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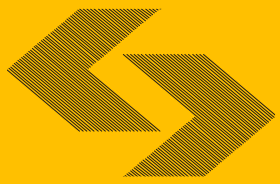

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Book review:

Mathematics of the 19th Century. Mathematical Logic, Algebra, Number Theory, Probability Theory

by

A.N. Kolmogorov and A.P. Yushkevich

The book (second, revised edition) forms a part (volume 1) of the three-volume history of mathematics in the 19^{th} century. The other two volumes treat geometry and analytic function theory (volume 2), function theory according to Chebyshev, ordinary differential equations, calculus of variations, and theory of finite differences (volume 3).

The book was first published in its Russian original in 1978. The set of three volumes concerning the 19^{th} century constituted a sequel to the history of mathematics from antiquity to the early 19^{th} century, published also in three volumes, in the years 1970-1972. On the other hand, the volumes devoted to the 19^{th} century were to be followed by the history of mathematics in the 20^{th} century, though the intention of the editors (explained by A. Kolmogorov and A. P. Yushkevich in the original Preface of the year 1977) was to stop at the time of the World War II, mainly for lack of an adequate historical perspective.

The particular chapters of the volume commented upon here are authored by altogether nine persons, usually outstanding mathematicians themselves (including, in particular, B.V. Gnedenko as one of two co-authors of the chapter on theory of probability). This is indeed a characteristic feature of this apparently historical book: it was written by people, who know the particular branches of mathematics not as a second-hand material, but as those who actively work in the field, and that with quite a success. Thus, the perspective is enriched with the acute consciousness of the persistent importance of the particular aspects of work done by the outstanding mathematicians from the past.

The course of the book, divided into chapters in accordance with the subtitle of the book, is primarily set along the deployment of the primary mathematical problems in the individual branches considered. This background is used for presentation of the most pronounced personalities of history of mathematics in the 19^{th} century. Thus, sections devoted to the description of issues,

their formulation, and solutions, are closely associated with the ones devoted to individuals, who contributed to the development of the respective areas.

Selection of the problems, which are considered in more detail, is definitely excellent. This selection does not only contain the leading problems, which in fact defined the pace of mathematics, not just in the 19^{th} century, but indeed over a much longer period of time. It also includes several interesting cases, which additionally highlight the course of events.

The present author, not being an historian of mathematics, does not feel competent to evaluate the qualities of the individual chapters nor sections. Yet, it must be admitted that I found the chapter on number theory especially interesting. Perhaps it is because many of the problems there considered are in some other form still an object of vivid interest.

There are two features of the book, which reflect definitely the fact that it was written in the Soviet Union in the middle of the 1970s. One is the inclusion of a slightly bigger number of Russian mathematicians than one would expect from a standard knowledge of history of mathematics. Thus, along with Chebyshev, Markov, and other personalities, whose names, like those of Gauss or Galois, do not seem any longer to belong to human being of flesh and blood, but to some mathematical constructs of a complex and versatile nature, there appear also scientists, who are by far less known. In most, if not all, of the cases, inclusion of these scholars is truly enlightening for the reader inasmuch as their achievements complement in an effective manner the history of particular problems and their solutions. The other is the slight ideological tang, which surfaces sometimes, like in the discussion of the work of L.A.J. Quetelet, ornamented with a citation from Karl Marx. It must be admitted that this tang, whenever identified, adds to the taste of the book, even if one does not necessarily have to share the opinions thus expressed.

The book contains, of course, a lot of information going beyond the pure mathematical considerations. In addition to the aspect of the book mentioned before, there are many explanations and details, which provide a frame for the course of the mathematical narrative. The book is certainly not a selection of anecdotes, and this was not the purpose of it. On the other hand, it is a very good source of many of them.

Translation from the Russian is accurate and careful, although in places it could be smoother, and not necessarily reminding the reader of the fact of dealing with a translated text. This is insofar important as the narrative is well organised and definitely interesting. It is stated by the publisher that all the illustrations in the book originate from the Russian edition. Indeed, this is well seen in, for instance, Figure 2 of Chapter One, where an editorial lapse

allowed Russian-language explanations to appear. Further, portraits of famous mathematicians, appearing in the book, do not have any sources. This is a flaw that should be otherwise easy to avoid.

Despite some editorial slips, the book is altogether an excellent exposition of the history of the main lines of mathematical thought. It will make a valuable item on the library shelves of any scientist dealing with mathematics. It has also a high educational value, and it certainly will be read with great interest by many students of mathematical and related faculties.

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