references might have been cited, e.g., O. Kempthorne, *Design and Analysis of Experiments*, W. G. Cochran and G. M. Cox, *Experimental Designs*, and O. L. Davies, *Design and Analysis of Industrial Experiments*.

These tables are excellently and clearly printed. After one becomes acquainted with their structure and arrangement the tables should prove useful on many occasions to those persons engaged in the design of experiments in any field. One unique feature of these tables deserves notice. A complete listing of all 576 configurations of the 4x4 Latin square is given. Continuation of this procedure for larger squares would have produced a bulky volume. One wonders about the special utility of 4x4 Latin squares which merited this complete listing.

There are two comments that must be made about these tables. The first comment is a criticism on the failure to include a table of random numbers within the volume. This reviewer's first act in using these tables will be to insert a small table of random numbers in both the front and rear of the volume. A table of experimental designs cannot be used without a random number table. As a consultant, when I pick up 'my tables,' I want to be sure that both items are with me.

The second comment follows from the first. A preliminary section on randomization procedures and choice of specific layout for each design should have been included. If omitted, specific references to such instructions in the Fisher & Yates tables or in O. Kempthorne's book should have been given. In this reviewer's experience both minor and major errors in designs have occurred because of a lack of clear understanding of proper randomization procedures.

Finally, one may remark that these tables would have been much improved by the inclusion of some explanatory materials, and references for each design included. For statisticians, R. A. Fisher & F. Yates, *Statistical Tables for Biological Agricultural and Medical Research*, Oliver & Boyd Ltd., Edinburgh (Fifth edition 1957), and E. S. Pearson & H. O. Hartley, *Biometrika Tables for Statisticians*, Vol. I, Cambridge, published for the Biometrika Trustees of the University Press (2nd printing, 1956) have set a high standard in this respect. The continued rapid development in the field of experimental design makes it difficult to keep tables of this type up to date. It is hoped that a really revised edition will soon appear. Designs for response surface investigation and new fractional factorial arrangements need to be readily available.

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44[K].—INGRAM OLKIN, SUDHISH G. GHURYE, WASSILY HOEFFDING, WILLIAM G. MADOW, & HENRY B. MANN, Editors, *Contributions to Probability and Statistics, Essays in Honor of Harold Hotelling*, Stanford University Press, 1960, x + 517 p., 24 cm. Price $6.50.

This volume contains a collection of forty-two essays on probability and mathematical statistics in honor of Professor Harold Hotelling on his sixty-fifth birthday. The list of contributors, limited to those who have been closely associated with

Professor Hotelling, looks nevertheless like an up-to-date "Who's Who" in the subject field. This fact alone pays an appropriate tribute to his influence and leadership.

The first two essays, fitting to the occasion, deal with Hotelling the man, and as a leader and teacher in the field of mathematical statistics. The third one is a reprint of Hotelling's own excellent paper on "Teaching of Statistics," and the fourth one is a bibliography of his work. A total of ninety papers, not including reviews, were credited to him between 1925 and 1959—a truly impressive record of accomplishment.

The remaining thirty-eight research papers cover a wide spectrum of topics. There are seven papers on design and analysis of experiments, and about the same number in non-parametric statistics and also multivariate problems. Investigations into power, optimality, consistency, and robustness of tests, distribution theorems, and stochastic processes make up the bulk of the remaining papers. There is one paper on the inversion of partitioned matrices (Greenberg and Sarhan) and one on the numerical convergence of iterative processes (Moriguti).

Since a listing of titles and authors takes about two pages, a detailed review of this diversified volume is an impossible task within the space allotted. If one paper has to be singled out as truly outstanding among the thirty-eight, I believe most people would agree to the choice of John Tukey's "A Survey of Sampling from Contaminated Distributions," which investigates the robustness of efficiency of competitive estimators. In the paper the author considers two normal populations which have the same mean but whose standard deviations are in the ratio 3:1. One of the questions asked was: "What fraction of the wider normal population must be added to the narrower one in order for the mean deviation to be as good a large sample measure of scale as the standard deviation?" The answer, given two pages later, turns out to be a shockingly low .008. Tukey then suggests that "Problems of robustness of efficiency are probably as important as problems of robustness of validity, and, because of their relatively undeveloped stage, deserve even more attention from statisticians." No doubt this suggestion will be heeded.

A list of titles and authors follows. Texts which are accompanied by tables are marked with an asterisk. The tables in paper No. 20 are separately described in the review immediately following. All the other tables are of illustrative nature, with limited selections of entries, and will not be discussed here.

Part I. An Appreciation

1. Harold Hotelling—William G. Madow
2. Harold Hotelling—A Leader in Mathematical Statistics—Jerzy Neyman
3. The Teaching of Statistics—Harold Hotelling
4. Bibliography of Harold Hotelling

Part II: Contributions to Probability and Statistics

5. Some Remarks on the Design and Analysis of Factorial Experiments—R. L. Anderson
6. A Limitation of the Optimum Property of the Sequential Probability Ratio Test—T. W. Anderson and Milton Friedman
7. Decision Theory and the Choice of a Level of Significance for the t-Test—Kenneth J. Arrow

