

Rubber Publishing Company, Cleveland, Ohio, 1962, x + 579 p., 23 cm. Price \$7.50.

The present volume is a further enlargement, reformatting, and repricing of the *CRC Standard Mathematical Tables* [1], which were themselves an outgrowth of the *Mathematical Tables from Handbook of Chemistry and Physics*.

The larger pages and type size in the new volume are a distinct improvement. The new tables (or sections) in the hundred or so extra pages include the following:

1. Six-place common logarithms (18 pages)
2. Table of Random Units (8 pages)
3. Legendre Function formulas (3 pages)
4. Surface Zonal Harmonics, $P_n(x)$ (10 pages)
5. Definitions of Concepts in Set Theory, Groups, Fields, etc. (7 pages)
6. Planetary Elliptic Orbit Theory (9 pages)
7. Binomial and Poisson Distributions (16 pages)
8. Dictionary of Curves and Surfaces (8 pages).

There exists, as in the older editions [1], a certain amount of disorder in the sequencing of the tables. Although the table of Factors and Primes is no longer found between the Elliptic Integrals and the table of Indefinite Integrals, as it was in the 10th edition of the CRC, some new disorder has entered. Thus, tables of factorials occur on page 209 and much later on page 260, the degree-radian tables are not adjacent to the trigonometric, the algebraic formulas and the (often duplicating) "miscellaneous" algebraic formulas are separated by the Planetary Orbits, and the Probable Error and χ^2 tables are far removed from other statistical tables.

Although some of the tables, such as the 23-page table of $\sin^2 \theta$, $\cos^2 \theta$, and $\sin \theta \cos \theta$, may strike certain readers as not being of urgent utility, the collection as a whole is certainly very useful.

D. S.

1. *CRC Standard Mathematical Tables*, Tenth & Eleventh Editions, RMT **61**, MTAC, v. 12, 1958, p. 146.

35[D].—HERBERT E. SALZER & NORMAN LEVINE, *Table of Sines and Cosines to Ten Decimal Places at Thousandths of a Degree*, Pergamon Press, New York, 1962, xiv + 900 p. (unnumbered), 22 cm. Price \$10.00.

This extensive table is a compilation of electronically computed 10D values of sines and cosines, without differences, arranged semiquadrantly in adjacent columns, at an increment of 0.001° in the argument. Each entry is printed *in extenso*, thereby obviating the necessity of searching generally elsewhere on the page for the leading three digits, as in other large tables of this kind.

In the introductory text Dr. Salzer shows in detail that linear interpolation in this table yields results correct to within a unit in the tenth decimal place. He cites the 15D table of sines and cosines published by the National Bureau of Standards [1], corresponding to an interval of 0.01° , which permits the attainment of only 8D accuracy when linear interpolation is used. Reference is also made to a table of Peters [2], which includes also the tangent and cotangent; it is arranged according to the subdivision 0.001° , but is limited to seven decimal places.

These limitations in earlier tables constitute the stated justification for the prepa-

ration of the present table. It seems appropriate to note here that a proposal for a similar table was made by O. Kohl [3] in 1953, using basic data computed by Peters.

The user of this table will undoubtedly read with profit the detailed discussion of both direct and inverse linear interpolation, including the use of both Lagrange's formula and Taylor's theorem, which is supplemented by a total of ten numerical illustrations. On the other hand, the user will vainly search in this book for a description of the procedures followed in the calculation and checking of the tabular data. Furthermore, he will probably be somewhat disconcerted to discover at the beginning of the table an inserted slip advertising several errors, the most conspicuous occurring in $\sin 30^\circ$!

Through correspondence with Dr. Salzer this reviewer learned the following details relating to the preparation of this table. Dr. Levine used a computer program based on Maclaurin series to obtain 15D values of sine and cosine at multiples of 0.001° , which were rounded to 10D on the computer and stored on tape preliminary to printout. A similar table was subsequently calculated by Ward Hardman on another electronic computer, using a different double-precision program, involving the use of key values in conjunction with the appropriate addition formulas. Proof-reading of both versions of the table was performed by Dr. Salzer, who thereby found no error in the duplicate table of Hardman.

The isolated error in $\sin 30^\circ$ was apparently caused by an error in the routine for converting the computer output from binary to decimal form. The error in $\sin 38.441^\circ$ noted on the errata slip is clearly attributable to a typographical imperfection, whereas the error noted in $\sin 42.055^\circ$ was caused by a careless hand-correction of a partially obliterated digit when this table was printed in Poland. Neither of these last two errors appeared in the original computer output.

A number of additional examples of annoying typographical imperfections are to be found, notably in $\cos 2.268^\circ$ and $\sin 38.438^\circ$, where individual digits are nearly obliterated. Despite these defects, this unique table should be very useful and reliable, after the necessary emendations have been made. Especially welcome would be a second printing, of improved quality, incorporating the known corrections.

J. W. W.

1. NATIONAL BUREAU OF STANDARDS, *Table of Sines and Cosines to Fifteen Decimal Places at Hundredths of a Degree*, Applied Mathematics Series, No. 5, U. S. Government Printing Office, Washington, D.C., 1949.

2. J. PETERS, *Seven-Place Values of Trigonometric Functions for Each Thousandth of a Degree*, Van Nostrand, New York, 1942.

3. A. FLETCHER, J. C. P. MILLER, L. ROSENHEAD, & L. J. COMRIE, *An Index of Mathematical Tables*, Second Edition, Addison-Wesley, Reading, Massachusetts, 1962. (See Vol. I, Art. 7.2, p. 173.)

36[E].—H. C. SPICER, *Tables of the Ascending Exponential Function e^x* , U. S. Geological Survey, Washington 25, D. C. Deposited in UMT File.

This manuscript is in the form of original computation sheets. It contains the values of e^x with x ranging in value as follows: [0(0.0001)1] 21D; [1(0.001)6.963] 24D; [6.96(0.01)15.80] 24D.

On each sheet the column indicated as x , the argument, is followed immediately on the same line with the 25-decimal-place value of e^x . The four sets of values just beneath the tabular e^x are to be disregarded, as they were obtained as parts of