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978-1-108-06719-5 - *Siluria: The History of the Oldest Known Rocks Containing Organic Remains, with a Brief Sketch of the Distribution of Gold Over the Earth*

Roderick Impey Murchison

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In the nineteenth century, geology emerged as a distinct academic discipline. It pointed the way towards the theory of evolution, as scientists including Gideon Mantell, Adam Sedgwick, Charles Lyell and Roderick Murchison began to use the evidence of minerals, rock formations and fossils to demonstrate that the earth was older by millions of years than the conventional, Bible-based wisdom had supposed. They argued convincingly that the climate, flora and fauna of the distant past could be deduced from geological evidence. Volcanic activity, the formation of mountains, and the action of glaciers and rivers, tides and ocean currents also became better understood. This series includes landmark publications by pioneers of the modern earth sciences, who advanced the scientific understanding of our planet and the processes by which it is constantly re-shaped.

Siluria

The Scottish geologist Sir Roderick Impey Murchison (1792–1871) first proposed the Silurian period after studying ancient rocks in Wales in the 1830s. Naming the sequence after the Silures, a Celtic tribe, he believed that the fossils representing the origins of life could be attributed to this period. This assertion sparked a heated dispute with his contemporary Adam Sedgwick, ultimately ruining their friendship. First published in 1854, *Siluria* is a significant reworking of Murchison's earlier book, *The Silurian System*, which had appeared in 1839. Thorough in his approach, he combines his own findings with those of researchers around the world, touching also on the later Devonian, Carboniferous and Permian periods as well as questions of natural history. An important text in nineteenth-century geology and palaeontology, the work contains a valuable geological map of Wales along with detailed engravings of fossils, including crustaceans, cephalopods and fish.

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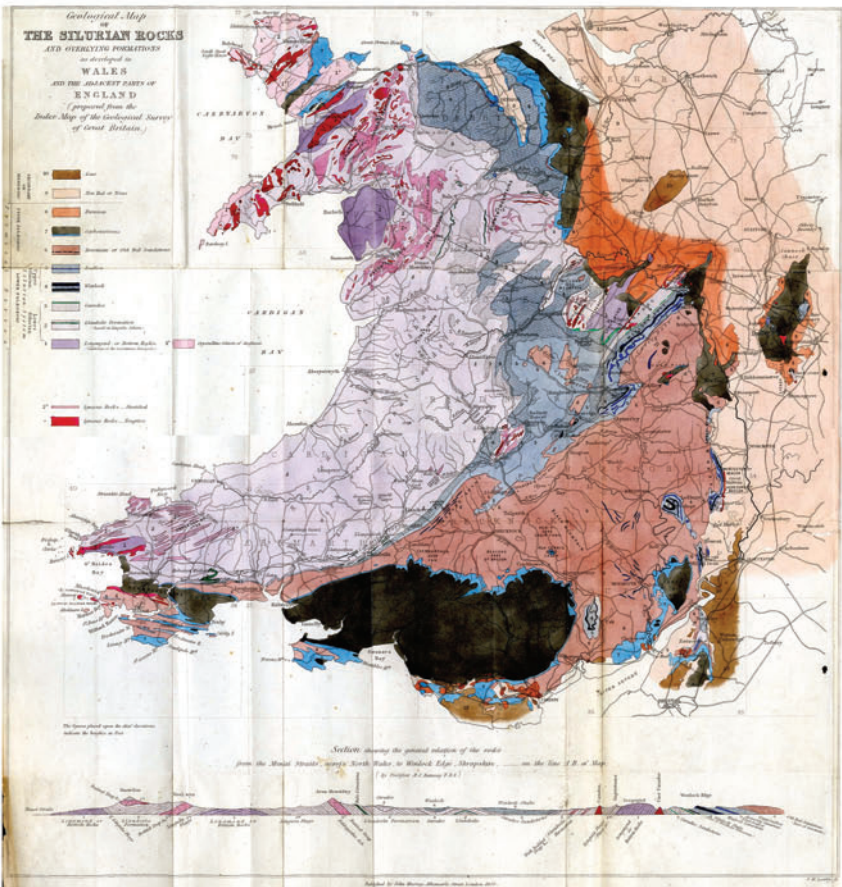
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Frontmatter

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Frontmatter

[More information](#)

S I L U R I A.

THE

HISTORY OF THE OLDEST KNOWN ROCKS

CONTAINING

ORGANIC REMAINS,

WITH A BRIEF SKETCH OF THE DISTRIBUTION OF GOLD

OVER THE EARTH.

