

THE
QUARTERLY JOURNAL
OF THE
GEOLOGICAL SOCIETY
OF LONDON

Quod si cui mortalium cordi et curæ sit, non tantum inventis hæere atque iis uti, sed ad ulteriora penetrare ; atque non disputando adversarium, sed opere naturam vincere ; denique non belle et probabiliter opinari, sed certo et ostensive scire ; tales, tanquam veri scientiarum filii, nobis (si videbitur) se adjungant ; ut omissis naturæ atriis, quæ infiniti contriverunt, aditus aliquando ad interiora patefiat.—*Novum Organum, Prefatio.*

VOLUME XCV

FOR 1939

LONDON :

LONGMANS, GREEN & CO. LTD.

PARIS : CHARLES KLINCKSIECK, 11 RUE DE LILLE.

SOLD ALSO AT THE APARTMENTS OF THE SOCIETY,

BURLINGTON HOUSE, W.1.

1940

GEOLOGICAL SOCIETY OF LONDON

LIST OF THE OFFICERS AND COUNCIL

Elected February 17th, 1939

PRESIDENT

Prof. Henry Hurd Swinnerton, D.Sc.

VICE-PRESIDENTS

Edward Battersby Bailey, M.C. M.A. D.Sc. F.R.S.	Prof. Owen Thomas Jones, M.A. D.Sc. F.R.S.
Prof. William George Fearnside, M.A. F.R.S.	Prof. Cecil Edgar Tilley, Ph.D. B.Sc. F.R.S.

SECRETARIES

Leonard Hawkes, D.Sc.	Prof. William Bernard Robinson King, O.B.E. M.A. Sc.D.
-----------------------	---

FOREIGN SECRETARY

Sir Arthur Smith Woodward, LL.D. F.R.S. F.L.S.

TREASURER

Frederick Noel Ashcroft, M.A. F.C.S.

COUNCIL

William Joscelyn Arkell, M.A. D.Sc. D.Phil.	Prof. Owen Thomas Jones, M.A. D.Sc. F.R.S.
Frederick Noel Ashcroft, M.A. F.C.S.	Prof. William Bernard Robinson King, O.B.E. M.A. Sc.D.
Edward Battersby Bailey, M.C. M.A. D.Sc. F.R.S.	George Martin Lees, M.C. D.F.C. Ph.D.
Maurice Black, M.A.	William Francis Porter McLintock, D.Sc.
Edmund Ernest Stockwell Brown.	Roy Woodhouse Pocock, D.Sc.
Prof. Arthur Hubert Cox, D.Sc. Ph.D.	Walter Campbell Smith, M.C. T.D. M.A.
Wilfred Norman Edwards, B.A. F.L.S.	Prof. Henry Hurd Swinnerton, D.Sc.
Prof. William George Fearnside, M.A. F.R.S.	Prof. Cecil Edgar Tilley, Ph.D. B.Sc. F.R.S.
Prof. Thomas Neville George, D.Sc. Ph.D.	David Williams, M.Sc. Ph.D. B.E.
John Vernon Harrison, D.Sc. F.R.S.E.	Prof. Leonard Johnston Wills, M.A. Sc.D. Ph.D.
Leonard Hawkes, D.Sc.	Sir Arthur Smith Woodward, LL.D. F.R.S. F.L.S.
Prof. Henry George Albert Hickling, D.Sc. M.Sc. F.R.S.	

ASSISTANT SECRETARY AND EDITOR

Arthur Greig

LIBRARIAN

Miss E. D. Eastwood, F.L.A.

CLERK

Miss M. M. Clarke, M.A.

ASSISTANT IN LIBRARY

D. G. Watkins

STANDING PUBLICATION COMMITTEE

Prof. H. H. Swinnerton, *President*

Dr. L. Hawkes Prof. W. B. R. King	} <i>Secretaries</i>	Mr. F. N. Ashcroft, <i>Treasurer</i> Sir A. Smith Woodward, <i>Foreign</i> <i>Secretary</i>
--------------------------------------	----------------------	---

