

Guides to Numerical Results

An Index of Mathematical Tables. vol. 1, *Index According to Functions*. vol. 2, *Bibliography, Lists of Errors in Published Tables, References*. A. Fletcher, J. C. P. Miller, L. Rosenhead, and L. J. Comrie. Addison-Wesley, Reading, Mass., ed. 2, 1962. xi + 994 pp. \$42.

Guide to Tables in Mathematical Statistics. J. Arthur Greenwood and H. O. Hartley. Princeton University Press, Princeton, N.J., 1962. lxii + 1014 pp. \$8.50.

The publication, after 16 years, of the second edition of *An Index of Mathematical Tables*, familiarly known as FMR, will be welcomed by all who need to reduce analytical solutions to numerical ones. The new edition preserves the general organization, scope, and fine typography of the original, but has doubled in length and, unfortunately, more than tripled in price.

The expansion of the contents is partially accounted for by part 3 (151 pages), in which errors that have been discovered in the tables cited are discussed, and part 4 (61 pages), in which there is a far more detailed and valuable index than the 5-page one of the first edition. Most of the growth, however, is due to the revolution that has occurred in table-making since 1944, the closing date for the first edition. The availability of automatic computers has made it possible to construct acceptable tables without the devotion required of the great tabulators of previous generations. Many of the new tables demonstrate the dangers that await the inexperienced tablemaker, even when assisted by an electronic robot, but the increased number of tables, particularly of the less common functions, is so great as to make the first edition obsolete.

The *Guide to Tables in Mathematical Statistics* is the culmination of more than 20 years of effort sponsored by the National Research Council. Although admittedly indebted to FMR for organization and for many of the details of format, the authors have included several features that will increase the *Guide's* usefulness. In the first place, the analytical table of contents has been expanded to 27 pages, thus allowing an easy grasp of the interrelations of the various functions. In addition, an index contains all permutations of the names of the func-

tions, although, unlike the FMR index, it does not include authors. For the benefit of those who use automatic computers, rational approximations and methods of generating pseudorandom numbers are included. Finally, the authors decided to sacrifice elegance of typography in the interest of cost. Although the photoreproduction from typed copy is not beautiful and is marred by difference in weight of impression and type face, their decision made it possible to keep the *Guide's* price within the means of the average individual.

There is a certain amount of duplication in the contents of the volumes, because statisticians frequently require tables of standard mathematical functions and some of the statistical distributions—such as the normal—are of general mathematical interest. The extent of the overlap with the first edition of FMR is explicitly indicated by Greenwood and Hartley. The emphases are, however, sufficiently different so that the overlap is almost trivial. The FMR index is concerned with tables of functions of general mathematical interest, and statistical tables are included only if the functions have nonstatistical applications. Greenwood and Hartley are concerned only with functions that might be used by mathematical statisticians; their list of generally useful tables does not pretend to be complete. Moreover, the inclusion of approximations in the *Guide* and the listing of errors in FMR will make it desirable to consult both sources in searching for tables that might be listed in either.

Although these volumes will be consulted primarily by those who wish to find suitable tables of some specific function, this is not their only use. The introductions to the sections contain definitions of the various functions which may be of great value in suggesting methods of reducing a result to tabulated forms. They also discuss variations in notation. FMR has long been used in selecting convenient and nonconflicting symbols; unfortunately, symbols are not included in the otherwise comprehensive index to the new edition, so that the identification of a function denoted only by its symbol is not easy. FMR is also a convenient source for 15 to 30 decimal values of key mathematical constants. An appreciation of the finer points of tabulation is another benefit that can be obtained by browsing through these volumes. All

the authors are masters of the art, and all are extremely critical in their evaluations. The neophyte who contemplates the computation of a table will benefit from considering the standards that these authors use in judging a table.

All institutions where numerical results are produced will need these two important works. In addition, many individual statisticians will find that Greenwood and Hartley's *Guide* is a valuable, and relatively inexpensive, reference. The new FMR, by Fletcher, Miller, Rosenhead, and Comrie, will, unfortunately, be beyond the means of most individuals, although many would benefit from having it readily available.

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Histological Technique

Animal Tissue Techniques. Gretchen L. Humason. Freeman, San Francisco, Calif., 1962. xvi + 458 pp. Illus. \$8.

It is the author's stated intention to provide a guide to basic histological techniques and an introduction only to more specialized procedures. The volume is written primarily for the beginning student or the novice technician. It is therefore a practical treatise, but Humason has managed to lace it with theoretical considerations where they can appropriately be given. Histological technique is one discipline, at least, in which, contrary to the old saw, only those who can, can teach. The author's practical experience is clearly reflected in her description. Short of looking over her shoulder, I doubt that the description could be made clearer. The expository portions of the text are written in as interesting a fashion as one could hope for, but a text on histological technique is hardly the book to settle down with in an easy chair in the company of a pound box of candy.

Original literature is cited throughout the text, which contains a bibliography of some 26 pages. In addition, a list of standard references precedes the table of contents. The author has also, thoughtfully, included in the text the sources of various materials.

For its length (468 pages) the book is remarkably complete. Chapters 1 through 8 deal with specimen preparation, from fixation through sectioning and mounting. A practical description