those areas. For teachers, statisticians in general, and members of operations research teams, this revised edition will be found to fill a real need. For applied work in fields like engineering, medicine, sociology, and psychology, the full treatment of the basic concepts of regression and correlation will be of immense value, and some slight reconsideration of the illustrative examples given will often provide insight into the real problems in these other fields.

Thanks are due to both the authors and publishers for making this material available. It is a text that should be in the library of every technical organization.

HARRY WEINGARTEN

Special Projects Office
Department of the Navy
Washington, D. C.

11[K].—E. FIX, J. L. HODGES & E. L. LEHMANN, "The restricted chi-square test," included in *Probability and Statistics*, edited by U. GRENANDER, Almqvist & Wiksell, Stockholm; John Wiley and Sons, New York, 1959, pages 92–108 [See the following review].

This paper contains some new tables of the power function of chi-square tests, i.e., of the non-central chi-square distribution, for small degrees of freedom. As is well-known, the power function $\beta = \beta(\alpha, f, \lambda)$ of a chi-square test depends on three parameters: α, the "level of significance" at which the test of the null hypothesis H_0 is conducted, i.e., the probability of the test falsely rejecting H_0 when it is true; f, the "degrees of freedom" of the test; and λ, the "non-centrality parameter," which measures the "distance" of the alternative $H = H(\lambda)$ under consideration, from the null hypothesis H_0. The tables of this article give λ to 3D as a function of $\beta = 0.5(0.1)0.9, 0.95$, for $f = 1(1)6$ and $\alpha = 0.001, 0.005, 0.01, 0.05(0.05)0.3, 0.4, 0.5$. The quantity tabulated is that value of the parameter λ which satisfied the equation

$$e^{-(\lambda/2)} \sum_{k=0}^{\infty} \frac{1}{k!\, 2^{(1/2)f+2k-1}\Gamma(f/2)} \int_{\chi_f(\alpha)}^{\infty} x^{f+2k-1} e^{-(1/2)x^2}\, dx = \beta$$

where f = number of degrees of freedom and $\chi_f(\alpha)$ is such that

$$\frac{1}{2^{(1/2)f-1}\Gamma(f/2)} \int_{\chi_f(\alpha)}^{\infty} x^{f-1} e^{-(1/2)x^2}\, dx = \alpha.$$

These tables thus supplement those of E. Fix (1949), reviewed in *MTAC*, v. 4, 1950, p. 206–207.

CHURCHILL EISENHART

National Bureau of Standards
Washington, D. C.

12[K].—ULF GRENANDER, Editor, *Probability and Statistics*, Almqvist & Wiksell, Stockholm; John Wiley & Sons, New York, 1959, 434 p., 24 cm. Price, $12.50.

"Once it had been suggested that a book of studies in probability and statistics should be presented to Harald Cramér in honor of his 65th birthday, the authors

needed little or no persuasion to contribute." This volume, subtitled The Harald Cramér Volume, is the result. It constitutes a fitting tribute to Harald Cramér, Professor of Mathematical Statistics and Actuarial Mathematics at the University of Stockholm for over three decades, then President, and now Chancellor of the University of Stockholm—Sweden's outstanding figure in the mathematical theory of probability, mathematical statistics, and actuarial mathematics.

The twenty-one contributors to this volume are from six countries—England (2), Finland (1), France (1), India (1), Sweden (3), United States (13); five are former students of Professor Cramér; and all have enviable international reputations in their respective fields. Their respective contributions are arranged within the volume in alphabetical sequence, with page-lengths indicated in parentheses, and are as follows: T. W. Anderson, "Some scaling models and estimation procedures in the latent class model" (30); M. S. Bartlett, "The impact of stochastic process theory on statistics" (11); J. L. Doob, "A Markov chain theorem" (8); G. Elfving, "Design of linear experiments" (17); W. Feller, "On combinatorial methods in fluctuation theory" (17); E. Fix, J. L. Hodges and E. L. Lehmann, "The restricted chi-square test" (16); U. Grenander, "Some non-linear problems in probability theory" (22); M. Kac, "Some remarks on stable processes with independent increments" (9); D. G. Kendall, "Unitary dilations of Markov transition operators, and the corresponding integral representations for transition-probability matrices" (23); P. Levy, "Construction du processus de W. Feller et H. P. McKean en partant du mouvement Brownien" (13); P. Masani, "Cramér's theorem on monotone matrix-valued functions and the Wold decomposition" (15); P. Masani and N. Wiener, "Non-linear prediction" (23); J. Neyman, "Optimal asymptotic tests of composite statistical hypotheses" (22); H. Robbins, "Sequential estimation of the mean of a normal population" (11); M. Rosenblatt, "Statistical analysis of stochastic processes with stationary residuals" (30); C. O. Segerdahl, "A survey of results in the collective theory of risk" (24); J. S. Tukey, "An introduction to the measurement of spectra" (31); S. S. Wilks, "Non-parametric statistical inference" (24); H. Wold, "Ends and means in econometric model building" (80). Only one of these papers (E. Fix et al) contains a mathematical table of general interest, which is considered separately in the immediately preceding review.

All in all, this volume provides a panoramic and stimulating view of the work at the frontiers of probability and statistical theory and some of their applications. The individual scientist, unless he is intimately concerned with the theory of stochastic processes, will very likely find only a small fraction of its contents of direct interest to him, and, therefore, may consider the volume much too expensive for personal acquisition. On the other hand, it *is* the type of volume that one expects to find in the library of a university where research in probability and mathematical statistics and their applications is conducted at the post-graduate level, and in the libraries of other organizations where research is carried out in the above and related fields.

Finally, it is to be regretted that the volume does not contain either a photograph or a biography of Professor Cramér at this milestone in his career.

CHURCHILL EISENHART

National Bureau of Standards
Washington, D. C.