

duced; perhaps the most interesting is that of a tadpole with three legs, the right front limb not yet having emerged from the opercular fold. A book which might interest a novice in "nature-study."

(4) In "Insect Wonderland" the author endeavours to interest little children in the natural history of insects by conversations between insects and flowers, birds, &c., to which the insects describe their life and habits. It may be doubted whether this method is really more attractive to children than straightforward accounts, if written simply and easily, but in any case, it is unfortunate to write of *Mr. Bee* when the individual speaking is a worker, or of the orange-tip butterfly as "*she*," when the orange colour is confined to the male. The flowers and insects described as talking together also are not all to be found at the same season. Otherwise the descriptions are clear and good; the illustrations are pretty, but not always easy to understand.

(5) "The Landscape Beautiful" is written by an American "landscape architect," to encourage the appreciation of beauty in nature and in gardens. The first five chapters ("Essays") are in praise of natural beauty in its broader aspects, followed by a chapter to prove that landscape gardening is entitled to a place among the fine arts, since it combines all the objects and technical difficulties of painting and sculpture. This subject is amplified in the succeeding chapters, which deal especially with American landscape gardening, and the need for a greater appreciation of beauty and care for its preservation by the American people. The concluding chapter on "Some Practical Applications," describing the methods used or suggested by the author for encouraging the study of natural beauty in schools is particularly interesting, and might well be read by teachers of "nature-study." The book is pleasantly written and illustrated by very pretty photographs by members of "The Postal Photographic Club."

(6) "Bees for Profit and Pleasure" is a practical handbook to bee-keeping, written by an expert on the subject. It points out the advantages of keeping bees either for pleasure or as a supplementary source of income, gives a clear, concise account of their natural history and habits, and a good account of the various kinds of hives and other apparatus, with prices, but in some places the mention of apparatus not described until later in the book might cause some difficulty to the beginner. The instructions for successful management are straightforward and interesting, and the book is provided with an index.

THE GEOLOGY AND ARCHÆOLOGY OF ORANGIA.<sup>1</sup>

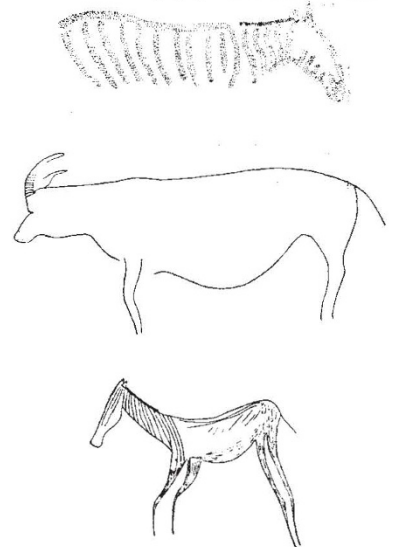
THIS work is the fourth of a series containing the author's personal observations and conclusions on the economic geology and archæology of South Africa. The present volume is devoted to Orangia, where the author has resided in practice as a mining engineer; his work gave him excellent opportunities for observation and research, and he has used his chances with admirable industry and judgment.

The first chapters are devoted mainly to the geology of Orangia, which is of less interest, owing to its monotonous uniformity, than that of any other South African State. Most of the country is occupied by rocks belonging to the Karoo system. The granitic mass of Vredeport outcrops near the northern frontier, and is surrounded by a belt of rocks corresponding to those of the Rand goldfield, which is situated further

<sup>1</sup> "Geological and Archæological Notes on Orangia." By J. P. Johnson. Pp. vi+102. (London: Longmans and Co., 1910.) Price 10s.

to the north. The extension of the Rand series under the Karoo has been proved by the bores recently made under the superintendence of Mr. A. R. Sawyer, and some of the results revealed by those boring operations are stated in the work. Mr. Johnson gives a short account of the diamond-bearing pipes of northern Orangia; he describes especially the Roberts-Victor Mine, of which he was for some time the mining engineer. This mine, among other points of interest, has yielded an eclogite boulder containing diamonds, which has been described by Dr. Corstorphine. The first such occurrence was found in the Newlands Mine at Kimberley, and is well known from the classical paper by Prof. Bonney. Mr. Johnson rejects the view that the eclogite was the original matrix of the diamond, and his conclusion is supported by the results of Mr. Gardner Williams's elaborate test, which proved by testing a large number that these boulders at Kimberley are barren of diamonds. He adopts the conclusions that the kimberlite, the igneous rock that fills the diamond-bearing pipes, is due to the intrusion of a magma at a comparatively low temperature.

