1. A. WALD & J. WOLFOWITZ, "Tolerance limits for a normal distribution," *Ann. Math. Stat.*, v. 17, 1946, p. 208–215.
2. CHURCHILL EISENHART, M. W. HASTAY & W. A. WALLIS, *Techniques of Statistical Analysis*, McGraw-Hill Book Co., New York. 1947. (See p. 102–107.)

91[K].—R. F. TATE & R. L. GOAN, "Minimum variance unbiased estimation for the truncated Poisson distribution," *Ann. Math. Stat.*, v. 29, 1958, p. 755–765.

For a sample of n from a population with the density function, $e^{-\lambda}\lambda^x/(1 - e^{-\lambda})$, $x = 1, 2, \cdots$, i.e., a Poisson distribution truncated on the left at $x = 1$, the authors derive the minimum variance unbiased estimation of

$$\lambda:\tilde{\lambda}_0(t) = \frac{t}{n}\left(1 - \frac{\mathfrak{S}_{t-1}^{n-1}}{\mathfrak{S}_t^n}\right) = \frac{t}{n}\, C(n, t),$$

in which t is the sample sum and $\mathfrak{S}_t^n$ is a Stirling number of the second kind. Using an unpublished table of F. L. Micksa [1] of $\mathfrak{S}_t^n$ for $n = 1(1)t$, $t = 1(1)50$, this paper contains a table of $C(n, t)$ to 5D for $n = 2(1)t - 1$, $t = 3(1)50$.

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1. FRANCIS L. MIKSA, *Stirling numbers of the second kind*, RMT 85, *MTAC* v. 9, 1955, p. 198.

92[K, P].—P. A. P. MORAN, *The Theory of Storage*, John Wiley & Sons, Inc., New York, 1960, 111 p., 19 cm. Price $2.50.

This is a book about dams. Prof. Moran is at the Australian National University at Canberra, and I imagine that dams have great practical interest there. For many years he has been interested in estimating the probability that a dam will go dry or that it will overflow. He is also interested in how one finds a program of releasing water from a dam in such a way as to optimize the operations of a hydroelectric plant.

The first chapter contains some basic information about statistics and probability. To spare 14 pages for this from a total of a mere 96 shows how necessary Prof. Moran considered it to be.

The second chapter considers various general inventory and queueing problems analogous to dam problems.

In the third chapter the author plunges into his favorite topic, dams. First he considers discrete time—he looks at his water level only once a day. Under certain conditions distributions for the amount of water can be found, but two troublesome conditions occur which limit the regions of analyticity of the distributions. One is overflow. The other is running dry. If one ignores either or both of these, then he is dealing with an imaginary "infinite dam". Some queueing is analogous to an infinite dam, since there is no law limiting the lengths of queues.

Another chapter is devoted to dams which have as input a continuous flow, and from which the release is continuous.

In practice the inputs do not satisfy the assumption of independence, dry weeks tend to come in succession, so the results of the first four chapters are of limited applicability. Monte Carlo methods get estimates of the probabilities without these restrictions, and in addition can be applied to configurations of dams completely beyond other methods of analysis. Of course Monte Carlo has disadvantages of its own. An example is given of a complex configuration for which probabilities were urgently wanted. A large retaining wall of earth was to be built. Overflow would ruin it, so a diversion tunnel was to be built large enough to insure against this contingency. During the building the tunnel is closed to permit pouring the concrete at its mouth. If water accumulates too high behind the wall there will be danger of overflow, ruining the wall. This can be prevented by opening the tunnel, ruining its outworks but preferable to damaging the main wall. The critical height changes each day as the wall is built up. What are the chances of this decision being forced?

The last few pages are devoted to ways of finding an optimum strategy for operating a hydroelectric system, or other program of releasing, replenishing, or otherwise tending the locks. The recommended solution is a method of successive approximations, which would probably be feasible only on a digital computer. The author suggests that a special analog device would be in order for the more complicated configurations.

The analogies between dams and queues or inventories are not pursued beyond the third chapter, in which it is merely mentioned. If these analogies are indeed valid they deserve more treatment. Without this treatment the title is misleading, for we find we are storing only water.

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93[M, X].—JAKOB HORN & HANS WITTICH, *Gewöhnliche Differentialgleichungen*, Walter de Gruyter & Co., Berlin, 1960, 275 p., 24 cm. Price DM 32.

This book is the sixth completely revised edition of Jakob Horn's *Gewöhnliche Differentialgleichungen*, which was published first in 1905. Like the previous editions, this book is intended for mathematicians, physicists, and engineers. In the selection of the material somewhat greater emphasis has been given to subjects that lend themselves to applications. Nevertheless, this book is primarily an introduction to the theory of ordinary differential equations. The text contains existence proofs and a comparatively detailed presentation of differential equations in the complex domain.

Considerable space is devoted to special functions which arise from differential equations. Numerical and graphical methods of solution are treated in a brief chapter. Besides a thorough knowledge of differential and integral calculus on the part of the reader, a familiarity with the basic concepts of the theory of functions of a complex variable is assumed.

No problem sections appear in the book, but numerous illustrative examples are provided.

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