Dr. W. J. Arkell
Mr. W. N. Edwards
Prof. W. G. Fearnside
Prof. O. T. Jones

Dr. G. M. Lees
Dr. W. F. P. McLintock
Prof. C. E. Tilley
Prof. L. J. Wills

TABLE OF CONTENTS

	PAGE
ARKELL, WILLIAM JOSCELYN. The ammonite succession at the Woodham Brick Company's pit, Akeman Street Station, Buckinghamshire, and its bearing on the classification of the Oxford Clay. (Plates VIII-XI)	135
BUSK, HENRY GOULD. Explanatory note on the block diagram of the Great Rift Valley from Nakuru to Lake Magadi. (Plate XIV)	231
BUTLER, ARTHUR JAMES. The stratigraphy of the Wenlock Limestone of Dudley. (Plate III).	37
CARRUTHERS, ROBERT GEORGE. On northern Glacial drifts; some peculiarities and their significance. (Plates XIX-XXII)	299
DERRY, DUNCAN RAMSAY. Some examples of detailed structure in early Pre-Cambrian rocks of Canada. (Plates V-VII)	109
DIXEY, FRANK. The early Cretaceous valley-floor peneplain of the Lake Nyasa region and its relation to Tertiary rift structures. (Plate IV)	75
ELLES, GERTRUDE LILIAN. The stratigraphy and faunal succession in the Ordovician rocks of the Builth-Llandrindod inlier, Radnorshire. (Plates XXVII-XXXII)	383
HAWKINS, HERBERT LEADER. The geological structure of the Kingsclere pericline. The Eocene succession between Kingsclere and Ecchinswell	235
HEARD, ALBERT. Further notes on Lower Devonian plants from South Wales. (Plates XII-XIII).	223
JONES, OWEN THOMAS. The geology of the Colwyn Bay district: a study of submarine slumping during the Salopian period. (Plates XXIII-XXVI)	335
LINDAL, JAKOB H. (communicated by LEONARD HAWKES). The interglacial formation in Viðidal, northern Iceland. (Plates XV-XVIII)	261

	PAGE
VERSEY, HENRY CHERRY. The petrography of the Permian rocks in the southern part of the Vale of Eden	275
WOODLAND, AUSTIN WILLIAM. The petrography and petrology of the Lower Cambrian manganese ore of West Merionethshire. (Plates I-II)	1

PROCEEDINGS

	PAGE
Proceedings of the Meetings	i
Annual Report of the Council	ix
Report of the Library Committee	xvi
Accounts for 1938 and Estimates for 1939	xvii
Anniversary Address of the President (Professor H. H. SWINNERTON): On palæontology and the mechanics of evolution	xxxiii
List of the Officers and Council	lxxi
List of the Foreign Fellows in 1938	lxxii
List of the Foreign Correspondents in 1938	lxxiii
List of the Wollaston Medallists and recipients of the Wollaston Donation Fund	lxxiv
List of the Murchison Medallists and recipients of the Murchison Geological Fund	lxxv
List of the Lyell Medallists and recipients of the Lyell Geological Fund	lxxvi, lxxvii
List of the Bigsby Medallists	lxxvii
List of the Prestwich Medallists and applications of the Prestwich Fund	lxxviii
Applications of the Barlow-Jameson Fund	lxxviii
Grants of the proceeds of the Daniel-Pidgeon Fund. J. B. Tyrrell Fund	lxxix
List of Fellows elected, Fellows deceased, resigned and removed, Foreign Members elected, and Foreign Correspondent deceased	lxxx
List of donors to the Library	lxxxi
Addresses by the President (Professor H. H. SWINNERTON) to the Medallists and recipients of Funds	lxxxvii
Obituary notices of Fellows and Foreign Members deceased	c
—————	
WAYLAND, EDWARD JAMES. The face of Uganda	i
BROUWER, H. A. The tectonic evolution of the Lesser Sunda Islands, near Australia	iii
DIXEY, FRANK, & others. Peneplains and related land-forms	cx
SOLOMON, JOHN DAVID. A correlation between the Pleistocene of South-east England and of neighbouring parts of the Continent	cxxiii

DATES OF ISSUE OF VOLUME XCV

- Part 1 : pages 1-134, i-xxxi, plates
I-VII March 22nd, 1939.
- Part 2 : pages 135-233, xxxiii-lxx,
plates VIII-XIV May 26th, 1939.
- Part 3 : pages 235-333, lxxi-cxxiv,
plates XV-XXII October 30th, 1939.
- Part 4 : pages 335-459, plates XXIII-
XXXII January 18th, 1940.

