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BOOK REVIEW

György Révész, Bevezetés a formális nyelvek elméletébe (Introduction to the theory of formal languages), 154 pages, Akadémiai Kiadó, Budapest, 1979. (In Hungarian)

The first six chapters of the book deal with the basic properties (including closedness under various operations) of the Chomsky language classes and the corresponding classes of accepting automata, while the other three chapters are short surveys of decidability, algorithmic complexity, and parsing (including ambiguity), respectively.

Instead of the usual one-tape Turing machine the author uses a simple an equivalent two-pushdown-store machine, hereby making the automaton-hierarchy more natural and unified. In general, the whole book may be characterized by exactness, clearness, good readability, and the author's regular giving the intuitive ideas behind the formal proofs. The reader's understanding the material is helped by illustrative examples and exercises. The presentation of some topics (together with the corresponding proofs) is simpler and clearer than in the usual textbooks (such is e.g. the presentation of Earley's algorithm). A further merit of the book is its conciseness: it contains just the most important, introductory material for the interested mathematician and computer scientist. This book has been a real success with the Hungarian reading public: soon after its appearance the bookshops ran out of it, and since that time it has been the main reference and textbook on formal languages written in Hungarian.

Of course, Gy. Révész's book does not replace the larger monographs (e.g. [1]), all the same, an English edition of the book (after some minor corrections) would be desirable because it could serve as a good, modern basis for a further, detailed study of formal languages.

REFERENCE

[1] M. A. Harrison, *Introduction to formal language theory*, Addison-Wesley, Reading (Mass.), 1978. *MR* **80h:** 68060

S. Horváth (Budapest)

Manfred Knebusch and Winfried Scharlau, Algebraic theory of quadratic forms, 44 pages, Birkhäuser, Basel, 1980.

The present book is the first issue of a series called DMV Seminar. The material of the seminars of the German Mathematical Society that appeared up to now in the Jahresberichte der DMV, will appear in book form. This provides wider availability to these interesting lectures.

The authors give an account on Pfister forms and on the generic theory of the quadratic forms from the beginning of the theory to up-to-date results and problems. Some applications concerning Witt rings are also given. The material is rather condensed. The proofs are sometimes only sketched, but the important steps are given, so the reader may fill the gaps. Of course this requires some time, but it gives a deeper understanding of the applied techniques as well.

The strictly limited time of the lectures prevented the authors from giving a broader scope on the subject, and this gives inevitably a feeling of incompleteness to the reader. It seems to us that, to a certain extent, this lack could have been compensated by giving some main references on the other aspects of the theory. An enlargement of the list of references would do, even concerning the material treated in the book. (Several results of Pfister are given without exact references.)

Despite of these scantinesses the book serves well the interested reader, and should be known by all mathematicians interested in classical algebraic structures. If the subsequent volumes of the series will reach the level of the present one, then these books will be indispensable in any mathematical library.

J. Kollár (Budapest)

Philip J. Davis and **Reuben Hersh, The mathematical experience,** 440 pages, Birkhäuser, Basel, 1981.

> "Mathematics is the science of infinite, its goal the symbolic comprehension of the infinite with human, that is finite, means." (H. WEYL)

The fine structure of present mathematics (according to the AMS Classification Scheme of 1980) consists of more than 3000 categories. In most of these categories new mathematics is being created. More than one hundred thousand mathematical theorems appear per year.

What are the leading problems and the most important theorems? What is the nature of mathematics? What is its meaning? What is its methodology? How is it created? How is it used? How is it fit in with human experience? What benefits from it? What harm? What importance can be ascribed to it? How do physicists view mathematics? And how does ŠAFAREVIČ view it? Why did the small country of Hungary in the years since 1900 produce such a large number of first rate mathemticians? Why have the governments since 1940 supported mathematical research while prior that date they did not? Why did mathematics go to sleep for at least 800 years from about 300 to 1100? What is Hardyism and mathematical Maoism? What can we learn from SAADIA GAON? What is a mathematical object, structure and a proof? How the notion of infinite breaks into mathematics? What is the role of the coin of TYCHE? Why P. A. DIRAC wrote that it was more important to have beauty in one's equation than to have them fit the experiment? What is the aesthetic component of mathematics? What is algorithmic mathematics? What are the most famous results and problems of the theory of finite groups, number theory, non-Euclidean geometry, non-Cantorian set theory, nonstandard analysis and Fourier analysis? What is the role of G. PÓLYA and I. LAKATOS in teaching and learning of mathematics? What is Platonism, formalism and constructivism? Why should we believe a computer?

These and many other related questions are discussed in the book under review. The answers give a wide ranging and most readable survey of many philosophical and historical facts of mathematics. Numerous earlier treatments of these topics can be found in the Bibliography. DAVIS and HERSH guide the readers on the horizontal landscape of the most vertical science. The book is a bit too horizontal: too many seemingly independent topics have been considered, but one can always feel the vertical depth. The reviewer has no doubt that most readers will enjoy the book and will be stimulated for further readings and discussions.

G. J. Székely (Budapest)