is the increase in precision of Table 1060 (Some Numerical Constants), so that all the entries appear now to 10 decimal places.

Errata pointed out in the earlier reviews have been corrected. However, the correction of $K(87^\circ.6)$ in Table 1040 was not followed by appropriate changes in the column of first differences. The reviewer has compared the entries in Table 1050 with the corresponding data in the tables of Lowell [1], and thereby has detected 72 last-figure errors in Dwight's values of the Kelvin functions of zeroth order and of their first derivatives.

This useful new edition of Professor Dwight's popular tables of integrals constitutes a valuable contribution to the increasing store of such mathematical literature.

J. W. W.

1. HERMAN H. LOWELL, *Tables of the Bessel-Kelvin Functions Ber, Bei, Ker, Kei, and their Derivatives for the Argument Range 0(0.01)107.50*, Technical Report R-32, National Aeronautics and Space Administration, Washington, D.C., 1959. (See Review 9, *Math. Comp.* v. 14, 1960, p. 81.)

43 [M].—W. F. HUGHES & F. T. DODGE, *A Table of J Integrals of Hydrodynamic Lubrication Theory*. Manuscript deposited in UMT file.

This unpublished table of the numerical values, mainly to five significant figures, of the integrals $J_n = \int_0^\theta (1 - \epsilon \cos \theta)^{-n} d\theta$, corresponding to $n = 1, 2, 3$, $\epsilon = 0.1(0.1)0.9$, and $\theta = 0°(5°)360°$, was prepared on an electronic digital computer by members of the Mechanical Engineering Department of the Carnegie Institute of Technology.

In the prefatory text the authors state that these integrals occur in the theory of the hydrodynamic lubrication of the journal bearings. The film thickness h is approximated by the formula $h = c(1 - \epsilon \cos \theta)$, in terms of the angular coordinate θ, the radial clearance c, and the ratio ϵ of the eccentricity of the journal to the radial clearance. Values of the ratio h/c to four decimal places are included in the table.

J. W. W.

44 [M].—G. PETIT BOIS, *Tables of Indefinite Integrals*, Dover Publications, Inc., New York, 1961, xiv + 151 p. 24 cm. Price $1.65.

This is a new printing, in an inexpensive paperback edition, of the original *Table d'Intégrales Indéfinies* published by Gauthier-Villars in Paris in 1906, and at the same time by Teubner in Leipzig under the title *Tafeln unbestimmte Integrale*.

This unabridged English translation contains 2544 indefinite integrals, systematically arranged according to integrands, as outlined in the table of contents. A preface lists the principal source books and tables. This is followed by an explanatory section devoted to notation and by a section listing 49 "transformations of integral expressions," that is, pairs of expressions possessing the same derivative.

With few exceptions, the indefinite integrals listed here involve elementary functions. Several integrals are shown to depend upon the evaluation of such functions as the sine and cosine integrals, although these are not identified as such. Examples of such higher transcendental functions, which are left in the form of

integrals without comments, appear on pages 118, 122, 123, 140, and 150. Furthermore, except for a footnote on page 62, elliptic integrals are nowhere referred to in these tables.

In the foreward to their extensive collection of indefinite integrals Gröbner and Hofreiter [1] refer to these tables as one of the sources for their material. Nevertheless, the tables of Petit Bois are not comparable to these recent German tables, nor indeed to the recently enlarged compilation of Dwight [2], principally because these last two tables cover a much larger spectrum of classes of functions.

The reviewer noted only one serious error of commission, namely, on page 150 appears an evaluation of the indefinite integral of $\log (a + \cos x)$ which is manifestly incorrect.

In conclusion, this reviewer considers this compilation to supplement to some degree the information presented in several more recent tables, such as those cited; nevertheless, it cannot replace them in general use.

J. W. W.

1. W. GRÖBNER & N. HOFREITER, *Integraltafel. Erster Teil: Unbestimmte Integrale.* Vienna and Innsbruck, Springer-Verlag, 1949.
2. H. B. DWIGHT, *Tables of Integrals and other Mathematical Data*, fourth edition. The Macmillan Co., New York, 1961.

45 [P, Z].—ROBERT S. LEDLEY, *Digital Computer and Control Engineering*, McGraw-Hill Book Co., New York, 1960, xvii + 835 p., 24 cm. Price $14.50.

The author's purpose in writing this book, as stated in the Preface, is "to fill the need for a comprehensive, elementary engineering textbook in the large and still growing field of digital computers and controls." Without doubt, it is comprehensive; more than enough is included in over 800 pages for a year's course or for several years of graduate work if the Additional Topics are included. The author, is justifiably proud of the 750 exercises scattered throughout the text. The exercises form a framework to hold the book together and permit some of the author's objectives to be achieved, while the additional topics provide opportunities for rich learning experiences for honors or graduate students, as well as insights for the exceptional student seeking more than grades and credits.

The book is divided into five parts, each one reasonably independent and self-contained.

Part 1, entitled Introduction to Digital Programming Systems, serves to introduce digital systems and to stimulate interest in them through examples and the theory of their applications. It may be that an unwary and not too disciplined student, not familiar with the field at all, may be frightened away by the rather sophisticated examples. Chapter I does show, however, that digital computers and controls are tools—the means to realize highly complex programs. There is not, in the first chapter, on the other hand, any hint of what these tools are or what they actually do, or how. This is probably a good technique, for now curiosity alone should lead the student to Chapter 2 to discover the secrets of such remarkably versatile hardware. This chapter, however, will probably have to be read twice to be understood by most neophytes. As all good computer people do, Professor Ledley personifies the hardware; for example, "the computer is told"; control "interprets" and "tells ... the arithmetic unit what to do," etc. Without a previous knowledge