CORRIGENDUM

Page lxxv, last line but one, right-hand column: *for*
Harold *read* Arthur.

LIST OF THE FOSSILS FIGURED AND DESCRIBED IN THIS VOLUME

GENERA & SPECIES	AGE	LOCALITY	PLATE, FIGURE	PAGE
PLANTE				
<i>Alnus</i>	Lr Eocene	Viðidal (Iceland)	XVIII, 2, 3	269
<i>Salix</i>	do.	do.	XVIII, 1	269
<i>Cooksonia downtonensis</i> sp. nov.	Lr Downtonian	Capel Horeb (S. Wales)	XII, 1-4	224
<i>Tullia breconensis</i> sp. nov.	Senni Beds	Brecon Beacons (S. Wales)	XIII, 8-10	225
cf. <i>Protaxites</i> (<i>Nematophyton</i>)	do.	do.	XIII, 6-7	226
<i>Arthrostigma gracile</i>	do.	do.	XII, 5	226
Pyritized fructifications	do.	do.	XIII, 11	226
GRAPTOLITOIDEA				
<i>Dicellograptus divaricatus</i>	Ordovician	Llanfawr quarry (Radnorsh.)	Text-fig. 9a-d	429
<i>Mesograptus foliaceus</i>	do.	Maesgwynne (Radnorsh.)	Text-fig. 9e	429
AMMONOIDEA				
<i>Aspidoceras</i> (<i>Euaspidoceras</i>) <i>babeaeum</i> var. <i>subcostata</i>	Oxford Clay	Akeman Street, Bucks.	IX, 7-9	162
— (—) <i>clynelishense</i> nom. nov.	do.	do.	—	180
— (—) <i>hirsutum</i>	do.	do.	—	181
— (—) aff. <i>ovale</i>	do.	do.	—	163
<i>Cardioceras</i> (<i>Scarburgiceras</i>) <i>scarburgense</i>	do.	do.	X, 1	156
<i>Creniceras rengereri</i>	do.	do.	IX, 15-27	150
<i>Distichoceras bicoastatum</i>	do.	do.	VIII, 19a, b	167
<i>Grossouvria</i> (<i>Binatisphinetes</i>) <i>binata</i>	do.	do.	—	180
— (<i>Grossouvria</i>) <i>miranda</i>	do.	do.	IX, 4, 5	157
— (<i>Poculisphinetes</i>) <i>auriculare</i>	do.	do.	—	179
— (—) <i>cardoti</i>	do.	do.	—	179
— (—) <i>petitelerci</i>	do.	do.	IX, 13, 14	158
— (—) <i>poculum</i>	do.	do.	—	178
— (—) cf. <i>subpatina</i>	do.	do.	—	179
— (—) <i>trina</i>	do.	do.	—	179
<i>Hecticoceras</i> (<i>Brightia</i>) <i>glyptum</i>	do.	do.	VIII, 20, 21	144
— (—) <i>matheyi</i>	do.	do.	VIII, 13, 14	145
— (—) <i>svevem</i> race <i>villersensis</i>	do.	do.	VIII, 10-12	144
— (—) <i>punctatum</i>	do.	do.	—	165
— (—) cf. <i>punctatum</i>	do.	do.	VIII, 17, 18	143
— (<i>Putealicerias</i>) <i>puteale</i>	do.	do.	—	164
— (—) <i>rossiense</i>	do.	do.	—	165
— (—) <i>sarasinii</i>	do.	do.	VIII, 15, 16	143
— (<i>Sublumoceras</i>) <i>bonarellii</i>	do.	do.	VIII, 22-25	146
— (—) <i>couffoni</i>	do.	do.	—	166
— (—) <i>dynastes</i>	do.	do.	—	166
— (—) <i>nodosulcatum</i>	do.	do.	—	166
— (—) <i>pseudopunctatum</i>	do.	do.	—	165
<i>Kosmoceras</i> (<i>Kosmoceras</i>) <i>annulatum</i>	do.	do.	XI, 5	190
— (—) <i>compressum</i>	do.	do.	—	191
— (—) <i>spinosum</i>	do.	do.	XI, 1	184
— (—) <i>tidmooreense</i> sp. nov.	do.	do.	XI, 2 & text-fig. 3	187
— (<i>Lobokosmoceras</i>) <i>duncani</i>	do.	do.	XI, 6, 7	188
— (—) <i>pronice</i>	do.	do.	—	192
				194

