THE ANNALS of MATHEMATICAL STATISTICS

FOUNDED AND EDITED BY H. C. CARVER, 1930-1938 EDITED BY S. S. WILKS, 1938-1949

THE OFFICIAL JOURNAL OF THE INSTITUTE OF MATHEMATICAL STATISTICS

C	0n	tos	nts
		I.C. I	1.1

PAGE

A Theory of Some Multiple Decision Problems, IIE. L. LEHMANN Invariance, Minimax Sequential Estimation, and Continuous Time Processes	
J. KIEFER	0/0
On the Comparative Anatomy of Transformations	602
The Problem of Estimation	633
Non-Parametric Empirical Bayes Procedures	649
On Queues with Poisson Arrivals	670
Idempotent Matrices and Quadratic Forms in the General Linear Hypothesis	
Franklin A. Graybill and George Marsaglia	678
Some Examples with Fiducial Relevance	687
Statistical Properties of Inverse Gaussian Distributions, IIM. C. K. TWEEDIE	696
The Mean and Variance of the Maximum of the Adjusted Partial Sums of a Finite	
Number of Independent Normal Variates	706
Remarks Concerning Characteristic FunctionsEUGENE LUKACS	717
The Distribution of the Ratios of Certain Quadratic Forms in Time Series	
Seymour Geisser	724
Restriction and Selection in Multinormal DistributionsA. CLIFFORD COHEN, JR.	
Components of Variance Analysis for Proportional Frequencies	101
J. D. BANKIER AND R. E. WALPOLE	749
Sums of Independent Truncated Random VariablesJ. M. Shapiro	
On the Identity Relationship for Fractional Replicates of the 2 ⁿ Series	104
R. C. Burton and W. S. Conner	769
R. C. Burton and W. S. Conner	102
Notes:	
Waiting Times when Queues are in Tandem	768
On the Power of Optimum Tolerance Regions when Sampling From Normal Dis-	
tributions	773
The Convergence of Certain Functions of Sample Spacings LIONEL WEISS	778
The Asymptotic Power of Certain Tests of Fit Based on Sample Spacings	•••
Lionel Weiss	783
The Distribution of the Number of Locally Maximal Elements in a Random Sample	•00
T. Austin, R. Fagen, R. Lehrer, W. Penney	786
Percolation Processes: Lower Bounds for the Critical Probability	100
	700
J. M. Hammersley Non-Parametric Up-and-Down Experimentation	705
Approximate Moments for the Serial Correlation Coefficient John S. White	700
On a Decision Procedure Based on the Tukey Statistic	190
K. V. RAMACHANDRAN AND C. G. KHATRI	802

(Continued on outside back cover)

Vol. 28, No. 3 — September, 1957

THE ANNALS OF MATHEMATICAL STATISTICS

Editor T. E. HARRIS

ASSOCIATE EDITORS

Z. W. BIRNBAUM DAVID BLACKWELL HERMAN CHERNOFF WILFRID J. DIXON J. M. HAMMERSLEY

J. KIEFER

WITH THE COOPERATION OF

R. L. ANDERSON R. C. BOSE D. G. CHAPMAN K. L. CHUNG D. R. COX J. F. DALY D. A. DARLING CYRUS DERMAN J. L. DOOB

MEYER DWASS
D. A. S. FRASER
J. L. HODGES, JR.
SAMUEL KARLIN
OSCAR KEMPTHORNE
C. H. KRAFT
W. H. KRUSKAL
SOLOMON KULLBACH

E. M. LECAM
F. J. MASSEY
G. E. NOETHER
HOWARD RAIFFA
H. E. ROBBINS
WALTER L. SMITH
C. M. STEIN
D. R. TRUAX
LIONEL WEISS

PAST EDITORS OF THE ANNALS

H. C. CARVER, 1930-1938

T. W. Anderson, 1950-1952

S. S. Wilks, 1938-1949 E. L. Lehmann, 1953-1955

Published quarterly by the Institute of Mathematical Statistics in March, June, September and December at Baltimore, Maryland.

Subscription Rates. Current issues are \$12 per volume (four issues of one calendar year) in the U. S. and Canada, \$10 per volume elsewhere. Single issues are \$3.50. Back numbers are \$12 per volume, \$3.50 per issue, \$200 for the first 25 volumes, \$10 per additional volume purchased at the same time as Volume I through XXV.

Communications concerning subscriptions, back numbers, payment of dues, etc., should be addressed to A. H. Bowker, Treasurer, Department of Statistics, Stanford University, Stanford, Calif.

Communications concerning membership, changes of address, etc., should be addressed to George E. Nicholson, Jr., Secretary, Department of Statistics, University of North Carolina, Chapel Hill, N. C. Changes of address which are to become effective for a given issue of the *Annals* should be reported to the Secretary on or before the 10th of the month preceding the month of issue.

Editorial Office. The RAND Corporation, 1700 Main St., Santa Monica, Calif., T. E. Harris, Editor.

Preparation of manuscripts. Manuscripts should be submitted to the editorial office. Each manuscript should be typewritten, double spaced, with wide margins at sides, top, and bottom, and the original should be submitted with one additional copy, on paper that will take corrections. Dittoed or mimeographed papers are acceptable only if completely legible. Footnotes should be reduced to a minimum, and where possible replaced by remarks in the text, or a bibliography at the end of the paper; formulae in footnotes should be avoided. References should follow current *Annals* style.

Figures, charts, and diagrams should be professionally drawn on plain white paper or tracing cloth in black India ink twice the size they are to be printed.

Authors are asked to keep in mind the typographical difficulties of complicated mathe (Continued on inside back cover)

Entered as second-class matter at the Post Office at Baltimore, Maryland, under the act of March 3, 1879

COMPOSED AND PRINTED AT THE

WAVERLY PRESS, Inc., BALTIMORE, MARYLAND, U. S. A.