Geology Today

Published under the co-sponsorship of The Geological Society and The Geologists' Association by Blackwell Scientific Publications Ltd

Editors

J.H. McD. Whitaker 11 Guildford Road, Leicester, England Peter J. Smith 32 St James Close, Hanslope, Milton Keynes, England

Geology Today is a magazine for both amateur and professional geologists. The only English-language journal of its kind, *Geology Today* is designed to provide a wide audience of both specialists and non-specialists with intelligible and readable information from different areas of specialization within both pure and applied geology. The editors select two or three feature articles each issue on various topics of current geological interest. Shorter articles, notes, news of geological meetings, exhibitions and field excursions, contributions from foreign correspondents, as well as book reviews keep both professional and amateur geologists abreast of developments and advances in the field.

Subscription Information

Geology Today is published bi-monthly. Subscription rates for 1987 are, for individuals $\pm 15.00 (\text{UK}), \pm 18.00$ (overseas), \$28.50 (USA, Canada & Japan), and for institutions $\pm 45.50 (\text{UK}), \pm 54.50$ (overseas), \$87.50 (USA, Canada & Japan) post free. Members of The Geological Society and The Geologists' Association are entitled to subscribe at special rates; details are available from the Society and the Association.

Order Form

Please tick the appropriate box and return to Blackwell Scientific Publications Ltd, P.O. Box 88, Oxford, England.				
I would like to subscribe to Geology Today				
I wish to pay by cheque/money order (delete as necessary) and enclose the sum of				
I wish to pay by Access/Barclaycard/VISA/Mastercard (delete as necessary)				
Please debit my credit card no.				
Expiry date with the sum of				
Signature Date				
Please send me a specimen copy of <i>Geology Today</i>				
Name				
Address				
Blackwell Scientific Publications				

P.O. Box 88, Oxford, England

CAMBRIDGE

Numerical Recipes

The Art of Scientific Computing

WILLIAM PRESS, BRIAN P. FLANNERY, SAUL TEUKOLSKY and WILLIAM T. VETTERLING

Numerical Recipes is exciting and informative, and I wish it every success. It will give guidance and pleasure to novice and expert alike.' Richard L. Garwin, *IBM Research Centre*

Numerical Recipes seems to match the needs of students and professional scientists far better than any other text I have seen'. Richard Muller, Professor of Physics, University of California

'Any technology company that doesn't have a few copies of this work and the accompanying diskettes is wasting the precious time of its best researchers. Both would be bargains at twice their price.' Dr Srully Blotnick, Forbes Magazine

Numerical Recipes is an instant 'classic', a book that should be purchased and read by anyone who uses numerical methods.' *American Journal of Physics*

'The authors are to be congratulated for providing the scientific community with a valuable resource.' The Scientist

Numerical Recipes provides a practical reference and textbook for anyone doing numerical analysis. It is not only a list of every numerical technique developed, but also a guide to those that work! The authors provide the techniques and computer programs needed for analysis and also advise on their applications. They show that the practical methods of numerical computation can be simultaneously efficient, clever, and clear.

The authors assume that the reader is mathematically literate and familiar with FORTRAN or PASCAL programming languages, but no prior experience with numerical analysis or numerical methods is assumed. The programs in the book are in ANSI- standard FORTRAN-77 for the main text, and are repeated in UCSD-PASCAL. Workbooks providing sample programs that illustrate the use of each subroutine and procedure are available and the listed programs can be obtained in several machine-readable formats and programming languages.

The diskettes listed below are published by Cambridge University Press. All are $5\frac{1}{4}$ " double-sided doubledensity floppy diskettes. They operate on DOS 2.0/3.0 on IBM-PC, XT, AT or IBM compatible personal computers. Technical questions, corrections and requests for information on other available formats and software products, should be directed to Numerical Recipes Software, PO Box 243, Cambridge, MA 02238, USA

818 pp. 1986 0 521 308119 **£25.00 net**

Recipe Diskettes

0 521 309557 (UCSD-PASCAL) \$15.00 + VAT in UK 0 521 30958 1 (FORTRAN-77) \$15.00 + VAT in UK

Example Diskettes

0 521 30954 9 (UCSD-PASCAL) £15.00 + VAT in UK 0 521 30957 5 (FORTRAN-77) £15.00 + VAT in UK 236 pp. 0 521 30956 5 (UCSD-PASCAL) Paperback £15.00 net 178 pp. 0 521 31330 9 (FORTRAN-77) Paperback £15.00 net

Full details of the books and diskettes may be obtained by writing to Sally Seed at the Cambridge address or Clay Gordon in New York

Cambridge University Press

Workbooks

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England 32 East 57 Street, New York, New York 10022, USA.

CAMBRIDGE EARTH SCIENCES

South Atlantic Palaeoceanography Edited by KENNETH J. HSU

and **HELMUT J. WEISSERT** This book brings together in one volume the results of the major discoveries made by the *Glomar Challenger* during five expeditions in 1980. Palaeotemperature studies have provided a history of climatic variations; geochemistry of carbon isotopes has provided

information on fertility of planktonic organisms and on intensity of oceanic overturns whilst the correlation of sediment character to changes in oceanic chemistry and fertility has permitted interpretations of the variation of the level at which fossil skeletons become dissolved.

The book therefore provides the first modern regional synthesis of ocean history, and it serves as a methodological model for studies of the world's other oceans.

350 pp. 1985 0 521 26609 2 \$42.50 net

Phosphate Deposits of the World

Volume 1: Proterozoic and Cambrian Phosphates Edited by P. J. COOK and J. H. SHERGOLD

This unique survey describes the world's ancient phosphorite deposits on a scale never previously attempted. The International Geological Correlation Programme started Project 156, on world phosphate resources, in 1977. It is expected that the final results of the project will be published as four reference volumes, of which this is the first.

The study extends through all continents except Antarctica and the data presented give a good understanding of the distribution, nature and origin of phosphate deposits. The book is an important contribution to the scientific study of such deposits, as well as a valuable aid in the search for exploitable phosphates throughout the world.

416 pp. 1986 0 521 25034 X **\$60.00 net** Cambridge Earth Science Series

Global Change

Edited by T. F. MALONE and J. G. ROEDERER

A multidisciplinary, integrated approach is necessary if we are to understand how our planet functions and thereby deal more effectively with environmental crises. This collection of papers (the result of a symposium sponsored by ICSU in September 1984) will form the basis for such an approach.

'The publication, containing 28 papers by 40 authors, many including extensive bibliographies, figures and tables, is well produced and eminently readable. ICSU is to be congratulated for its initiative and the editors for their industry.' WMOBulletin

512 pp. 1985 0 521 30670 1 **£45.00 net** ICSU Press

The Pleistocene History of the Middle Thames Valley P. L. GIBBARD

This is the first detailed geological study of an area of great importance to British Pleistocene geology. The Middle Thames Valley, stretching from Goring near Reading to central London, includes the largest single spread of river terrace deposits in the country. These deposits record the Thames' history over the last million years, which in turn reflects the evolution of lowland southeastern Britain, and they have been studied in detail by the author.

Dr Gibbard's study will be of great interest to specialists in Quaternary geology, palaeontology, palynology and palaeolithic archaeologists.

