

THE
GEOLOGICAL MAGAZINE.

VOL. LXVIII OF WHOLE SERIES.
JANUARY—DECEMBER, 1931.

THE
GEOLOGICAL MAGAZINE

OR

Monthly Journal of Geology.

WITH WHICH IS INCORPORATED

THE GEOLOGIST.

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

EDITED BY

R. H. RASTALL, Sc.D., M.Inst.M.M.,

FELLOW OF CHRIST'S COLLEGE AND
UNIVERSITY LECTURER IN ECONOMIC GEOLOGY, CAMBRIDGE.

ASSISTED BY

PROFESSOR W. S. BOULTON, D.Sc.

PROFESSOR J. W. GREGORY, D.Sc., F.R.S.

F. H. HATCH, Ph.D., M.Inst.M.M.

SIR T. H. HOLLAND, K.C.S.I., D.Sc., F.R.S.

PROFESSOR J. E. MARR, Sc.D., F.R.S.

PROFESSOR W. W. WATTS, Sc.D., LL.D., M.Sc., F.R.S.

HENRY WOODS, M.A., F.R.S.

SIR ARTHUR SMITH WOODWARD, LL.D., F.R.S.

VOL. LXVIII OF WHOLE SERIES.

JANUARY—DECEMBER, 1931.

LONDON:

DULAU & CO., LTD., 32 OLD BOND STREET, W.1.

1931.

GEOLOGY DEPARTMENT,

BIRKBECK COLLEGE, E.C.4

HERTFORD
STEPHEN AUSTIN AND SONS, LTD.

LIST OF PLATES.

PLATE	FACING PAGE
I. Tertiary Foraminifera from Somaliland. <i>Miogypsina</i> and <i>Nummulites</i>	64
II. <i>Nummulites</i>	64
III. <i>Nummulites</i> and <i>Dictyoconooides</i>	64
IV. <i>Dictyoconooides</i> , <i>Dictyoconus</i> , <i>Siderolites</i> , and <i>Linderina</i>	64
V. Boulder-bed at School Share, Settle	92
VI. Crushed Lamprophyre Dykes, Ards Peninsula	111
VII. Coastal Features of North Cardiganshire	120
VIII. Members of the Younger Series of Lamprophyre Dykes, Ards Peninsula	160
IX. Photomicrographs of Lamprophyres characterized by Biotite and Pyroxene, Ards Peninsula	160
X. Photomicrographs of Lamprophyres characterized by Horn- blende, Ards Peninsula	165
XI. Upper Devonian Fishes, Taggerty, Victoria	231
XII. Microphotographs of Rocks from Marulan, N.S. Wales	314
XIII. Finished Section, Red Crag, Walton-on-the-Naze	420
XIV. Pseudomorph of Termitarium in Haematite on the River Camasamba, Angola	443
XV. Photomicrographs of Cassiterite in Pegmatite and Aplite, Manitoba	462
XVI. Spodumene crystals, Silverleaf, Manitoba	465
XVII. Replacement of Potash Felspar by Albite, Manitoba	466
XVIII. "Founder"-Breccia, Ayampe Point, Ecuador	488
XIX. Limestone, Biotite-Granite, Ecuador	488
XX. Dislocations in Tertiary Strata, near Ancon, Ecuador	494
XXI. Thin Section of Orbicule, and Boulder with Orbicules, Alderney	506
XXII. Photomicrographs of Odenwald Beerbachites, etc.	520
XXIII. Sheet of Granulite Hornfels enclosed in Hypersthene-Gabbro	520

LIST OF ILLUSTRATIONS IN THE TEXT.

