$\alpha'(x) > 0$ a.e. in $[-1, 1]$. This is then applied to discuss interpolation of analytic functions at the zeros of orthogonal polynomials. The chapter concludes with a result on the equidistribution of zeros (more precisely, their projections on the unit circle) of orthogonal polynomials. In Chapter IV, the author then turns his attention to the convergence and summability theory of orthogonal series, assuming measures with support in $[-1, 1]$. The final Chapter V presents Szegö's theory, i.e., the theory of orthogonal polynomials on the unit circle, and contains further important asymptotic results on orthogonal polynomials, Christoffel numbers, and the distance between consecutive zeros.

Each chapter is followed by a collection of exercises, which form an integral part of the book. These in turn are followed by historical notes. In an epilogue, the author points toward certain parts of the theory which are not as yet completely developed and lists a series of important open problems. This should be especially valuable for the young mathematician seeking research problems in the area of orthogonal polynomials.

It is impossible, in a brief review, to convey the extraordinary wealth and beauty of the results presented. Any reader who seriously studies this book will find his efforts richly rewarded.

It is only to be regretted that the printing is not up to the high standards one has come to expect from the publisher and that there are a disturbing number of typographical errors.

W. G.

18[2.35].—J. M. Ortega & W. C. Rheinboldt, *Iterative Solution of Nonlinear Equations in Several Variables*, Academic Press, New York, 1970, xx + 572 pp., 24 cm. Price $24.00.

This mature presentation is said by the authors to be the outgrowth of their research and graduate teaching over the last five years. Their "aim is to present a survey of the basic theoretical results about nonlinear equations in n dimensions as well as an analysis of the major iterative methods for their numerical solution—to provide here a text for graduate numerical analysis courses—to make the work useful as a reference source".

The authors succeed admirably. They supply numerous exercises to extend the text, many with references to research articles by other workers. Another outstanding feature is the addition of a supplement, called "Notes and Remarks", to each section. This auxiliary material gives pertinent literature citations, and valuable extensions of the text which give the reader a feeling for the state of our current knowledge in this field. They supply a two page annotated list of basic reference texts and a thirty-five page comprehensive bibliography.

The authors deal almost exclusively with methods that involve, at most, first-order derivatives. They divide the book into five parts, with each part containing two or more sections.

Part I—Background Material—contains:

Section 1—Sample Problems—an interesting collection of problems from ordinary differential, partial differential, and integral equations, along with minimization and variational problems. This section gives the motivation for studying the subject.

Section 2—Linear Algebra—and

Section 3—Analysis—good summaries of multivariate calculus and linear algebra, with references to the basic texts.

The remainder of the book is now developed within the background of Part I. A listing of the remaining section headings may suffice to indicate the scope of the book:

Part II—Nonconstructive Existence Theorems,
 Section 4—Gradient Mappings and Minimization,
 Section 5—Contractions and the Continuation Property,
 Section 6—The Degree of a Mapping;

Part III—Iterative Methods,
 Section 7—General Iterative Methods,
 Section 8—Minimization Methods;

Part IV—Local Convergence,
 Section 9—Rates of Convergence—General,
 Section 10—One-Step Stationary Methods,
 Section 11—Multistep Methods and Additional One-Step Methods;

Part V—Semilocal and Global Convergence,
 Section 12—Contractions and Nonlinear Majorants,
 Section 13—Convergence under Partial Ordering,
 Section 14—Convergence of Minimization Methods.

An analysis of asymptotic convergence rates and appropriate indications of how to use the general theory in the presence of round-off errors are given. The book is not only well conceived mathematically, but it is beautifully written and "as self-contained as possible".

E. I.

19[2.45, 2.55, 12].—John K. Rice & John R. Rice, *Introduction to Computer Science*, Holt, Rinehart & Winston, Inc., New York, 1969, xv + 463 pp., 24 cm. Price $12.95.

Among those concerned with teaching computer science, there is a view, currently in the ascendant, that one ought to teach principles of algorithm construction rather than mere programming technique. The authors of this book hold this view, and have ably constructed a textbook, based upon it, for a first course in computer science. They have written a textbook as textbooks ought to be written: clear prose, ample and relevant exercises, clean organization, but with a great deal of inherent flexibility, and pleasing typography and layout, with two-color printing. It is a triumph of the pedagogue's craft.

Nevertheless, I disagree with the basic principle upon which this book is constructed: that one can, in a meaningful sense, study algorithms outside of the context