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 $\gamma_0$ and $\gamma_1$ in terms of $n_0$ and $n_1$ and the given $X$, $n$, and $\alpha$. Then trial values of $n_0$ and $n_1$ are used until the resulting $\gamma_0$ and $\gamma_1$ 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 $n$, $\alpha$ prints out $n_0 + \gamma_0$, $n_1 + \gamma_1$ for any equally spaced set of $p^*$ values. From these the Neyman shortest unbiased $\alpha$-confidence set for $p$, $X + Y \in \alpha(p^*)$ 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, $\lambda$, were found by the same method. The table gives Neyman shortest unbiased 95% confidence intervals for $\lambda$ 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 Lezhandra* $P_{-1/2+i\tau}(x)$, 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 high-speed electronic calculator STRELA at the Computational Center of the Academy.

The Russian work has been concerned with the functions $P_{-1/2+i\tau}(x)$, where $\tau$ is real and $x > -1$. The functions are real, and satisfy the differential equation

$$(1 - x^2)u'' - 2xu' - (\tfrac{1}{4} + \tau^2)u = 0.$$

The functions occur in potential problems relating, for example, to cones and hyperboloids of revolution; they also occur in the Mehler-Fock inversion formulas [1]. The tables for $-1 < x < 1$ and $x > 1$ are given in Volumes I and II, respectively. The formulas given in the Introduction to Vol. I are limited to those which have some application in the range $-1 < x < 1$. The values were computed from

$$P_{-1/2+i\tau}(x) = F(\tfrac{1}{2} - i\tau, \tfrac{1}{2} + i\tau; 1; \tfrac{1}{2} - \tfrac{1}{2}x),$$

where $F(a,b;c;z)$ denotes the hypergeometric function, and were checked by differencing. The main table (pages 13–312) gives values of $P_{-1/2+i\tau}(x)$ to 7S for $\tau = 0(0.01)50$, $x = +0.9(-0.1)-0.9$, without differences. (It is stated that Vol. II, which the reviewer has not seen, gives values for $x = 1.1(0.1)2(0.2)5(0.5)10(10)60$.) The interval in $\tau$ has been made narrow because applications in mathematical physics frequently require integration with respect to $\tau$. It is stated that interpolation in $\tau$ may be performed by the three-point Lagrange formula with an error not exceeding 1.6 final units; it may be added that such an error can occur in only a small part of the table. Interpolation in $x$ is naturally more troublesome, even well away from a logarithmic singularity at $x = -1$.

An auxiliary table on pages 315–318 facilitates use of an asymptotic series for large $\tau$; arc cos $x$ and four coefficients which are functions of $x$ are tabulated to 7D for $x = 0.99(-0.01)-0.90$, without differences. Values of the Bessel functions $I_0$ and $I_1$ are required to be available for use with the auxiliary table.

A useful bibliography of 16 items averages about one misprint per item in the five non-Russian titles, the most entertaining being MacRobert's well-known book on "Spherical Harmonies" and a paper by Barnes on "Veneralized Legendre Functions."

The reviewer differenced about a hundred values without finding any error. Assuming its accuracy, this must be reckoned a valuable table.

A. F.

1. A. Erdélyi et al, *Higher Transcendental Functions*, Vol. 1, McGraw-Hill, New York, 1953, p. 175.

**23 [X].**—A. Charnes & W. W. Cooper, *Management Models & Industrial Applications of Linear Programming*, v. 1, John Wiley & Sons, Inc., New York, 1961, xxiii + 471 p., 26 cm. Price $11.95.

This book is addressed to persons interested in the application of linear programming techniques to various aspects of management planning. Much of the material has been published previously by the authors in scattered journals and texts; however, this volume offers the advantage of a unified mathematical treatment of sundry topics in mathematical programming and managerial economics within the framework of adjacent-extreme-point techniques.