REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

1 [A, Z].—EDGAR KARST, *Six-Digit Fraction Conversion from Decimal to Octal with Unlimited Accuracy*, ms. of six tables (343 numbered sheets) and 15 handwritten sheets, 23 cm., deposited in UMT File.

Construction of these voluminous decimal-to-octal conversion tables was based on the author's earlier four-digit decimal-fraction conversion tables, which are described in [1]. Use of the present tables is illustrated by six numerical examples, one for each of the tables in this manuscript. The IBM 650 program (of 20 lines) used in the underlying calculations is given, and other details of the construction and checking of the tables are supplied.

Professor Karst also gives a list of references, which includes titles of related tables of Wijngaarden [2], Causey [3], and Fröberg [4].

J. W. W.

1. EDGAR KARST, *Tables for converting 4 digit decimal fractions to periodic octal fractions.* [See RMT **6**, *MTAC*, v. 10, 1956, p. 37.]
2. A. VAN WIJNGAARDEN, *Decimary-Binary Conversion and Deconversion*, Report R-130 of the Computation Department, Mathematical Center at Amsterdam. [See RMT **83**, *MTAC*, v. 11, 1957, p. 208.]
3. ROBERT L. CAUSEY, *Decimal to Octal and Octal to Decimal Conversion Tables*, U.S. Naval Air Missile Test Center, Point Mugu, California, 1952. [See RMT **65**, *MTAC*, v. 10, 1956, p. 227.]
4. CARL-ERIK FRÖBERG, *Hexadecimal Conversion Tables*, second edition, C. W. K. Gleerup, Lund, Sweden, 1957. [See RMT **82**, *MTAC*, v. 11, 1957, p. 208.]

2 [C].—JOSEPHINE G. BOERNGEN, *Table of Common Logarithms and their Squares*, Report PB 181 100, Office of Technical Services, Department of Commerce, Washington 25, D.C., December 1961, 3 + 22 p., 27 cm. Price $0.75.

This table, which was prepared in connection with a statistical study of chemical analyses of rock samples, contains log N and $(\log N)^2$ to 5D for $N = 1(1)\,10^3\,(10^2)10^4$. According to the author, 5D values of log N were used to obtain the tabulated values of $(\log N)^2$. The author's statement that the corresponding truncation errors are as large as a unit in the last decimal place printed was evidently not based on an appropriate error analysis. Such analysis indicates the possibility of terminal-digit errors of as much as *four* units in the listed values of $(\log N)^2$. An error of this magnitude is attained, in fact, in the tabulated square of the common logarithm of 9900. Clearly, the last place in that table is generally unreliable.

J. W. W.

3 [F].—F. J. BERRY, "*Table of prime numbers from 12000000 to 12041000*," Royal Armament Research and Development Establishment, Fort Halstead, Sevenoaks, Kent, England. Ms. of 11 p., 8″ x 13″, deposited in UMT File.

This list of the 2500 consecutive primes directly following 12,000,000 was computed on a new electronic computer, COSMOS, in a single run of 9 hours 20 minutes, using an unsophisticated program.

In his introductory remarks the author expresses his belief that this range has not been hitherto investigated in his country. He is apparently unaware both of the efforts of his countrymen J. C. P. Miller and D. O. Claydon [1], who have prepared printed lists of primes to 21,000,000 and punched tape lists to 36,000,000, and of the results of D. H. Lehmer [2] and of Baker and Gruenberger [3] in this country.

J. W. W.

1. A. FLETCHER, J. C. P. MILLER, L. ROSENHEAD & L. J. COMRIE, *An Index of Mathematical Tables*, Addison-Wesley Publishing Company, Inc., 1962, v. I, p. 21.
2. D. H. LEHMER, "Tables concerning the distribution of primes up to 37 millions," reviewed in *MTAC*, v. 13, 1959, p. 56–57, RMT 3.
3. C. L. BAKER & F. J. GRUENBERGER, *The First Six Million Prime Numbers*, The Microcard Foundation, Madison, Wisconsin, 1959. (See *Math. Comp.*, v. 15, 1961, p. 82, RMT 4.)

4 [F].—IVAN NIVEN, *Diophantine Approximations*, Interscience Publishers, New York, 1963, viii + 68 p., 24 cm. Price $5.00.

From the author's preface:

"At the 1960 summer meeting of the Mathematical Association of America it was my privilege to deliver the Earle Raymond Hedrick lectures. This monograph is an extension of those lectures, many details having been added that were omitted or mentioned only briefly in the lectures. The monograph is self-contained. It does not offer a complete survey of the field. In fact the title should perhaps contain some circumscribing words to suggest the restricted nature of the contents, . . .

"The topics covered are: basic results on homogeneous approximation of real numbers in Chapter 1; the analogue for complex numbers in Chapter 4; basic results on non-homogeneous approximation in the real case in Chapter 2; the analogue for complex numbers in Chapter 5; fundamental properties of the multiples of an irrational number, for both the fractional and integral parts, in Chapter 3. . . .

"A unique feature of this monograph is that continued fractions are not used. This is a gain in that no space need be given over to their description, but a loss in that certain refinements appear out of reach without the continued fraction approach. Another feature of this monograph is the inclusion of basic results in the complex case, which are often neglected in favor of the real number discussion. . . ."

"Homogeneous" and "non-homogeneous" above have reference to the following: If θ is irrational, the problem of finding integers k and h such that $k\theta - h$ is small (relative to some inverse power of k) is the homogeneous problem, while if α is real, the corresponding problem for $k\theta - h - \alpha$ is non-homogeneous.

"Not offer a complete survey" above has reference to the omission of important but more difficult topics such as Markoff numbers, Weyl's criterion for equidistribution, and the celebrated Roth theorem on approximations of real algebraic numbers. (See the following review.)

These more advanced topics have been treated in the older, more complete, and more difficult book [1] by Cassels: *An Introduction to Diophantine Approximation.* In fact, it would be appropriate if that book and this could exchange their titles. The present volume is certainly much more readable for a beginner and can be strongly recommended as an introduction to the subject.

Perhaps a mild rebuke is due the publisher. The price seems a little high for so slim a volume.

D. S.

1. J. W. S. CASSELS, *An Introduction to Diophantine Approximation*, Cambridge Tracts No. 45, Cambridge University Press, 1957.