matrices, and the field of values (one of the omitted proofs is that of the convexity of the field of values).

The few algorithms presented are given solely as constructive existence proofs, and not as computational techniques. Nevertheless, the numerical analyst would find it a handy reference book, with much information condensed into a very small volume. The student will find many challenges, and the careful documentation will permit him to look up the proofs, when necessary, if his library is adequate. The proofreading seems to have been very carefully done, for which the reader can be doubly grateful in view of the compactness.

A. S. H.

4[H, X].—J. F. TRAUB, *Iterative Methods for the Solution of Equations*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1964, xviii + 310 p., 24 cm. Price $12.50.

As "iterative methods," the author includes Newton's and the method of false position, but he excludes Graefe's, and even Bernoulli's. By "equations," he means nonlinear equations, no consideration being given to linear systems.

There is a wealth of literature buried in journals on the subject of the numerical solution of equations, but remarkably little in books. In this book there is a fourteen-page bibliography, but only five items, or possibly six, are books devoted exclusively or primarily to the numerical solution of nonlinear equations. Of these, perhaps the best known, and the earliest one to appear in English, is by Ostrowski, published in 1960. Books on numerical methods in general usually do no more than summarize three or four of the standard methods, and sometimes not even that.

The author attempts to develop a general theory of the particular class of methods under consideration. Accordingly, the initial chapters present rather general theorems on convergence, and outline methods of constructing functions for iteration. Subsequent chapters deal with particular types (e.g., one-point), or with particular complexities (e.g., multiple roots). One short chapter deals with systems, and a final chapter gives a compilation of particular functions. Several appendices give background material (e.g., on interpolation), some extensions (e.g., "acceleration"), and discussion of some numerical examples. But except for this, very little is said about computational error.

The author has attempted to trace the methods of their sources, and references can be found in the bibliography to Halley (1694) and Lambert (1770), though not to Newton! An interesting feature of the bibliography is the listing with each item of each page in the text where reference is made to this item.

The rather elaborate systematic notation permits greater compactness, but may seem a bit forbidding to the casual reader who wishes to use the book mainly for reference. As a text, its value could have been enhanced by the addition of some problems. But as a systematic development of a large and important class of methods, the book is by far the most complete of anything now to be found in the literature.

A. S. H.

5[I].—D. S. MITRINOVIĆ & R. S. MITRINOVIĆ, *Tableaux d'une classe de nombres reliés aux nombres de Stirling*, (a) II. *Publ. Fac. Elect. Univ. Belgrade* (*Serie*: *Math. et*

Phys.) No. 107, 1963, 77p., (b) III. *Belgrade, Mat. Inst., Posebna izdanja*, Knjiga 1 (*Editions speciales*, 1), 1963, 200 p.

A number of tables by these authors have been reviewed in *Math. Comp.* from time to time. In recent years the tables have most commonly appeared, as does (a) above, in *Publ. Fac. Elect. Univ. Belgrade*, whereas in (b) we now have the first "book" in a new series of occasional special publications of the Mathematical Institute at Belgrade; the new series is destined to contain monographs, extended original articles and original numerical tables.

In (a) and on p. 13–156 of (b) we find two continuations of tables (*Publ. Fac. Elect.*, No. 77, 1962) already reviewed in *Math. Comp.*, v. 17, 1963, p. 311. The integers ${}^pP_n{}^+$ defined by

$$\prod_{r=0}^{n-1} (x - p - r) = \sum_{r=0}^{n} {}^pP_n{}^+x^+,$$

previously listed for $p = 2(1)5$, are now listed in (a) for $p = 6(1)11$ and in (b) for $p = 12(1)48$. In both (a) and (b) the values of the other arguments for given p are $n = 1(1)50 - p$, $r = 0(1)n - 1$; when $r = n$, the value of ${}^pP_n{}^r$ is obviously unity.

In the second part (p. 159–200) of (b) are tables of the integers ${}^\nu S_n{}^k$ defined by

$$t(t - 1) \cdots (t - \nu + 1)(t - \nu - 1) \cdots (t - n + 1) = \sum_{k=1}^{n-1} {}^\nu S_n{}^k t^{n-k},$$

where it is to be noted that the left side contains $(n - 1)$ factors, $(t - \nu)$ being omitted. The table is for arguments $n = 3(1)26$, $\nu = 1(1)n - 2$, $k = 1(1)n - 1$.

The tabular values were computed on desk calculating machines, and all are given exactly, even when they contain more than 60 digits. Various spot checks were made in the Instituto Nazionale per le Applicazioni del Calcolo at Rome and in the Computer Laboratory of the University of Liverpool. Details of some of the verificatory computations are given.

A. F.

6[I, X].—PETER HENRICI, *Error Propagation for Difference Methods*, John Wiley & Sons, Inc., New York, 1963, vi + 73 p., 24 cm. Price $4.95.

This little monograph is a sequel to the author's now classic *Discrete Variable Methods in Ordinary Differential Equations*, published by Wiley in 1962. The subject here is the use of multi-step methods for systems of equations, and the treatment, though in the spirit of the previous volume, is independent of it. The author remarks, however, that to pass from one to several variables was "not a mere exercise in easy generalization," so that the reader would be well advised to read the volumes in the order of their appearance. The two together provide a unified treatment of the subject that will not soon be surpassed.

A. S. H.

7[K].—I. G. ABRAHAMSON, *A Table for Use in Calculating Orthant Probabilities of the Quadrivariate Normal Distribution*, 5 p.+ 71 computer sheets, ms. deposited in UMT File.