Elements of Numerical Analysis, by Peter Henrici. John Wiley and Sons, Inc. New York, 1964. xv + 328 pages. $8.00.

The book is divided into three main parts besides the Introduction, which consists of 3 Chapters including one on Complex numbers. Part I consists of 5 Chapters and is concerned mainly with iteration and solution of equations. Part II deals with interpolation and approximation and consists of 6 Chapters. Part III is very brief and is devoted to Computational aspects, fixed point and floating point arithmetic and mainly to propagation of round-off errors.

An interating feature of the book is Chapter 8 on the Quotient-Difference method and its connection with Aitken-Bernoulli method. Another inclusion which distinguishes the book is a fairly complete discussion of Romberg integration in the Chapter on Numerical integration.

The reader will find very little algebra and matrix theory in this book. However the discussion of Newton's method for more than one variable and the theorem on contraction mapping in finite dimensional vector space adds to the merity of the book. Aitken's Δ^2-method, Bairstow's method for quadratic factors and Muller's method for finding the zeros of polynomials are welcome inclusions. Regarding Muller's method, a theoretical justification of the method has recently appeared (see Ostrowski, Journal SIAM, Numerical Analysis, Series B, 1964, pp. 104-130).

The book has many interesting and instructive examples and exercises throughout. It is written in a lively style and anyone using the book will find it rewarding.

There are a few minor misprints; for example, on p. 247, the first mean-value theorem is referred as the second. Chapter 10 begins on p. 198 but the contents lists it as 194. These and other minor slips, it is hoped, will be corrected in later editions. On the whole the book is an excellent introduction to the subject and can be used as a text-book in a 1 or 2 semester course on numerical analysis.

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"Proceedings of a Harvard Symposium on Digital Computers and their Applications", The Annals of the Computation Laboratory of Harvard University, XXXI, 1962. Harvard University Press, Cambridge, Mass. 332 pages. $18.00. (Published in Canada by S.J. Reginald Saunders and Co. Limited, Toronto.)

This volume gives the papers presented at a symposium at Harvard University in April, 1961. The contributions cover a wide

range of applications of computers including statistics, educational research, crystallography, medicine, public health, psychology, economics, information retrieval, and number theory. It might be best described in a few words by quoting the first and last sentences of the introduction: "The purpose of this volume is to present to the reader a cross section of university research, actual or planned, related to computers.... There are omissions - music and theology, for instance, are not represented - but, on the whole, the reader who glances at all papers, stopping for a longer look where his interests dictate, can be assured that he has visited most of the places where computers are already at home and some into which they are about to move."

This is a most handsome looking volume which sells, unfortunately, for a most handsome price.

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Numerical Methods in Fortran, by John M. McCormick and Mario G. Salvadori. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1964. xii + 324 pages. $10.50.

This book is, according to the cover, "an elementary book on numerical analysis in which, for the first time, each numerical method is programmed for use on electronic computers". The book virtually consists of three parts. The first part offers the material usually given in elementary texts on numerical methods, including sections on boundary- and characteristic value problems in ordinary differential equations. The second part consists of more than 40 complete programs and subroutines in Fortran, accompanied by flow-charts and prints of results, in which the methods discussed in the first part can be seen at work. Several peculiarities of Fortran are explained. The book does not, however, make formal Fortran references dispensible. The third part offers a few routines "based on techniques beyond the scope of the analytical part of this book", like a complex square root routine (?) and routines for computing Bessel functions, for solving simultaneous complex equations and for computing integrals with interval halving. "They are included to make the book more valuable as a handbook of useful Fortran programs." Speaking from the numerical analyst's point of view, the programs are not very sophisticated, the only bit of glamour being a Richardson extrapolation step at the end of a number of them. Iterative procedures are either stopped when two successive iterates coincide (Newton Raphson) or differ by a prescribed epsilon (Simpson's interval halving), or after a prescribed number of iterations has been performed (Laplace's equation), or by manual interruption. Therefore, the book is more valuable for those seeking to gain some experience in Fortran programming than for those wishing to learn numerical analysis. The book is well-written and excellently edited.

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