There are altogether sixteen chapters and one Appendix, each followed by a section of problems, usually of a widely varying level of difficulty. Each section is followed by references to the quite extensive bibliography.

Since the book is intended to be as the preface says, "a book about mathematics, for physicists," the level of rigor is governed by this consideration. At frequent occasions the reader is referred to the bibliography for a more rigorous treatment of the subject. There are occasions when the deemphasis of rigor is carried too far, for example, when Problem 3-2 calls for evaluation of the integral $\int_0^\infty \sin bx\, dx$, followed by the hint: "apply a convergence factor; do integral; remove the convergence factor."

Numerous cross references from one chapter to another appear, and the relatedness of subjects treated in different chapters is frequently brought out. An example for such a frequent cross reference is the subject of eigenvalues, which is part of Chapter 6 (Vectors and Matrices), Chapter 9 (Eigenfunctions, Eigenvalues, and Green's Functions) and Chapter 11 (Integral Equations). The authors point out in the preface, "there is deliberate nonuniformity in the depth of presentation. Some subjects are skimmed, while very detailed applications are worked out in other areas." The reader may well be surprised that in Chapter 16 (Introduction to Groups and Group Representation) the presentation is quite elaborate on the subject of group representations, while Chapter 14 (Probability and Statistics) does not mention at all the modern approach to probability.

In addition to the topics mentioned, the book deals with Infinite Series, Evaluation of Integrals, Integral Transforms (Chapters 2, 3, 4), Special Functions, Partial Differential Equations (Chapters 7, 8), Perturbation Theory (Chapter 10), Calculus of Variations, Numerical Methods (Chapters 12, 13), and Tensor Analysis and Differential Geometry (Chapter 15).

FEODOR THEILHEIMER

Applied Mathematics Laboratory
David Taylor Model Basin
Washington, D. C.

37[V, X, Z].—BERNI ALDER, SIDNEY FERNBACH & MANUEL ROTENBERG, Editors, *Methods in Computational Physics*, Volume 3: *Fundamental Methods in Hydrodynamics*, Academic Press, New York, 1964, xii + 386 pp., 24 cm. Price $13.50.

A large number of very complex hydrodynamic computer codes have been in existence for several years, particularly at the various A.E.C. Laboratories. These codes were designed to solve unsteady-flow problems in one and two space dimensions and included provisions for handling multiple shocks. Some unclassified reports have been written describing the numerical techniques used, but these reports usually had limited circulation. Relatively little has appeared in journal or book form which describes in detail how these numerical procedures are carried out.

This volume contains ten papers describing either general difference methods for unsteady hydrodynamics or giving details of particular codes. A list of the contributions is as follows:

"Two-Dimensional Lagrangian Hydrodynamic Difference Equations," by William D. Schulz.

"Mixed Eulerian-Lagrangian Method," by R. M. Frank and R. B. Lazarus.

"The Strip Code and the Jetting of Gas Between Plates," by John G. Trulio.

"Cel: A Time-Dependent, Two-Space-Dimensional, Coupled Eulerian-Lagrange Code," by W. F. Noh.

"The Tensor Code," by G. Maenchen and S. Sack.

"Calculation of Elastic-Plastic Flow," by Mark L. Wilkins.

"Solution by Characteristics of the Equations of One-Dimensional Unsteady Flow," by N. E. Hoskin.

"The Solution of Two-Dimensional Hydrodynamic Equations by the Method of Characteristics," by D. J. Richardson.

"The Particle-In-Cell Computing Method for Fluid Dynamics," by Francis H. Harlow.

"The Time Dependent Flow of an Incompressible Viscous Fluid," by Jacob Fromm.

The editors have gathered together a variety of different methods and are to be congratulated for making them readily available in this volume. Some of the papers go into more detail than others but the general impression of all of them is a good one. Some examples are given, and the editors state that the next volume of the series will be devoted to hydrodynamics from an applied point of view.

Richard C. Roberts

U. S. Naval Ordnance Laboratory
White Oak, Silver Spring, Maryland

38[X].—N. K. Bary, *A Treatise on Trigonometric Series*, Pergamon Press, New York, 1965, Vol. I, xxiii + 553 pp., price $12.00; Vol. II, xix + 508 pp., price $15.00.

This is an interesting and valuable treatise. It contains a lot of material not otherwise available in book form. Moreover, following an old and well established Russian pedagogical tradition, the author pays much attention to the matter of presentation. The proofs are laid out carefully and in great detail, both mathematically and graphically, so that the difficulties of reading and following the arguments are at a minimum. Another important aspect of value to the beginner: the basic facts from various parts of the theory are assembled together in Chapter I of the book, which, preceded by an Introduction containing auxiliary material, may be treated as a textbook within the textbook, giving fundamentals without overwhelming the reader with excessive details. The book contains a considerable number of examples and exercises, often with hints of solutions.

The theory of trigonometric series has a long history. It has had a strong impact on other branches of mathematical analysis and has, in turn, been affected by developments in other fields. The modern theory emerged roughly some sixty years ago, primarily in connection with the appearance of Lebesgue's integral, but now we see a number of trends in the theory. These trends are not pure and are constantly influencing one another, but still they are easily discernible.

The oldest of them goes back to Lebesgue himself and treats the subject primarily as a branch of Real Variable. Problems are stated in terms of properties of real functions, and progress is achieved through a refined analysis of sets and functions. Of considerable importance here was the work of the Russian school. It