One's impression upon reading the book is that it is more an essay than a text or reference. A good many of its 170 pages are given over to the discussion of peripheral subjects which are treated much more exhaustively elsewhere and could more appropriately have been referred to. This reviewer would rather that the author had taken this space and perhaps more for greater thoroughness in discussing problems intimately germane to the development of dynamical prediction by numerical methods. A more complete discussion of computational instability of the various types that have already been encountered would have been extremely useful. A comprehensive account of mapping techniques for finite differences would be useful if found in one place. Very little attention is given to Green's function techniques and Fourier space, to the process of barotropic stability, to Lagrangian methods, to "staggered" finite difference methods yielding non-redundant solutions (such as that of Eliassen). The powerful methods and useful results of scale analysis are prominent in their omission. One would hope that in the absence of thoroughness Dr. Thompson would have given an exhaustive bibliography; however, his references are sometimes vague if not scanty (Phillips' significant contributions are virtually ignored) and those which are included often are given a superficial critique. Being the first of its kind, this book does fill a gap. However, this reviewer feels it to fall short of the needs, if not of the author's objectives.

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60[X].—W. F. FREIBERGER, Editor-in-chief, *International Dictionary of Applied Mathematics*, D. Van Nostrand Co., Inc., Princeton, N. J., 1960, 1173 p., 26 cm. Price $25.00.

At the outset it is perhaps appropriate to say a word concerning the title of this useful reference book. One might think that a book so named would confine itself to descriptions of those branches of *mathematics* which are applied to physics, engineering, etc., that is, to numerical analysis, vector analysis, statistics, etc. Instead a large number, or even most, of the entries here, e.g., Binary Stars, Polymer, Isotopes, Pfund Series, etc., are descriptions of those *phenomena* to which such mathematics may be applied. Of the 32 fields covered in this volume only 6 are applied mathematics in the strict sense, while Acoustical Engineering, Acoustics, Aerodynamics and Hydrodynamics, Astronomy, Atomic Structure, Automatic Control, Chemistry, Elasticity, Electromagnetic Theory, and 17 other fields are, rather, physical sciences to which mathematics is applied.

Each of the 32 fields had one or more authorities as a contributing editor. For example, that for Numerical Analysis was A. S. Householder. The 8000-plus entries are all listed alphabetically and not by field.

The many entries differ widely in their length and character. Those on modern physics, e.g., Relativity, Quantum Mechanics, S-Matrix, etc. are often fairly long and informative, but are weakened by a complete lack of references. The reader who wishes to learn more about Positronium or the Zeroth Law of Thermodynamics is given no assistance here. A number of the mathematical entries, on the other hand, are so brief that important qualifications and clarifications are omitted. Thus, in

"Continuous Function" we should have $\delta > 0$; in "Contour Integration" the quantities η_j should be defined; in "Analytic Function" it does not suffice for the derivative to be single-valued at the point itself; in "Gibbs Phenomenon," $x = \pi/(2n + 1)$ is not the discontinuity, but is merely near it; and in "Asymptotic Series" the expansion may be different in different sectors in the complex plane.

The typography is good and there appear to be relatively few errors such as Fronde Number in "Hydraulic Jump" and Hamiltonsion Theory in "Eikonal."

There are a few eccentricities. "Bigit" is advocated for what is now called "bit" in the binary system of numeration, and the number π is defined as the smallest positive *time* t at which the *oscillator* given by

$$\ddot{x} = -x \quad \text{and} \quad x(0) = 1, \quad \dot{x}(0) = 0$$

again attains $\dot{x}(t) = 0$.

In line with the current trend there are appropriate foreign language dictionaries in the appendix. The languages here are French, German, Spanish, and Russian.

Without question, this volume will be a standard reference in many technical libraries.

D. S.

61[Z].—J. F. Davison, *Programming for Digital Computers*, Gordon and Breach Science Publishers, New York, 1962, xi + 175 p., 22 cm. Price $6.00.

The aim of this book is to provide an introduction to the general subject of writing programs, and it is written so as to be intelligible to the non-mathematician. It begins with a general discussion of the role and task of the programmer, assuming that he starts with the statement of a problem that needs to be programmed, and progresses to the point where routine computer operation has been achieved.

The essential vehicle for discussing the techniques of programming is a theoretical machine—TRIDEC—a 3-address decimal machine. With the aid of this machine and the limited set of orders, the author develops the basic concepts of programming up to the point where the reader has a feel for writing a simple routine using index register techniques and loops. There is then a brief discussion of a simple type of console to convey some notion of how the machine is controlled.

Under the heading of more sophisticated techniques there is a look at symbolic programming, subroutines, and floating-point computation.

Interpretive schemes and some aspects of automatic coding are then briefly mentioned. For such a broad subject the treatment is necessarily sketchy and it attempts merely to give general impressions.

Finally there is a discussion of differences among some different types of machines.

Some of the operating concepts will seem odd to American programmers, particularly the idea of using an endless loop as an equivalent to a halt.

For its small size, the book gives a general appreciation of programming. In particular, the details of TRIDEC coding are effectively presented.

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