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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.

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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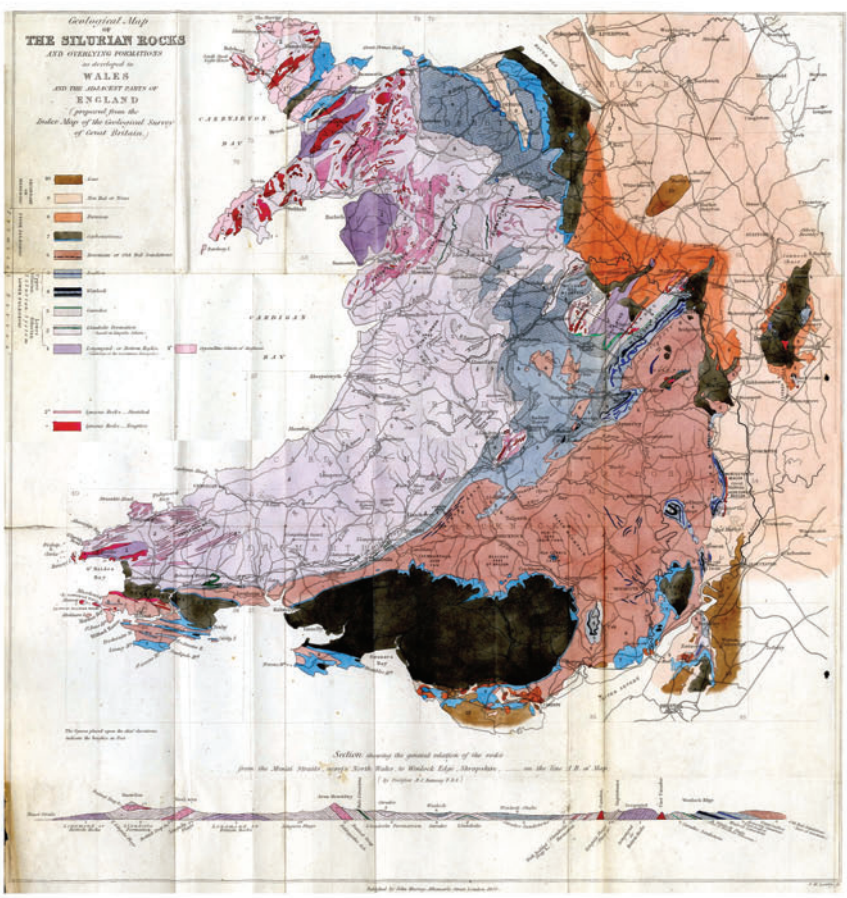

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SILURIA.

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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"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 edit. p. 116.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1854.

LONDON:
A. and G. A. SPOTTISWOODE,
New-street-Square.

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.

PREFACE.

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

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 eqnivalent 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

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.

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. Barrande, 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!

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PLATES OF FOSSILS, ETC.

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

ERRATA.

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

Page
13. last line, *et passim*, *for* mezozoic *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.; and
l. 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.
163. 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* Ruppersdorf.
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.