viii LIST OF THE FOSSILS FIGURED AND DESCRIBED

GENERA & SPECIES	AGE	LOCALITY	PLATE, FIGURE	PAGE
<i>Kosmoceras</i> (<i>Zugokosmoceras</i>) <i>rowlstonense</i>	Oxford Clay	Akeman Street, Bucks.	—	185
<i>Oppelia</i> (<i>Paralcidia</i>) <i>glabella</i>	do.	do.	—	192
<i>Pachyceras</i> <i>rugosum</i>	do.	do.	—	163
<i>Peltoceras</i> (<i>Peltoceras</i>) <i>athleta</i>	do.	do.	—	177
— (<i>Peltoceratoides</i>) <i>subtense</i>	do.	do.	—	181
— (<i>Rursiceras</i>) cf. <i>pseudotorosum</i>	do.	do.	—	183
— (—) <i>reversum</i>	do.	do.	—	182
<i>Perisphinctes</i> (<i>Alligaticeras</i>) <i>alligatus</i>	do.	do.	—	182
— (—) sp.	do.	do.	—	180
— (—) <i>pseudogracious</i> sp. nov.	do.	do.	IX, 12	161
— (<i>Properisphinctes</i>) <i>bernensis</i>	do.	do.	IX, 10, 11	159
— (—) <i>latlinguatus</i>	do.	do.	IX, 2, 3	160
— (<i>Prospisphinctes</i>) <i>consociatus</i>	do.	do.	IX, 1, 6	195
<i>Phylloceras</i> (<i>Colliphylloceras</i>) <i>demidoffi</i>	do.	do.	—	161
<i>Pseudopeltoceras</i> <i>famulum</i>	do.	do.	—	141
<i>Quenstedtoceras</i> (<i>Bourke-</i> <i>lamberticeras</i>) <i>henrici</i>	do.	do.	—	184
— (—) <i>intermissum</i>	do.	do.	—	173
— (—) <i>lamberti</i>	do.	do.	—	172
— (<i>Eboraciceras</i>) <i>cadifor-</i> <i>forme</i>	do.	do.	—	171
— (—) <i>dissimile</i>	do.	do.	—	175
— (—) <i>grande</i> nom. nov.	do.	do.	—	173
— (—) <i>juratum</i>	do.	do.	—	176
— (—) <i>ordinarium</i>	do.	do.	—	177
— (—) <i>sutherlandiae</i>	do.	do.	—	174
— (<i>Pavloviceras</i>) <i>marie</i>	do.	do.	XI, 3, 4 X, 6-8	175
— (—) <i>omphaloides</i>	do.	do.	X, 9, 10, ? 11	152
— (—) aff. <i>williamsoni</i>	do.	do.	X, 12, 13	151
— (—) <i>woodhamense</i> sp. nov.	do.	do.	X, 2-4	154
— (<i>Prosiceras</i>) <i>gregarium</i>	do.	do.	—	155
— (<i>Quenstedtoceras</i>) <i>leachi</i>	do.	do.	—	170
— (—) cf. <i>macrum</i>	do.	do.	X, 5	168
— (—) <i>spatium</i>	do.	do.	—	169
— (<i>Weissermeliceras</i>) <i>longilobatum</i>	do.	do.	—	169
<i>Reineckia</i> (<i>Collotia</i> ?) sp.	do.	do.	Text-fig. 2	177
<i>Taramelliceras</i> (<i>Proscaphites</i>) <i>episcopale</i>	do.	do.	VIII, 5-7	185
— (—) <i>langi</i>	do.	do.	VIII, 8, 9	149
— (—) <i>richei</i>	do.	do.	VIII, 1-4	149
TRILOBITA				
<i>Ampyx bisectus</i> sp. nov.	Ordovician	Llanfawr quarry (Radnorsh.)	XXXIX, 1-5	421
<i>Ogyginus corndensis</i> mut. <i>intermedius</i> nov.	do.	Llandeilo & Howey Brook (Radnorsh.)	XXXI, 10, 11	428
<i>Trinucleoides reticulatus</i> sp. nov.	do.	Llandrindod Wells	XXXIX, 6-9	427
— <i>salleri</i>	do.	Llandeilo, Builth	XXX, 9	428
<i>Trinucleus chamberlaini</i> sp. nov.	do.	Howey Brook (Radnorsh.)	XXXIX, 10-13	423
— <i>fimbriatus</i>	do.	Llanfawr quarry (Radnorsh.)	XXX, 6	424
— — mut. <i>primus</i> nov.	do.	Maesgwynne & Pencerrig (Radnorsh.)	XXX, 1-5	424
— — mut. <i>ultimus</i> nov.	do.	Llanfawr quarry (Radnorsh.)	XXX, 7, 8	424
— cf. <i>foveolatus</i>	do.	Gwern y fed fach (Radnorsh.)	XXXI, 1-2a	425
— (<i>Cryptolithus</i>) <i>gibbosus</i> sp. nov.	do.	Howey Brook & Camnant Brook (Radnorsh.)	XXXI, 3-9	425

