

# MATHEMATICAL PROCEEDINGS

*(formerly Proceedings)*  
*of the*  
*Cambridge Philosophical Society*

VOLUME 91 PART 1

*January 1982*



CAMBRIDGE UNIVERSITY PRESS

# CAMBRIDGE PHILOSOPHICAL SOCIETY

FOUNDED 1819; ROYAL CHARTER 1832

1982

*President:* H. B. WHITTINGTON

*Vice-Presidents:* R. C. EVANS, D. LYNDEN-BELL, D. A. PARRY

*Treasurer:* S. G. FLEET

*Secretaries:* (Physical) J. E. FIELD (Biological) M. A. MESSAGE

(Mathematical) G. A. REID

The Society publishes *Mathematical Proceedings* (until 1975 entitled *Proceedings*) and *Biological Reviews*. The publication of *Transactions* was suspended at the end of Volume XXIII.

Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent or direct to Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, or in the U.S.A. and Canada, Cambridge University Press, 32 East 57th Street, New York, N.Y. 10022. POSTMASTER: send address changes in U.S.A. and Canada to Cambridge University Press, 32 East 57th Street, New York, N.Y. 10022.

*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, at the Society's office.*

Correspondence about library exchanges should be sent to the Librarian at the Society's office.

Back numbers of *Mathematical Proceedings* and *Biological Reviews* may be obtained from the CAMBRIDGE PHILOSOPHICAL SOCIETY, BENET STREET, CAMBRIDGE CB2 3PY, ENGLAND. All parts of *Mathematical Proceedings* (including indices to Vols. 1-50, 51-60, 61-70 and 71-80) and of *Biological Reviews* are available. Prices will be quoted on application.

Some parts of *Transactions* are available from the above address. The complete set on microfilm may be obtained from Microfilm Division, E.P. Group of Companies, Bradford Road, East Ardsley, Wakefield, Yorkshire, price £77.

## MATHEMATICAL PROCEEDINGS

of the

## CAMBRIDGE PHILOSOPHICAL SOCIETY

edited by J. E. ROSEBLADE in consultation with

J. F. ADAMS

P. GODDARD

T. W. KÖRNER

M. F. ATIYAH

S. W. HAWKING

G. A. REID

A. D. BARBOUR

W. K. HAYMAN

F. SMITHIES

T. BROOKE

R. HILL

J. S. WILSON

BENJAMIN

P. T. JOHNSTONE

1. *Mathematical Proceedings* (ISSN 0305-0041) issues one part every two months. Two volumes of three parts are published each year. The subscription price (which includes second-class postage) of volumes 91 and 92 (1982) is £42.00 net per volume (U.S. \$105.00 in the U.S.A. and Canada).

2. *Scope of the Mathematical Proceedings.* Papers which advance knowledge of mathematics, either pure or applied, will be considered by the Editorial Committee. The work must be original and not submitted to another journal. Papers should be sent to the Editor, *Mathematical Proceedings*, Cambridge Philosophical Society, Bene't Street, Cambridge CB2 3PY, England. Papers in languages other than English should be sent only after prior consultation with the Editor.

3. *Correction of proofs.* If a paper is accepted, the author will receive in due course page proofs for him to correct and return within one week. To minimize disturbance of type, when words or phrases are added in proof, others of equal length should be removed if possible.

If many corrections are made in the proofs, the Council reserve the right to charge the cost.

4. Authors get free offprints, 50 in covers or 100 without, and may obtain more on payment. An order form is sent with the proofs.

© Cambridge Philosophical Society, 1982.

*Copying.* This journal is registered with the Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970. Organizations in the U.S.A. who are also registered with CCC may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. copyright law) subject to payment to CCC of the per-copy fee of \$3.50. Code 0305-0041/82/0000-0001 \$3.50. This consent does not extend to multiple copying for promotional or commercial purposes.

ISI Tear Service, 3501 Market Street, Philadelphia, Pennsylvania 19104, U.S.A., is authorized to supply single copies of separate articles for private use only.

For all other use, permission should be sought from the Cambridge or New York offices of the Cambridge University Press.