Proceedings of the CAMBRIDGE PHILOSOPHICAL SOCIETY

(MATHEMATICAL AND PHYSICAL SCIENCES)

VOLUME 53
PART 3

CAMBRIDGE UNIVERSITY PRESS

BENTLEY HOUSE, 200 EUSTON ROAD, LONDON, N.W.1

AMERICAN BRANCH: 32 EAST 57th STREET, NEW YORK 22, N.Y.

Price Thirty-five Shillings Net (U.S.A. \$6.00)

Subscription price per volume £6 net post free (\$20.00 in U.S.A.)

July 1957

CAMBRIDGE PHILOSOPHICAL SOCIETY

FOUNDED 1819; ROYAL CHARTER 1832

Session 1956-1957

President: F. J. W. ROUGHTON

Vice-Presidents: E. C. BATE-SMITH, F. P. BOWDEN, F. G. YOUNG

Treasurer: M. V. WILKES

Secretaries: (Mathematical) H. G. EGGLESTON

(Physical) T. E. FABER (Biological) S. SMITH

The publications of the Society consist of the Proceedings and of the Biological Reviews.

The publication of Transactions was suspended at the end of Volume XXII.

Orders should be sent to: The Manager, Cambridge University Press, Bentley House, 200 Euston Road, London, N.W.1. Enquiries from the U.S.A. should be addressed to the Cambridge University Press, American Branch, 32 East 57th Street, New York 22, U.S.A.

For the purchase of early parts of the *Transactions*, *Proceedings* and *Biological Reviews* application should be made to the Secretaries. All parts of the *Proceedings* and *Biological Reviews* are available, and prices of sets or single parts will be quoted on application.

Fellows and Associates of the Society are particularly requested to inform the Secretaries of any change of postal address, and to send their subscriptions to the Treasurer, Cambridge Philosophical Society, Free School Lane, Cambridge.

All correspondence regarding library exchanges and Fellows' copies should be addressed

to the Secretaries at the Society's office.

PROCEEDINGS of the CAMBRIDGE PHILOSOPHICAL SOCIETY

edited by

H. G. EGGLESTON

H. P. F. SWINNERTON-DYER

in consultation with

T. E. FABER F. SMITHIES D. R. HARTREE F. URSELL

D. G. KENDALL D. H. WILKINSON

- 1. Four parts of the *Proceedings* are issued each year.
- 2. Communications for the *Proceedings* should be sent to *The Librarian*, *Cambridge Philosophical Society*, *Free School Lane*, *Cambridge*. Papers by Fellows and Associates of the Society should be communicated directly by the author. Other papers must be communicated by a Fellow, who in doing so should give his opinion on the suitability of the paper for publication.
 - 3. Papers occupying more than twenty pages of print can only very rarely be accepted.
- 4. It is recommended that each paper be prefaced by a short abstract. Copies of a *Guide for the Preparation of Synopses*, prepared by the Abstracting Services Consultative Committee and issued by the Royal Society, may be obtained from the Librarian.
- 5. Drawings for illustrations and diagrams should be on a large scale and on smooth white Bristol board in Indian ink.
- 6. References should be listed at the end of each paper. World List abbreviations for titles of journals should be used and first and last page numbers given where relevant.
- 7. Authors are particularly requested to prepare their manuscripts in a form suitable for printing, with adequate margins. A pamphlet on the preparation of papers may be obtained from the Librarian. If a large number of corrections are required in the proofs, the Council reserves the right to make a charge towards the cost.
- 8. Authors may receive, on request, fifty offprints of a paper in the *Proceedings* without charge.

ROYAL STATISTICAL SOCIETY

THE JOURNAL OF THE ROYAL STATISTICAL SOCIETY is published in two series: SERIES A (GENERAL), four issues a year, 20s. each part, annual subscription £4. 2s. post free; SERIES B (METHODOLOGICAL), two issues a year, 30s. each part, annual subscription £3. 1s. post free.

Contents of Series B (Methodological), Vol. 19, Part 1, 1957

Symposium on Spectral Approach to Time Series (with Discussion):

The Spectral Analysis of Time Series. By G. M. JENKINS and M. B. PRIESTLEY.

On Estimating the Spectral Density Function of a Stochastic Process. By Z. A. LOMNICKI and S. K. ZAREMBA.

Curve and Periodogram Smoothing. By P. WHITTLE.

Distributions Associated with Random Walk and Recurrent Events. By J. G. Skellam and L. R. Shenton (with Discussion).

A Comparison of Two Sorts of Test for a Change of Location applicable to Truncated Data. By D. E. BARTON.

Confirming Statistical Hypotheses. By M. G. BULMER.

Sequential Confidence Intervals for the Mean of a Normal Population with Unknown Variance. By W. D. RAY.

Joint Asymptotic Distribution of the Median and a U-Statistic. By B. V. SUKHATME.

The Efficiency of the Records Test for Trend in Normal Regression. By A. STUART.

Some Experimental Designs of Use in Changing from One Set of Treatments to Another, Parts I and II. By G. H. FREEMAN.

The Efficiency of N Machines Uni-Directionally Patrolled by One Operative when Walking Time and Repair Times are Constants. By C. MACK, T. MURPHY and N. L. Webb.

The Efficiency of N Machines Uni-Directionally Patrolled by One Operative when Walking Time is Constant and Repair Times are Variable. By C. Mack.

Comment on the Notes by Neyman, Bartlett and Welch in the issue (B, Vol. 18, No. 2) for December 1956. By SIR RONALD FISHER.

Obtainable through any bookseller or direct from:
ROYAL STATISTICAL SOCIETY
21 BENTINCK STREET, LONDON, W.1



The Institution of* Electrical Engineers

Office for Advertisements in the Publications

Terminal House Grosvenor Gardens London, S.W. 1 SLOANE 7266

THE JOURNAL

MONTHLY. Subjects of general interest, as apart from the specialised papers and discussions appearing in Parts "A" and "B" of the Proceedings, are treated in the monthly JOURNAL which is distributed free to members of the Institution but is also on sale to non-members.

THE PROCEEDINGS

Part "A". Contains papers and discussions concerning the specialised spheres of power generation, transmission, meters and instruments...and applications of electricity. Published in February, April, June, August, October, and December.



THE PROCEEDINGS

Part "B". Contains papers and discussions concerning the progress and developments in the fields of telecommunication, radio, electronics and the many allied interests. Published in January, March, May, July, September, and November.



MONOGRAPHS OF THE SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS

NO. 1

Report on

A SURVEY OF TRAINING AND RESEARCH IN APPLIED MATHEMATICS IN THE UNITED STATES

A Report by the National Research Council Committee on Training and Research in Applied Mathematics

F. J. WEYL, Investigator

Copies are available at \$2.00 each from

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS

Box 7541, Philadelphia 1, Pennsylvania, U.S.A.