BY

SIR RODERICK IMPEY MURCHISON,

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EX-PRESIDENT OF THE GEOLOGICAL AND ROYAL GEOGRAPHICAL SOCIETIES OF LONDON; TRUSTEE OF
THE BRITISH MUSEUM; HON. MEMBER OF THE ACADEMIES AND NAT. HIST. SOCIETIES
OF ST. PETERSBURG, MOSCOW, BERLIN, Breslau, COPENHAGEN, HOLLAND, SWITZERLAND, TURIN,
BOSTON, NEW YORK, PHILADELPHIA, ETC. ETC.; AND
CORR. INSTITUTE OF FRANCE.

“Where were we when these grains of sand were assorted? Compared with their date, the fall
of Babylon has just happened, and the Creation of man is an event of yesterday!”

Geology, Rev. D. KING, 4th ediz. p. 116.

LONDON:

JOHN MURRAY, ALBEMARLE STREET.

1854.

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[More information](#)

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Frontmatter

[More information](#)

Dedication.



TO

SIR HENRY THOMAS DE LA BECHE, C.B. F.R.S.

DIRECTOR GENERAL OF H. M. GEOLOGICAL SURVEY, &c. &c. &c.

To you, my dear De la Beche, who, by your labours and those of your associates, have demonstrated the wide extension of the Silurian Rocks in the British Isles, I dedicate this work; referring my readers to the instructive National Geological Museum of your foundation, for complete evidence of the truths I have endeavoured to sustain.

RODERICK IMPEY MURCHISON.

May 1, 1854.

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Frontmatter

[More information](#)

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Frontmatter

[More information](#)

P R E F A C E.

THE design of this work is sufficiently explained in the Introductory Chapter. I would here, however, make a few additional remarks, if only to express my great obligations to some of the authors referred to in the subsequent pages. And first to my friend, Mr. J. W. Salter, for his assistance and advice in describing, grouping, and comparing the fossils, all the most characteristic forms of which he has himself selected and drawn on wood. These woodcuts contain small figures either of species which have been discovered in the Silurian rocks of Britain since my former work was published, or of which better specimens have been obtained. The original typical forms so admirably delineated, according to their natural size, by Mr. James De C. Sowerby, in the ‘*Silurian System*,’ have been transferred from his etchings on copper to lithographic stones; and being classified and re-arranged, are presented in thirty-seven plates at the end of this volume. In regard to its illustrations, therefore, the ‘*Siluria*’ now offered to the public is a faithful outline of my previous labours and also of our present knowledge of the older palæozoic rocks, as registered in the noble series of organic life collected in the Government Museum of Practical Geology.

The chief deficiency in this part of the work, which my old friends will remark, is the absence of the beautiful lithographs of the Corals of the ‘*Silurian System*,’ drawn under the superintendence of my able associate, Mr. Lonsdale, and so lucidly described by him. These zoophytes not having been etched on copper, like the other organic remains, could not be transferred; and a selection has, therefore, been made of the most typical forms only, as represented in certain woodcuts. In naming and describing them, a few errata, alluded to in the volume, would have been avoided, had I

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Frontmatter

[More information](#)

submitted the proofs, while going through the press, to the critical eye of the same valued friend, whose assistance was of so much service to me in preparing the original 'Silurian System,' and who, notwithstanding his state of health and absence from London, has kindly enabled me to make those corrections.

But passing over these and other defects, which might have been avoided had I been less engaged in different occupations, I trust that my main object will have been obtained, in presenting a clear, general view of the succession of primeval life, and in rendering the earlier pages of geological history accessible to many readers.

To render the work a *vade mecum* of geologists, on which foreigners, as well as my countrymen, might depend, a coloured map is annexed, which is simply a reduction of the geological map of Wales and the adjacent region of Britain prepared by Professor Ramsay and the Government Surveyors, under Sir H. T. De la Beche, and wherein the order of the Silurian Rocks and their relations to overlying deposits are best displayed. The reader who may wish to examine the details of any one district, has only to look at the large figures inscribed on this map, which refer him to each sheet, illustrated in detail by the Government geologists. The friends who supported me when I ventured to prepare my original map of the Silurian region (at a time when a large portion of the country had not even been represented in the Ordnance maps) will observe that the main features of the range of the Silurian Rocks (Lower and Upper), and their relations to *overlying* deposits, remain as I had traced them. The fundamental change made by my successors is, that nearly all the Welsh country coloured in my original map as the Cambrian of Sedgwick, and supposed to be occupied by rocks lower than those I described has been shown to be composed of their exact equivalents. In other words, the tract extending westwards from the Longmynd, which I long ago reduced to order, as best exhibiting the Cambrian and Lower Silurian types of Shropshire and Montgomeryshire, *contains the same geological series as the mountains of N. Wales*; the Cambrian rocks and the equivalent of the Lingula flags, (lowest Silurian of the Survey), both inclusive.

