REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

56[A-F, H, I, K-N, P, X, Z].—KARL SCHÜTTE, *Index Mathematischer Tafelwerke und Tabellen* (*Index of Mathematical Tables*), second edition, R. Oldenbourg, München, 1966, 239 pp., 24 cm. Price DM 49.00.

This new edition of Professor Schütte's index of mathematical tables constitutes a considerable enlargement of the first edition, which appeared in 1955. The format of that edition has been retained, including the use of both English and German on the title page and in the preface, the table of contents, and the headings and subheadings.

As the author notes in the preface, the number of references cited has been increased to more than 2800 from approximately 1200 in the earlier edition. The same 16 general classifications of publications are used; namely: I. Numerical and practical calculating, II. Logarithms of natural numbers, III. Logarithms of circular functions, IV. Natural values of circular functions, V. Simple functions derived from elementary functions, VI. Primes, prime factors, compound interest and rent; theory of numbers and algebra, VII. Factorials, gamma functions, exponential and hyperbolic functions; elementary transcendental functions, VIII. Elliptic functions and integrals, spherical, Bessel and other higher functions, IX. Integral tables, statistics, numerical solution of equations and differential equations, other higher functions, X. Tables applicable to physics, chemistry and other sciences, XI. Astronomy and astrophysics, XII. Geodesy, geophysics and geography, XIII. Nautical and aeronautical determination of position, XIV. Meteorology, XV. Astronautics, XVI. Tables without detailed table of contents, collections of formulas; tables of measures, weights, monetary units; miscellaneous tables.

Each of these classifications is further subdivided into sections and subsections, totalling more than 210, in place of 130 in the first edition. Within each of these subdivisions of the index, the arrangement of reference material is chronological. Mathematical tables are further grouped according to their precision; thus, for example, on p. 62 one finds 4D tables of circular functions listed chronologically, followed by 5D tables of such functions also arranged chronologically, and similarly for more precise tables.

When examining this index one is naturally led to compare it with the FMRC *Index* [1], which appeared in a second edition in 1962, following extensive revision and updating. A defect in the Schütte index that is immediately apparent upon such a comparison is the lack of any indication of the interval or range of arguments or of provision for interpolation. These deficiencies have been pointed out in a review [2] of the first edition of this index. Thus, in contrast to the FMRC *Index*, the present index is essentially merely a bibliographic listing of mathematical tables and related works, with occasionally some additional information such as the precision of a table. Certainly, this cannot rival the comparative wealth of detail available in the FMRC *Index*.

No attempt is made to present a comprehensive list of statistical tables; instead, the author refers the interested reader to the elaborate index of Greenwood & Hartley [3].

As in the first edition of this present index, there is included a list of abbreviations used in the book, an index of authors of works cited, and an index of institutes referred to in the body of the book.

Although it is disappointing to note the perpetuation of errors and deficiencies noted previously in the first edition, it should be pointed out that this new edition does serve as a valuable supplement to the FMRC *Index*, particularly with respect to the listing of publications that have appeared since about 1961.

J. W. W.

1. A. Fletcher, J. C. P. Miller, L. Rosenhead & L. J. Comrie, *An Index of Mathematical Tables*, second edition (in two volumes), Addison-Wesley, Reading, Mass., 1962. (See *Math. Comp.*, v. 17, 1963, pp. 302–303, RMT **33**.)
2. *MTAC*, v. 10, 1956, pp. 100–102, RMT **34**.
3. J. A. Greenwood & H. O. Hartley, *Guide to Tables in Mathematical Statistics*, Princeton Univ. Press, Princeton, N. J., 1962. (See *Math. Comp.*, v. 18, 1964, pp. 157–158, RMT **13**.)

57[A, K].—Rudolph Ondrejka, *The First* 100 *Exact Subfactorials*, ms. of 9 pp. (handwritten) deposited in the UMT file.

The subfactorial of n, designated here by the symbol $n¡$ following the notation of Chrystal [1], is most commonly associated with the number of derangements of n objects so that none is in its original place. This interpretation yields the well-known formula

$$n¡ = n! \sum_{k=0}^{n} (-1)^k/k!,$$

which implies the useful recurrence relation $n¡ = n(n-1)¡ + (-1)^n$.

The author has thereby calculated the present carefully checked table of the exact values of the first one hundred subfactorials, which appears to be by far the most extensive tabulation of its kind.

Examples of previous compilations are to be found in books by Whitworth [2] and by Riordan [3]. These extend to only $n = 12$ and $n = 10$, respectively.

J. W. W.

1. G. Chrystal, *Textbook of Algebra*, 6th ed., Chelsea, New York, 1952, Vol. II, p. 25.
2. W. A. Whitworth, *Choice and Chance*, 5th ed., Bell, Cambridge and London, 1901, p. 107.
3. J. Riordan, *An Introduction to Combinatorial Analysis*, Wiley, New York, 1958, p. 65.

58[G, H, X].—Frank S. Cater, *Lectures on Real and Complex Vector Spaces*, W. B. Saunders Co., Philadelphia, Pa., 1966, x + 167 pp., 24 cm. Price $5.00.

This is an abstract development, some of which is considered suitable for undergraduates, and all of it for first-year graduates. The presentation is quite condensed and an amazing amount of material is covered.

There are five "Parts," the first, on "Fundamental Concepts," consists of three "Lectures." The Maximum Principle and the Axiom of Choice are stated and their equivalence asserted. Other topics include the factorization of polynomials and the definition of vector spaces and linear combinations. The remaining Parts are made up of six or seven Lectures each, and each Lecture is followed by a page or more of problems. The Cayley-Hamilton Theorem and the Jordan normal form occur in Part 3. Part 4 deals with infinite-dimensional spaces and operator algebras; Part 5 with finite-dimensional unitary spaces.