

THE  
GEOLOGICAL MAGAZINE

NEW SERIES.

DECADE VI. VOL. VI.

OR

VOL. LVI OF WHOLE SERIES.

JANUARY — DECEMBER, 1919.

THE  
GEOLOGICAL MAGAZINE

OR

Monthly Journal of Geology.

WITH WHICH IS INCORPORATED

THE GEOLOGIST,  
GEOLOGY DEPARTMENT.

NOS. DELY TO DCI XVI  
**BIRKBECK COLLEGE, F.C.A**

EDITED BY

HENRY WOODWARD, LL.D., F.R.S., F.G.S., F.R.M.S.

LATE OF THE BRITISH MUSEUM OF NATURAL HISTORY; PRESIDENT OF THE  
PALÆONTOGRAPHICAL SOCIETY; ETC.

AND

R. H. RASTALL, M.A.

ASSISTED BY

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

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

PROFESSOR J. E. MARR, Sc.D. (Camb.), F.R.S., F.G.S.

SIR JETHRO TEALL, Sc.D. (Camb.), LL.D., F.R.S., V.P.G.S.

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

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

DR. ARTHUR SMITH WOODWARD, LL.D., F.R.S., F.L.S.,  
F.G.S.

NEW SERIES. DECADE VI. VOL. VI.

VOL. LVI OF WHOLE SERIES.

JANUARY—DECEMBER, 1919.

LONDON:

DULAU & CO., LTD., 34-36 MARGARET STREET,  
CAVENDISH SQUARE, W. 1.

1919.

STEPHEN AUSTIN AND SONS, LTD.  
PRINTERS, HERTFORD

## LIST OF PLATES.

PLATE	FACING PAGE
I. Dr. Charles Doolittle Walcott . . . . .	1
II. Palæolithic Flake Implements . . . . .	49
III. Pores and Channel-Systems in <i>Megacystis</i> . . . . .	115
IV. Lower Cambrian Hyolithidæ, etc., from Hartshill . . . . .	157
V. Slabs of Clay Ironstone from the Highest Coal-measures, Claxheugh, Co. Durham . . . . .	211
VI. Adoral Surfaces of <i>Megacystis</i> . . . . .	262
VII. Section across the Northern and Southern Oil- and Gas-fields of Pennsylvania . . . . .	290
VIII. <i>Neolenus serratus</i> (Rominger), Burgess Shale, C. D. Walcott . . . . .	359
IX. Fossil Myriopod from Rochdale, Lancashire . . . . .	411
X. John Hopkinson . . . . .	431
XI. <i>Cryptophyllum Hibernicum</i> , gen. et sp. nov. . . . .	441
XII. Shell-Limestone Conglomerate at Blackhall Rocks and Jean Jiveson's Rock . . . . .	498
XIII. Rock and Spindle Shore Stack East from St. Andrews. Con- centric arrangement of Ash Layers, Rock and Spindle . . . . .	506
XIV. <i>Bunatia Woodwardi</i> , gen. et sp. nov., J. M. Clarke . . . . .	532
XV. <i>Archæocryptolaria skeatsi</i> , Chapman, etc. . . . .	550

