

THE  
**GEOLOGICAL MAGAZINE**

VOL. 105 OF WHOLE SERIES

JANUARY-DECEMBER, 1968

**PRINTED IN ENGLAND BY STEPHEN AUSTIN AND SONS, LTD., HERTFORD.**

# GEOLOGICAL MAGAZINE

with which is incorporated

## THE GEOLOGIST

FOUNDED IN 1864 BY THE LATE DR. HENRY WOODWARD, F.R.S.

Edited by

O. M. B. BULMAN, Sc.D., A.R.C.Sc., F.R.S.,

S. R. NOCKOLDS, Ph.D., F.R.S.,

and

W. B. HARLAND, M.A.

assisted by MRS. K. N. HEROD

Associate Editors

PROFESSOR K. C. DUNHAM, D.Sc., F.R.S.

MR. N. L. FALCON, M.A., F.R.S.

PROFESSOR LEONARD HAWKES, D.Sc., F.R.S.

PROFESSOR SIR WILLIAM PUGH, O.B.E., D.Sc., F.R.S.

PROFESSOR F. W. SHOTTON, M.B.E., M.A., Sc.D., F.R.S.

SIR JAMES STUBBLEFIELD, D.Sc., F.R.S.

PROFESSOR C. E. TILLEY, Ph.D., F.R.S.

Vol. 105 of Whole Series

JANUARY-DECEMBER, 1968

MIMRAM BOOKS

CAXTON HILL, WARE ROAD, HERTFORD, HERTS

## CONTENTS

### ARTICLES

(Figures in bold type denote number of issue)

AJAKAIYE, D. E.

A gravity interpretation of the Liruei Younger Granite Ring Complex of Northern Nigeria, **3**, 256.

ALLEN, J. R. L.

The accumulation of sediment in the lee of ripples and dunes, and the thickness of bottomset deposits, **2**, 166.

ALLEN, P. M.

The stratigraphy of a geosynclinal succession in western Sierra Leone, West Africa, **1**, 62.

ALLEN, P. M., & A. J. REEDMAN,

Stratigraphic classification in Pre-Cambrian rocks, **3**, 290.

ASLIN, C. J.

Echinoid preservation in the Upper Estuarine Limestone of Blisworth, Northamptonshire, **6**, 506.

AUSTIN, R. L.

Five Viséan conodont horizons in the north of England, **4**, 367.

BENJAMIN, R. E. K.

The quartz-plagioclase gneisses of Western Connemara, Ireland, **5**, 456.

BLAKE, D. H.

Gravitational sorting of phenocrysts in some Icelandic intrusive sheets, **2**, 140.

BRYAN, W. B.

Low-potash dacite drift pumice from the Coral Sea, **5**, 431.

BULMAN, O. M. B.

The mode of development of *Isograptus manubriatus* (T. S. Hall), **3**, 211.

CAMPBELL, I. H.

The origin of heteradcumulate and adcumulate textures in the Jimberlana Norite, **4**, 378.

CHAUDHRI, R. S.

Stratigraphy of the Lower Tertiary formations of Panjab Himalayas, **5**, 421.

CLAXTON, C. W.

Mineral layering in the Galway Granite, Connemara, Eire, **2**, 149.

COCKS, L. R. M., & G. WALTON

A large temporary exposure in the Lower Silurian of Shropshire, **4**, 390.

COOPE, G. R.

Coleoptera from the "Arctic Bed" at Barnwell Station, Cambridge, **5**, 482.

CRIMES, T. P.

*Cruiziana*: A stratigraphically useful trace fossil, **4**, 360.

FLEMING, P. D., & R. OFFLER.

Pre-tectonic metamorphic crystallization in the Mt. Lofty Ranges, South Australia, **4**, 356.

GUEST, J. E.

Banded Pumice in a Chilean Ignimbrite, **2**, 177.