155 pp. 1986 0 521 26578 9 £45.00 net

Plankton Stratigraphy

Edited by H. M. BOLLI, J. B. SAUNDERS and K. PERCH-NIELSEN

Covering every aspect of the stratigraphy of plankton, this comprehensive reference book will facilitate the accurate dating of marine deposits.

The various zonal schemes are compared and then the species within 8 major fossil groups are examined. A particular strength of the work is the provision of thousands of photographs and diagrams of particular planktic fossils; more than 3200 taxa are considered and illustrated by over 7000 figures. In addition more than 150 range charts designed for easy reference are presented.

1032 pp. 1985 0 521 23576 6 **£95.00 net** Cambridge Earth Science Series

Also of interest

The Scientific Study of Flint and Chert

Edited by G. SIEVEKING and M. B. HART 304 pp. 1986 0 521 26252 6 £60.00 net

and

The Human Uses of Flint and Chert

Edited by G. SIEVEKING and M. H. NEWCOMER

268 pp. 0 521 26253 4 £60.00 net

For further details of all Cambridge Earth Science titles, please write to Sally Seed at the address below.

Cambridge University Press

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU



Theories of the Earth and Universe

A History of Dogma in the Earth Sciences

S. WARREN CAREY

In this sweeping work—part treatise, part history, part memoir a world renowned geologist traces the evolution of beliefs about the earth and universe. Carey reviews the history of geology from earliest times, showing how new insights have battled for acceptance against entrenched scientific dogma. He probes the weaknesses of platetectonic theory (geology's currently reigning paradigm) and explains at length the well-developed alternative theory of an expanding earth. Finally, he ties planetary expansion to the independently known expansion of the universe. Over 100 maps and line drawings. 320 pp. \$35.00

Stanford University Press STANFORD, CA 94305

(iv)

Geological Magazine

with which is incorporated

The Geologist

founded in 1864 by the late DR HENRY WOODWARD, F.R.S.

Edited by W. B. HARLAND, M.A. C. P. HUGHES, M.A. and R. S. J. SPARKS, M.A.

assisted by MRS J. M. HOLLAND

Associate editors SIR KINGSLEY DUNHAM, D.SC., F.R.S. N. L. FALCON, M.A., F.R.S. F. W. SHOTTON, M.B.E., M.A., SC.D., F.R.S. SIR JAMES STUBBLEFIELD, D.SC., F.R.S.

Editorial Advisory Board M. P. COWARD J. K. LEGGETT B. D. WEBBY P. J. WYLLIE B. W. D. YARDLEY



Volume 124 of Whole Series January–December 1987

CAMBRIDGE UNIVERSITY PRESS CAMBRIDGE NEW YORK NEW ROCHELLE MELBOURNE SYDNEY

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE

The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, NY 10022, USA

10 Stamford Road, Oakleigh, Melbourne, Australia

© Cambridge University Press 1987

Pagination and dates of publication of issues in this volume

Number	l:pp. 1–96	January 1987
	2: pp. 97-190	March 1987
	3: pp. 191-302	May 1987
	4: pp. 303-404	July 1987
	5: pp. 405-500	September 1987
	6: pp. 501604	November 1987

Printed in Great Britain by the University Press, Cambridge

Contents

ARTICLES

(Figures in **bold** type denote number of issue)

ANDREWS, J. E.

- Jurassic clay mineral assemblages and their post-depositional alteration: upper Great Estuarine Group, Scotland, 3, 261
- BAR-MATTHEWS, M.

The genesis of uranium in manganese and phosphorite assemblages, Timna Basin, Israel, 3, 211

BHATTACHARYYA, P. K. & MUKHERJEE, S.

Granulites in and around the Bengal anorthosite, eastern India: genesis of coronal garnet, and evolution of the granulite-anorthosite complex, 1, 21

BOYLE, A. P.

A model for stratigraphic and metamorphic inversions at Sulitjelma, central Scandes, 5, 451.

BRASIER, M. D. & SINGH, P.

Microfossils and Precambrian-Cambrian boundary stratigraphy at Maldeota, Lesser Himalaya, 4, 323

CAMPBELL, S D. G., REEDMAN, A. J., HOWELLS, M. F. & MANN, A.C.

The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, U.K., 6, 501

CATTELL, A.

Enriched komatiitic basalts from Newton Township, Ontario: their genesis by crustal contamination of depleted komatiite magma, 4, 303

COOPER, D. J. W.

Hamrat Duru Group: revised stratigraphy of a Mesozoic deep-water passive margin in the Oman Mountains, 2, 157

CRIMES, T. P.

Trace fossils and correlation of late Precambrian and early Cambrian strata, 2, 97

CROWTHER, P. R., RICKARDS, R. B. & URBANEK, A.

Possible cellular tissue in an Ordovician graptoblast, 1, 67

HOLLAND, C. H.

Stratigraphical and structural relationships of the Dingle Group (Silurian), County Kerry, Ireland, 1, 33

HUTTON, D. H. W.

Strike-slip terranes and a model for the evolution of the British and Irish Caledonides, 5, 405

KAROWE, A. L. & JEFFERSON, T. H.

Burial of trees by eruptions of Mount St Helens, Washington: implications for the interpretation of fossil forests, 3, 191

KRAPEZ, B. & BARLEY, M. E.

Archaean strike-slip faulting and related ensialic basins: evidence from the Pilbara Block, Australia, 6, 555 KRUSE, PETER D.

Further Australian Cambrian sphinctozoans, 6, 543

LAW, R. D. & POTTS, G. J.

The Tarskavaig Nappe of Skye, northwest Scotland: a re-examination of the fabrics and their kinematic significance, 3, 231

McDOUGALL, N., BRENCHLEY, P. J., REBELO, J. A. & ROMANO, M.

Fans and fan deltas - precursors to the Armorican Quartzite (Ordovician) in western Iberia, 4, 347

MORSE, S. A., OWENS, B. E. & BUTCHER, A. R.

Origin of finger structures in the Rhum Complex: phase equilibrium and heat effects, 3, 205

MURPHY, F. C.

Late Caledonian granitoids and timing of deformation in the Iapetus suture zone of eastern Ireland, 2, 135 NAIDIN, D. P.

