

TRANSACTIONS  
OF  
THE ROYAL SOCIETY  
OF  
EDINBURGH



EARTH SCIENCES

Volume 86 Part 3

PUBLISHED BY THE ROYAL SOCIETY OF EDINBURGH

22 GEORGE STREET · EDINBURGH · EH2 2PQ

1996 (for 1995)

## Editorial Board

J. B. DAWSON  
University of Edinburgh  
(Chairman)

C. H. DONALDSON  
University of St Andrews  
(Executive Editor)

E. N. K. CLARKSON  
University of Edinburgh

A. E. FALLICK  
S.U.R.R.C., East Kilbride

D. J. FETTES  
British Geological Survey, Edinburgh

J. H. HULL  
British Geological Survey, Edinburgh

A. L. PANCHEN  
University of Newcastle upon Tyne  
(Executive Editor)

B. J. BLUCK  
University of Glasgow  
(Executive Editor)

J. D. PEACOCK  
Heriot-Watt University

T. P. SCOFFIN  
University of Edinburgh

F. WILLETT  
(Curator)  
University of Glasgow

## Consulting Editors

SHOHEI BANNO  
Kyoto University

W. L. BROWN  
Centre de Recherches Pétrographiques et Géo-chimiques,  
Vandoeuvre-les-Nancy

R. L. CARROLL  
McGill University, Montreal

B. W. CHAPPELL  
Australian National University, Canberra

J. M. COLEMAN  
Louisiana State University, Baton Rouge

J. F. DEWEY  
University of Oxford

S. J. GOULD  
University of Harvard

R. W. HUTCHINSON  
Colorado School of Mines

J. KONTA  
Charles University, Prague

D. B. MCINTYRE  
Kinfauns, Perth

K. J. MÜLLER  
Rhein. Friedrich-Wilhelms-Universität Bonn

D. F. STRONG  
University of Victoria, B.C.

V. C. THAKUR  
Wadia Institute of Himalayan Geology

S. UYEDA  
University of Tokyo

R. WOODALL  
Western Mining Co., Adelaide

*Publications Manager*, Royal Society of Edinburgh: T. Dart

**COPYRIGHT:** It is the policy of the Royal Society of Edinburgh not to charge any royalty for the production of a single copy of any one article made for private study or research. Specific permission will not be required for photocopying multiple copies of copyright material, to be used for *bona fide* educational purposes, provided this is done by a member of the staff of the university, school or other comparable institution, for distribution without profit to student members of that institution and provided the copies are made from the original journal. Requests for the copying or reprinting of any article for any other purpose should be sent to the Royal Society of Edinburgh.

*Transactions of the Royal Society of Edinburgh: Earth Sciences* publishes one volume per year usually in three or four parts. Volume 87 will be published in 1996 in three issues: Vol 87 1/2 (double issue), 87.3 and 87.4. An annual subscription costs £94. Orders should be placed with CAB International (to whom cheques should be made payable), Wallingford, Oxon OX10 8DE, UK. (Tel 01491 832111; Fax 01491 826090.)

*Transactions* is indexed in the following: Current Contents/Physical, Chemical & Earth Sciences, SciSearch, CABS Database, Mineralogical Abstracts, Biosciences Information Service, Geoabstracts and GEOBASE.

© 1996 The Royal Society of Edinburgh and copyright-owners of individual papers.