It has truly been a subject of deep regret to me, that an old and cherished friend, with whom I had long worked in foreign as well as British lands, and whose powerful mind and brilliant eloquence have thrown so much light on the science which we mutually cultivate, should, of late years, have so strenuously objected to this application of the term Lower Silurian. But here the reader must remember, that the question

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Frontmatter

[More information](#)

PREFACE.

vii

has been determined by many competent and independent authorities, all of them equally the friends of my distinguished associate as of myself. They have, in short, extended to the more complicated regions of Wales, the cession which I originally described in memoirs, map, and sections, illustrative of the adjacent Silurian counties.*

Indicating, as I have always done, a great difference in the organic remains of the Lower and Upper Silurian, I firmly adhere to my old view of the *union of these two groups in one system of life*. Aloof from their common *facies*, a careful revision of all the Silurian fossils in the Government Museum, collected from various parts of the British Isles, has led the palæontologists of that institution to the belief, that nearly one hundred species are common to the Lower and Upper divisions of the Silurian system; even excluding the Upper Caradoc, or intermediate zone, from the estimate. [See also the work, 'The Palæozoic Fossils of the Cambridge Museum,' and the Tabular List, with comments, in the Appendices A., B.]

Those persons who may wish to trace the historical evidences relating to the original researches, will do well to read a condensed sketch by that sound geologist, one of my first instructors, Dr. Fitton†, who clearly exposed the state of the subject in the year 1841, correctly noticing the effect also produced by other early labourers in the same field, among whom my most efficient coadjutor was the Rev. T. T. Lewis, of Aymestry. On the other hand, in addition to the various communications by Professor Sedgwick and myself, practical geologists will peruse with interest the memoirs of Bowman, Sharpe, and other authors published in the Proceedings and Journal of the Geological Society of London; as well as the work of Professor Phillips 'On the Malvern and Abberley Hills,' a truly philosophical view of that Silurian region.

One of the most successful efforts to apply the true palæozoic succession to a distant part of Europe was made by my eminent and lamented friend Leopold von Buch‡, who, simply by comparing fossils sent to him by General Tcheffkine with the types published in my former work, demonstrated that true Silurian rocks were developed in various parts of Russia. The work on Russia and the Ural Mountains, by my associates de Verneuil, von Keyserling, and myself, was, however (I hope I may say it

* See some good general recent observations bearing on this question, by J. B. Jukes, F.R.S., (Journ. Geol. Soc. Dublin, vol. vi., President's Discourse, p. 88.).

† Edinburgh Review, April, 1841, vol. cxlvii. p. 1.; see also Quarterly Review, 1839, vol. lxiv., p. 102.

‡ Beitrage Gebirgs-formationen in Russland, Berlin, 1840.

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Frontmatter

[More information](#)

viii

PREFACE.

without presumption), the first which, in extending those results to the north-western edge of Asia, developed a complete ascending series over the larger half of Europe, from the oldest known fossiliferous strata to the youngest tertiary deposits.

In perusing the fifteenth and sixteenth chapters, which indicate the parallelism of the palæozoic rocks of France, Spain, and the United States of America to those of Britain, geologists will at once recognize the vast amount of knowledge which has been contributed by my dear and enlightened companion, M. Edouard de Verneuil.

To my other numerous foreign contemporaries, and especially to M. Barande, who have seen reason to apply to their own lands the classification and nomenclature first elaborated in the ancient kingdom of the Silures, I also tender my grateful acknowledgments. May the following pages not be without use in stimulating them to bring the older rocks of their respective countries into a closer comparison with our British types, than I have been able to effect in the present outline!

TABLE OF CONTENTS.

CHAPTER I.

INTRODUCTION—ORIGINAL SILURIAN RESEARCHES.—DESIGN OF THIS WORK	Page 1
--	-----------

CHAP. II.

BASE OF THE SILURIAN ROCKS, AND EARLIEST ZONE OF FORMER LIFE.