Mr. Johnson's archæological contributions include figures and descriptions of many rock paintings, of which one is here reproduced; the figures show no new general results, but they are interesting additions to those previously recorded. They are cruder than many of those found in South Africa, as shown by the exaggerated steatopygy in one of the figures. Mr. Johnson has diligently collected stone implements at many localities



Representation of Zebra, Hippotragus, and Quagga pecked and engraved on rock, Biesjesfontein. (Scale  $\frac{1}{2}$ .) Reduced from "Geological and Archæological Notes on Orangia."

in Orangia, and investigated the sites of many ancient settlements. At one site he collected 700 stone implements from a small area in a short time. Mr. Johnson's most original archæological contribution is the claim that the stone implements belong to two separate periods, which he compares with the Acheulian and Solutrian of Europe. In some localities he found his Acheulic type—a common form of which he calls amygdaliths—below the alluvium and the Solutrian above it. The author candidly remarks at the end of his discussion of this question that his observations may merely prove that some of his Acheulic are older than some of his Solutric implements. This caution appears justified, as the results stated are not quite convincing, and more details as to the depths at which the implements were found would be useful.

In his agricultural notes the author directs attention to the great progress that has been made in Orangia by the adoption of the methods often known as "dry farming," which have long been used by farmers on our chalk downs. They have only recently been adopted in South Africa, where they have already

proved remarkably successful; Mr. Johnson reports that the rainfall for the ten years' records at Kimberley, Kronstad, and Bloemfontein are respectively 20.4, 27.1, and 25.2 inches; so the climate would not be regarded as arid in Australia, where wheat cultivation has long been undertaken in areas with a rainfall of as low as fourteen inches. Most of the rain in South Africa falls in the six summer months, and its amount is sufficient to justify Mr. Johnson's confidence as to the future agricultural prosperity of the State.

J. W. G.

#### SPORT ON THE MOORS AND BROADS.<sup>1</sup>

SO far as I am aware, Messrs. Malcolm and Maxwell are the first to present the public with a concise, authentic, and at the same time highly interesting account of the rise and expansion of modern grouse-shooting in the North—a sport which

connection between grouse and heather, and grouse disease. At one time it was hoped that the number of grouse on a moor might be largely augmented by suitable treatment, but it is now ascertained that there is a limit to this. In view of the prospect of a second edition, Mr. Malcolm's attention may be directed to a couple of obvious grammatical errors on the latter part of the second page.

The last six chapters are from the pen of Captain Maxwell, who discourses pleasantly on ancient and modern grouse-shooting, with a couple of chapters devoted to blackcock and ptarmigan. In urging the need for an extension of the close season in the case of blackcock, the author ought to enlist the support and sympathy of true sportsmen, since it is a crying shame that half-fledged "cheapers" should, as is so often the case, be shot in August. It is also satisfactory to find Captain Maxwell remarking that grouse-driving has resulted in a more or less indifference to natural history and wood-craft on the part of the



Coot and Great Crested Grebe on their Nests. From "Life and Sport on the Norfolk Broads."

they rightly declare to have been rendered accessible to English sportsmen as a whole by the development of railways. In our own days the steadily increasing demand for well-stocked moors produced by these means has given rise to great improvements in the care and cult of the moors, themselves coupled with a large extension of the area devoted to grouse; and this, in turn, has added very considerably to the financial prosperity of many parts of North Britain. How enormous is the value of Scottish and Yorkshire moors is told in the second chapter of the volume by Mr. Malcolm, who also discourses, with the confidence of an authority, on the management of moors, the

<sup>1</sup> "Grouse and Grouse Moors." By George Malcolm and Aymer Maxwell. Illustrated by Charles Whympers. Pp. viii+286. (London: A. and C. Black, 1910). Price 7s. 6d. net.

"Life and Sport on the Norfolk Broads in the Golden Days." By Oliver G. Ready. Pp. xvi.+249. (London: T. Werner Laurie, n.d.) Price 7s. 6d. net.

modern sportsman, who thereby falls far behind his grandfather, to whom such knowledge was essential.

In commending the united efforts of the two authors, I must not omit a word of praise for the 16 coloured reproductions of sketches of Scottish game-birds and scenery, by Mr. C. Whympers, which add so greatly to the attraction of the volume.

Mr. Ready, the author of the second volume mentioned above, is a born "Broadsman," having been brought up in a rectory in the heart of the broad-country, where forty years ago no railway had penetrated, while a visit to Norwich entailed an eighteen-mile journey by coach. Those early days of the author's life can be recalled only in memory, for the penetration of the district by the railway has altered its primitive character in many ways, although the charm of the more secluded portions of the Broads cannot, fortunately, be destroyed.