

epochs. It would obviously be premature to attempt at present to correlate the glacial succession in North America with that in Europe, but the fact of important climatic oscillations during the Ice Age is as clearly shown in the former country as in the latter.

In this edition the consideration of the cause of the Climatic and Geographical Changes of the Glacial period forms the final chapter of the book. The author still holds that the astronomical theory of the late Dr. Croll appears the best solution of the Glacial puzzle, as it accounts for all the leading facts; for the occurrence of alternating cold and warm epochs, and for the peculiar character of Glacial and inter-Glacial climates, and further, it postulates no other distribution of land and sea than now obtains. This theory has undoubtedly thrown a flood of light upon the difficulties of the subject, and it may be that some modification of his views will eventually clear up the mystery.

This third edition of the "Great Ice Age" should be received by those interested in the study of Glacial Geology with as warm a welcome as that which was accorded to the first edition twenty years ago. Opinions will differ respecting some of the generalisations of the author, but all will agree on the value and importance of having the evidence on this subject brought down to date, and stated in a clear and impartial manner.

G. J. H.

II.—**THE LIFE OF RICHARD OWEN.**¹ By his Grandson, the Rev. RICHARD OWEN, M.A. With the Scientific portions revised by C. DAVIES SHERBORN. Also an Essay on Owen's Position in Anatomical Science by the Right Hon. T. H. HUXLEY, F.R.S. 2 vols. 8vo. Pp. 409 and 393, with Portraits and Illustrations. (London: John Murray.)

THE record of the life of so well known a man as the late Prof. Owen cannot fail to be of great interest, not only to those to whom his researches more especially appeal, or who have known him as a friend, but also to the more general reader. For Owen, although a scientific man whose province was principally that of Comparative Anatomy, and perhaps more especially that of Vertebrate Palæontology, was at the same time a man of very broad human sympathies, and devoted a large amount of his earlier life to the services of his fellow-men by acting on various hygienic commissions; he was further very successful both as a popular and a special lecturer; finally, by his efforts as Hunterian Professor at the Royal College of Surgeons, and afterwards as Superintendent of the Natural History Departments of the British Museum, he did more than any of his predecessors to bring the study of Natural History before the public, to force its recognition on, and obtain its continual support from, the Government. It is hardly an exaggeration to say that Owen was the most popular and widely known of all the scientific men the present century has seen.

These records consist of letters and extracts from the diaries of

¹ For an Obituary of Owen, accompanied by an excellent portrait, see *GEOLOGICAL MAGAZINE*, 1893, Decade III. Vol. X. p. 49.

Prof. Owen and his wife, more especially from that of the latter, who, it appears, kept a most exhaustive account of all Owen's doings and work. It is delightful to notice what deep interest she took in all his researches, and how carefully she recorded their progress; and the fact that she did not complain even when the house was occupied by a defunct Rhinoceros or portion of an Elephant sufficiently hung to necessitate keeping all the windows open, shows that she was a most sympathetic wife for a scientific man.

Vol. I. commences with Owen's ancestry, and his early training at school and at home; his letters to and from his mother and sisters show what a lovable man he was. It is amusing to read of his having been stigmatized while at school as "lazy and impudent": what would that master think of his forecast if he could read these volumes? We find an interesting account of his early taste for ethnology in his adventure with the negro's head (page 23) during his apprenticeship to a surgeon at Lancaster. But it was not until he went to Edinburgh, where he founded the Hunterian Society, that his scientific inclinations were really manifested. From Edinburgh, acting on the advice of Barclay, he came to London to study at St. Bartholomew's under Abernethy, and it was owing to the recommendation of the latter that he was appointed Assistant Curator of the Hunterian Collection at the Royal College of Surgeons.

It is from this date (1826) that Owen's career as a scientific man commenced, and the greater part of Vol. I. is devoted to his life at the College of Surgeons. This is, perhaps, the most interesting part of the work, for we are able to trace how he gradually weaned himself from medicine and devoted himself more and more to comparative anatomy, due in the first place to the nature of his work, and also, probably, in a large manner to the unconscious influence of the great scientists with whom he came in contact. One of the earliest of these was Cuvier, who visited the College and invited Owen in return to Paris. His biographers evidently consider that the supposed influence of Cuvier on Owen's future work has been overestimated, but, as Huxley points out, Cuvier's work stands out so pre-eminently when compared with that of his contemporaries that it must have had considerable influence in directing the method of work of a young aspiring anatomist such as Owen then was, and the mere fact that no reference of such influence is recorded in Owen's diary goes for nothing.

It is perfectly marvellous to note the amount of energy which Owen must have possessed, for we read of his working all day at his catalogues, his dissections, his lectures, and his duties on various Commissions, then winding up the day with theatres or concerts, and commencing the next by sitting up to write scientific papers or, sad to relate! to consume novels.

During the thirty years of his connection with the College of Surgeons, the most important of Owen's scientific work was done; and we are here able to read of the rapid growth of his now world-wide reputation as an Anatomist and a Palæontologist. Here, too,

we read of his social intercourse with all the celebrated men of those days. To the general reader this portion will especially appeal, for here we find interesting letters and anecdotes of Turner, Carlyle, Dickens, and many more distinguished men in every branch of life.

In the second volume we come to Owen's connection with the British Museum, and a special chapter is devoted to the account of his efforts and ultimate triumph in the removal of the Natural History Collections to a special building. Here are reproduced Owen's original plan and Waterhouse's first modification of the same; in both of these we recognise a building intended to serve primarily as a Museum but also provided with lecture theatre and teaching collections. How the present architectural structure, devoid of so many of the best features of the original design arose, is not explained.

Appended to the second volume is an interesting account tracing the development of Anatomical Science, and Owen's relation to the same, by Prof. Huxley. This is written in such a manner that it may be easily followed by the non-scientific reader. It seems a pity, for the sake of the latter, that this was not rather placed as an introduction to Vol. I.

The perusal of this work by the public would do much to dispel the favourite representations of scientific professors being necessarily dry old bores, for Owen was one of the most charming of men, and, in addition to his great qualifications as a scientist, was pre-eminently calculated to shine in society. The recognition of his social qualities may be seen all through his life, both by Royalties and Commoners; and we find him being entertained by the Prince of Wales, and on other occasions by his fellow scientists, at social meetings where every kind of "ology" was barred.

The two volumes contain some charming portraits of Owen, especially the frontispiece to the second volume; there are also illustrations of Owen's most important discoveries. As an Appendix we find a most imposing list of his distinctions, and a complete Catalogue of his works, numbering in all about 650. M. F. W.

III.—THE PERMIAN FISHES OF BOHEMIA.

FAUNA DER GASKOHLLE UND DER KALKSTEINE DER PERMFORMATION
BÖHMENS. By Prof. Dr. ANTON FRITSCH. Band III. Heft 3.
Pp. 81-104, Pls. 113-122. Prague, 1894.

DR. ANTON FRITSCH has just issued another part of his well-known work on the Bohemian Gas-coal (Lower Permian). For some time he has been treating of the fishes, and now he is well advanced in the description of the Palæoniscidæ. The present instalment is as exhaustive as ever, and we cannot but admire the care with which the author turns to good use even the most fragmentary specimens.

Before treating of undoubted Palæoniscidæ, Dr. Fritsch places a section "Incertæ sedis" to which he assigns an imperfectly known fish under the name of *Acentrophorus dispersus*, sp. nov. If the