The Cretaceous-Tertiary boundary in Mangyshlak, U.S.S.R., 1, 13

NEEDHAM, D. T.
Asymmetric extensional structures and their implications for the generation of melanges, 4, 311 NICHOLS, G. J.
Syntectonic alluvial fan sedimentation, southern Pyrenees, 2, 121
Mass extinction pattern: result of chance, 4, 319
PHILIP, G. M. & WATSON, D. F. Probabilism in Geological Data Analysis, 6, 577
 REEDMAN, A. J., HOWELLS, M. F., ORTON, G. & CAMPBELL, S. D. G. The Pitts Head Tuff Formation: a subaerial to submarine welded ash-flow tuff of Ordovician age, North Wales, 5, 427
REX, G. M. & SCOTT, A. C. The sedimentology, palaeoecology and preservation of the Lower Carboniferous plant deposits at Pettycur, Fife, Scotland, 1, 43
RICE, A. H. N. Continuous out-of-sequence ductile thrusting in the Norwegian Caledonides, 3, 249
SOPER, N. J. & HIGGINS, A. K. A shallow detachment beneath the North Greenland fold belt: implications for sedimentation and tectonics, 5, 441
SUAREZ, M. & BELL, C. M. Upper Triassic to Lower Cretaceous continental and coastal saline lake evaporites in the Atacama region of northern Chile, 5, 467
SUAREZ, M., HERVE, M. & PUIG, A. Cretaceous diapiric plutonism in the southern cordillera, Chile, 6, 569
TALBOT, C. J. & VON BRUNN, V. Intrusive and extrusive (micro) melange couplets as distal effects of tidal pumping by a marine ice sheet, 6, 513
 TAYLOR, P. D. & COPE, J. C. W. A trepostome bryozoan from the Lower Arenig of south Wales: implications of the oldest described bryozoan, 4, 367
THY, P. Petrogenetic implications of mineral crystallization trends of Troodos cumulates, Cyprus, 1, 1
TIPPER, J. C. On the directional nature of stratigraphic correlation, 2, 149
WANG FUXING Palaeoenvironmental setting of the Kangdian area, southwest China, in Proterozoic Datian-Meidang time, 2, 143
 WATERHOUSE, J. B. Stratigraphy and the age of the ammonoid <i>Durvilleoceras woodmani</i> from the Greville Subgroup, New Zeland, 6, 527
WILLIAMS, D. M. & NEALON, T. The significance of large-scale sedimentary structures in the Silurian succession of western Ireland, 4, 361
YAKOBSON, K. E. Vendian strata in their type area, 1, 73
CORRESPONDENCE

ALLEN, P. M., The Solway Line is not the Iapetus suture, 5, 485

- BLAND, B. H., EVANS, G., GOLDRING, R., MOURANT, A. E., RENOUF, J. T. & SQUIRE, A. D., Supposed Precambrian trace fossils from Jersey, Channel Islands, 2, 173
- DOYLE, P., Systematic status of *Pseudohibolites* Blüthgen, 1936 (Belemnitida, Coleoidea) from Kong Karls Land, Svalbard, 2, 165

- FIRMAN, R. J. & LEE, M. K., The English Lake District batholith Ordovician, Silurian, Devonian....? 6, 585
- KOKELAAR, P. & MOORE, J. G., Discussion of 'Structure and eruptive mechanisms at Surtsey Volcano, Iceland' by J. G. Moore, 1, 79
- KUMAR, G., BHATT, D. K. & RAINA, B. K., Skeletal microfauna of Meishucunian and Qiongzhusian (Precambrian-Cambrian boundary) age from the Ganga Valley, Lesser Himalaya, India, 2, 167
- SOPER, N. J. and WEBB, B., MILLWARD, D., JOHNSON, E. & COOPER, T., The Ordovician batholith of the English Lake District, 5, 481
- TREMLETT, W. E., New fold terminology equal and unequal folds, 6, 589
- WRIGHT, V. P., The evolution of the early Carboniferous Limestone province in southwest Britain, 5, 477

REVIEWS

- A Short History of Vertebrate Palaeontology, 6, 593
- A Stratigraphical Index of Conodonts, 1, 91
- An Introduction to the Theory of Climate, 6, 597
- Advances in Soil Science, Volume 2, 5, 488
- Advances in Soil Science, Volume 3, 5, 489
- Advances in Soil Science, Volume 4, 5, 489
- Advances in Soil Science, Volume 5, 4, 384
- An Introduction to Soil Science, 5, 496
- Archaean Geochemistry, The Origin and Evolution of the Archaean Continental Crust, 2, 182
- Archaean Geology, 2, 184
- Archaeopteryx, The Primordial Bird, A Case of Fossil Forgery, 2, 181
- Aspects of Fluvial Sedimentation in the Lower Triassic Buntsandstein of Europe, 3, 280
- Atlas of Selected Oil and Gas Reservoir Rocks from North America, 4, 392
- Catastrophes and Earth History. The New Uniformitarianism, 4, 396
- Chemistry and Physics of Terrestrial Planets, 5, 494
- Chemistry of Clays and Clay Minerals, 6, 596
- Clay Minerals and the Origin of Life, 4, 395
- Coastal and Estuarine Sediment Dynamics, 3, 286
- Conodonts, Investigative Techniques and Applications, 3, 295
- Correlation of Uranium Geology between South America and Africa, 5, 488
- Dating and Age Determination of Biological Materials, 2, 187
- Designing Optimal Strategies for Mineral Exploration, 4, 389
- Diagenetic Bedding, A Model for Marl-Limestone Alternations, 5, 487
- Earth and Astronomical Sciences Research Centres, A World Directory of Organizations and Programmes, 3, 285
- Elements of Petroleum Geology, 5, 496
- English-Russian Dictionary of Applied Geophysics, 4, 398
- European Dinantian Environments, 5, 490
- Evolution and Environment in the Late Silurian and Early Devonian, 2, 182
- Fossil Arthropods as Living Animals, 3, 281
- Fragmentation, Form and Flow in Fractured Media, 2, 186
- Geochemical Processes at Mineral Surfaces, 4, 390
- Geochemistry of Buried Sediments, 3, 295
- Geologic Analysis of Naturally Fractured Reservoirs, 4, 387
- Geological Evolution of the Mediterranean Basin, 3, 284

Geological Science, 3, 285 Geological and Cosmogonic Cycles as Reflected by the New Law of Universal Cyclicity, 3, 273 Geology and Scenery in the Lake District, 5, 492 Geology in Petroleum Production, 1, 87 Geology in the Real World – The Kingsley Dunham Volume, 3, 288 Geology of Sedimentary Phosphates, 3, 290 Geophysical Logs in British Stratigraphy, 2, 188 Guidelines for the Curation of Geological Materials, 5, 497 Habitat of Palaeozoic Gas in N.W. Europe, 4, 395 Handbook for Soil Thin Section Description, 2, 183 Handbook of Paleozoology, 4, 391 Image Interpretation in Geology, 4, 388 Imaging Radar for Resources Surveys, 5, 497 Impact Geology, 5, 492 Introductory Digital Image Processing. A Remote Sensing Perspective, 3, 284 Isle of Arran. A Field Guide for Students of Geology, 2, 175 Issues in Atmospheric and Oceanic Modeling. Part A. Climate Dynamics, 1, 89 Kimberlites, Mineralogy, Geochemistry, and Petrology, 3, 282 Kinetics and Mass Transport in Silicate and Oxide Systems, 3, 283 Les Grands Foraminferes du Cretace moyen de la region mediterranéenne, 3, 292 Lothian Geology. An Excursion Guide, 5, 495 Magmatic Processes: Physicochemical Principles, 5, 493 Magnetite Biomineralization and Magnetoreception in Organisms, 3, 287 Manual of Carbonate Sedimentology. A Lexicographical Approach, 3, 294 Major Crustal Lineaments and the Influence on the Geological History of the Continental Lithosphere, 6, 595 Metallogeny of Basic and Ultrabasic Rocks, 2, 184 Metamorphic Reactions. Kinetics, Textures and Deformation, 4, 385 Microcomputer Applications in Geology, 3, 297 Microtextures of Igneous and Metamorphic Rocks, 3, 287 Microwave Remote Sensing, Active and Passive. Volume 3. From Theory to Applications, 1, 88 Mid-Tertiary Stratigraphy and Paleogeographic Evolution of Hungary, 3, 283 Milankovitch and Climate: Understanding the Response to Astronomical Forcing, 3, 273 Mineral Deposites of Europe, Volume 3: Central Europe, 4, 394 Miocene-Pleistocene Planktic Foraminifers from D.S.D.P. Sites 208 and 77, and Phylogeny and Classification of Cenozoic Species, 2, 188 Numerical Recipes Example Book (Pascal), 1, 90 Numerical Recipes. The Art of Scientific Computing, 1, 90 Observation of the Continental Crust through Drilling, I, 4, 379 Ocean Seismo-Acoustics, Low Frequency Underwater Acoustics, 4, 388 Optical Mineralogy, 1, 87 Organic Marine Geochemistry, 3, 282 Palaeobiology of Conodonts, 3, 295 Palaeoecology and Biostratigraphy of Graptolites, 3, 289 Palaeomagnetism and the Continental Crust, 6, 596 Paleogene Fossil Sporomorphs of the Bakony Mountains, Part IV, 2, 186 Phosphate Deposits of the World. Volume 1. Proterozoic and Cambrian Phosphorites, 5, 487 Photochemistry of Environmental Aquatic Systems, 4, 384