Outlines, Structure, and Order of the older Rocks. — Earliest Crystalline Rocks. — The lowest Deposits in which a true Sedimentary Origin is seen are usually void of Signs of former Life.	
Order of Succession from such Unfossiliferous Strata upwards to the lowest Zone in which Fossil Remains have been detected in Great Britain	17

CHAP. III.

LOWER SILURIAN ROCKS — *continued.*

The Llandeilo Formation, its Slates, Schists, Sandstones, Limestones, and Interpo- lated Igneous Rocks. (2* and 2 of Map and Coloured Sections.)	45
---	----

CHAP. IV.

LOWER SILURIAN ROCKS — *continued.*

THE CARADOC FORMATION.

Caradoc Sandstone as developed in North Wales and Radnorshire. Types of the Formation in Shropshire, Herefordshire, &c.	
The Caradoc strictly united with the lower Deposits by its Structure and Fossil Contents	78

CHAP. V.

UPPER SILURIAN ROCKS.

General Character of the Upper Silurian Rocks, as divided into the Wenlock and Ludlow Formations	Page
The Wenlock Formation of Shale and Limestone, with its chief Fossils, described in ascending Order - - - - -	100

CHAP. VI.

UPPER SILURIAN ROCKS — *continued.*

The Ludlow Formation, General Character of. Its Subdivision in the Typical Districts, into Lower Ludlow Rocks, Aymestry Limestone, and Upper Ludlow Rocks - - - - -	124
---	-----

CHAP. VII.

SILURIAN ROCKS OF BRITAIN BEYOND THE TYPICAL REGION OF ENGLAND AND WALES, AS SEEN IN CORNWALL, THE NORTH-WEST OF ENGLAND, SCOTLAND, AND IRELAND - - - - -	144
---	-----

CHAP. VIII.

ORGANIC REMAINS OF THE LOWER SILURIAN ROCKS - - - - -	176
---	-----

CHAP. IX.

FOSSILS OF THE UPPER SILURIAN ROCKS - - - - -	207
---	-----

CHAP. X.

THE DEVONIAN ROCKS, OR OLD RED SANDSTONE, AS EXHIBITED IN THE BRITISH ISLES - - - - -	241
---	-----

CHAP. XI.

CARBONIFEROUS ROCKS.

Great Primeval Flora the Source of the Old Coal Deposits, — General View of these Deposits and their Organic Remains in the British Isles - - - - -	267
---	-----

TABLE OF CONTENTS. xi

CHAP. XII.

PERMIAN ROCKS.

Changes of the Surface before the Permian Deposits were accumulated. — Origin of the Term Permian as applied to the highest Group of Primeval Deposits. — The Permian Rocks of Russia, Germany, and England. — The Organic Remains of the Group	Page 289
---	-------------

CHAP. XIII.

GENERAL VIEW OF THE SILURIAN, DEVONIAN, AND CARBONIFEROUS ROCKS OF SCANDINAVIA AND RUSSIA	316
---	-----

CHAP. XIV.

PRIMEVAL SUCCESSION IN GERMANY AND BELGIUM.

General Sketch of the Character of the Older Rocks extending westwards from Poland and Turkey in Europe into the Alps and Carpathians. Devonian, Carboniferous, and Permian Rocks of Silesia and Moravia. Silurian Rocks (Lower and Upper) of Bohemia. Lower Silurian, Devonian, Carboniferous, and Permian Rocks of Saxony, the Thüringerwald, &c. General View of the Succession of Devonian and Carboniferous Rocks in the Rhenish Provinces and Belgium	336
---	-----

CHAP. XV.

SILURIAN, DEVONIAN, AND CARBONIFEROUS ROCKS OF FRANCE, SPAIN, PORTUGAL, AND SARDINIA	383
--	-----

CHAP. XVI.

SUCCESSION OF PRIMEVAL ROCKS IN AMERICA.

Order of the Palæozoic Strata in South America, the United States, and British North America	408
--	-----

CHAP. XVII.

ON THE ORIGINAL FORMATION OF GOLD, AND ITS SUBSEQUENT DISTRIBUTION IN DEBRIS OVER PARTS OF THE EARTH'S SURFACE	431
--	-----

CHAP. XVIII.

CONCLUSION.

	Page
Recapitulation — General View of the Succession of Life from a Beginning as based on positive Observation — The Progress of Creation — Theoretical Specu- lations distinguished from absolute Geological Results - - - - -	459

APPENDIX.

