Computer experts, electrical engineers, mathematicians, industrialists, psychologists etc. The result is what one may expect from such an interdisciplinary symposium: Informative lectures are mixed with after-dinner-type speeches, and it is not always easy for the non-expert to tell the difference. However, the book is easy to read, almost like science fiction. The reviewer cannot resist the temptation to repeat here some quotable statements:

N. Wiener: Let language translating machines learn grammar by doing exercises and having them corrected.

J. G. Kemeny: Many librarians have discovered that if a book is misplaced on the shelves and cannot be located after a short search, it is less costly to replace it than to find it.

Anonymous: European rats solve problems by insight, American rats solve problems by trial and error.

J. R. Pierce: Wang's program has enabled the I. B. M. 704 computer to prove all 350 theorems in the first 13 chapters of Principia Mathematica in 8.4 minutes.

Several of the speakers envisaged the future as a kind of symbiosis between man and computer. Mathematicians will probably be interested in Kemeny's proposal to meet the threatening library explosion by a single, centrally located, automated library. A vast electronic computer will aid readers throughout the country simultaneously in their search for information. We are all familiar with the references at the end of a research paper, they enable us to find related material in the past. Under Kemeny's system it will be possible to extend this search into the future: One quickly finds all papers which quote a given paper. Better still, one finds out from the central computer which papers have been consulted by which mathematicians. This will undoubtedly add another dimension of debatable desirability to mathematical research. But perhaps Kemeny is altogether mistaken about the library of 2000 A. D., and information will be stored not on magnetic tapes, but on clay tablets.

J. Lambek, McGill University

Numerical Analysis, by N. Macon. John Wiley and Sons, Inc., New York, 1963. xiii + 161 pages. $5.50 U. S.

As the author points out in his preface, the book is designed for a one-semester first course in numerical analysis or as a volume for independent study by one who wishes to grasp the rudiments of the subject. The author also points out that the book requires only a knowledge of freshman mathematics and calculus, as exemplified

by the textbooks of Allendoerfer and Oakley and Johnson and Kiokmeister.

An idea of the scope of the book is best obtained from the twelve chapter headings. These are as follows: Basic Concepts, Approximation of Functions by Polynomials, Iterative Methods of Solving Equations, Matrices and Systems of Linear Equations, Computational Methods with Matrices, The Characteristic Values and Characteristic Vectors of a Matrix, Interpolation, Differentiation and Integration, Remainder Terms for the Integration Formulas, Ordinary Differential Equations, Systems of First-Order Equations, Difference Equations. Since these topics are covered in a short volume of 157 pages, it is obvious that the treatment has to be quite abbreviated in many spots.

The reviewer feels that the book will fill the purpose for which it was designed; it is a useful addition to the literature. In reading the volume, a few minor inaccuracies were noted, but these will easily be corrected in a second printing. For example, on page 36, it is not correct to say that "direct use of Newton's Method ... is impossible with two equal roots, in the sense that the expression $f(c)/f'(c)$ is indeterminate when $x = c$ is a multiple root of $f(x) = 0$". The only problem introduced by a multiple root is that the speed of convergence of the iteration decreases; for example, the equation

$$x^8 - 11x^7 + 38x^6 - 25x^5 - 88x^4 + 127x^3 - 62x^2 + 13x - 1 = 0$$

has a triple root with the value $2 + \sqrt{3}$. Using 28 decimals, 36 iterations, and Newton's Method without any modification, we find this root as 3.732051. It is certainly true that $f(c)$ and $f'(c)$ both approach 0 as x approaches the root c; but this fact is immaterial to the computer, since the rates of approach differ and their quotient is thus not indeterminate to the computer.

R. G. Stanton, University of Waterloo

Cours d'analyse de l'École Polytechnique, par J. Favard. Cahiers Scientifiques, Fasc. 26. Gauthier-Villars, Paris. Tome III, Fasc. I, 294 pages, 1962, 45 NF. Fasc. II, 542 pages, 1963, 100 NF.

The two parts of volume III are devoted to ordinary and partial differential equations, integral equations, and the calculus of variations. The book is written from a classical point of view, in a pleasant, unhurried style. The chapter headings are as follows:

Volume III, Part I. (Ordinary differential equations). I Elementary methods and results; II differential equations in the real field and the equations in total differentials, theorems of existence, local problems;