## LIST OF PLATES.

PLATE	FACING PAGE
I. Dr. Charles Doolittle Walcott . . . . .	1
II. Palæolithic Flake Implements . . . . .	49
III. Pores and Channel-Systems in <i>Megacystis</i> . . . . .	115
IV. Lower Cambrian Hyolithidæ, etc., from Hartshill . . . . .	157
V. Slabs of Clay Ironstone from the Highest Coal-measures, Claxheugh, Co. Durham . . . . .	211
VI. Adoral Surfaces of <i>Megacystis</i> . . . . .	262
VII. Section across the Northern and Southern Oil- and Gas-fields of Pennsylvania . . . . .	290
VIII. <i>Neolenus serratus</i> (Rominger), Burgess Shale, C. D. Walcott . . . . .	359
IX. Fossil Myriopod from Rochdale, Lancashire . . . . .	411
X. John Hopkinson . . . . .	431
XI. <i>Cryptophyllum Hibernicum</i> , gen. et sp. nov. . . . .	441
XII. Shell-Limestone Conglomerate at Blackhall Rocks and Jean Jiveson's Rock . . . . .	498
XIII. Rock and Spindle Shore Stack East from St. Andrews. Con- centric arrangement of Ash Layers, Rock and Spindle . . . . .	506
XIV. <i>Bumia Woodwardi</i> , gen. et sp. nov., J. M. Clarke . . . . .	532
XV. <i>Archæocryptolaria skeatsi</i> , Chapman, etc. . . . .	550

## LIST OF ILLUSTRATIONS IN THE TEXT.

	PAGE
Sketch-map of Carboniferous Limestone outcrops near Wellington, Salop	78
Facial suture in Trilobites . . . . .	104
Diagrammatic section of the atmosphere from the Equator to the Pole . . . . .	159
Air rising in the centre of a cyclone . . . . .	160
Diagrammatic section of termination of Coal-measures, S. Durham . . . . .	169
Section showing position of fossiliferous ironstone bands and thrust plane . . . . .	204
Section at XY in previous Figure . . . . .	206
<i>Bellinurus Trechmanni</i> , H. Woodw., sp. nov. . . . .	210
Kyanite, Sandringham Sands . . . . .	214
Zircons, Great Gransden . . . . .	217
Zoned Crystals of Zircon, Great Gransden . . . . .	218
Crystals of Rutile, Great Gransden . . . . .	219
Map of Drake's Island, Plymouth . . . . .	263
Quartz grains, Parish Sand-pit, Aspley Guise . . . . .	267
Sphene, Aspley Guise . . . . .	268
Kyanite Crystals, near Woburn . . . . .	271
Isoseismal lines and disturbed area, Stafford Earthquake . . . . .	302, 304
Earthquake cutting a crust-fold . . . . .	310
Map showing site of Gravel Plain near Corwen . . . . .	313
Hydropore-sutures in <i>Megacystis</i> . . . . .	323
Geological sketch-map of parts of Eritrea and Abyssinia . . . . .	341
Map showing the outcrops in the Harbertonford area . . . . .	351
Diagram illustrating arrangements of the coarse fragments in the Crag . . . . .	353
Sections at Crowdy's Quarry, New Quarry, and Copse of Austin's Close . . . . .	357
<i>Neolenus serratus</i> (Rominger), by C. D. Walcott . . . . .	360
Sketch-map of distribution of Igneous rocks, Strathbogie and Lower Banffshire . . . . .	365
Iron-ore and basic steel . . . . .	389
Sketch-map of part of Southern Sikkim . . . . .	399
View from Badamtam across the Valley of the Ranjit . . . . .	401
Map of N. India showing localities connected with Pleistocene glaciation	402

	PAGE
North bank of the Great Rangit Valley . . . . .	405
Five segments from the cast of <i>Palæosoma giganteum</i> . . . . .	407
Reconstructed posterior segments of <i>Palæosoma giganteum</i> . . . . .	408
<i>Palæosoma robustum</i> . . . . .	409
Development of major septa in a normal Rugose Coral . . . . .	436
Analysis of interambulacral tuberculation in <i>Pyrina</i> and <i>Conulus</i> . . . . .	445
Iceland, after Th. Thoroddsen . . . . .	468
Diagrammatic section across the Bryozoa Reef . . . . .	486
Curve showing number of invertebrate species, Durham Permian . . . . .	488
Diagrammatic section across the Permian outcrop . . . . .	489
Diagram to illustrate structure of Rock and Spindle shore stack . . . . .	502
Four diagrams to illustrate the occurrence, proportions, and distribution of silica in Chalk . . . . .	538-44