

shown is not surprising. It is due to the too free use of metaphorical language on the part of expounders of the Darwinian hypothesis.

In the chapter entitled "Criticisms of the Theory of Natural Selection," an interesting digest is given of the work of Prof. Ewart and others on the electric organ of the skate, concerning which Mr. Romanes says, "I freely confess that the difficulty presented by this case appears to me of a magnitude and importance altogether unequalled by that of any other single case or any series of cases—which have hitherto been encountered by the theory of natural selection." And he adds, "So that, if there were many other cases of the like kind to be met with in nature, I should myself at once allow that the theory of natural selection would have to be discarded," by which he means, we presume, that the theory would have to be discarded as offering a solution of such cases.

The book contains many excellent illustrations, the series which show the variations due to artificial selection being a noteworthy feature. They, and the volume which contains them, will prove of service to those general readers for whom, as the author tells us in his preface, this exposition of the Darwinian theory has been mainly prepared.

FERNS OF SOUTH AFRICA.

The Ferns of South Africa, containing Descriptions and Figures of the Ferns and Fern-allies of South Africa.

By Thomas R. Sim. 275 pp., 159 plates. (Cape Town and Johannesburg: J. C. Juta and Co. London: Wm. Wesley and Son, 1892.)

THE present work will be a useful and acceptable addition to our stock of fern-books. It contains descriptions and plates of all the ferns and fern-allies known to exist in Africa south of the tropic of Capricorn, the same area which is included by Harvey and Sonder in their "Flora Capensis," three volumes of which, including the orders from Ranunculaceæ to Campanulaceæ, have been published. The author won the Jubilee gold medal given by the North of Scotland Horticultural Association, and for many years has filled the post of curator of the Botanic Gardens at King William's Town. Several years ago Mr. Sim published an illustrated handbook of the ferns of Kaffraria, and now he has extended his area so as to include the whole of South Temperate Africa.

The fern flora of the Cape does not show the same richness and remarkable individuality which characterises its phanerogamic flora. It is probable that the flowering plants of this area are not less than ten thousand, and the number of large endemic genera and of species is very considerable. In ferns we get in South Africa 179 species, out of which 42 species, or something under 25 per cent., are endemic. There is no genus that is peculiar to the Cape; of *Mohria*, which comes nearest, the Cape species, *M. caffrorum* extends to Madagascar and Tropical Africa, and two new species have lately been found in the high regions north of the colony. The section *Rhizoglossum* of the genus *Ophioglossum*, which differs from the true adder's tongues by having the fertile spike separate from the barren frond, the single species, *O. bergianum*, is peculiar to the Cape.

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Hymenophyllum is represented by 8 species, Trichomanes by 5, Adiantum by 6, Cheilanthes by 8, Pellæa by 14, Pteris by 7, Lomaria by 5, Asplenium by 25, Nephrodium by 12, Polypodium by 12, Acrostichum by 8; and Lycopodium by 8 species. Some of the species, e.g. *Vittaria lineata*, *Marattia* and the two tree-ferns, are tropical types; some, such as *Cystopteris fragilis* and *Lycopodium clavatum*, are common to Britain and the Cape. *Todea barbara* is confined to the Cape and Australia, and abundant in both areas. *Lomaria alpina* is a plant of all the three south-temperate areas. *Blechnum australe* of the Cape is not, I think, really distinct specifically from *B. hastatum*, and is widely spread in South Temperate America.

Lomaria punctulata is remarkable for its polymorphic fructification, which is sometimes like that of a *Scolopendrium*. *Asplenium lunulatum* is remarkable for its variability in outline and cutting.

Mr. Sim gives introductory chapters on the parts of ferns and their nomenclature, on their reproduction and propagation, on their cultivation and the preparation of herbarium specimens, and on the history of the discovery of the Cape species and the books and papers that have been written about them. His statistic table on page 34 needs much revision in some of its items. He gives the ferns of Madagascar at 144. The number now known in the island is 326 true ferns and 40 fern allies, a total of 366. There are nothing like 683 species and 458 endemic types in Africa and its islands. When I counted them up in 1868 I made the two figures 346 and 127. Since that date probably 100 species have been added. Madagascar, Bourbon, and Mauritius are very rich in ferns, but Continental Africa is very poor both in number of species and in peculiar types as compared with Asia and America.

The descriptions are carefully drawn up from the study of actual specimens, and by the aid of these and the plates there can be no difficulty for any one, even without any previous botanical knowledge, in making out the name of any reasonably complete specimen of any of the Cape species.

Therefore, no doubt, the existence of such a book will give a great impulse to the study of ferns by ladies and others who reside in or visit the Colony.

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OUR BOOK SHELF.

Newcomb-Engelmann's Populäre Astronomie, Zweite vermehrte Auflage. Herausgegeben von Dr. H. C. Vogel. (Leipzig: Wilhelm Engelmann, 1892.)

THE well-known Popular Astronomy of Prof. Newcomb was translated into German by Rudolf Engelmann, and published in 1881 with considerable additions and alterations, most of which were improvements. It was very favourably received on its first appearance in German, probably because it is not only comprehensive, exact, and scientific, but has a fresh and vigorous style, in pleasing contrast to the ponderous German standard works. The original translator being dead, the publishers entrusted the work of preparing a new edition to Dr. H. C. Vogel, Director of the Astrophysical Observatory at Potsdam, a task for which he was specially fitted, because astronomical progress during the decade since the appearance of the first edition of the book has been mainly in his special