- HAILE, N. S., & MOHAMMAD BIN AYOB.**  
Note on radiometric age determination of samples of peat and wood from tin-bearing Quaternary deposits at Sungai Besi Tin Mines, Kuala Lumpur, Selangor, Malaysia, **6**, 519.
- HALLAM, A., & N. B. PRICE.**  
Further notes on the strontium contents of unaltered fossil cephalopod shells **1**, 52.
- HAPUARACHCHI, D. J. A. C.**  
Cordierite and wollastonite-bearing rocks of south-western Ceylon, **4**, 317.
- HUTCHISON, R.**  
Origin of the White Allivalite, Western Cuillin, Isle of Skye, **4**, 338.
- HUTT, JANA.**  
A redescription of the Llandoveryan monograptid "*Graptolithus tenuis*", Portlock 1843, **3**, 251.
- KATZ, M. B.**  
Retrograde contact metamorphism in the granulite facies terrain of Mont Tremblant Park, Quebec, Canada, **5**, 487.
- KAY, M., & N. ELDREDGE.**  
Cambrian trilobites in central Newfoundland volcanic belt, **4**, 372.
- KAZI, A.**  
Sedimentology of the Ghazij Formation, Harnai, Baluchistan, **1**, 35.
- KRINSLEY, D., & J. DONAHUE.**  
Pebble surface textures, **6**, 521.
- LOWELL, J. D.**  
Upper Palaeozoic and Lower Mesozoic stratigraphy of south-western Nordaustlandet, Spitsbergen, **4**, 348.
- MATSCHINSKI, M.**  
Alignment of dolines north-west of Lake Constance, Germany, **1**, 56.
- MIDDLEMOST, E.**  
The term farsundite, **4**, 387.
- MORGAN, W. R.**  
On the usage of nepheline-basalt, olivine-nephelinite, olivine-nemafite, and similar rock names, **3**, 247.
- NICHOLS, R. A. H.**  
Structural observations on the Carboniferous Limestone of the North Wales coast, **3**, 216.
- PAUL, C. R. C.**  
Notes on cystoids, **5**, 413.
- PHILLIPS, E. R.**  
Mafic hybrid rocks from the New England Batholith, New South Wales, **2**, 160.
- PHILLIPS, W. J.**  
The crystallization of the teschenite from the Lugar Sill, Ayrshire, **1**, 23.
- REID, R. E. H.**  
Hexactinellid faunas in the chalk of England and Ireland, **1**, 15.  
Bathymetric distributions of Calcarea and Hexactinellida in the present and the past, **6**, 546.
- RICKARDS, R. B., & A. W. A. RUSHTON.**  
The thecal form of some slender Llandovery *Monograptus*, **3**, 264.
- SAMANTA, B. K.**  
The Eocene beds of Garo Hills, Assam, India, **2**, 124.

- SAXENA, M. N., & S. K. SINGH.  
Sub-marine volcanic explosion during the sedimentation of the Baghdhar Limestone  
of Dalhousie Chamba, Himalaya, **5**, 454.
- SHELDON, R. W.  
Probable gasteropod tracks from the Kinderscout Grit of Soyland Moor, Yorkshire,  
**4**, 365.
- SHELLEY, D.  
A note on the relationship of sillimanite to biotite, **6**, 543.
- SIGURDSSON, H.  
Petrology of acid xenoliths from Surtsey, **5**, 440.
- SOKOLOV, Y. N., A. A. KRASILCHIKOV, & JU. JA. LIVSHITZ.  
The main features of the tectonic structure of Spitsbergen, **2**, 95.
- SPARKS, B. W., & R. G. WEST.  
Interglacial deposits of Wortwell, Norfolk, **5**, 471.
- STEPHENSON, D. G.  
An aberrant species of *Fibularia* from Kenya and Madagascar, **2**, 136.
- TOGHILL, P.  
The stratigraphical relationships of the earliest monograptidae, and the dimorpho-  
graptidae, **1**, 46.  
A new Lower Llandovery graptolite from Coal Pit Bay, County Down, **4**, 384.
- TOZER, E. T., & J. R. PARKER.  
Notes on the Triassic biostratigraphy of Svalbard, **6**, 526.
- WALKER, A. D.  
*Protosuchus, Proterochampsia*, and the origin of phytosaurs and crocodiles, **1**, 1.
- WEILL, D. F., & A. H. KUDO.  
Initial melting in alkali feldspar-plagioclase-quartz systems, **4**, 325.
- WEST, R. G., & D. G. WILSON.  
Plant remains from the Corton Beds at Lowestoft, Suffolk, **2**, 116.
- WESTGATE, J. A.  
Linear sole markings in Pleistocene till, **6**, 501.
- WHITEMAN, A. J.  
Formation of the Red Sea Depression, **3**, 231.
- WILKINSON, J. F. G.  
The magmatic affinities of some volcanic rocks from the Tweed Shield Volcano,  
S.E. Queensland-N.E. New South Wales, **3**, 275.