Contents

- Physical Geology, 6, 595 Practical Physical Geology. Problems and Solutions, 3, 289
- Principles of Applied Geophysics, 4, 384
- Principles of Isotope Geology, 6, 594
- Principles of Rock Deformation, 4, 389
- Problematic Fossil Taxa, 6, 600
- Quaternary Geology and Environment of China, 2, 185
- Reef Diagenesis, 3, 293
- Remote Sensing Yearbook 1987, 4, 391
- Remote Sensing, Principles and Interpretation, 3, 296
- Reservoir Characterization, 4, 383
- Ring Complex Granites and Anorogenic Magmatism, 5, 491
- Russian-English Geological Dictionary, 4, 398
- Satellite Remote Sensing for Resources Development, 3, 280
- Sedimentary and Evolutionary Cycles, 3, 273
- Sedimentation in the African Rifts, 4, 393
- Seismic Wave Propagation in Stratified Media, 1, 91
- Soil Erosion and Conservation, 5, 493
- Soils and Quaternary Geology, 6, 597
- Sponges of the Burgess Shale (Middle Cambrian), British Columbia, 4, 386
- Storm Depositional Systems: Dynamic Stratigraphy in Modern and Ancient Shallow-Marine Sequences, 2, 184
- Thermodynamic Values at Low Temperature for Natural Inorganic Materials, 6, 594
- The Atmosphere and Ocean: A Physical Introduction, 3, 291
- The Caledonide Orogen Scandinavia and Related Areas, 3, 277
- The Chronology of the Geological Record, 4, 373
- The Continental Crust. A Geophysical Approach, 5, 491
- The Evolution and Palaeobiology of Land Plants, 6, 598
- The Fracture of Rocks, 2, 181
- The Geological Interpretation of Well Logs, 2, 187
- The Nemesis Affair: A Story of the Death of Dinosaurs and the Ways of Science, 3, 273
- The Physics of Atmospheres, 3, 291
- The Physics of the Earth's Core. An Introduction, 4, 383
- The Remote Sensing Sourcebook. A Guide to Remote Sensing Products, Services, Facilities, Publications and other Materials, 2, 183
- The Scientific Study of Flint and Chert, 2, 185
- The Structural Analysis of Granitic Rocks, 1, 88
- The Use of LANDSAT Data in Forestry, 4, 390
- Thin Section Preparation of Soils and Sediments, 3, 286
- Thunderstones and Shooting Stars. The Meaning of Meteorites, 5, 496
- Trilobites of the Upper Cambrian Sunwaptan Stage, southern Rocky Mountains, Alberta, 3, 293
- Turbidite-Hosted Gold Deposits, 5, 495
- Volcanoes of the World: A Regional Directory, Gazetteer, and Chronology of Volcanism during the Last 10,000 Years, 4, 399

PUBLICATIONS RECEIVED

Lists appear beginning pages 1, 93; 2, 189; 3, 302; 4, 401; 5, 499; 6, 603

NOTICES

Notices from the International Commission on Zoological Nomenclature occur on pages 2, 180; 4, 404

ERRATA

An erratum appears on page 3, 302

Index

To Authors, key words in titles, and to new taxa and new stratigraphical terms in Volume 124; (R) indicates Review

- A Stratigraphical Index of Conodonts (R), 91 A Short History of Vertebrate Palaeontology (R), 593 Advances in Soil Science, Volume 2 (R), 488 Advances in Soil Science, Volume 3 (R), 489 Advances in Soil Science, Volume 4 (R), 489 Advances in Soil Science, Volume 5 (R), 384 Africa (R), 488 African Rifts (R), 393 Allen, P. M. The Solway Line is not the Iapetus Suture, 485 Alluvian fan, 121 Ammonites, 527 An Introduction to Soil Science (R), 496 An Introduction to the Theory of Climate (R), 597 Andrews, J. E. Jurassic clay mineral assemblages and their post-depositional alteration: upper Great Estuarine Group, Scotland, 261 Anorogenic magmatism (R), 491 Anorthosite, 21 Archaean, 555 Archaean Geochemistry, The Origin and Evolution of the Archaean Continental Crust (R), 182 Archaean Geology (R), 184
- Archaean, 303
- Archaean strike-slip faulting and related ensialic basins; evidence from the Pilbara Block, Australia, 555
- Archaeopteryx, The Primordial Bird, A Case of Fossil Forgery (R), 181
- Arenig, 367
- Armorican Quartzite, 347
- Arran (R), 175
- Arthropods (R), 281
- Ash-flow tuff, 427
- Aspects of Fluvial Sedimentation in the Lower Triassic Buntsandstein of Europe (R), 280
- Atacama, 467
- Atlas of Selected Oil and Gas Reservoir Rocks from North America (R), 392
- Atmosphere (R), 291.
- Atmospheric Modeling (R), 89
- Australia, 543
- Barley, M. E. & Krapez, B. Archaean strike-slip faulting and related ensialic basins: evidence from the Pilbara Block, Australia, 555
- Bar-Matthews, M. The genesis of uranium in manganese and phosphorite assemblages, Timna Basin, Israel, 211
- Basic Rocks (R), 184
- Batholith, 482, 483, 585
- Belemnite, 165
- Bell, C. M. & Suarez, M. Upper Triassic to Lower Cretaceous continental and coastal saline lake evaporites in the Atacama region of northern Chile, 467
- Bengal, 21
- Bhatt, D. K., Raina, B. K. & Kumar, G. Skeletal microfauna of Meishucunian and Qiongzhusian (Precambrian-Cambrian boundary) age from the Ganga Valley, Lesser Himalaya, India, 167