	PAGE
Sections of <i>Arenicolites lymensis</i> sp. nov.	14
Structural types in South Africa	16
Plan of the structural elements forming the epsilon of E. China	20
Map of coastal area between Boyne Bay and Findochty	25
Rough sketch-map of coast near the Boyne Line	26
Diagrammatic section to show possible relationship of Cowhythe Gneiss to Portsoy igneous rocks	28
Portsoy Group (a) Limestone and Calcareous Schists; (b) Quartzite and Quartz Schists	29
<i>Nummulites somaliensis</i> sp. nov.	52
<i>Dictyoconoides kohaticus</i> (Davies)	55
<i>Linderina buranensis</i> sp. nov.	58
Types of Mountain Structure	75
Sketch-map showing position of Boulder-bed and Lower Bowland Shales at School Share	82
Boulder-bed and Junction of Viséan and Namurian at School Share	83
Map showing general distribution of dykes around the coast of the Ards Peninsula	99
Map of part of the coast at the headland north of Portavogie	105
Diagram of theoretical longitudinal stream-profiles at a coast	112
" " profile of a coast where subaerial erosion is not concentrated in a stream	113
Diagram of theoretical profiles of a coast; the coastline advancing across a hill	114
Sketch-map of the coast of N. Cardiganshire	115
Coastal profiles, N. Cardiganshire	117
Index Map of N.E. Ireland and S. Kintyre	127
Subdivisions of the Dalradian Rocks in Antrim	129
Diagrams in illustration to Heavy Mineral Separation	138
A crystal of hornblende with outgrowths of blue amphibole and tremolite	149
Drusy cavity in a kersantite showing replacement of quartz and felspar by calcite	154
Geological sketch-map of the neighbourhood of Dunrod Hill, Renfrewshire	168
Front view and section of limestone-schist contact at Gunong Terendum	195
Sketch-map of Victoria	208
Phyllolepid plates. Blue Hills, Taggerty	212
Section of a Phyllolepid plate	213
<i>Striacanthus siccaeformis</i> gen et sp. nov.	214
Reconstruction of the body-armour of <i>Bothriolepis gippslandiensis</i> Hills	215
Median occipital and dorsal view of <i>B. gippslandiensis</i> Hills	218
" " section of a large anterior median dorsal of <i>B. gippslandiensis</i> Hills	220
Sketch section showing the general sequence of Upper Palaeozoic rocks	222
Tholeiite, Dolerite	235
Idealized representation of a cupola-shaped magma reservoir	244
To illustrate the upward transfer of heat brought about by convective circulation	246
Idealized representation of the convective circulation in a cupola-shaped magma	247
Idealized representation of the convective circulation in a cupola that has ascended into the "granitic" layer	249
Columnar section of the strata, at Jubulpore	277
Geological sketch-map of the neighbourhood of "The Limekilns", near Marulan	290
Sketch-map showing situation of Skerryvore	316
" " " Sule Skerry	317

	PAGE
<i>Fibularia craniolaris</i>	327
<i>Paraster savignyi</i>	328
<i>Paraster savignyi</i> , <i>Paraster gibberules</i>	330
Outline Map of the Ouachita Mountains in Oklahoma	339
Illustrating specific gravity control of the size-distribution of the minerals of the sands	352
Sketch-map of the Sahara, after Captain Cameron's route map	364
Geological sketch-map of Jebel Usdum	367
Sketch-section through salt-mass at salt-cave, Jebel Usdum	369
" " " at Lot's Wife, Jebel Usdum	370
Position of Jebel Usdum and trend of ancient shore line	371
Map of the Vobster Quarries	422
Sketch of west and north faces of Vobster Quarries	425
Result of crustal shortening by oblique fracture	439
" " " continuous yield	440
Secondary result of crustal shortening, with outflow above due to gravity	441
Ultimate result of outflow	441
Corundum-spinel xenoliths	447
Surface outcrop showing intrusive succession	456
Sketches of surface outcrops	458
Vertical sections through two sills of tin-bearing pegmatite	461
Three vertical sections through an inclined sill of complex pegmatite	463
Sketch-map of the Silverleaf Lithium Deposit	464
Face of pegmatite displaying tantalite replacing red albite	466
General section from Babahoyo to Riobamba, Ecuador	482
" " " Pacific to Pascaules	484
Sketch-map of Ecuador	489
" " Coastal District north of Santa Elena, Ecuador	491
Diagram illustrating contact zone between igneous and sedimentaries	493
A sedimentation subsidence due to differential heating of the sub-crustal material	495
The folding of the sediments by a convection current	495
The light folded mass floating up to form mountains	496
Diagram showing the main outcrop of Millstone Grit in Gower	530
Sketch-map of the Bishopston area	533
Sketch-map of the area around Ilston	536
Sketch-map of the area around Llanrhidian	538
Locality map, West Cumberland	544
Sections at Langhorn and Overend	546
Calcareous (Upper) Sandstone, Langhorn	548
Calcareous (Upper) Sandstone, below First Limestone, Langhorn	552
Ferruginous (Upper) Sandstone, Langhorn	552
Sandstone with fluorspar cement	552
" Lower " Sandstone from below the First Limestone, Langhorn	554
Ferruginous (Middle) Sandstone, Overend	554
Mineral grains from the (Middle) Sandstone below the First Limestone, Overend	554
Heavy Minerals from the Lower Carboniferous Sandstones of Cumberland	554