

# THE ANNALS *of* MATHEMATICAL STATISTICS

(FOUNDED BY H. C. CARVER)

THE OFFICIAL JOURNAL OF THE INSTITUTE  
OF MATHEMATICAL STATISTICS

## *Contents*

	PAGE
Problems in Probability Theory. HARALD CRAMÉR .....	165
The Estimation of Dispersion from Differences. ANTHONY P. MORSE AND FRANK E. GRUBBS .....	194
The Efficiency of Sequential Estimates and Wald's Equation for Sequential Processes. J. WOLFOWITZ .....	215
Estimation of Linear Functions of Cell Proportions. JOHN H. SMITH .....	231
A Statistical Problem Connected with the Counting of Radioactive Particles. STEN MALMQUIST .....	255
The Probability Function of the Product of Two Normally Distributed Variables. LEO A. AROIAN .....	265
NOTES:	
A Remark on Characteristic Functions. A. ZYGMUND .....	272
A Lower Bound for the Variance of Some Unbiased Sequential Estimates. D. BLACKWELL AND M. A. GIRSHICK .....	277
An Extension to Two populations of an Analogue of Student's <i>t</i> -Test Using the Sample Range. JOHN E. WALSH .....	280
On the Norm of a Matrix. ALBERT H. BOWKER .....	285
Definition of the Probable Deviation. M. FRÉCHET .....	288
The General Relation Between the Mean and Mode for a Discontinuous Variate. M. FRÉCHET .....	290
Note on Differentiation Under the Expectation Sign in the Fundamental Identity of Sequential Analysis. T. E. HARRIS .....	294
A Uniqueness Theorem for Unbiased Sequential Binomial Estimation. L. J. SAVAGE .....	295
Acknowledgement of Priority. H. E. ROBBINS .....	297
Abstracts of Papers .....	298
News and Notices .....	301
Report on the Atlantic City Meeting of the Institute .....	306

Vol. XVIII, No. 2 — June, 1947

# THE ANNALS OF MATHEMATICAL STATISTICS

EDITED BY

S. S. WILKS, *Editor*

M. S. BARTLETT  
WILLIAM G. COCHRAN  
ALLEN T. CRAIG  
C. C. CRAIG

HARALD CRAMÉR  
W. EDWARDS DEMING  
J. L. DOOB  
W. FELLER  
HAROLD HOTELLING

J. NEYMAN  
WALTER A. SHEWHART  
JOHN W. TUKEY  
A. WALD

WITH THE COÖPERATION OF

T. W. ANDERSON, JR.  
J. H. CURTISS  
J. F. DALY  
HAROLD F. DODGE  
PAUL S. DWYER

CHURCHILL EISENHART  
M. A. GIRSHICK  
PAUL R. HALMOS  
PAUL G. HOEL  
MARK KAC

WILLIAM G. MADOW  
ALEXANDER M. MOOD  
FREDERICK MOSTELLER  
HENRY SCHEFFÉ  
JACOB WOLFOWITZ

The ANNALS OF MATHEMATICAL STATISTICS is published quarterly by the Institute of Mathematical Statistics, Mt. Royal & Guilford Aves., Baltimore 2, Md. Subscriptions, renewals, orders for back numbers and other business communications should be sent to the ANNALS OF MATHEMATICAL STATISTICS, Mt. Royal & Guilford Aves., Baltimore 2, Md., or to the Secretary of the Institute of Mathematical Statistics, P. S. Dwyer, 116 Rackham Hall, University of Michigan, Ann Arbor, Mich.

Changes in mailing address which are to become effective for a given issue should be reported to the Secretary on or before the 15th of the month preceding the month of that issue. The months of issue are March, June, September and December.

Manuscripts for publication in the ANNALS OF MATHEMATICAL STATISTICS should be sent to S. S. Wilks, Fine Hall, Princeton, New Jersey. Manuscripts should be typewritten double-spaced with wide margins, and the original copy should be submitted. Footnotes should be reduced to a minimum and whenever possible replaced by a bibliography at the end of the paper; formulae in footnotes should be avoided. Figures, charts, and diagrams should be drawn on plain white paper or tracing cloth in black India ink twice the size they are to be printed. Authors are requested to keep in mind typographical difficulties of complicated mathematical formulae.

Authors will ordinarily receive only galley proofs. Fifty reprints without covers will be furnished free. Additional reprints and covers furnished at cost.

The subscription price for the ANNALS is \$5.00 per year. Single copies \$1.50. Back numbers are available at \$5.00 per volume, or \$1.50 per single issue.

COMPOSED AND PRINTED AT THE  
WAVERLY PRESS, INC.  
BALTIMORE, MD., U. S. A.