As an exercise in evaluating how useful this listing might be in actual practice, this reviewer made a listing of 16 real constants (before studying the authors' definition of the book's contents). Of these, all but four were actually indexed in the book. It is worth mentioning, and briefly discussing, the four exceptions:

1. 4.6692016091 = Feigenbaum's δ constant (from the theory of chaos). This constant was not included in the standard domain.
2. 14.1347251417 = the imaginary part of the first zero of Riemann's ζ function. Note the "Real" in the title of the book.
3. $0.4619397663 = \frac{1}{2}\sin(3\pi/8) = \frac{1}{4}\sqrt{2+\sqrt{2}}$. Twice this constant is included.
4. $0.9772498680 = P(2)$, where $P(\cdot)$ denotes the cumulative Gaussian probability function. Twice this constant is included, since $P(x) = \frac{1}{2}[1 + \operatorname{erf}(x/\sqrt{2})]$, and the values of erf are indexed.

This exercise underscores both the strengths and the weaknesses of the book. On one hand, it appears that most numbers ordinarily encountered in mathematics are included. However, there are some holes in the list. Most notable are those cases where the constant one is looking for differs from some special function result by a simple rational factor, such as one-half.

Twenty years ago, tables of mathematical functions were widely used by both pure and applied mathematicians. In the intervening years such compilations have been rendered obsolete by the widespread availability of scientific calculators and subroutine libraries that can evaluate even fairly esoteric functions. One wonders if eventually the same fate will come to a book such as this. Already part of this table, namely the tabulation of roots of simple polynomials, has been rendered obsolete by the availability of relation-finding algorithms in packages such as Mathematica. These routines detect polynomial roots by searching for small integer relations in the vector $(1, x, x^2, x^3, \ldots, x^{n-1})$. Perhaps eventually such routines can be expanded in power to search for many other possible relationships. But in the meantime the Borwein book is all we have.

David H. Bailey

Numerical Aerodynamic Simulation Systems Division
NASA Ames Research Center
Moffett Field, California 94035

21[11-01, 11B39].—S. Vajda, *Fibonacci & Lucas Numbers, and the Golden Section: Theory and Applications*, Ellis Horwood Series in Mathematics and its Applications, Wiley, New York, 1989, 190 pp., $24\frac{1}{2}$ cm. Price \$64.95.

Although there is a journal devoted to Fibonacci numbers and their generalizations, few monographs deal with this subject alone. There is a short book about Fibonacci and Lucas numbers by V. E. Hoggatt, Jr. [1] and a little book by N. N. Vorob′ev [2]. Thus, Vajda's book, which is longer than both of these books combined, is a welcome addition to the literature of the subject.

The introduction lists some problems in which Fibonacci numbers arise, from biology to computer science and from poetry to probability. In the main body of the book, scores of identities involving Fibonacci and Lucas numbers are derived. The important ones are numbered and repeated at the end of the book for easy reference. Some of the topics considered are Pell's equation, paradoxical dissection of rectangles, the golden section, finite sums involving Fibonacci and Lucas numbers and binomial coefficients, divisibility properties, distribution of Fibonacci numbers modulo m, search for extrema of real functions, and analysis of games. One chapter was written by B. W. Conolly; it deals with *Meta-Fibonacci sequences* such as $H(1) = H(2) = 1$, $H(n) = H(n - H(n-1)) + H(n - H(n-2))$ for $n > 2$. An appendix gives results from number theory which are used in the main text.

The reader should beware of many typographical errors and even a few factual errors. For example, formula (77) on p. 60 states that

$$\sum_{i=1}^{\infty} 1/F_i = 3 + \sigma = 4 - \tau = \frac{7-\sqrt{5}}{2}.$$

In fact, it is a famous unsolved problem to evaluate this sum in closed form or to decide whether it is transcendental. The proof which follows (77) actually demonstrates the true formula

$$\sum_{i=0}^{\infty} 1/F_{2^i} = \frac{7-\sqrt{5}}{2}.$$

S. S. WAGSTAFF, JR.

Department of Computer Sciences
Purdue University
West Lafayette, Indiana 47907

1. V. E. Hoggatt, Jr., *Fibonacci and Lucas numbers*, Houghton Mifflin, New York, 1969.
2. N. N. Vorob′ev, *The Fibonacci numbers*, Translated from Russian by Halina Moss, Blaisdell, New York, 1961.

22[65–06, 65L05, 65P05].—R. E. BANK, R. BULIRSCH & K. MERTEN (Editors), *Mathematical Modelling and Simulation of Electrical Circuits and Semiconductor Devices*, International Series of Numerical Mathematics, Vol. 93, Birkhäuser, Basel, 1990, xv + 297 pp., 24 cm. Price $59.00.

These are the proceedings of a conference held at the Mathematics Research Institute in Oberwolfach, October 30–November 5, 1988. There are eight contributions on circuit simulation, most of them dealing with the numerical treatment of differential-algebraic equations, and 13 contributions on device