error estimates pertinent to that application. In the seventh paper, Daubechies discusses wavelet bases on an interval and the interaction of wavelets with the differentiation operator. At issue in the first topic is how to avoid edge effects when a wavelet basis on the line is restricted to an interval. In the second topic, the question is how to compute the derivative of a function efficiently from its wavelet decomposition. In the eighth paper, Donoho analyzes smooth wavelets whose dual bases consist of characteristic functions of intervals. He discusses the characterization of smoothness classes using such wavelet transforms. In the ninth paper, Flandrin and Gonçalvès study bilinear extensions of the wavelet transform. They explore the relation between time-scale and time-frequency energy distributions. In the final paper, Goodman, Micchelli, and Ward investigate spectral radius formulas for subdivision operators. They find related finite-rank operators with the same spectral radius. The rank of this associated operator depends only on the length of the mask in the subdivision operator and on the dimension of the underlying ambient space.

Each paper has a valuable bibliography, and the book has a subject index.

E. W. C.

14[28-00, 65D30].—Daniel Zwillinger, *Handbook of Integration*, Jones and Bartlett, Boston, MA, 1992, xvi + 367 pp., $23\frac{1}{2}$ cm. Price \$49.95.

This book is a compilation of methods for dealing with integrals appearing in science and engineering problems. It starts with two introductory chapters, one on applications of integration and one containing concepts and definitions. This chapter closes with several sections on the transformation of integrals which is one of the more useful tools in evaluating integrals, both analytically and numerically. Chapter III discusses exact analytical methods, among them the use of computer packages which include a symbolic integrator. The next chapter on approximate analytical methods discusses among other techniques, asymptotic expansions, Laplace's method, stationary phase and steepest descent. The final two chapters are on numerical methods. Chapter V is concerned mainly with the use of Numerical Integration Software while Chapter VI discusses some of the standard numerical integration techniques such as adaptive integration, Clenshaw-Curtis and Gauss-Kronrod rules, cubic splines, lattice rules, Monte Carlo and number-theoretic methods, etc. Each section contains a particular procedure, usually followed by an example, notes and references. The notes are important for the understanding of the main text and sometimes correct inaccuracies therein. They also extend the scope of the text and provide many of the references. The references range from the standard sources to the recent literature.

This book is very uneven. On the one hand, it contains many sections of substance and great practical interest; on the other hand, it contains much trivial and useless material. Thus, the section on the MIT Integration Bee is entirely superfluous, nor could I see much point in the section on integral inequalities, even though it gave an impressive list of such inequalities. The section of excerpts from GAMS could be dispensed with and replaced with a reference and similarly with the collection of integration formulas over planar regions. In place of these sections, I would have liked to see a treatment of Sinc rules for one-dimensional integration and a discussion of periodization in quasi-Monte Carlo rules for multidimensional integration.

There are more than the usual quota of typographical errors and many questionable statements as well as much material which could use further elaboration. However, in spite of its shortcomings, the book serves a useful purpose and should be of benefit to the audience to whom it is addressed.

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15[65–00, 65–02, 65D30].—H. V. SMITH, *Numerical Methods of Integration*, Studentlitteratur, Chartwell-Bratt, Kent, England, 1993, iv + 147 pp., $22\frac{1}{2}$ cm. Price: Softcover $17.00.

This reference monograph summarizes a class of one-dimensional quadrature methods. Typically, the results given are presented in the form

$$\int_a^b w(x)f(x)\,dx = \sum_{j=1}^{n} w_j f(x_j) + E_n(f),$$

along with explicit descriptions for the weights, w_j, the abscissae, x_j, and the error term, $E_n(f)$. In addition, the author often adds brief comments on the evaluation of the sum approximating the integral, or on the error term. Although derivations of the formulae are omitted in the monograph, references are given to paper publications where the formulae are derived and discussed in detail. In addition, one finds worked examples illustrating the application of the formulae, as well as supplementary problems at the end of each chapter.

The monograph is divided into the following chapters:

1. Newton-Cotes Quadrature
2. Gauss-Type Quadrature Rules
3. Chebyshev Polynomials
4. The Error Term
5. Kronrod Quadrature
6. Oscillatory/Periodic Integrals
7. Integrals Involving Singularities
8. Infinite, Semi-Infinite Integrals
9. Divergent Integrals

These titles are sufficiently descriptive to give the reader an idea of the content of each chapter.

At the end of the monograph, one also finds several pages devoted to each of the following:

(i) Solution to Selected Supplementary Problems
(ii) Appendix A. NAG
(iii) Appendix B. Tables
(iv) Bibliography
(v) Index

The above headings (i), (iv) and (v) are sufficiently descriptive to make their content self-explanatory. The Appendix A, NAG, contains a brief reference