## CORRESPONDENCE

- ADAMS, S. J. A new cleaning technique for the preparation of calcareous fossils, **4**, 400.
- BAKER, J. W., G. G. LEMON, R. A. GAYER, & R. R. MARSHMAN. The Dutch Gin Schists,  
**5**, 493.
- BOULTON, G. S. A Middle Würm interstadial in South-West Wales, **2**, 190.
- CRIMES, T. P., & N. B. DHONAU. Pre-Cambrian of South-East Eire, **1**, 77.
- DOWNIE, C., & W. E. TREMLETT. Micropalaeontological evidence on the age of the  
Clara Group (South-East Ireland), **4**, 401.
- FENNING, P. J., & E. C. FRESHNEY. Preliminary results of a borehole at Petrockstow,  
North Devon, **2**, 188.
- HEDBERG, H. D. Some views on chronostratigraphic classification, **2**, 192.
- HUGHES, N. F., D. B. WILLIAMS, J. L. CUTBILL, & W. B. HARLAND. Hierarchy in  
stratigraphical nomenclature, **1**, 78.

- JOHN, B. S. A Middle Würm interstadial in South-West Wales—A reply to G. S. Boulton, **4**, 398.
- KENT, P. E. Hierarchy in stratigraphical nomenclature, **1**, 80.
- MARSHALL, B. Joint and fault patterns in North-East Tasmania, **2**, 186.
- MILLER, J. A., & P. E. BROWN. Isotopic ages of late Caledonian granitic intrusions in the British Isles, **6**, 561.
- PARKINSON, D. The Lower Carboniferous Limestone knolls, Clitheroe district, Lancashire and Yorkshire, **3**, 299.
- POTTER, J. F. The Silurian-Devonian boundary, **2**, 187.
- RANSON, C. E. Ice wedge casts in the Corton Beds, **1**, 74.
- SMITH, T. E. Isotopic ages of late Caledonian granitic intrusions in the British Isles, **6**, 560.
- THOMAS, T. N. A new occurrence of celestite, near Llantrisant, Glamorgan, **2**, 185.
- WHITEMAN, A. J. The Lower Carboniferous Limestone knolls, Clitheroe district, Lancashire and Yorkshire, **3**, 298.
- WILLIAMSON, I. A., & R. I. H. Trace fossils from Namurian Sandstone, Yorkshire, **6**, 562.
- WRIGHT, A. E. Pre-Cambrian of South-East Eire, **1**, 75.

## REVIEWS

- Alps (Eastern), Geology of, **5**, 497.
- Ancient Environments, **4**, 407.
- Arctic bibliography, **1**, 85.
- Atmospheric Sciences and Astrology, Encyclopedia of, **4**, 405.
- Beaverlodge Mining Area, Saskatchewan, Geology of, **6**, 568.
- Bering Land Bridge, **5**, 496.
- British Isles, Structure of, **3**, 308.
- Burrows and surface traces from the lower chalk of Southern England, **2**, 203.
- Calymenid and other Ordovician Trilobites from Kentucky and Ohio, **3**, 306.
- Cambrian Trilobites of East-Central Alaska, **4**, 406.
- Canada, Geological Survey of (Essay Review), **1**, 81.
- Canadian Upper Mantle Report, **2**, 200.
- Church Stretton area, Geology of, **3**, 305.
- Continental Margins and Island Arcs, **3**, 307.
- Crustal development of Central America and the West Indies, **2**, 201.
- Crystal Optics, Introduction to, **1**, 87.
- Deformation of the Basement Complex, Northern Rhodesia, **1**, 84.
- Devonian Reef Complexes, Western Australia, **5**, 497.
- Devonian Sections in Northern Yukon Territory and N.W. District of Mackenzie, **3**, 309.
- Devonian (Lower and Middle) Trilobites of the Canadian Arctic Islands, **3**, 309.
- Durham and West Hartlepool, Geology of the Country between, **4**, 408.
- Elgin District, Geology of, **5**, 495.
- Evaporites of the Ukraine, **3**, 308.
- Fossil Vertebrates, **2**, 205.
- Fossils in colour, **2**, 201.
- Geography, Dictionary of, **3**, 306.
- Geologic Time, **6**, 564.