- Bhattacharyya, P. K., Mukherjee, S., Granulites in and around the Bengal anorthosite, eastern India: genesis of coronal garnet, and evolution of the granulite-anorthosite complex, 21
- Biostratigraphy (R), 289
- Bland, B. H., Evans, G., Goldring, R., Mourant, A. E., Renouf, J. T. & Squire, A. D. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173
- Boyle, A. P. A model for stratigraphic and metamorphic inversions at Sulitjelma, central Scandes, 451
- Brasier, M. D. & Singh, P. Microfossils and Precambrian--Cambrian boundary stratigraphy at Maldeota, Lesser Himalaya, 323
- Brenchley, P. J., Rebelo, J. A., Romano, M. & McDougall, N. Fans and fan deltas - precursors to the Armorican Quartzite (Ordovician) in western Iberia, 347
- Bryozoan, 367
- Burgess Shale (R), 386
- Butcher, A. R., Morse, S. A. & Owens, B. E. Origin of finger structures in the Rhum Complex; phase equilibrium and heat effects, 205

Caldera, 501

- Caledonide Orogen (R), 277
- Caledonides, 135, 249, 405, 451, 485
- Cambrian, 97, 323; (R) 293, 386; (R) 487
- Campbell, S. D. G., Reedman, A. J., Howells, M. F. & Orton, G. The Pitts Head Tuff Formation; a subaerial to submarine welded ash-flow tuff of Ordovician age, North Wales, 427
- Campbell, S. D. G., Reedman, A. J., Howells, M. F. & Mann, A. C. The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, 501
- Canada, 303; (R) 386
- Carbonates, 477; (R) 294, (R) 487
- Carboniferous Limestone, 477
- Carboniferous, 43, 477; (R) 490
- Catastrophes and Earth History. The New Uniformitarianism (R), 396
- Cattell, A. Enriched komatiitic basalts from Newton Township, Ontario; their genesis by crustal contamination of depleted komatiite magma, 303
- Channel Islands, 173
- Chemistry and Physics of Terrestrial Planets (R), 494
- Chemistry of Clays and Clay Minerals (R), 596
- Chert (R), 185

Chile, 467, 569

- China, 143; (R) 185
- Chronostratigraphy (R), 373
- Clay Minerals and the Origin of Life (R), 395
- Clay minerals, 261; (R), 596
- Climate Dynamics (R), 89
- Climate models (R), 597
- Coastal and Estuarine Sediment Dynamics (R), 286
- Computing (R), 90
- Conodonts (R), 91, 295.

- Conodonts. Investigative Techniques and Applications (R), 295
- Continental Crust (R), 379; (R) 491; (R), 596
- Continental lithosphere (R), 595
- Cooper, D. J. W. Hamrat Duru Group: revised stratigraphy of a Mesozoic deep-water passive margin in the Oman Mountains, 157
- Cooper, T., Webb, B., Millward, D. & Johnson, E. The Ordovician(?) batholith of the English Lake District, 483
- Cope, J. C. W. & Taylor, P. D. A trepostome bryozoan from the Lower Arenig of south Wales: implications of the oldest described bryozoan, 367
- Correlation of Uranium Geology between South America and Africa (R), 488
- Cratonization, 555
- Cretaceous, 13, 467
- Cretaceous diapiric plutonism in the southern cordillera, Chile, 569
- Cretaceous-Tertiary boundary, 13
- Crimes, T. P. Trace fossils and correlation of late Precambrian and early Cambrian strata, 97
- Crowther, P. R., Rickards, R. B. & Urbanek, A. Possible cellular tissue in an Ordovician graptoblast, 67
- Crustal Evolution (R), 182
- Crustal contamination, 303
- Crystallization trend, 1
- Cumulates, 1
- Curation of materials (R), 497
- Cycles, 311, 319; (R) 273

Dating and Age Determination of Biological Materials (R), 187

- Deep drilling (R), 379
- Deformation, 451; (R) 389
- Designing Optimal Strategies for Mineral Exploration (R), 389
- Detachment, 441
- Devonian (R), 182
- Diachroneity, 149
- Diagenesis, 261; (R) 293, 295; (R) 487
- Diagenetic Bedding. A Model for Marl-Limestone Alternations (R), 487
- Diapir, 569
- Dictionaries (R), 398
- Digital Image Processing (R), 284
- Dingle Group, 33
- Doyle, P. Systematic status of *Pseudohibolites* Blüthgen, 1936 (Belemnitida, Coleoidea) from Kong Karls Land, Svalbard, 165
- Earth and Astronomical Sciences Research Centres. A World Directory of Organizations and Programmes (R), 285
- Eastern Europe, 73
- Elements of Petroleum Geology (R), 496
- England, 482, 483
- English Lake District batholith, 585
- English-Russian Dictionary of Applied Geophysics (R), 398
- Ensialic basin, 555
- Environment (R), 185
- Epigenetic assemblages, 211
- Estuarine Sediment Dynamics (R), 286
- European Dinantian Environments (R), 490

- Evans, G., Goldring, R., Mourant, A. E., Renouf, J. T., Squire, A. D. & Bland, B. H. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173 Evaporite, 467
- Evolution and Environment in the Late Silurian and Early Devonian (R), 182
- Evolution, 405, 477; (R) 182, 283, 284, (R) 593, (R) 598
- Evolution and Palaeobiology of Land Plants, The (R), 598
- Exploration, Mineral (R), 389
- Extensional structures, 311
- Extinction, 319 Extinctions (R), 396
- Fabric, tectonic, 231
- Faults, 555; (R) 595
- Finger structures, 205
- Firman, R. J. The English Lake District batholith Ordovician, Silurian, Devonian or...? 585
- Flint (R), 185
- Fluvial Sedimentation (R), 280
- Fold belt, 441
- Folds, 589
- Foraminifera (R), 188, 292
- Fortran (R), 90
- Fossil Arthropods as Living Animals (R), 281
- Fossil forest, 191
- Fragmentation, Form and Flow in Fractured Media (R), 186
- Frature (R), 186
- Further Australian Cambrian sphinctozoans, 543
- Garnet, 21 Gas (R), 395 Geochemical Processes at Mineral Surfaces (R), 390 Geochemistry (R), 182, 282 Geochemistry of Buried Sediments (R), 295 Geologic Analysis of Naturally Fractured Reservoirs (R), 387 Geological and Cosmogonic Cycles as Reflected by the New Law of Universal Cylicity (R), 273 Geological Evolution of the Mediterranean Basin (R), 284 Geological Science (R), 285 Geology and Scenery in the Lake District (R), 492 Geology in Petroleum Production (R), 87 Geology in the Real World-The Kingsley Dunham Volume (R), 288 Geology of Sedimentary Phosphates (R), 290 Geophysical Logs in British Stratigraphy (R), 188 Geophysics (R), 383, 384, (R) 491 Glass, A. L. & Noma, E. Mass extinction pattern: result of chance, 319 Goldring, R., Mourant, A. E., Renouf, J. T., Squire, A. D., Bland, B. H. & Evans, G. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173 Granite (R), 88 Granites (R), 491 Granitoid, 135 Granulite, 21 Graptoblast, 67 Graptolite, 67 Graptolites (R), 289 Greenland, 441
- Guidelines for the Curation of Geological Materials (R) 497

Habitat of Palaeozoic Gas in N.W. Europe (R), 395

Handbook for Soil Thin Section Description (R), 183

- Handbook of Paleozoology (R), 391
- Harland, W. B. The Chronology of the Geological Record 1985, 373
- Harland, W. B. More Arran Geology, 175