A. Vertical Range of Silurian Fossils - - - - -	485
B. Recent Surveys of the British Silurian Rocks - - - - -	490
C. Traces of Vegetable Matter in the Silurian and older Rocks - - - - -	492
D. Unconformity in Ireland of the Longmynd or Bottom Rocks ('Cambrian' of the Survey) to the Lower Silurian - - - - -	493
E. Barrande's Silurian System in Bohemia - - - - -	493
F. Depth of the Primeval Seas, and Colouring of the Shells of the Mollusca which lived in them - - - - -	495
G. Extension of Silurian Rocks in Spain - - - - -	<i>ib.</i>
H. Foraminifera in the Silurian Rocks - - - - -	496
I. Supposed Anomaly at Neffiez in France explained - - - - -	497
K. Australian Gold - - - - -	<i>ib.</i>
L. Produce of Silver - - - - -	<i>ib.</i>
M. Silurian Rocks in Silesia - - - - -	<i>ib.</i>
N. Palæozoic Rocks in Asia Minor - - - - -	498
O. Discoveries along the Flanks of the Malvern Hills - - - - -	<i>ib.</i>
P. Other Reptilian Remains in the Permian Rocks of Russia - - - - -	<i>ib.</i>
Q. On the former Changes of the Alps - - - - -	499
INDEX - - - - -	507

LIST OF ILLUSTRATIONS.

GEOLOGICAL MAP - - - - - *Frontispiece*

WOODCUTS.

	Page		Page
General Order of the Primeval Rocks	22	Silurian Rocks of Marloes Bay, Pem-	
Contorted Schists at the South Stack		broke, dipping under the Old Red	
Lighthouse, Anglesea - - -	24	Sandstone of Hook Point - - -	66
The Longmynd - - - - -	26	Section at Llandewi Felfrey, Pem-	
Section from the Longmynd on the		brokeshire - - - - -	68
E.S.E. across the Stiper Stones to		View from Dynevor Park, Llandeilo,	
the Tract of Shelve and Corndon on		looking to the Hills above Golden	
the W.N.W. - - - - -	29	Grove - - - - -	69
Pass of Llanberis from the Lower		Noeth Grüg - - - - -	72
Lake - - - - -	30	Section near Llangadock. From the	
Oldhamia antiqua, from Bray Head,		Lower Silurian to the Old Red	
Ireland - - - - -	32	Sandstone - - - - -	73
Slaty Cleavage and Bedding - -	34	Section near Llandeilo. From the	
The Western Face of the Stiper Stones	37	Lower Silurian to the Edge of the	
The Eastern Face of the Stiper Stones	<i>ib.</i>	great South-Welsh Coal-field - -	<i>ib.</i>
Section of Rocks at Barmouth -	40	Llanwrtyd Wells - - - - -	75
Lingula Flags, North Wales - -	42	Cader Idris - - - - -	77
Hymenocaris vermicauda, Salter. Lin-		Llandeilo Schists supporting Caradoc	
gula Flags, Dolgelly - - - -	42	Sandstone - - - - -	79
Paradoxides Forchhammeri, Angelin?		Pegwn's Fawr, Borders of Radnor and	
Black Schists of North Wales -	43	Montgomery - - - - -	80
Trilobites from the Black Schists of		The Caradoc Range - - - - -	81
the Malverns - - - - -	43	Relations of Caradoc Sandstone to the	
Lower Silurian Graptolites - -	46	Upper Silurian Rocks in Shropshire	82
Section at Llandewi Felfrey, Pem-		Caradoc Fossils - - - - -	86
brokeshire - - - - -	49	Upper Caradoc Fossils - - - -	87
Whittery Quarries in Marrington		Section at Corton - - - - -	90
Dingle - - - - -	55	Unconformable Relations of Llandeilo	
Volcanic Breccia - - - - -	56	Flags and Upper Silurian, near	
Ideal Representation of the Manner in		Builth - - - - -	<i>ib.</i>
which submarine Volcanic Dejec-		View of the Malvern Hills from the	
tions were formed in the Lower		West - - - - -	92
Silurian Period - - - - -	<i>ib.</i>	Section from the Malvern Hills to	
Lower Silurian and bedded Trap, tra-		Ledbury - - - - -	94
versed by eruptive Rocks, the Corn-		General Order of the Upper Silurian	
don Mountain in the Distance -	57	Rocks between the Caradoc Sand-	
Alternations of Llandeilo Flags and		stone beneath, and the Old Red	
Schists with Volcanic Grits - -	<i>ib.</i>	Sandstone above them - - - -	102
View of the Breidden Hills near		Lower Wenlock at Corton, near Pres-	
Welshpool, from Powis Castle -	59	teign - - - - -	103
Section across the Breidden Hills -	60	Altered Amorphous Limestone of Nash	
Section across the Gelli Hills -	61	Scar - - - - -	<i>ib.</i>
Lower Silurian Rocks in Aberiddy		Section at Yat Hill and Hanter Hill -	104
Bay - - - - -	64	View from Stanner Rocks (Ousal	
Llandeilo Schists in Muselewick Bay -	65	Wood, Hanter Hill, and Hergest	
View of Skomer Isles, seen from the		Ridge being successively seen in the	
Mainland - - - - -	66	Distance) - - - - -	105

