when the number, N, of abscissas is equal to 200(200)1000 and 2000. The abscissas x_{kN} (the zeros of the Hermite polynomial $H_N(x)$), the corresponding weights, and the products of the weights multiplied by exp (x_{kN}^2) are all tabulated in floating-point form to 27S, except for $N = 2000$, where the precision is limited to 26S. (Because of symmetry, only the positive zeros and corresponding weights are given.)

The zeros and weights were checked to the precision of the printed entries by the respective relations

$$\prod_{k=1}^{N/2} x_{kN}^2 = N!/[2^N(N/2)!] \quad \text{and} \quad 2\sum_{k=1}^{N/2} a_{kN} = \sqrt{\pi}\,.$$

Further details of the calculations are presented in the introduction to these tables, which constitute a unique supplement to the valuable tables of Stroud & Secrest [3].

J. W. W.

1. Bruce S. Berger & Robert Danson, *Tables of Zeros and Weights for Gauss-Laguerre Quadrature*, ms. deposited in UMT file. (See *Math. Comp.*, v. 22, 1968, pp. 458–459, RMT **40**.)
2. Bruce S. Berger, Robert Danson & Robert Carpenter, *Tables of Zeros and Weights for Gauss-Laguerre Quadrature to* 24S *for* $N = 400$, 500, *and* 600, and *Tables of Zeros and Weights for Gauss-Laguerre Quadrature to* 23S *for* $N = 700$, 800, *and* 900, mss. deposited in the UMT file. (See *Math. Comp.*, v. 23, 1969, p. 882, RMT **60**.)
3. A. H. Stroud & Don Secrest, *Gaussian Quadrature Formulas*, Prentice-Hall, Englewood Cliffs, N. J., 1966. (See *Math. Comp.*, v. 21, 1967, pp. 125–126, RMT **14**.)

3[2.20, 13.00].—R. J. Herbold & P. N. Ross, *The Roots of Certain Transcendental Equations*, Professional Services Department, The Procter and Gamble Co., Winton Hill Technical Center, Cincinnati, Ohio, ms. of 32 typewritten pp. deposited in the UMT file.

Herein are tabulated 15S values (in floating-point form) of the first 50 positive roots of the equations $x \tan x - k = 0$ and $x \cot x + k = 0$, for $k = 0(0.001)0.002(0.002)0.01$, $0.02(0.02)0.1(0.1)1(0.5)2(1)10(5)20(10)60(20)100$. These decimal approximations to the roots were calculated on an IBM 360/65 system, using Newton-Raphson iteration programmed in double-precision Fortran.

As the authors note in their introduction, these tables can be considered to be an extension of the tables of Carslaw & Jaeger [1] for the same range of the parameter k.

A specific example of the numerical solution of a problem in the field of chemical engineering is adduced to show the practical need for these more elaborate tables.

J. W. W.

1. H. S. Carslaw & J. C. Jaeger, *Conduction of Heat in Solids*, 2nd ed., Oxford University Press, Oxford, 1959.

4[2.35, 6].—Louis B. Rall, *Computational Solution of Nonlinear Operator Equations*, John Wiley & Sons, Inc., New York, 1969, viii + 224 pp., 24 cm. Price $14.95.

The topic of this book has received an increasing amount of research in the last several years, and many books devoted at least in part to this subject have already appeared (for example, the books by Collatz, Goldstein, Kantorovich and Akilov, Keller, Kowalik and Osborne, and Ostrowski). In comparison with these existing works, the present book places somewhat more emphasis on computational aspects and practical error analysis.

Chapter 1, comprising about a quarter of the book, is an introduction to Hilbert and Banach spaces and the solution of linear operator equations, while a somewhat shorter Chapter 3 contains additional background material on differentiation of nonlinear operators. In between is a short (29 pages) chapter on the contraction mapping principle, and some of its variants, with an application to an integral equation.

The last and longest chapter (85 pages) is devoted to Newton's method and a few of its modifications. The author presents the now famous Kantorovich analysis and then discusses in some detail the implications of these results for practical programming. This discussion, together with the point of view put forth, is perhaps the strongest and most novel part of the book and concerns primarily the author's own research using interval arithmetic and similar ideas in order to obtain error bounds. Additional results relating to error estimation, as well as applications to various differential and integral equations, are also given.

Although the book makes a valuable contribution in those areas that it covers, its scope is rather limited. There is little or no mention of the important class of minimization methods nor of a large number of variants of Newton's method including, in particular, the secant methods and more recent "quasi-Newton" methods. Even within the confines of Newton's method, the author has restricted his analysis to the setting of normed linear spaces which precludes mention of the powerful results available in partially ordered linear spaces.

Nevertheless, the book will make useful supplementary reading in various graduate courses in both computer science and mathematics. Unfortunately, however, it seems to be overpriced, for its size, by a factor of almost two.

J. M. O.

5[2.45, 12].—JULIUS T. TOU, Editor, *Advances in Information Systems Science*, Vol. 1, Plenum Press, New York, 1969, xv + 303 pp., 23 cm. Price $14.00.

This volume is part of a proposed series which attempts "(1) to provide authoritative review articles on important topics which chart the field with some regularity and completeness, and (2) to organize the multidisciplinary core of knowledge needed to build a unified foundation." The articles in this volume do indicate some of the most prominent directions in the field of computer or information systems science. The series is aimed at "a wide audience, from graduate students to practicing engineers and active research workers." However, in order to avoid the learning of appropriate responses to the terminology of the field without learning the meanings of the terms, the prospective reader should have some familiarity with the field, especially the history and justification of the current lines of investigation.

The first article, "Theory of Algorithms and Discrete Processors," by V. M. Glushkov and A. A. Letichevskii (translated by Edwin S. Spiegelthal), is slightly out of place in this collection. In a modified form (even including its brief and incomplete excursion into the history of the development of automata theory) it might have been published as original research. Still, it is representative enough to serve as a description, by example, of one of the main directions of automata theory.