Hawasina Complex, 157

- Herve, M., Puig, A. & Suarez, M. Cretaceous diapiric plutonism in the southern cordillera, Chile, 569
- Higgins, A. K. & Soper, N. J. A shallow detachment beneath the North Greenland fold belt: implications for sedimentation and tectonics, 441

Himalaya, 167

- History (R), 593
- Holland, C. H. Stratigraphical and structural relationships of the Dingle Group (Silurian), County Kerry, Ireland, 33
- House, M. R. Geological rhythms, cycles and other revolutions, 273
- Howells, M. F., Orton, G., Campbell, S. D. G. & Reedman, A. J. The Pitts Head Tuff Formation: a subaerial to submarine welded ash-flow tuff of Ordovician age, North Wales, 427
- Howells, M. F., Mann, A. C., Campbell, S. D. G. & Reedman, A. J. The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, 501

Hungary (R), 186, 283

- Hutton, D. H. W. Strike-slip terranes and a model for the evolution of the British and Irish Caledonides, 405
- Iapetus suture, 135, 485

Iberia, 347

- Iceland, 79
- Igneous Rocks (R), 287
- Image Interpretation in Geology (R), 388
- Imaging Radar for Resources Surveys (R), 497 Impact Geology (R), 492

India, 21, 167, 323

- Inorganic minerals (R), 594
- Interpretation of Well Logs (R), 187
- Introductory Digital Image Processing. A Remote Sensing Perspective (R), 284
- Intrusive and Extrusive (Micro) melange Couplets as distal effects of Tidal Pumping by a Marine Ice Sheet, 513
- Inversion, 451
- Ireland, 33, 135, 361, 405 Isotope geology (R), 594
- isotope geology (it), .
- Israel, 211
- Issues in Atmospheric and Oceanic Modeling. Part A. Climate Dynamics (R), 89
- Japan, 311

Jawonya gurumal, 543

- Jawanya tiro, 543
- Jefferson, T. H. & Karowe, A. L. Burial of trees by eruptions of Mount St Helens, Washington: implications for the interpretation of fossil forests, 191

Jersey, 173

- Johnson, E., Cooper, T., Webb, B. & Millward, D. The Ordovician(?) batholith of the English Lake District, 483
- Jurassic, 261

- Kalak Nappe, 249
- Kangdian, 143
- Karowe, A. L. & Jefferson, T. H. Burial of trees by eruptions of Mount St Helens, Washington: implications for the interpretation of fossil forests, 191
- Kimberlites, Mineralogy, Geochemistry, and Petrology (R), 282
- Kinetics and Mass Transport in Silicate and Oxide Systems (R), 283
- Kinetics, Mineral (R), 385
- Kingsley Dunham (R), 288
- Kokelaar, P. & Moore, J. G. Discussion of 'Structure and eruptive mechanisms at Surtsey Volcano, Iceland' by J. G. Moore, 79
- Komatiite, 303
- Krapez, B. & Barley, M. E. Archaean strike-slip faulting and related ensialic basins: evidence from the Pilbara Block, Australia, 555
- Kruse, P. D. Further Australian Cambrian sphinctozoans, 543
- Kumar, G., Bhatt, D. K. & Raina, B. K. Skeletal microfauna of Meishucunian and Qiongzhusian (Precambrian-Cambrian boundary) age from the Ganga Valley, Lesser Himalaya, India, 167

Lake District, 482, 483; (R) 492

- Law, R. D. & Potts, G. J. The Tarskavaig Nappe of Skye, northwest Scotland: a re-examination of the fabrics and their kinematic significance, 231
- Lee, M. K. & Firman, R. J. The English Lake District batholith – Ordovician, Silurian, Devonian or...? 585
- Les Grands Foraminferes du Cretace moyen de la region mediterranéenne (R), 292
- Lineaments (R), 595
- Lothian Geology. An Excursion Guide (R), 494

Magmatic Processes: Physicochemical Principles (R), 493 Magmatism (R), 491

Magnetite Biomineralization and Magnetoreception in Organisms (R), 287

Magnetoreception (R), 287

- Major Crustal Lineaments and their Influence on the Geological History of the Continental Lithosphere (R), 595
- Manganese, 211
- Mann, A. C., Campbell, S. D. G., Reedman, A. J. & Howells, M. F. The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, 501
- Manual of Carbonate Sedimentology. A Lexicographical Approach (R), 294
- Marine geochemistry (R), 282, 384
- Mass extinction, 319
- McDougall, N., Brenchley, P. J., Rebelo, J. A. & Romano, M. Fans and fan deltas – precursors to the Armorican Quartzite (Ordovician) in western Iberia, 347
- Mediterranean (R), 284, 292
- Melange, 311, 513
- Metallogeny of Basic and Ultrabasic Rocks (R), 184
- Metamorphic Reactions. Kinetics, Textures and Deformation (R), 385
- Metamorphic inversion, 451
- Metamorphic Rocks (R), 287
- Meteorites (R) 496
- Microcomputer Applications in Geology (R), 297

- Microtextures of Igneous and Metamorphic Rocks (R), 287
- Microwave Remote Sensing, Active and Passive, Vol. 3. From Theory to Applications (R), 88
- Mid-Tertiary Stratigraphy and Paleogeographic Evolution of Hungary (R), 283
- Milankovitch and Climate: Understanding the Response to Astronomical Forcing (R), 273
- Millward, D., Johnson, E., Cooper, T. & Webb, B. The Ordovician(?) batholith of the English Lake District, 483
- Mineral deposit (R) 487; (R) 488
- Mineral Deposits of Europe, Volume 3: Central Europe (R), 394
- Mineral Exploration (R), 389
- Mineral-Water Interface (R), 390
- Mineralogy (R), 87, 282
- Miocene, 121
- Miocene-Pleistocene Planktic Foraminifers from D.S.D.P. Sites 208 and 77, and Phylogeny and Classification of Cenozoic Species (R), 188
- Moine Thrust, 231
- Moore, J. G. & Kokelaar, P. Discussion of 'Structure and eruptive mechanisms at Surtsey Volcano, Iceland' by J. G. Moore, 79
- Morse, S. A., Owens, B. E. & Butcher, A. R. Origin of finger structures in the Rhum Complex : phase equilibrium and heat effects, 205
- Mount St Helens, 191
- Mourant, A. E., Renouf, J. T., Squire, A. D., Bland, B. H., Evans, G. & Goldring, R. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173
- Mukherjee, S. & Bhattacharyya, P. K. Granulites in and around the Bengal anorthosite, eastern India: genesis of coronal garnet, and evolution of the granulite-anorthosite complex, 21
- Murphy, F. C. Late Caledonian granitoids and timing of deformation in the Iapetus suture zone of eastern Ireland, 135
- Naidin, D. P. The Cretaceous-Tertiary boundary in Mangyshlak, U.S.S.R., 13
- Nappe, 231, 249, 451
- Nealon, T. & Williams, D. M. The significance of largescale sedimentary structures in the Silurian succession of western Ireland, 361
- Needham, D. T. Asymmetric extensional structures and their implications for the generation of melanges, 311
- New fold terminology equal and unequal folds, 589
- New Zealand, 527
- Nichols, G. J. Syntectonic alluvial fan sedimentation, southern Pyrenees, 121
- Noma, E. & Glass, A. L. Mass extinction pattern: result of chance, 319
- North Wales, 501
- Norway, 249
- Numerical Recipes Example Book (Pascal) (R), 90
- Numerical Recipes. The Art of Scientific Computing (R), 90
- Observation of the Continental Crust through Drilling, I (R), 379
- Ocean Seismo-Acoustics. Low Frequency Underwater Acoustics (R), 388
- Oceanic Modeling (R), 89
- Oceanography, Physical (R), 291