Cambridge University Press

978-1-108-06719-5 - *Siluria: The History of the Oldest Known Rocks Containing Organic Remains, with a Brief Sketch of the Distribution of Gold Over the Earth*

Roderick Impey Murchison

Frontmatter

[More information](#)

xiv

LIST OF ILLUSTRATIONS.

	Page		Page
Section across the elevated Valley of Woolhope - - -	106	overlooking rounded Hills of Upper Silurian; with Mountains of Old Red Sandstone in the distance, the latter being defined by the untinted outline - - -	<i>ib.</i>
Trilobites of the Lower Wenlock or Woolhope Limestone - -	108	Section from the Top of the Silurian Rocks, on the N.W., across the whole area of the Old Red Sandstone, to the bottom beds of the S. Welsh Coal Field, on the S.E. - -	243
View of Wenlock Edge, as seen from the Hills of Ludlow Rock on the S.W. - - -	113	Section across the Old Red of Forfarshire - - -	248
Old Quarries in the Wenlock Limestone - - -	114	Mountains of the West Coast of the Highlands - - -	249
Dudley, from the Wren's Nest - -	116	Old Red Sandstone Fish - - -	251
Section across the Wren's Nest - -	117	Old Red Fish - - -	252
The South End of the Wren's Nest - -	<i>ib.</i>	Old Red Ganoid Fish - - -	253
Corals of the Wenlock Limestone - -	119	Reptile of the Upper Old Red - -	254
	120, 121	Old Red Sandstone Plant - -	255
Ludlow Castle - - -	125	Section across North Devon - -	256
Section across the Ludlow Promontory -	126	Shells of the Lower Devonian Limestone - - -	261
Whiteway Head - - -	130	Shells of the Upper Devonian Limestone - - -	263
The Palmer's Cairn Landslip - -	131	Ideal View of the Vegetation of the Carboniferous Era - - -	268
Upper Ludlow Rocks at the Bone Well - - -	134	General Relations of the Carboniferous Rocks in the Central and Southern Parts of England - - -	270
Brecon Anticlinal of Ludlow Rocks, throwing off Old Red Sandstone -	141	Stackpole Cliffs of Carboniferous Limestone - - -	271
View of the Cliffs near St. Abb's Head	150	Stackpole Rock - - -	272
Silurian Rocks of the South of Scotland - - -	152	General Order in Pembrokeshire - -	<i>ib.</i>
Section across the Bins of Connemara, and Killery Harbour - - -	169	Section across the Cornbrook Coal Basin of the Clee Hills - -	273
Lower Silurian Zoophytes - - -	178	Slash of Culm - - -	275
Lower Silurian Crinoid - - -	180	<i>Limulus rotundatus</i> , Prestwich - -	281
Lower Silurian Cystideans - - -	181	Coral of the Mountain Limestone -	282
Lower Silurian Star-fish - - -	182	Some Fossils of the Carboniferous Limestone - - -	283
Lower Silurian Orthides - - -	184	Insect and Shells of the Coal - -	284
Lower Silurian Brachiopods - - -	185, 186, 187, 189	Fern from Coal of Coalbrook Dale -	285
Lamellibranchiata - - -	191	Uppermost Limestone of the Coal -	285, 286
Gasteropoda - - -	193	The Gurmaya Hills of the South Ural Mountains - - -	295
Heteropod and Pteropod Mollusca -	196	Section of the West Flank of the South Ural - - -	296
Cephalopoda - - -	197	Permian Rocks of Britain - - -	300
Cephalopods - - -	199	Relations of Permian Rocks to the Coal near Hales Owen - -	301
Annelids; or marine Worm-tracks -	<i>ib.</i>	Position of the Permian Rocks in Shropshire - - -	303
Trilobites typical of the Lower Silurian Rocks - - -	201	Permian Plants, &c. - - -	306
Trinucleus concentricus, three Specimens, distorted by Slaty Cleavage -	203	Permian Shells - - -	309
Other Lower Silurian Trilobites -	204	Permian Fish - - -	312
Section of <i>Stromatopora striatella</i> , D'Orb. - - -	210	Lower Silurian Strata of Sweden reposing on Gneiss - - -	318
Corals of the Upper Silurian Rocks -	212	Oldest Silurian Strata of Sweden resting on Granite - - -	318
Cup Corals of the Wenlock Limestone	213	Succession in Norway - - -	319
Upper Silurian Bryozoa - - -	215	Succession in Norway (continued to the east) - - -	320
<i>Ptilodictya scalpellum</i> , Lonsdale -	216		
Cystidæ of the Wenlock Limestone -	217		
Crinoidea of the Dudley Limestone -	219		
Upper Silurian Starfish - - -	221		
Upper Silurian Brachiopoda - - -	222		
Upper Silurian Brachiopoda - - -	224		
Upper Silurian Lamellibranchiata -	225, 226		
Upper Silurian Cephalopods - - -	231		
Upper Silurian Crustacea - - -	234		
Wenlock Limestone Trilobites - - -	235		
View from the Slaty Lower Silurian Rocks near Llanwrtyd, Brecon,			

