

Bermudas, which are more than three times the distance from the nearest mainland, will give some idea of the differences in the age of the two. The latter contains no endemic genus, and only about half a dozen species, and these are not of a highly differentiated character—one is a portion of a very old flora, and the other a flora of recent derivation. The small flora of Juan Fernandez (which lies about 400 miles from the coast of Chili) contains 21 per cent. of endemic genera and 78 per cent. of endemic species.

The endemic element in Socotra is distributed over fifty-four natural orders, and includes some highly curious types, such as *Cocculus Balfourii*, remarkable for its thick rigid cladodes and often leafless condition; *Thamnosma socotrana*, a member of a Mexican genus; *Dirachma*, a geraniaceous genus of American affinities; *Dendrosicyos*, unique in the Cucurbitaceæ for its arboreous character; *Trichocalyx*, a new genus of the Acanthaceæ; *Cockburnia*, a new genus of the almost exclusively African Selagineæ; and *Calocarpus*, a new genus of the Verbenaceæ, having strong American affinities. Of the 136 genera to which the endemic species belong, 98 are only known to be represented by endemic species; and of the 20 endemic genera, 18 are monotypic. The isolated types of American affinities are a repetition of what has also been observed in the fauna and flora of Madagascar.

In summing up, Dr. Balfour finds that the affinities of the flora are essentially tropical African and Asian, the former more pronounced. A former, though very ancient, land connection with Africa he regards as conclusively proved, and the evidence strongly favours the supposition that it was also united with Arabia. With regard to the element of strongest American affinity, its presence is still an unsolvable problem.

W. B. H.

THE METALLURGY OF GOLD.

The Metallurgy of Gold; a Practical Treatise on the Metallurgical Treatment of Gold-bearing Ores. By M. Eissler. (London: Crosby Lockwood and Son, 1888.)

THE title suggests that this little volume is a more comprehensive treatise than the author has attempted to write, but it is nevertheless likely to be useful to a large class of readers.

There is a wide-spread belief that, as much of the gold in Nature is found in the "native" or metallic state, its metallurgy must be comparatively simple; and so it would be in nearly all cases if it were not for the fact that the precious metal often occurs in a very fine state of division, or in association with sulphides and tellurides of other metals. Ignorance as to the true nature of such ores has led to their being considered to be "base" or "rebellious," and has entailed much loss and disappointment.

It is asserted, on p. 5, that native gold is never quite pure, being almost invariably alloyed with silver; reference might, however, have been made to the interesting deposit of gold of exceptional purity recently discovered at Mount Morgan, in Australia.

The author points out that "the loss on working gold ores, even with our most modern appliances, is still enormous"; and he gives, among other statistical statements, the results of seven years' working in Colorado, where the average value of the precious metal in the ore, by

assay, was £7 18s. per ton, while the amount actually extracted was only £3, showing a loss of over 60 per cent. A large section of the work is devoted to the consideration of methods of concentrating the free gold lost during crushing and amalgamating, and the processes for extracting the gold either by amalgamation or by chlorination. The author writes with a practical experience of the processes he describes, but his information is in many cases not up to date.

The illustrations are usually very clear, but in no instance is the scale on which they are drawn given, and there are too few references to the dimensions of the appliances described. The appearance of the illustrations often suggests that they have been borrowed from the trade circulars of the makers of mining machinery. It would surely have been possible to give a more intelligible section of a chlorination works than the one (p. 142) which was suitable enough for its purpose when it originally appeared as an incidental illustration to an Official Report to the United States Government published in 1873; and a far more useful drawing might have been found to accompany the description of the refining of gold by Miller's process than the diagrammatic one which was drawn eighteen years ago by the writer of the present review in order to make the nature of the process clear in an Official Memorandum.

More useful information than is to be found in the twenty-one pages devoted to assaying might easily have been condensed into them, and it is much to be regretted that no attempt has been made to deal with the treatment of tellurides, which are so troublesome to the smelter, and have occasioned so much loss. In a future edition it would also be well to give a description of the process of collecting the precious metals in lead, which plays so important a part in the smelting of complex auriferous ores of lead and copper. Hydraulic mining, also, should find a place. Certain defects of style will no doubt be corrected in a second edition; this will be welcome, for, although the work is hardly in sufficient detail to justify its being called a "practical treatise," it will be useful, especially to men who are engaged in smelting. The author suggests that it contains sufficiently full information for "investors and others interested in gold-mining operations who may wish to gain an intelligent insight into the *modus operandi* at the gold-mines." To them it may be warmly recommended, for, although the element of speculation can hardly be separated from genuine investment in gold-mines, the "adventurers," to use the old name, often deliberately neglect all investigation into the nature of the methods by which they hope to profit.

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OUR BOOK SHELF.

Viaggio di L. Fea in Birmania e regioni vicine. II. "Primo saggio sui Ragni Birmani." Del Prof. T. Thorell. (Genova: Tipographia del R. Istituto Sordomuti, 1887.)

DR. THORELL deserves our best thanks for having begun a faunistic work on the spiders of Burmah; still greater would have been our gratitude had his minute and exhaustive descriptions been accompanied by figures of the numerous new species recorded. One of the greatest hindrances in the study of exotic araneology is the paucity of such works. The present, however, is not