- Oligocene, 121
- Oman, 157
- Ophiolite, 1
- Optical Mineralogy (R), 87 Ordovician, 67, 347, 367, 427, 482, 483
- Ores, 211; (R) 290, 394; (R) 488
- Organic Marine Geochemistry (R), 282
- Origin of Life (R), 395
- Orton, G., Campbell, S. D. G., Reedman, A. J. & Howells, M. F. The Pitts Head Tuff Formation: a subaerial to submarine welded ash-flow tuff of Ordovician age, North Wales, 427
- Owens, B. E., Butcher, A. R. & Morse, S. A. Origin of finger structures in the Rhum Complex : phase equilibrium and heat effects, 205
- Oxide systems (R), 283
- Palaeobiology of Conodonts (R), 295
- Palaeobiology (R), 598
- Palaeoecology and Biostratigraphy of Graptolites (R), 289
- Palaeoenvironment, 143
- Palaeomagnetism and the Continental Crust (R), 596
- Palaeomagnetism (R), 596
- Paleogene Fossil Sporomorphs of the Bakony Mountains, Part IV (R), 186
- Paleozoology (R), 391
- Pascal (R), 90
- Periodicity, 319
- Petroleum Geology (R), 383, 392, 395; (R) 496
- Petroleum Production (R), 87
- Petrology (R), 282
- Pettycur, 43
- Phase equilibrium, 205
- Philip, G. M. & Watson, D. F. Probabilism in Geological Data Analysis, 577
- Phosphate Deposits of the World. Volume 1. Proterozoic and Cambrian Phosphorites (R), 487
- Phosphates (R), 290
- Phosphorite, 211; (R) 487
- Photochemistry of Environmental Aquatic Systems (R), 384
- Physical geology (R), 289; (R), 595
- Pilbara Block, 555
- Plants, 43, 191
- Playa lake, 467
- Pleistocene (R), 188
- Plutonism, 569
- Pollen (R), 186
- Portugal, 347
- Potts, G. J. & Law, R. D. The Tarskavaig Nappe of Skye, northwest Scotland: a re-examination of the fabrics and their kinematic significance, 231
- Practical Physical Geology. Problems and Solutions (R), 289
- Precambrian, 97, 173, 323
- Precambrian-Cambrian boundary, 97, 167, 323
- Principles of Applied Geophysics (R), 384
- Principles of Isotope Geology (R), 594
- Principles of Rock Deformation (R), 389
- Probabilism in Geological Data Analysis, 577
- Problematic Fossil Taxa (R), 600
- Proterozoic, 143; (R) 487
- Pseudohibolites Blüthgen, 165
- Puig, A., Suarez, M. & Herve, M. Cretaceous diapiric plutonism in the southern cordillera, Chile, 569

Pyrenees, 121

Ouartzite, 347

Quaternary Geology and Environment of China (R), 185

- Raina, B. K., Kumar, G. & Bhatt, D. K. Skeletal microfauna of Meishucunian and Qiongzhusian (Precambrian-Cambrian boundary) age from the Ganga Valley, Lesser Himalaya, India, 167
- Rebelo, J. A., Romano, M., McDougall, N. & Brenchley, P. J. Fans and fan deltas – precursors to the Armorican Quartzite (Ordovician) in western Iberia, 347
- Reedman, A. J., Howells, M. F., Orton, G. & Campbell, S. D. G. The Pitts Head Tuff Formation: a subaerial to submarine welded ash-flow tuff of Ordovician age, North Wales, 427
- Reedman, A. J., Howells, M. F., Mann, A. C. & Campbell, S. D. G. The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, 501
- Remote Sensing (R), 88, 280, 284, 388, 391, 381, (R) 497
- Remote Sensing Yearbook 1987 (R), 391
- Remote Sensing. Principles and Interpretation (R), 296
- Renouf, J. T., Squire, A. D., Bland, B. H., Evans, G., Goldring, R. & Mourant, A. E. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173
- Research Centres (R), 285
- Reservoir Characterization (R), 383
- Reservoir Rocks (R), 392
- Reservoirs, Fractured (R), 387
- Resources Development (R), 280
- Rex, G. M. & Scott, A. C. The sedimentology, palaeoecology and preservation of the Lower Carboniferous plant deposits at Pettycur, Fife, Scotland, 43
- Rex, G. M. & Scott, A. C. The sedimentology, palaeoecology and preservation of the Lower Carboniferous plant deposits at Pettycur, Fife, Scotland, 43
- Rhum, 205
- Rhyolites, 501
- Rhythms, 319; (R) 273
- Rice, A. H. N. Continuous out-of-sequence ductile thrusting in the Norwegian Caledonides, 249
- Rickards, R. B., Urbanek, A. & Crowther, P. R. Possible cellular tissue in an Ordovician graptoblast, 67
- Rift System, African (R), 393
- Ring Complex Granites and Anorogenic Magmatism (R), 491
- Romano, M., McDougall, N., Brenchley, P. J. & Rebelo, J. A. Fans and fan deltas – precursors to the Armorican Quartzite (Ordovician) in western Iberia, 347
- Russian-English Geological Dictionary (R), 398
- Sabkha, 467
- Saline lake, 467
- Sampling, 577
- Satellite Remote Sensing for Resources Development (R), 280
- Scandinavia, 451; (R) 277
- Scotland, 43, 205, 231, 261; (R) 494
- Scott, A. C. & Rex, G. M. The sedimentology, palaeoecology and preservation of the Lower Carboniferous plant deposits at Pettycur, Fife, Scotland, 43
- Sediment Thin Sections (R), 286