8. Simultaneous Comparison of the Optimum and Sign Tests of a Normal Mean—R. R. Bahadur
9. Some Stochastic Models in Ecology and Epidemiology—M. S. Bartlett
10. Random Orderings and Stochastic Theories of Responses—H. D. Block and J. Marschak
11. On a Method of Constructing Steiner's Triple Systems—R. C. Bose*
12. A Representation of Hotelling's T^2 and Anderson's Classification Statistic W in Terms of Simple Statistics—Albert H. Bowker
13. Euler Squares—Kenneth A. Bush
14. A Compromise Between Bias and Variance in the Use of Nonrepresentative Samples—Herman Chernoff
15. Construction of Fractional Factorial Designs of the Mixed 2^m 3^n Series—W. S. Connor
16. Application of Boundary Theory to Sums of Independent Random Variables—J. L. Doob, J. L. Snell, and R. E. Williamson
17. Some k-Sample Rank-order Tests—Meyer Dwass
18. Characterization of Some Location and Scale Parameter Families of Distributions—S. G. Ghurye
19. Generalization of Some Results for Inversion of Partitioned Matrices—B. G. Greenberg and A. E. Sarhan
20. Selecting a Subset Containing the Best of Several Binomial Populations—Shanti S. Gupta and Milton Sobel*
21. Consistency of Maximum Likelihood Estimation of Discrete Distributions—J. Hannan
22. An Upper Bound for the Variance of Kendall's "Tau" and of Related Statistics—Wassily Hoeffding
23. On the Amount of Information Contained in a σ-Field—Gopinath Kallianpur
24. The Evergreen Correlation Coefficient—M. G. Kendall
25. Robust Tests for Equality of Variances—Howard Levene*
26. Intrablock and Interblock Estimates—Henry B. Mann and M. V. Menon
27. A Bivariate Chebyshev Inequality for Symmetric Convex Polygons—Albert W. Marshall and Ingram Olkin
28. Notes on the Numerical Convergence of Iterative Processes—Sigeiti Moriguti
29. Prediction in Future Samples—George E. Nicholson, Jr.*
30. Ranking in Triple Comparisons—R. N. Pendergrass and R. A. Bradley*
31. A Statistical Screening Problem—Herbert Robbins
32. On the Power of Some Rank-order Two-sample Tests—Joan Raup Rosenblatt
33. Some Non-parametric Analogs of "Normal" ANOVA, MANOVA, and of Studies in "Normal" Association—S. N. Roy and V. P. Bhapkar
34. Relations Between Certain Incomplete Block Designs—S. S. Shrikhande
35. Infinitesimal Renewal Processes—Walter L. Smith
36. Classification Procedures Based on Dichotomous Response Vectors—Herbert Solomon
37. Multiple Regression—Charles Stein
38. An Optimum Replicated Two-sample Test Using Ranks—Milton E. Terry*
39. A Survey of Sampling from Contaminated Distributions—John W. Tukey
40. Multidimensional Statistical Scatter—S. S. Wilks

41. Convergence of the Empiric Distribution Function on Half-Spaces—J. Wolfowitz
42. Analysis of Two-factor Classifications With Respect to Life Tests—M. Zelen.*

The five editors are to be congratulated for assembling and presenting this volume in an excellent manner.

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45[K].—Shanti S. Gupta & Milton Sobel, "Selecting a subset containing the best of several binomial populations," p. 224–248, *Contributions to Probability and Statistics, Essays in Honor of Harold Hotelling*, edited by Olkin et al., Stanford University Press, 1960. [See preceding review.]

Given k binomial populations with unknown probabilities of success p_1, p_2, $\cdots$ p_k, a procedure R is studied by the authors which selects a subset that guarantees with preassigned probability P^* that, regardless of the true unknown parameter values, it will include the best population; i.e., the one with the highest parameter value. Procedure R for equal sample sizes is given as follows. Retain in the selected subset only those populations for which $x_i \geqq x_{\max} - d$, where $d = d(n, k, P^*)$ is a non-negative integer, and x_i denotes number of successes based on n observations from the ith population. Table 2 gives the values of d for $k = 2(1)20, 20(5)50$; $n = 1(1)20, 20(5)50, 50(10)100, 100(25)200, 200(50)500$; $P^* = .75, .90, .95, .99$ (a trial and error procedure R is given for large, unequal sample sizes).

Table 3 gives the expected proportion of populations retained in the selected subset by procedure R (for the special case $p_1 = p_2 = \cdots = p_{k-1} = p$, $p_k = p + \delta$, $0 \leqq \delta \leqq 1$, $0 \leqq p \leqq 1 - \delta$) for $n = 5(5)25$; $p^* = .75, .90, .95$; $\delta = .00, .10, .25, .50$; and $p + \delta = .50, .75, .95, 1.00$.

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46[K].—Maurice Henri Quenouille, "Tables of random observations from standard distributions," *Biometrika*, v. 46, 1959, p. 178–202. Egon Sharpe Pearson, "Note on Mr. Quenouille's Edgeworth Type A transformation," *Biometrika*, v. 46, 1959, p. 203–204.

Quenouille offers a random sample of 1000 each from the normal distribution and seven specified non-normal distributions. While a sample of 1000 is too small for much serious Monte Carlo work, the method of construction of the present tables, where the normal sample uniquely and monotonely determines the 7 non-normal samples, makes it suitable for pilot studies of the sensitivity of statistical procedures to departures from normality.

Specifically, let x_1 be a unit normal deviate from the tables of Wold [1]. Define

$$y = (2\pi)^{-1/2} \int_{-\infty}^{x_1} \exp(-\tfrac{1}{2}x^2)\, dx,$$

$$x_2 = 3^{1/2}[2y - 1],$$