18 [F].—ROGER OSBORN, *Tables of All Primitive Roots of Odd Primes Less than 1000*, University of Texas Press, Austin, 1961, 70 p., 30 cm. Price $3.00.

This slim volume lists all 28,597 primitive roots of the 167 odd primes less than 1000. These tables were computed on an IBM 650. The program and running times are not indicated. The most extensive earlier table, as noted by the author, is due to Chebyshev and extends to $p = 353$.

There also is a small table of statistical information. Perhaps the most interesting column here lists the number of (positive) primitive roots less than $p/2$ for each prime p. Of the 87 primes $\equiv -1 \pmod 4$, eight have exactly one-half of their primitive roots less than $p/2$. The seven primes 223, 379, 463, 631, 691, 883, and 907 have more than one-half less than $p/2$. The remaining 72 primes have less than one-half there. The author associates this preponderance with the well-known fact that more than one-half of the quadratic residues of such primes lie in this interval.

For the primes $\equiv +1 \pmod 4$ this column is clearly redundant, since it is easily seen that if g is a primitive root for such a prime then so is $p - g$. For these primes the real interval of interest is $p/4 < g < 3p/4$. Since the quadratic non-residues are in excess here, one would expect the primitive roots to also be preponderantly in excess, since approximately three-fourths of all non-residues are primitive roots.

D. S.

19 [I, X].—D. S. MITRINOVIĆ & R. S. MITRINOVIĆ, *Sur les nombres de Stirling et les nombres de Bernoulli de l'ordre supérieur*, *Publ. Fac Élect. Univ. Belgrade* (Série: *Math. et Phys.*), No. 43, 1960, 64 p. (French with Serbian summary.)

The tables in this paper extend those given in previous papers, especially the three reviewed in *Mathematics of Computation*, v. 15, 1961, p. 107. The notation used is explained in that review.

Table I (p. 15–44) gives $(-)^m C_m^{\ k}$ for $k = 0(1)32$, $m = 33(1)50$, and for $k = 33(1)49$, $m = k + 1(1)50$,

Table II (p. 45–50) gives $S_n^{\ n-m}$ for $m = 33(1)49$, $n = m + 1(1)50$, and also for $m = 50$, $n = 51$.

Table III (p. 51–63) gives $S_n^{\ n-m}$ for $m = 1(1)3$, $n = 201(1)1000$.

The tables were computed on desk machines. Checks made by the authors were supplemented by comparison with Miksa's unpublished tables and by many-figure computations made in laboratories at Liverpool, Rome, and Munich. A bibliography of 26 items is given.

A. F.

20 [K].—B. M. BENNETT & P. HSU, *Significance Tests in a 2 × 2 Contingency Table: Further Extension of Finney-Latscha Tables*, February 1961. Deposited in UMT File.

These manuscript tables constitute an extension for $A = 21(1)30$ of tables prepared by Latscha for $A = 16(1)20$, and supersede the previous tables by the present authors for $A = 21(1)25$. (See Review 9, *Math. Comp.*, v. 15, 1961, p. 88–89.) The format and precision of those tables (four decimal places) is retained in this addendum.

J. W. W.

21 [K].—COLIN R. BLYTH & DAVID W. HUTCHINSON, *Tables of Neyman Shortest Unbiased Confidence Intervals (a) for the Binomial Parameter (b) for the Poisson Parameter*, (reproduced from *Biometrika*, v. 47, p. 381–391, v. 48, p. 191–194, respectively) University Press, London, 1960, 16 p., 28 cm. Price 2s. 6d.

Anscombe [1] observed that exact confidence intervals for a parameter in the distribution function of a discrete random variable could be obtained by adding to the sample value, X, of the discrete variable a randomly drawn value, Y, from the rectangular distribution on $(0, 1)$. Eudey [2] has applied this idea in the case of the binomial parameter, p, to find the Neyman shortest unbiased confidence set. The present authors use Eudey's equations for a uniformly most powerful level $1\text{-}\alpha$ test of $p = p^*$ vs $p \neq p^*$ based on an X in a sample of n, which give the acceptance interval $a(p^*)$ determined by a value of Y in the form $n_0 + \gamma_0 \leqq X + Y \leqq n_1 + \gamma_1$ in which n_0 and n_1 are integers and $0 \leqq \gamma_0 \leqq 1$, $0 \leqq \gamma_1 \leqq 1$. These are solved for γ_0 and γ_1 in terms of n_0 and n_1 and the given X, n, and α. Then trial values of n_0 and n_1 are used until the resulting γ_0 and γ_1 are both on $(0, 1)$. The computation was carried out on the University of Illinois Digital Computer Laboratory's ILLIAC. The program used for arbitrary n, α prints out $n_0 + \gamma_0$, $n_1 + \gamma_1$ for any equally spaced set of p^* values. From these the Neyman shortest unbiased α-confidence set for p, $X + Y \epsilon \alpha(p^*)$ can be read off to 2D. The tables give such 95% and 99% confidence intervals for p to 2D for $n = 2(1)24(2)50$ and $X + Y = 0(.1)5.5$ for $n \leqq 10$, $0(.1)1(.2)10$ for $11 \leqq n \leqq 19$, $0(.1)1(.2)6(.5)15(1)17$ for $20 \leqq n \leqq 32$, and $0(.2)2(.5)23(1)26$ for $34 \leqq n \leqq 50$. For n, $X + Y$ not tabled, one enters the table at n, $n + 1 - (X + Y)$ and takes the reflection about $p = \frac{1}{2}$ of the interval given.

Similar confidence intervals for the Poisson parameter, λ, were found by the same method. The table gives Neyman shortest unbiased 95% confidence intervals for λ to 1D for $X + Y = .01(.01).1(.02).2(.05)1(.1)10(.2)40(.5)55(1)59$ and to the nearest integer for $X + Y = 60(1)250$. For the same values of $X + Y$, 99% confidence intervals are given to 1D for $X + Y \leqq 54$ and to the nearest integer for $X + Y > 54$.

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1. F. J. ANSCOMBE, "The validity of comparative experiments," *J. Roy Statist. Soc. Ser. A.* v. 111, 1948, p. 181–211.
2. M. W. EUDEY, *On the Treatment of a Discontinuous Random Variable*, Technical Report No. 13 (1949), Statistical Laboratory, University of California, Berkeley.

22 [L].—M. I. ZHURINA & L. N. KARAMAZINA, *Tablit͡sy funkt͡siĭ Lezh͡andra* $P_{-1/2+i\tau}(x)$, Tom I (Tables of the Legendre functions $P_{-1/2+i\tau}(x)$, Vol. I), Izdatel'stov Akad. Nauk SSSR, Moscow, 1960, 320 p., 27 cm., 2700 copies. Price 34.50 (now 37.95) rubles.

This important volume belongs to the well-known series of Mathematical Tables of the Academy of Sciences of the USSR, and the tables were computed on the