1. R. A. Fisher, "The general sampling distribution of the multiple correlation," *Proc. Roy. Soc., A.*, 1928, p. 654–673. See p. 665.

81[K].—G. J. Lieberman, "Tables for one-sided statistical tolerance limits," *Industrial Quality Control*, v. 14, No. 10, 1958, p. 7–9.

Given a sample of n from $N(\mu, \sigma^2)$, it is desired to determine from the sample a quantity a (or b) such that with probability γ, the interval $(-\infty, a)$ (or the interval (b, ∞)) will include at least the fraction $1 - \alpha$ of the population. The tables give values of K to 3D for $n = 3(1)25(5)50$, $\gamma = .75, .9, .95, .99$, and $\alpha = .25, .1, .05, .01, .001$, such that $a = \bar{X} - Ks$ and $b = \bar{X} - Ks$, where X is the sample mean and S^2 is the usual unbiased estimate of σ^2. For more extensive tables and a more complete discussion see [1].

C. C. Craig

University of Michigan
Ann Arbor, Michigan

1. D. B. Owen, *Tables of Factors for One-sided Tolerance Limits for a Normal Distribution*, Office of Technical Services, Dept. of Commerce, Washington, D. C., 1958. [See RMT 82.]

82[K].—D. B. Owen, *Tables of Factors for One-sided Tolerance Limits for a Normal Distribution*, Sandia Corporation, SCR-13, 1958, 131 p., 28 cm. Obtainable from the Office of Technical Services, Dept. of Commerce, Washington 25, D. C. Price \$2.75.

Given a sample of n from $N(\mu, \sigma^2)$, with $\bar{x}$ the sample mean and S^2 the usual unbiased estimate of σ^2, these tables give values of k for which

$$\Pr[\Pr(x \leqq \bar{x} + ks) \geqq P] = \gamma.$$

As stated, Table I is a reproduction of one given by Johnson & Welch [1] in which values of k are given to 3D for $\gamma = .95$, $n = 5(1)10, 17, 37, 145, \infty$ and $P = 0.7(.05).85, .875, .9, .935, .95, .96, .975, .99, .995, .996, .9975, .999, .9995$. It is also explained that Table II was obtained from Resnikoff & Lieberman's table of percentage points of the noncentral t-distribution [2] appropriately modified to give k values to 3D for $n = 3(1)25(5)50, \infty$ and $P = .75, .85, .9, .935, .96, .975, .99, .996, .9975, .999$ for $\gamma = .75, .9, .95$. For $\gamma = .99, .995$, $n = 6(1)25(5)50, \infty$, while P has the same range as before. The more extensive Table III gives values to 5D obtained by an approximative method due to Wallis [3] for $n = 2(1)200(5)400(25)1000, \infty$, $P = .7, .8, .9, .95, .99, .999$, and $\gamma = .7, .8, .9, .95, .99, .999$. For small n and the larger values of P and γ, the approximation breaks down and the entry is left blank or given with a warning sign that comparison should be made with neighboring values. (However it looks to the reviewer as if this sign has been omitted from the entries for $n = 2$, $P = .99, .999$, and $\gamma = .999$.) Finally Table IV is obtained from Bowker's table of two-sided tolerance limits [3] by an approximate procedure suggested by McClung [4] to give conservative values of k for one-sided limits. Here values are given to 3D for $n = 2(1)102(2)180(5)300(10)400(25)750(50)1000, \infty$, $P = .875, .95, .975, .995, .9995$, and $\gamma = .75, .9, .99$.

In an appendix auxiliary tables compare values in the four tables for selected values of the four parameters. The maximum difference shown between Tables I and II is .01. It is concluded that values in Table III will probably be underestimates for $\gamma \leqq .95$ and overestimates for $\gamma \geqq .99$, while in Table IV, k is probably underestimated for $P = .875$ and overestimated for the other P values. Differences shown between Table II and Table III values in a few cases exceed 20% of the presumably more accurate Table II values and differences shown between Table II and Table IV sometimes exceed 10% of the Table II values.

C. C. CRAIG

University of Michigan
Ann Arbor, Michigan

1. N. L. JOHNSON & B. L. WELCH, "Applications of the non-central t-distribution," *Biometrika*, v. 31, 1939, p. 362–389.
2. G. J. RESNIKOFF & G. J. LIEBERMAN, *Tables of the Noncentral t-Distribution*, Stanford University Press, Stanford, Calif., 1957.
3. C. EISENHART, M. W. HASTAY & W. A. WALLIS, *Techniques of Statistical Analysis*, McGraw-Hill Book Co., New York, 1947.
4. R. M. MCCLUNG, "First aid for pet projects injured in the lab or on the range or what to do until the statistician comes," U. S. Naval Ordnance Test Station Technical Memorandum No. 1113, October 1955.

83[K].—K. V. RAMACHANDRAN, "On the Studentized smallest chi-square," Amer. Stat. Assn., *Jn.*, v. 53, 1958, p. 868–872.

Consider the F statistics, $\frac{S_i}{S} \cdot \frac{m}{t}$, $i = 1, 2, \cdots, k$, in which $S_1, S_2, \cdots, S_k$ and S are mutually independent, with each $S_{i/\sigma}2$ having a χ^2 distribution under the null hypothesis with t degrees of freedom and S/σ^2 a χ^2 distribution with m d.f. There are numerous applications of statistical methods, a few of which are discussed, in which one needs the value of V for which $\Pr | \frac{S_{\min}}{S} \frac{m}{t} \geqq V | = 1 - \alpha$. The author tabulates lower 5% points of $\frac{S_{\min}}{S} \cdot \frac{m}{t}$ for values of t, m and k as follows: For $t = 1, m \geqq 5, k = 1(1)8$ to 1S; for $t = 2, 5 < m < 10$ and $m \geqq 12, k = 1(1)8$ to 3D; for $t = 3, 4, 6, m = 5, 6(2)12, 20, 24, \infty, k = 1(1)8$ to 3D; for $t = 1(1)4(2)12, 16, 20, m = \infty, k = 1(1)8$ to 3D; for $t = 1(1)4(2)12, 16, 20, m = 5, 6(2)12, 20, 24, \infty, k = 1, 2, 3$ to 3D.

C. C. CRAIG

University of Michigan
Ann Arbor, Michigan

84[K].—A. E. SARHAN & B. G. GREENBERG, "Estimation of location and scale parameters by order statistics from singly and doubly censored samples. Part II.," *Ann. Math. Stat.*, v. 29, 1958, p. 79–105.

This paper, a continuation of a previous one [1], is mainly devoted to an extension of tables given in the earlier paper to cover samples $11 \leqq n \leqq 15$ and to a discussion of efficiencies of the estimators used. Samples of n are from $N(\mu, \sigma^2)$; r_1 and r_2 observations are censored in the left and right tails respectively ($r_1 r_2 \geqq 0$); and $\bar{x}$ and σ are estimated by the most efficient linear forms in the ordered uncensored observations. Table I gives the coefficients for these best linear systematic statistics to 4D for all combinations of r_1, r_2 for $n = 11(1)15$. Table II gives variances and the covariance of these estimates to 4D for $n = 11(1)15$ and all pairs of r_1, r_2 values. In Table III efficiencies of the two estimates relative to that for uncensored samples are given to 4D for the same range of values of n and r_1, r_2. For