaken by the tradition. According to the introduction, in the past, studies in mathematics education were mainly related to techniques for making mathematics more comprehensible to students; but now studies in mathematics education consider teaching of mathematics as a continuous process of getting students to think mathematically (p. 7). It is important to say that it is according to this paradigm that the aforementioned authors try to cut the diamond in order to make its first facet as bright as possible.

Facet (2), which is on the history of mathematics, comprises the following four articles: 2.a) "O livro didático no Brasil no século XIX" (p. 109-162) - The textbook in Brazil during the 19th century -, which is written by C. M. S. Silva and presents a list of textbooks used in Brazil in the aforementioned period and organises them according to the area of mathematics to which they are mainly related; 2.b) "Um processo de Newton para encontrar a tangente à uma cônica" (p. 163-168) - Newton's process for finding the tangent to a conic -, which is written by E. S. Ferreira and takes into account Newton's first chapter of "Miscellaneous Researches" on finding the tangent to a conic without knowing its diameter, published in 1667; 2.c) "Contribuição de jesuítas para a escrita da história da matemática" (p. 169-184) - The Jesuit's contribution to the writing of the history of mathematics -, which is written by S. Nobre and presents the most important Jesuit mathematicians and some of their important works on mathematics; 2.d) "Sobre a proporção entre os elementos materiais no Timeu" (p. 185-202) - On the proportion among the material elements in the Timaeus -, which is written by J. A. Fossa and G. W. Erickson and solves a problem that was raised by their article entitled "Os sólidos regulares na Antigüidade" - Regular solids in Antiquity -, published in 1990.

What is important to see here is that history as a whole, in order to make sense, has to take into account at least the presuppositions that a specific historical fact really happened and that there is sufficient evidence for the assertion that it took place somewhere in the past. History of mathematics, in its turn, goes beyond this and tries to establish how a prior fact has influenced a latter one or, in other words, it could be said that the history of mathematics is mainly concerned with how mathematicians deal with mathematical information in order to come out with some other new mathematical facts. The four articles in facet (2) are evidently related to these questions.

Facet (3) concerns the relations between mathematics education and the history of mathematics and is subdivided into the following two articles: 3.a) "Histórias da relação matemática/música e construção de significados" (p. 205-240) - Histories of the mathematics/music relationship and the construction of meanings -, which is written by O. J. Abdounur and shows how mathematics and music can be related and how this relationship can be useful in motivating students to enjoy mathematics; 3.b) "A interface entre história e matemática: uma visão histórico-pedagógica" (p. 241-271) - The interface

between history and mathematics: a historical-pedagogical perspective -, which is written by U. D'Ambrosio and discusses the history of mathematics extensively, making competent approaches to some of the main questions relating this history to mathematics education.

The fact is that both articles in facet (3) try to relate section (1) to section (2). That is, it is reasonable to say that the way historians of mathematics see how the history of mathematics is constructed has an enormous influence on how this mathematical information could be apprehended easier by the students. And, of course, the way mathematics is taught modifies the lens through which mathematicians and students see the mathematics of the past and, therefore, the way they construct the history of mathematics. It is, therefore, a two way street, which is properly approached by article (3.a), in specific terms, and by article (3.b), in general terms.

In short, Facets of the Diamond is a remarkable work in the field to which it is mainly dedicated, which is the history and education of mathematics. That is, the book raises some of the most important questions in the subject and presents ways according to which these questions can be approached. It is, therefore, strongly recommended.