be acceptable on its own, but, in addition, the randomness of the RAND deck, on which these tables are based, has been checked [1] and thus provides a check on the randomness of the permutations, and vice versa.

In the experimental sciences the most frequent uses of random numbers are in connection with assignments of experimental units, and for this purpose tables of random permutations are required. Cochran and Cox [2] give 1000 permutations of the integers 1–9 and 1000 permutations of the integers 1–16. For small numbers, creating a permutation from tables of random numbers is not difficult; however, in permutations of 20 or more numbers the work involved is not negligible, and one would accordingly predict that the Moses-Oakford tables will be extensively used in the experimental sciences.

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1. RAND CORPORATION, *A Million Random Digits with 100,000 Normal Deviates*, Free Press, Glencoe, Illinois, 1955.
2. W. G. COCHRAN and G. M. COX, *Experimental Design*, second edition, John Wiley and Sons, Inc., New York, 1957.

13 [K].—J. ARTHUR GREENWOOD & H. O. HARTLEY, *Guide to Tables in Mathematical Statistics*, Princeton University Press, New Jersey, 1962, lxii + 1014 p., 26 cm. Price $8.50.

Greenwood and Hartley's *Guide* will be on the desks of all sophisticated users of statistical methods and of all applications-oriented statisticians. It will be on a nearby bookshelf of nearly all theory-oriented statisticians. The rapidly increasing use of statistical methods in science and industry and the rapid expansion of the body of available statistical methodology has caused a corresponding increase in the production of tables to facilitate application of the new methods. While a new high-speed calculating machine may, in many cases, calculate a needed constant more quickly than it can consult a table, statisticians who do not have access to such a machine need tables, and statisticians with high-speed machines use tables anyway rather than to program the calculation of the needed constants. Fortunately, the new machines have made table-making less expensive. The *Guide* will direct one to an appropriate table if it is among the approximately 1500 tables, published mostly before 1961, which the authors have catalogued.

The body of the *Guide* is arranged in chapters, sections, and subsections to facilitate rapid discovery of the catalogue of tables of the type sought. Within each section and subsection the authors have described the functions tabulated, either by exhibiting a functional form or by describing the method of calculation. Authors of guides to mathematical tables have noted great difficulty in producing such descriptions for statistical tables. Happily the authors have done even more and, except for tables of types which have been in wide use for many years, have described the purpose for which each table was intended. The authors have been remarkably successful in giving concise, yet fully adequate explanations. In a few cases where there is no concise explanation possible, the reader is told where a competent explanation can be found. The range of the table and the number of decimals or significant figures tabled are, of course, given and frequently there are

comments on the accuracy of the entries. Methods of approximations beyond the limits of available tables are often presented.

Three chapters are worthy of particular note. Chapter 13 deals with tables of random numbers. By fault of the authors of the tables, rather than of the authors of the *Guide*, the description of the method of computation of some of these tables is less complete than might be wished. Chapter 14 covers acceptance sampling, control charts, and tolerance limits. Chapter 15 (one of the longer chapters) is a collection of tables for the design of experiments.

Throughout the *Guide* the appearance of a listed table in one or more of 16 standard collections of statistical tables is noted, so that the table seeker can avoid a library search for a table he already has handy.

A detailed subject index provides reference to the proper page in case the table seeker uses key words which do not fall under the system of classification used by the authors of the *Guide*. The devices used by the authors to conserve space are simple, and a glance at the introduction is enough to make them clear. The introduction does give considerable detail on the more subtle aspects of the bibliographic art and on the applications of that art in the *Guide*.

Main chapter headings, in abbreviated form, are as follows:

1. The normal distribution
2. The chi-squared and Poisson distributions
3. The beta and binomial distributions
4. The t-, F- and z-distributions
5. Various discrete distributions
6. Likelihood-test statistics
7. Correlation, mostly product-moment
8. Rank correlation; asymptotic theory of extreme values
9. Non-parametric tests
10. Frequency curves; symmetric functions
11. Regression and other curves
12. Variate transformations
13. Random numbers
14. Quality control
15. Design of experiments, etc.
16. Sundry mathematical tables

Appendices are devoted to:

1. Supplement to the descriptive catalogue
2. Contents of some standard collections of tables for statisticians
3. Material treated both in this *Guide* and in Fletcher *et al.* 1946

The *Guide* is equipped with extensive author and subject indices, respectively, comprising the concluding sections.

The authors and the sponsors, the Committee on Statistics of the Division of Mathematics of the National Academy of Sciences—National Research Council, and the Office of Naval Research are to be commended for time and money well spent on behalf of nearly all users of statistical tables.

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