- Geology, Introduction to : Physical and Historical, **4**, 402.  
Geology, A new, **4**, 404.  
Geology, Source Book, **3**, 306.  
Geology and Uranium Deposits of the Laguna District, New Mexico, **1**, 88.  
Glacial and Periglacial Geomorphology, **4**, 407.  
Grampian Highlands, **1**, 86.  
Gravity, Deformation and the Earth's Crust (Essay Review), **3**, 302.  
Hemicytheridae and Trachyleberididae (Ostracoda), N. America, **2**, 202.  
Hettangian ammonite faunas, Taseko Lake, B.C., **1**, 84.  
Iniskin-Tuxedni Region, Alaska, Geology of, **1**, 87.  
Langholm, Geology of the neighbourhood, **3**, 310.  
Layered igneous rocks, **2**, 204.  
Lovozero Alkali Massif, **1**, 87.  
Micropalaeontology of the foraminifera, Manual of, **2**, 201.  
Morphology of the earth, **2**, 207.  
Oceanography, **2**, 200.  
Ollerton, Geology of the Country around, **3**, 309.  
Ostracoda of the U.S.S.R. : Family Cyprididae, **6**, 565.  
Ostracods of Mesozoic deposits in the Volga-Ural region, **6**, 567.  
Pacific Coast Ranges of Costa Rica, **2**, 201.  
Petrology, Introduction to, **4**, 403.  
Petrology of Morrison Formation, Colorado Plateau region, **1**, 89.  
Plagioclase, Optical orientation of, **1**, 85.  
Pleistocene Extinctions : Search for a cause, **6**, 562.  
Quaternary Palynology in the Western Mainland region of the Canadian Arctic, Some problems of, **6**, 568.  
Radioactive minerals in Chile, Explorations for, **1**, 88.  
Science, Government in, **5**, 494.  
Scotland's Scenery, Evolution of, **2**, 206.  
Sea, **2**, 200.  
Sea, Waters of, **2**, 200.  
Sediments, Diagenesis in, **4**, 403.  
Source-book of geological, geomorphological and soil maps for Wales and the Welsh Borders, **1**, 84.  
South Wales Coalfield, Seams of, **3**, 305.  
Stratigraphy of the British Isles, **2**, 208.  
Triassic Time, Standard for, **4**, 404.  
Uranium deposits in Sandstone, U.S.A., Geology of, **1**, 88.  
Volcanic hazards at Mount Rainier, Washington, **1**, 83.  
Volcanoes, **1**, 83.  
Westport Map-Area, Ontario, **1**, 89.  
World Rift System, **3**, 307.

## PLATES

1. Monograptids from Dobb's Linn, **1**, *facing p. 51.*
- 2-3. Photomicrographs of specimens from the intrusive sheets, **2**, *facing p. 148.*
4. Mafic hybrid rocks from New England batholith, **2**, *facing p. 165.*
- 5-6. Banded pumice in Chilean ignimbrite, **2**, *facing p. 184.*

7. Satellite photograph showing structural trends, **3**, *facing p. 246.*
8. Porphyroblasts from Mt. Lofty Ranges, **4**, *facing p. 359.*
9. *Cruziana semplicata* (Lectotype), **4**, *facing p. 364.*
10. *Cruziana semplicata*, **4**, *facing p. 364.*
11. *Cruziana furcifera*, **4**, *facing p. 364.*
12. Namurian Grit showing Gasteropod tracks, **4**, *facing p. 366.*
13. A new Llandovery Monograptid, **4**, *facing p. 386.*
14. Silurian and ?Cambrian Cystoids, **5**, *facing p. 420.*
15. Xenoliths from Surtsey, **5**, *facing p. 453.*
16. Substratal Lineation in Till, **6**, *facing p. 504.*
- 17–18. Groove moulds in Till, **6**, *facing p. 504.*
19. Sole markings on the undersurface of a Till bed, **6**, *facing p. 505.*
20. Echinoid material from U. Estuarine Limestone, **6**, *facing p. 518.*
21. Upper Estuarine Limestone Sediments, **6**, *facing p. 519.*
22. Light photograph of Pebble Surface, **6**, *facing p. 524.*
- 23–26. Electron micrograph of Pebble Surface, **6**, *facing p. 524.*
27. Lower Triassic Ammonoids and bivalves from Spitsbergen, **6**, *facing p. 542.*
28. Middle Triassic Ammonoids and bivalves from Spitsbergen, **6**, *facing p. 542.*
29. Lower and Middle Triassic Ammonoids and bivalves from Spitsbergen, **6**, *facing p. 542.*