superficial treatment of stability and convergence of difference methods for hyperbolic and parabolic problems, a subject which could as well have been left out completely.

3. *The Group Diffusion Equations of Reactor Physics.* This chapter presents a derivation of these basic equations and some difference approximations to them. Much stress is rightly put on the correspondence between certain laws of physics and properties of the matrices of the discrete problems.

4. *Successive Overrelaxation* gives the standard theory for this iterative method. Also included are methods for the estimation of the optimal parameter and a discussion of the role of eigenvector deficiency.

5. *Residual Polynomials.* The author describes Lanczos' methods, Chebyshev extrapolation, and some combined semi-iterative methods to improve the convergence rate of iterative procedures.

6. *Alternating Direction Implicit Iteration.* The commutative model problem and the selection of optimal parameters are treated in full detail. Available results for general noncommutative problems are surveyed. The author advocates compound iteration techniques for the general case.

7. *The Positive Eigenvector* is a short section on an important aspect of the eigenvalue problem. There is a discussion of several methods and strategies for the determination of the first eigenvalue.

8. *Numerical Studies for the Diffusion Equation* contains results from a series of numerical experiments designed to compare the efficiency of different numerical methods. This is a valuable contribution to the literature. Both practical and theoretical numerical analysts would profit very much from a larger literature on the results of careful numerical experiments.

9. *Variational Techniques for Accelerating Convergence* discusses the periodic application of variational acceleration techniques in linear iterative schemes.

This book undoubtedly contains much interesting material. It can serve as a source for numerical ideas but it should be read with care. The presentation of the material is not very good and part of this book lacks in precision.

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91[L].—Henry E. Fettis & James C. Caslin, *Tables of the Modified Bessel Functions $I_0(x)$, $I_1(x)$, $e^{-x}I_0(x)$, and $e^{-x}I_1(x)$*, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio, March 1967, ms. of 223 computer sheets deposited in the UMT file.

These impressive manuscript tables consist of 15S approximations to the modified Bessel functions of the first kind of orders 0 and 1, that is $I_0(x)$ and $I_1(x)$, and their respective products with e^{-x}, for $x = 0(0.001)10$.

These values were computed by double-precision arithmetic on an IBM 7094 system, using a computer program based on the integral representation

$$e^{-x}I_n(x) = \frac{1}{\pi}\int_0^\pi e^{-x(1-\cos\theta)}\cos n\theta d\theta\,.$$

This reviewer has compared these data with the 18D and 21D values of I_0 and I_1 given by Aldis [1] and thereby detected several rounding errors in the present tables, none exceeding a unit in the least significant figure.

The authors compared their values of $e^{-x}I_n(x)$, $n = 0, 1$, with the corresponding 10D data in Table 9.8 in the *NBS Handbook* [2] and discovered a number of rounding errors in the latter, which they will enumerate separately in an appropriate errata notice.

Despite the presence of rounding errors, these manuscript tables constitute a valuable addition to the extensive tabular literature relating to modified Bessel functions [3].

J. W. W.

1. W. S. Aldis, "Tables for the solution of the equation $d^2y/dx^2 + 1/x \cdot dy/dx - (1 + n^2/x^2)y = 0$," *Proc. Roy. Soc. London*, v. 64, 1899, pp. 203–223.

2. M. Abramowitz & I. A. Stegun, editors, *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*, National Bureau of Standards Applied Mathematics Series, No. 55, U. S. Government Printing Office, Washington, D. C., 1964.

3. A. Fletcher, J. C. P. Miller, L. Rosenhead & L. J. Comrie, *An Index of Mathematical Tables*, second edition, Addison-Wesley Publishing Company, Reading, Massachusetts, 1962, v. I, pp. 417–418, 423.

92[L, X].—C. Chang & C. Yeh, *The Radial Prolate Spheroidal Functions*, USCEE Report 166, Department of Electrical Engineering, University of Southern California, Los Angeles, California, June 1966, iii + 25 + 990 pp., 28 cm.

The radial prolate spheroidal functions are the two independent solutions of the differential equation

$$\frac{d}{d\xi}\left[(\xi^2 - 1)\frac{d}{d\xi}R_{mn}(c, \xi)\right] - \left[\lambda_{mn} - c^2\xi^2 + \frac{m^2}{\xi^2 - 1}\right]R_{mn}(c, \xi) = 0$$

which occurs in the solution of the time-periodic scalar wave equation in prolate spheroidal coordinates by the method of separation of variables.

The authors have herein tabulated to 8S the functions $R_{mn}^{(1)}(c, \xi)$, $R_{mn}^{(2)}(c, \xi)$ and their first derivatives with respect to ξ for $m = 0(1)9$, $n = m(1)9$, $c = 0.1(0.1)1(0.2)6$, $\xi = \xi_0(0.001)1.01(0.01)1.1$, $1.25(0.25)2$, 5, 10, where ξ_0 varies from 1.004 when $m = 0$ to 1.009 when $m = 9$. Functional values corresponding to $\xi = 1.044$ and 1.077 are also included; they were calculated to check the corresponding entries in the tables of Flammer [1]. For each of the listed values of m, n, and c the corresponding eigenvalue λ_{mn} is tabulated to 12S except for $m = 0, 1$, where only 8S are given.

All the underlying calculations were carried to 12S at the computing center at the University of Southern California, and the final results were compared with the tables of Flammer, Slepian [2], Slepian & Sonnenblick [3], and Hunter et al. [4]. The computed values were also checked by use of the appropriate Wronskian relation. The belief is expressed by the authors that the tabulated values are accurate to at least 7S.

The computer output was reduced photographically prior to printing in report form, so that the contents of two computer sheets now appear on a single page; however, the numbering of the original sheets has been retained.