LIST OF ILLUSTRATIONS. xv

	Page		Page
Lower Silurian Rocks — Cliffs near		Ideal Section across the Appalachian	
Waiwara - - - - -	324	Chain - - - - -	424
Asaphus expansus, var. cornutus, from		General Section across the Older Rocks	
the St. Petersburg Limestone - <i>ib.</i>		of Lower Canada near the Mouth of	
Orthoceras duplex, Wahlenberg -	326	the St. Lawrence - - - - -	<i>ib.</i>
Ravine of the Belaia in the Valdai		View from the Summit of the Katch-	
Hills - - - - -	328	kanar, N. Ural - - - - -	438
Devonian and Carboniferous Rocks in		Lake of Aushkul, S. Ural - - - - -	441
the Gorge of the Tehussovaya River	330	Hills of Cossatchi-Datchi - - - - -	<i>ib.</i>
Generalized Section across the Silurian		Diggings at the Soimanofsk Mines -	442
Basin of Central Bohemia -	342	Gold Diggings at Zarevo Alexandrofsk	444
Inversion in the Eifel explained -	377	Gold Shingle near Ekaterinburg -	445
Inverted Strata South of Brilon -	378	Ideal Representation of the Original	
Section from Sillé le Guillaume to		Formation of Gold in the Rocks,	
Sablé - - - - -	385	and its subsequent Translation into	
		Heaps of Gravel - - - - -	449

PLATES OF FOSSILS, ETC.

[*To be placed at the End of the Book.*]

I.—IV.	Lower Silurian	Crustacea.
V.—VIII.	" "	Brachiopoda.
IX.—X.	" "	Bivalve and Univalve Shells.
XI.	" "	Cephalopoda.
XII.	" "	Graptolites and ‘Incertæ Sedis.’
XIII.—XV.	Upper Silurian	Crinoidea and Annelida.
XVII.—XIX.	" "	Trilobites and Crustacea.
XX.—XXII.	" "	Brachiopoda and Lamellibranchiata.
XXIV.—XXV.	" "	Gasteropoda, Pteropoda, and Heteropoda.
XXVI.—XXXIII.	Cephalopoda.	
XXXIV.	Upper Ludlow Rock (Tilestone).	
XXXV.	Fossils of Upper Ludlow Bone bed.	
XXXVI.—XXXVII.	Fishes of Old Red Sandstone.	
GENERAL MAP OF PALÆOZOIC FORMATIONS. To face p. 475.		

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Roderick Impey Murchison

Frontmatter

[More information](#)

ERRATA.

Preface, p. vii. l. 4. *for* cession, *read* succession.

