45[K].—I. D. J. BROSS & E. L. KASTEN, "Rapid analysis of 2 x 2 tables", Amer. Stat. Assn., *Jn.*, v. 52, 1957, p. 18–28.

Conventional statistical analysis of 2 x 2 tables such as

Sample	A	$\bar{A}$	
1	a	b	$N_1 = NP$
2	c	d	$N_2 = NQ$
	T		N

involves use of triple-entry tables for critical values of a. These tables are entered with N, N_1, and T, or some equivalent combination of three numbers. The body of the table then usually gives critical values for the observation a. The authors remark that the statistical test is relatively insensitive to variation in N and propose to reduce the complexity of the tabular entry to double entry by ignoring N and using only the parameters T and P. Charts I to IV inclusive present lower tail critical values for a at 5%, 2.5%, 1% and .5% levels of probability for $.1 < P < .9$ and $5 \leqq T \leqq 49$. Interchange of P and Q produces lower tail critical values for c (and by subtraction) upper tail critical values for a.

The authors claim that the approximation is good, provided P and Q are both at least .1 and T is not larger than $.2N$.

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46[K].—F. E. CLARK, "Truncation to meet requirements on means," Amer. Stat. Assn., *Jn.*, v. 52, 1957, p. 527–536.

The problem under consideration is that of truncating a given distribution so that the resulting population will meet specified sampling requirements. This problem arises when one wishes to screen the output of some production process in order to reduce the risk (probability) of having lots rejected on the basis of a requirement that only those lots will be accepted for which the mean $\bar{X}$ of a random sample of n items shall, for example, exceed or be less than some value, say UAL (upper average level) or LAL (lower average level).

Methods are given for determining a single point of truncation A such that the mean $\bar{X}_A$ of a random sample from a normal population (μ, σ) screened or truncated at A will meet a specification requirement $\bar{X}_A \geqq$ LAL or $\bar{X}_A \leqq$ UAL with risk of rejection r.

Methods are also given for determining double points of truncation A and B such that a normal population (μ, σ) truncated at $X = A$ and at $X = B$ will meet the requirement LAL $\leqq \bar{X}_{AB} \leqq$ UAL with risk r.

As aids in carrying out the computations involved in the above methods, a table is included which lists values of the mean μ_{ab} and the standard deviation σ_{ab} of the standard normal population (0, 1) truncated at a and at b ($a \leqq b$). Entries are given to $4D$ for $a = -3.00(.25).50$ and for $b = 3.00(-.25)0$. A chart is included which contains curves of constant μ_{ab} and σ_{ab} for fixed degrees of truncation p, where p is the proportion of the complete population which is eliminated by truncation. In this chart, a extends from -3.0 to 0.5, b extends from -0.5 to $+3$, $p = .05$, .10(.10)1.0, $\mu_{ab} = -1.0(.1)1.0$, $\sigma_{ab} = 0(.1).9$. A second chart contains a set of five curves for selected values of n and r to be used in determining a and p as a function of h, where $h = (\mu - \text{LAL})/\sigma$. Values of a extend from -1.4 to 0.4, h extends from -1.0 to 0.4, and p from .10 to .65.

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47[K].—W. H. CLATWORTHY, *Contributions on Partially Balanced Incomplete Block Designs with Two Associate Classes*, NBS Applied Mathematics Series, No. 47, U. S. Government Printing Office, Washington 25, D. C., 1956, iv + 70 p., 26 cm. Price $.45.

This publication contains six papers dealing with various aspects (enumeration, dualization, and tabulation) of partially balanced incomplete block designs with two associate classes, and with the construction of some new group divisible designs, triangular incomplete block designs, and Latin square type designs with two constraints. Approximately 75 new designs not contained in the monograph of Bose, Clatworthy, and Shrikhande [1] are given in the present paper. A number of theorems are proved in the six papers. Two of the theorems give bounds on the parameters v, p_{11}^1, and p_{12}^1 in terms of the parameters r, k, n_1, n_2, λ_1, and λ_2 of the partially balanced incomplete block design with two associate classes. The two theorems on the duals of partially balanced designs are useful in identifying certain partially balanced incomplete block designs.

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1. R. C. BOSE, W. H. CLATWORTHY & S. S. SHRIKHANDE, *Tables of Partially Balanced Designs with Two Associate Classes*, North Carolina Agricultural Experiment Station Technical Bulletin No. 107, 1954.

48[K].—W. J. DIXON, "Estimates of the mean and standard deviation of a normal population," *Ann. Math. Stat.*, v. 28, 1957, p. 806–809.

Four estimates of the mean in samples of N from a normal population are compared as to variance and efficiency. These are (a) median, (b) mid-range, (c) mean of the best two, (d) $\bar{X}_{)1,N(} = \sum_{i+2}^{N-1} [X_i/(N-2)]$. The sample values are denoted $X_1 \leqq X_2 \leqq \cdots \leqq X_N$. The results for the median and mid-range are given primarily for comparison purposes, since results are well known. The mean of the best two is reported as the small sample equivalent of the mean of the 27th and 73rd percentiles.

The variance and efficiency are given to $3S$ for $N = 2(1)20$. The estimate (d) is compared to the best linear systematic statistics (BLSS) as developed in [1] and [2]. It is noted that the ratio Var (BLSS)/Var $(\bar{X}_{)1,N(})$ is never less than 0.990.

Two estimates of the standard deviation are given in Table II. One, the range, is well known. The quantity k which satisfies $E(kW) = \sigma$ is tabulated to $3D$ for $N = 2(1)20$. Denote the subranges $X_{N-i+1} - X_i$ by $W_{(i)}$ and $W_{(1)} = W$. The estimate $S' = k'(\sum W_{(i)})$, where the summation is over the subset of all $W_{(i)}$ which gives