LIST OF THE PLATES IN VOLUME XCV

	<i>Facing page</i>
PLATES I & II. Photomicrographs of the Cambrian manganese ore of West Merionethshire	32
PLATE III. Geological map of Wren's Nest Hill, Dudley. Scale : 8 inches to 1 mile	74
„ IV. Map of the early Cretaceous valley-floor peneplain of the Lake Nyasa region. Scale : 1 inch to 60 miles	108
„ V. Geological map of eastern Canada. Scale : 1 inch to 87 miles approx.	134
„ VI. Perspective drawings of folded structures in early Pre-Cambrian rocks of Canada, as would be shown by removing everything but a single stratigraphic horizon in each case	134
„ VII. Plans and cross-sections showing the geological structure of the Coniaurum Mine, Ontario	134
„ VIII. Opeledæ from Woodham pit	220
„ IX. Perisphinctidæ, <i>Aspidoceras</i> and <i>Creniceras</i> from Woodham pit	220
„ X. <i>Quenstedtoceras</i> , mainly from Woodham pit, and early <i>Cardioceras</i>	220
„ XI. <i>Kosmoceras</i> from Woodham pit, and type specimens for comparison	220
PLATES XII & XIII. Early Devonian plants from South Wales.	228
PLATE XIV. Block diagram in isometric perspective (greatly idealized) of the Great Rift Valley from Nakuru to Lake Magadi	232
„ XV. The Viðidalsá ravine and the Bergárfoss	272
„ XVI. The Viðidalsá cliff and the Bakkabrú cliff	272
„ XVII. The Bakkabrú cliff	272
„ XVIII. Leaf impressions of <i>Salix</i> and <i>Alnus</i> , and leaf membrane of <i>Alnus</i>	272
„ XIX. Structures in glacial drifts	330
„ XX. Pressed clays	330
PLATES XXI & XXII. Structures in northern glacial drifts	330

PLATE XXIII.	General view of ground near Pant; general view of the Cefn Du area; photograph of an exposure of highly disturbed beds south of Llwydcoed School, Bryn y maen district	376
„ XXIV.	General structural map of the area, and section across same. Scale of map : 3 inches to 1 mile; scale of section : 4 inches to 1 mile	376
„ XXV.	Geological map of, and section across, the Pant area. Scale : 12 inches to 1 mile	376
„ XXVI.	Geological map of, and section across, the Cefn Du area. Scale : 12 inches to 1 mile	376
„ XXVII.	Camnant Brook cliff section; Penddol Rocks, River Wye	442
„ XXVIII.	Llanfawr quarry	442
„ XXIX.	<i>Ampyx</i> , <i>Trinucleoides</i> , and <i>Trinucleus</i>	442
„ XXX.	<i>Trinucleus</i>	442
„ XXXI.	<i>Trinucleus</i> and <i>Ogyginus</i>	442
„ XXXII.	Map showing the general distribution of the fossil zones in the Ordovician rocks of the Llandrindod district. Scale : 2 inches to 1 mile.	424