Page

13. last line, *et passim*, *for* meozoic *read* mesozoic.43. last line but one, *omit*, The Olenus occurs in Bohemia.44. l. 3. *omit* traces.47. l. 7. from bottom, *for* has, *read* have.54. l. 18. *read* (porphyries of Sedgwick), *after* igneous rocks.68. l. 4. from bottom, *for* ch. 5., *read* ch. 8.74. Note. *for* Pl. 3., *read* Pl. 11.; also ch. 8. instead of ch. 5.l. 20. *dele* Orthis alternata, Foss. 8.; andl. 22. *dele* Asaphus Powisii, pl. 2. See p. 98.l. 2. *for* B. ornatus, Conrad, *read* B. nodosus, Salter.l. 5. *for* next chapter, *read* chap. 8.89. l. 21. *for* sixth, *read* fifth.91. letters *under* Section near Builth, *for* c, *read* d.103. l. 8. *for* girt, *read* grit.105. l. 5. *for* amorphorus, *read* amorphous.107. l. 5. *et passim*, *for* Petraia bina, Lonsdale, *read* Petraia bina, sp. Lonsd.112. l. 2. *et passim*, *for* Rhynconella, *read* Rhynchonella.116. l. 5. *for* extended, *read* extruded.118. l. 4. *for* exterior nucleus, *read* exterior of the nucleus.119. l. 7. from bottom, Fav. cristata, *for* Linn., *read* Blumenbach.

121. Foss. 12. f. 1. the name omitted is Diastopora? consimilis (Aulopora id. Sil. Syst.) The Author is indebted to Mr. Lonsdale for this correction, and also for a suggestion that f. 5. is a distinct species from the S. ramulosa, Goldfuss.

133. l. 10. *for* Avicula reticulata, *read* Pterinea Sowerbyi.142. l. 5. from bottom *for* fossil, *read* seed-vessel of a plant.l. 10. from bottom, *for* Thelodus parvidens, *read* Onchus Murchisoni.158. l. 1. *for* Trenton, *read* Chazy.161. l. 15. *for* sarcinulata, *read* lata.l. 16. *for* Avicular lineata, *read* Pterinea (Avicula) lineatula.168. l. 7. from bottom, *for* comform, *read* conform.164. note 2. *add* and vol. 5. 2nd ser. p. 1. *seq.*

Page

167. l. 5. *dele* the *. Note. l. 2. *for* vol. iv. old ser., *read* vol. v. 2nd ser. p. 1. *et seq.*169. l. 13. *for* masses granular, *read* masses of granular.In the section, *for* letter o under Glenkeen, *read* c; and a letter b should be placed under the dark rocks which rest on the granite (*). See descr. p. 172.172. l. 10. *for* a, *read* c.184. l. 8. *omit* O. flabellulum, f. 1.187. l. 4. *for* last year, *read* in 1852 (the page was printed in 1853).188. l. 6. from bottom *for* Pl. 9., *read* Pl. 5.192. l. 2. *for* Foss. 10., *read* Foss. 23.l. 7. *for* Foss. 12. f. 7., *read* Foss. 7. f. 12.195. l. 18. *dele* if, f. 7.—same species.196. l. 6. *for* triated, *read* striated.226. l. 8. *for* Mytilus antiquus, *read* Modiola antiqua.231. l. 3. and 12. *for* Foss. 21., *read* Foss. 25.240. l. 2. from bottom, *for* in which, *read* on which.244. l. 19. *for* (g), *read* (f).245. l. 7. *for* usher into, *read* usher in.252. l. 8. *for* one sgeciesis, *read* one species is

256. l. 3. of description, place the (*) with 'Eruptive granite.'

l. 5. *transfer* 'Club Mosses' to the Cryptogamæ above.259. l. 6. *dele* in.286. Note, l. 2, *for* tracts, *read* tracks.304. l. 7. from bottom, *for* do not sto, *read* do not stop.305. l. 17. *for* that, *read* those.308. l. 2. *after* Polycœlia *dele* the semicolon.310. l. 9. *for* Keratophoga, *read* Keratophaga.315. P.S., end of, *for* Ruppendorf, *read* Ruppendorf.322. l. 19. *for* on, *read* in.323. l. 4. from bottom, *for* Kutörga, *read* Kutorga.327. l. 2. from bottom, *for* but the, *read* but to the.l. 5. from bottom, *for* Devonian rocks of Russia, *read* Devonian and Carboniferous rocks of Russia.335. l. 2. *for* arise, *read* rise.371. l. 10. *for* its, *read* the.401. note, *for* 1852, *read* 1853.421. l. 11. *for* Shurman, *read* Shumard.508. Index, *to* references to Dr. Buckland, *add* Alps, 500.