- Sediment Dynamics (R), 286
- Sedimentary stratabound assemblages, 211
- Sedimentary basins, 555
- Sedimentary and Evolutionary Cycles (R), 273 Sedimentary structures, 361
- Sedimentation (R), 487; (R) 490
- Sedimentation in the African Rifts (R), 393
- Sedimentology (R), 294, 295
- Seismic Wave Propagation in Stratified Media (R), 91
- Seismo-Acoustics (R), 388
- Shallow-Marine Sequences (R), 184
- Silicate Systems (R), 283
- Silts, 513
- Silurian, 33, 361; (R) 182
- Singh, P. & Brasier, M. D. Microfossils and Precambrian-Cambrian boundary stratigraphy at Maldeota, Lesser Himalaya, 323
- Skeletal microfauna, 167
- Skye, 231
- Small shelly fossils, 167
- Snowdon Volcanic Group, 501
- Soft-sediment structures, 513
- Soil Erosion and Conservation (R), 493
- Soil Science (R), 384; (R) 488; (R) 489; (R) 489; (R) 493; (R) 496
- Soil Sections (R), 286
- Soils (R), 183; (R) 597
- Soils and Quaternary Geology. A handbook for Field Scientists (R), 597
- Solway Line, 485
- Soper, N. J. & Higgins, A. K. A shallow detachment beneath the North Greenland fold belt: implications for sedimentation and tectonics, 441
- Soper, N. J. The Ordovician batholith of the English Lake District, 482
- South America (R), 488
- South Arm Formation, 527
- Spain, 121, 347
- Sphinctozoans, 543
- Sponges of the Burgess Shale (Middle Cambrian), British Columbia (R), 386
- Sporomorphs (R), 186
- Squire, A. D., Bland, B. H., Evans, G., Goldring, R., Mourant, A. E. & Renouf, J. T. Supposed Precambrian trace fossils from Jersey, Channel Islands, 173
- Storm Depositional Systems: Dynamic Stratigraphy in Modern and Ancient Shallow-Marine Sequences (R), 184
- Stratigraphic correlation, 149
- Stratigraphy, 157, 323; (R) 184, 283
- Stratigraphy and age of the ammonoid *Durvilleoceras* woodmani from the Greville Subgroup, New Zealand, 527

Statistics, 577

- Strike-slip terrane, 405
- Structural Analysis (R), 88
- Structural Geology (R), 181, 186
- Suarez, M. & Bell, C. M. Upper Triassic to Lower Cretaceous continental and coastal saline lake evaporites in the Atacama region of northern Chile, 467
- Suarez, M., Herve, M. & Puig, A. Cretaceous diapiric plutonism in the southern cordillera, Chile, 569
- Surtsey, 79
- Svalbard, 165
- Systematics (R), 391

- Talbot, C. J. & Von Brunn, V. Intrusive and Extrusive (Micro) melange Couplets as distal effects of Tidal Pumping by a Marine Ice Sheet, 513
- Taxa (R), 600
- Taylor, P. D. & Cope, J. C. W. A trepostome bryozoan from the Lower Arenig of south Wales: implications of the oldest described bryozoan, 367
- Tectonics, 441
- Te Mokai Group, 527
- Tertiary, 13
- The Atmosphere and Ocean: A Physical Introduction (R), 291
- The Caledonide Orogen Scandinavia and Related Areas (R), 277
- The Chronology of the Geological Record (R), 373
- The Continental Crust. A Geophysical Approach (R), 491
- The Fracture of Rocks (R), 181
- The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, 501
- The Geological Interpretation of Well Logs (R), 187
- The Nemesis Affair: A Story of the Death of Dinosaurs and the Ways of Science (R), 273
- The Physics of Atmospheres (R), 291
- The Physics of the Earth's Core: An Introduction (R), 383
- The Remote Sensing Sourcebook. A Guide to Remote Sensing Products, Services, Facilities, Publications and other Materials (R), 183
- The Scientific Study of Flint and Chert (R), 185
- The Structural Analysis of Granitic Rocks (R), 88
- The Use of LANDSET Data in Forestry (R), 390
- Thermodynamic Values, at Low Temperature for Natural Inorganic Minerals (R), 594
- Thermodynamics (R), 594
- Thin Section Preparation of Soils and Sediments (R), 286
- Thrusting, 249
- Thunderstones and Shooting Stars. The Meaning of Meteorites (R), 496
- Thy, P. Petrogenetic implications of mineral crystallization trends of Troodos cumulates, Cyprus, 1
- Tidal, Pumping, 513
- Timna Basin, 211
- Tipper, J. C. On the directional nature of stratigraphic correlation, 149
- Trace fossils, 97, 173
- Tremlett, W. E. New fold terminology equal and unequal folds, 589

- Triassic, 467; (R) 280
- Trilobites of the Upper Cambrian Sunwaptan Stage, southern Rocky Mountains, Alberta (R), 293
- Troodos, 1
- Tuff, 427, 501
- Turbidite-Hosted Gold Deposits (R), 495
- UK, 43, 173, 205, 231, 261, 367, 405, 427, 477, 482, 483
- USA, 191 USSR, 13
- Ultrabasic Rocks (R), 184
- Uniformitarianism (R), 396
- Uranium, 211; (R) 488
- Urbanek, A., Crowther, P. R. & Rickards, R. B. Possible cellular tissue in an Ordovician graptoblast, 67
- Vendian, 73
- Vertebrate Palaeontology (R), 593
- Volcanoes of the World: A Regional Directory, Gazeteer, and Chronology of Volcanism during the Last 10,000 Years (R), 399
- Von Brunn, V. & Talbot, C. J. Intrusive and Extrusive (Micro) melange Couplets as distal effects of Tidal Pumping by a Marine Ice Sheet, 513
- Wagima galbangin, 543
- Wales, 367, 427
- Wang Fuxing, Palaeoenvironmental setting of the Kangdian area, southwest China, in Proterozoic Datian-Meidang time, 143
- Waterhouse, J. B. Stratigraphy and age of the ammonoid *Durvilleoceras woodmani* from the Greville Subgroup, New Zealand, 527
- Watson, D. F. & Philip, G. M. Probabilism in Geological Data Analysis, 577
- Webb, B., Millward, D., Johnson, E. & Cooper, T. The Ordovician(?) batholith of the English Lake District, 483
- Well Logs (R), 187, 188
- Wells Arm Formation, 527
- Whittaker, A. Underground truth from deep scientific drilling, 379
- Williams, D. M. & Nealon, T. The significance of largescale sedimentary structures in the Silurian succession of western Ireland, 361
- Wright, V. P. The evolution of the early Carboniferous Limestone province in southwest Britain, 477
- Yakobson, K. E., Vendian strata in their type area, 73

Geological Magazine

Volume 124, Number 6, November 1987

CAMPBELL, S. D. G., REEDMAN, A. J., HOWELLS, M. F. & MANN, A. C. The emplacement of geochemically distinct groups of rhyolites during the evolution of the Lower Rhyolitic Tuff Formation caldera (Ordovician), North Wales, U.K.	501-511
TALBOT, C. J. & VON BRUNN, V. Intrusive and extrusive (micro)melange couplets as distal effects of tidal pumping by a marine ice sheet	513-525
WATERHOUSE, J. B. Stratigraphy and age of the ammonoid <i>Durvilleoceras woodmani</i> from the Greville Subgroup, New Zealand	527-542
KRUSE, P. D. Further Australian Cambrian sphinctozoans	543-553
KRAPEZ, B. & BARLEY, M. E. Archaean strike-slip faulting and related ensialic basins: evidence from the Pilbara Block, Australia	555-567
SUAREZ, M., HERVE, M. & PUIG, A. Cretaceous diapiric plutonism in the southern cordillera, Chile	569-575
PHILIP, G. M. & WATSON, D. F. Probabilism in Geological Data Analysis	577-583
CORRESPONDENCE AND NOTES The English Lake District batholith – Ordovician, Silurian, Devonian or? R. J. FIRMAN & M. K. LEE	585-587
New fold terminology - equal and unequal folds: W. E. TREMLETT	589-591
REVIEWS	593-601
PUBLICATIONS RECEIVED	603-604

© Cambridge University Press 1987