

# 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

## Contents

	PAGE
Large Sample Theory: Parametric Case. HERMAN CHERNOFF.....	1
A "Mixed Model" for the Analysis of Variance. HENRY SCHEFFÉ.....	23
Keeping Moment-Like Sampling Computations Simple. JOHN W. TUKEY.....	37
Symmetric Functions of a Two-way Array. ROBERT HOOKE.....	55
Some Applications of Bipolykeys to the Estimation of Variance Components and Their Moments. ROBERT HOOKE.....	80
On the Estimation of Regression Coefficients of a Vector-Valued Time Series With a Stationary Residual. MURRAY ROSENBLATT.....	99
An Application of Information Theory to Multivariate Analysis, II. S. KULLBACK....	122
On the Characteristics of the General Queueing Process, with Applications to Random Walk. J. KIEFER AND J. WOLFOWITZ.....	147
Tolerance Regions. D. A. S. FRASER AND IRWIN GUTTMAN.....	162
Generalized Tolerance Limits. J. H. B. KEMPERMAN.....	180
On a Characterization of the Stable Law with Finite Expectation. R. G. LAHA.....	187
Notes:	
A Variable Probability Distribution Function. RURIC E. WHEELER.....	196
Uniform Convergence of Random Functions with Applications to Statistics. HERMAN RUBIN.....	200
Correction to "On the Maximum Number of Constraints of an Orthogonal Array." ESTHER SEIDEN.....	204
Abstracts of Papers.....	204
News and Notices.....	224
Report of the New York Meeting.....	231
Report of the Annual Business Meeting, December 27, 1955.....	231
Report of the President of the Institute.....	240
Resolutions of the Institute.....	247
Report of the Secretary of the Institute.....	247
Report of the Editor of the Annals.....	248
Publications Received.....	249

Vol. 27, No. 1 — March, 1956

# THE ANNALS OF MATHEMATICAL STATISTICS

EDITOR

T. E. HARRIS

ASSOCIATE EDITORS

Z. W. BIRNBAUM  
HERMAN CHERNOFF

J. M. HAMMERSLEY  
WILFRID J. DIXON

L. J. SAVAGE  
J. WOLFOWITZ

WITH THE COOPERATION OF

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

D. A. S. FRASER  
J. L. HODGES, JR.  
SAMUEL KARLIN  
O. A. KEMPTHORNE  
J. C. KIEFER  
C. H. KRAFT  
W. H. KRUSKAL  
SOLOMON KULLBACH  
L. M. LECAM

F. J. MASSEY  
G. E. NOETHER  
HOWARD RAIFFA  
H. E. ROBBINS  
MILTON SOBEL  
C. M. STEIN  
D. R. TRUAX  
LIONEL WEISS  
M. A. WOODBURY

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

---

## INSTITUTE OF MATHEMATICAL STATISTICS

- Treasurer's Office** Department of Statistics, Stanford University, Stanford, Cal.  
A. H. Bowker, Treasurer  
These addresses should be used for communications concerning subscriptions, back numbers, payment of dues, etc.
- Secretary's Office** Department of Statistics, University of North Carolina, Chapel Hill, N. C.  
George E. Nicholson, Jr., Secretary  
These addresses should be used for communications concerning membership, changes of address, etc. 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, Cal.  
T. E. Harris, Editor  
Manuscripts should be submitted to this address; each manuscript should be typewritten, double-spaced with wide margins, and the original copy should be submitted (preferably with one additional copy). Dittoed and mimeographed papers are acceptable if they are completely legible and printed on paper that will take corrections. 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 professionally 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.
- Subscription Prices** 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.

COMPOSED AND PRINTED AT THE

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

## **NEW POLICY FOR ABSTRACTS**

The Institute of Mathematical Statistics has a new policy on abstracts. They should be submitted in duplicate to the Editor, preferably on abstract blanks, which can be obtained from the IMS Secretary. Abstracts must be received at least 47 days before the first day of the meeting at which they are to be presented, indicating whether presented by title or in person. (Only one contributed paper may be given in person at any one meeting.) They may be printed prior to the publication of the report of the meeting. Those received by April 30 will appear in the September *Annals*, by July 31 in December, etc. Abstracts should be limited to 200 words or the equivalent, and should avoid displayed expressions and complicated formulae. They can be accepted from non-members of the IMS only if transmitted by members.