

THE  
GEOLOGICAL MAGAZINE

OR

Monthly Journal of Geology:

WITH WHICH IS INCORPORATED

“THE GEOLOGIST”.

NOS. DLXXI TO DLXXXII  
GEOLOGY DEPARTMENT,  
BIRKBECK COLLEGE, E.C.4  
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., ETC.

ASSISTED BY

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

DR. GEORGE J. HINDE, F.R.S., F.G.S.

SIR THOS. H. HOLLAND, K.C.I.E., A.R.C.S., F.R.S.

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

ARTHUR SMITH WOODWARD, LL.D. GLASGOW,  
F.R.S., F.L.S., SEC. G. Soc.

AND

HORACE B. WOODWARD, F.R.S., F.G.S.

NEW SERIES. DECADE V. VOL. IX.

JANUARY—DECEMBER, 1912.

LONDON:

DULAU & CO., LTD., 37 SOHO SQUARE, W.

1912.

PRINTED BY  
STEPHEN AUSTIN AND SONS, LTD.  
HERTFORD.

# LIST OF PLATES.

PLATE	FACING PAGE
I. Chalk Polyzoa . . . . .	8
II. Apical Systems of some Irregular Echinoidea . . . . .	16
III. Professor A. E. Törnebohm . . . . .	49
IV. Tachylite, Cleveland Dyke . . . . .	68
V. <i>Dictyocalamites</i> and <i>Pterophyllum</i> from Kent Coal-field . . . . .	99
VI. Map of English Channel River-Valley . . . . .	101
VII. Chalk Polyzoa . . . . .	146
VIII. Map of South Donegal, showing distribution of 'Drumlins' . . . . .	153
IX. 'Drumlins' of South Donegal . . . . .	158
X. Portrait of William Carruthers . . . . .	193
XI. <i>Dionide atra</i> , Salter . . . . .	202
XII. Map of Usu-san, Japan . . . . .	248
XIII. Usu-san, with the New Mountain, Lake of Toya . . . . .	250
XIV. Chalk Polyzoa . . . . .	294
XV. Chalk Polyzoa . . . . .	296
XVI. <i>Fibularia Nigeriæ</i> , Hawkins, sp. nov. . . . .	300
XVII. Portrait of Professor John Milne . . . . .	337
XVIII. British Ordovician species of <i>Trinucleus</i> . . . . .	352
XIX. 'Fringe' around head-shield of <i>Trinucleus</i> . . . . .	394
XX. <i>Brachylepas Naissanti</i> , Hébert, sp. . . . .	358
XXI. <i>Archarenicola Rhatica</i> , Horwood, sp. nov. . . . .	398
XXII. New Chalk Polyzoa . . . . .	433
XXIII. <i>Brachylepas</i> (?) <i>fimbriatus</i> and <i>B.</i> (?) <i>tithonicus</i> . . . . .	508
XXIV. The Rev. R. Ashington Bullen . . . . .	525
XXV. <i>Cidaris faringdonensis</i> , Wright . . . . .	529
XXVI. <i>Cidaris corwellensis</i> , Hawkins . . . . .	529

# LIST OF ILLUSTRATIONS IN THE TEXT.

	PAGE
Lower molars of <i>Mus catreus</i> , n.sp., <i>Rhagomys orthodon</i> , and <i>Cricetomys</i>	5
Oil accumulation due to terrace structure . . . . .	19
Oil accumulation, undenuded folded beds . . . . .	20
Oil accumulation caused by a salt dome . . . . .	21
Oil accumulation due to igneous doming . . . . .	22
Oil accumulation in sand dammed by dykes . . . . .	22
Oil accumulation in porous beds dammed by fault . . . . .	22
Oilfield at Bushterrari . . . . .	23
Oil derived from upfolded saliferous Miocene . . . . .	23
Oil accumulation in porous strata . . . . .	54
Oil accumulation in strata tipping unconformably from old shore-line . . . . .	54
Oil in outcropping beds sealed in by bitumen . . . . .	55
Oil accumulation in horizontal sand lenticle . . . . .	55
Oil in inclined discontinuous porous bed . . . . .	56
Diagrammatic longitudinal section of picrite-teschenite sill, Lugar . . . . .	75
Sketch-map of the Jiblong and Bors Rivers, Africa . . . . .	107
Portion of molar tooth of elephant, Khartum . . . . .	111
Map of Bannus Lough, Donegal . . . . .	117
Map of Lough Awehy, Donegal . . . . .	118
View looking south-east from Upper Donegal . . . . .	154
Map of district west of Pettigo, Donegal . . . . .	155
View of drumlins looking west from Trumman . . . . .	156
View looking W.S.W. from near Ballintra . . . . .	157
Contour map of drumlins west of Ballintra . . . . .	158
Map of S.W. Trinidad . . . . .	160
Gneiss showing the inclusion of quartz in orthoclase, etc. . . . .	216
Gneiss showing biotite myrmekitically intergrown with quartz . . . . .	217
Piece of fossil rib, partially sawn across at ends . . . . .	218
Base of shed antler of red deer, antlers partly sawn off . . . . .	219
Piece of red ochre cut into shape for marking lines . . . . .	220

	PAGE
Cut fragment of bone from Bedfordshire . . . . .	220
Sketch of bone showing part from which above fragment was obtained . . . . .	221
Plating of buccal membrane in <i>Echinocorys</i> . . . . .	223
Stages in development of buccal membrane of <i>Echinocardium flavescens</i> . . . . .	224
Map of Bunter Pebble Beds, Notts and Lincs . . . . .	256
Map of Peninsula of Nicoya, Costa Rica . . . . .	259
Diagram to illustrate viscosity of ice . . . . .	269
Carved <i>Pectunculus</i> shell, Red Crag . . . . .	285
Sketch-map of 'westerly chalk bluff', Trimmingham . . . . .	290
Diagram of Chalk boulder and associated gravel, Trimmingham . . . . .	291
Cross-section of typical 'Gnamma' hole . . . . .	301
Cross-section of 'Night Well' . . . . .	303
Comparisons of correlations of Younger Rocks . . . . .	314
Sections showing stratigraphical succession at Waipara, Weka Pass, and Oamaru . . . . .	315
Portrait of Professor John Milne, F.R.S. . . . .	342
<i>Pollicipes polymerus</i> and <i>P. mitella</i> . . . . .	354
<i>Catophragmus polymerus</i> and <i>Brachylepas Naissanti</i> . . . . .	355
Diagram showing mode of occurrence of laterites in Western Australia . . . . .	402
Map of Western Australia . . . . .	405
Diagrammatic section through Crich Hill . . . . .	407
Map of South Staffordshire . . . . .	438
Section, north and south of Tram Bridge, Saltwells . . . . .	442
Section of Downton Sandstones, Brewins Tunnel . . . . .	443
<i>Craterosaurus pottonensis</i> , Seeley . . . . .	482
<i>Stegosaurus</i> sp. . . . .	483
Section at Brewins Tunnel of Temeside Beds . . . . .	486
Sections, Cretaceo-Tertiary, New Zealand . . . . .	492
Section, Orewa Bridge, South Head . . . . .	493
Map showing Tertiary and Cretaceous Series . . . . .	494
Section through Cape Colony . . . . .	543
Sketch-map of ocean floor south of South Africa . . . . .	546