accurate. For the reader from an allied technical or scientific discipline who is interested in the activity of his colleagues working on discrete-time systems, and for the graduate student who is first being introduced to discrete-time systems, the book will be something of a disappointment in its attempts to fulfill the need recognized in the preface.

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21[K, P].—THORNTON C. FRY, *Probability and Its Engineering Uses*, Second Edition, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1965, xv + 462 pp., 24 cm. Price $12.00.

Thirty-seven years have elapsed since the famous first edition appeared. Such an exceptional delay is fitting, however, since the book has often been called a classic, and one should not tamper (too much) with classics. Nonetheless, considerable changes have now been made. Three chapters have been added: Chapter II, *The Language of Probability*; Chapter X, *Matrix Methods and Markov Processes*; and Chapter XI, *The Foundations of Statistics*; and two chapters have been deleted: the old Chapter IX, *Curve Fitting*; and the old Chapter XI, *Fluctuation Phenomena in Physics*. The book is now slightly shorter than before. No explanation is given for the deletions, and the reviewer wishes that the theory of fluctuation phenomena had been kept; the physical phenomena there are of interest, and the theory may even be applicable to some number-theoretic situations (cf. *MTAC*, v. 13, 1959, p. 279).

The remaining nine chapters (those with their previous names) have been thoroughly rewritten, even to the extent of including minor stylistic changes here and there. There are nine tables in the Appendix (factorials, binomial coefficients, normal error and Poisson functions, etc.). Of these, the table of Student's Test of Significance is new, while three other short tables have been deleted.

A publisher's blurb on the jacket neatly characterizes the book as follows:

> "The point of view of the first edition has been retained in the revision. Thus, it is less pragmatic and more postulational than was fashionable in 1928, but less abstract and more attuned to the realities of the physical world than is usual today."

The new edition will therefore be read eagerly by those who continue to have some interest in the real world.

D. S.

22[K, P].—LEONARD KLEINROCK, *Communication Nets: Stochastic Message Flow and Delay*, McGraw-Hill Book Company, New York, 1964, ix + 209 pp., 24 cm. Price $12.50.

Elementary queueing theory and linear programming form the basis for the author's paradigm of communication nets presented in this much revised doctoral thesis on electrical engineering carried out at MIT. Mathematical prerequisites

for the "easy" reading of the essentially self-contained treatise include a year of calculus, and, say, the first-half of either Feller's *Introduction to Probability Theory and its Applications* (Wiley, New York, 1957) or else Riordan's *Introduction to Combinatorial Analysis* (Wiley, New York, 1958).

The research monograph (it is *not* a textbook) commences with numerous preliminary examples; e.g., the well-known cases of static maximal flow, minimal cost flow, multiterminal network flow, and multicommodity network flow. That discussion leads the author into the principal concern of his investigation, namely, the behavior of connected networks subjected to stochastic flow capable of accommodating queues. His most crucial measure of performance for such nets is the average time for a message to arrive at its destination. The remainder of the text is primarily concerned with optimization of performance for various nets. For example, supposing a fixed-cost constraint, he optimizes network performance relative to a prescribed assignment of channel capacities to the branches.

The author's format is, for the most part, the concise theorem-proof style supplemented by occasional concrete examples. Further, the book is replete with figures and diagrams as heuristic aids for the reader. For those readers unfamiliar with elementary queueing theory there is an appendix which includes the results needed in the text-proper. The author even provides a discussion on the simulation of communication nets on Lincoln Laboratory's TX-2 digital computer as a means of experimentally checking his theoretical results. Finally, he includes a brief section on suggestions for further research.

Investigators and students interested in communication theory and operations research should find this well-indexed and well-documented tract of considerable use.

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23[L].—G. BLANCH & DONALD S. CLEMM, *Tables Relating to the Radial Mathieu Functions*, Vol. 2: *Functions of the First Kind*, U. S. Government Printing Office, Washington, D. C., 20402, 1965, xxiii + 481 pp., 27 cm. Price $4.00.

The volume under review represents the second of a two-volume set. Volume 1 was reviewed earlier in this journal (Volume 18, 1964, pp. 159–160). The functions tabulated are solutions of the equation

$$\frac{d^2f}{dx^2} - (a(q) - 2q\cos 2x)f = 0, \quad \text{where } a(q) \text{ is an eigenvalue} \tag{1}$$

corresponding to which the related equation

$$\frac{d^2g}{dx^2} + (a(q) + 2q\cos 2x)g = 0 \tag{2}$$

has solutions of period π or 2π. The tabulated solutions depend on three parameters; namely, q, x, and the order of the eigenvalue r.

The solutions of (2) fall into four categories; namely, even or odd, and periodicity π or 2π. When the variable x is replaced by ix in these solutions they be-