

organ. In that from Cresswell Crags, as well as those from La Madelaine, the jaw is heavier than in the recent specimen.
 Brosely, August 29 W. W. WATTS

"The Ores of Leadville"

MY attention has lately been drawn to a review in NATURE for April 17 of a work on "The Ores of Leadville and their Mode of Occurrence," by Mr. L. D. Ricketts, from which one would be led to suppose that all the facts mentioned were due to original investigation on the part of the author. Your reviewer does not state that which is acknowledged by the author himself, namely, that much of his information was obtained from the Report of the U.S. Geological Survey by Mr. S. F. Emmons, contained in the Second Annual Report, published a year previously.

A large atlas has lately been issued also by the U.S. Geological Survey completely illustrating the Leadville ore deposits, and an exhaustive monograph to accompany it is now in the printers' hands. I speak from an intimate knowledge of the subject, having taken part in the work, and should be much obliged by your inserting this correction without delay.

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AUSTRALIAN ORCHIDS

THE seventh and last part of vol. i. of Fitzgerald's "Australian Orchids," and the first part of vol. ii. have lately reached us. The testimony we bore to the value and merits of this work in our notice of part 5, vol. i. (NATURE, vol. xxii. p. 53) we can now repeat, and with emphasis, as we can base it on an examination of all the parts at present issued.

Mr. Fitzgerald is an ardent admirer and disciple of Darwin—indeed what true lover of orchids is not?—and his work is dedicated to his memory "as a token of the veneration in which he holds that great naturalist and fearless expounder of science." The synopsis shows that twenty-eight genera and 104 species are illustrated and described in vol. i., each part containing ten folio lithographic plates. The drawings and dissections leave nothing to be desired in point of fulness, completeness, and accuracy, the latter especially being far more numerous and varied than in any similar work we are acquainted with. There is one point on which those who are responsible for the nomenclature of Australian orchids are entitled to decided praise. All but one of the genera and 90 out of the 104 species in vol. i. bear really descriptive names, instead of being christened after "enterprising," or rather advertising, nurserymen or vanity-stricken cultivators, which is unfortunately the fate of most of the new orchids introduced into England. A large proportion of the orchids as yet described in this work are natives of New South Wales, but a few are contributed by Western Australia, Queensland, South Australia, and Tasmania. The enormous importance of insects to the maintenance of orchids is shown by the fact that, out of 104 species described in vol. i., ten only are self-fertilising. But the curious point is noted by the author that "self-fertilising species always produce a far greater proportion of seed." The difficulty with which some genera undergo fertilisation is illustrated by an instance given where a splendid plant of *Dendrobium Hillii* in the Sydney Botanic Gardens, freely open to insects, did not produce a single seed, though covered with about 40,000 flowers on 190 spikes! In another case mentioned by the author he found a small caterpillar on a flower of *Dendrobium speciosum*, which had partly eaten an adjoining flower. He marked the latter, and the flower so marked was the only one on the entire plant which produced seed. There is strong evidence that many species are dependent, not simply on insects, but on some particular, perhaps local, insect for fertilisation. *Sarcophilus parviflorus* often produces seed capsules in

its native habitat, the Blue Mountains; if removed to Sydney, it flowers well, but does not produce seed unless artificially fertilised. One question discussed by the author is the fertility of hybrid orchids. We believe that this question has been settled in English plant-houses, where hybrids have been proved to be fertile in the case of one genus (*Cypripedium*) at all events. This result is what Mr. Fitzgerald anticipates, on account of the facility with which species of the same genus may be cross-fertilised, however far apparently they may be removed from one another. As he says, "a repugnance to intermixture does not exist in this family as it does in others."

While terrestrial orchids are very numerous in Australia, epiphytal orchids are comparatively rare. The latter are more ordinarily denizens of the hot and moist forests of tropical or sub-tropical regions. Thus not more than one-fifth of the species illustrated in Mr. Fitzgerald's work are epiphytal, and these belong almost entirely to the genera *Sarcophilus* and *Dendrobium*—the latter a genus of which there are probably two or three hundred species, mostly natives of Indo-Chinese regions, cultivated in this country. On the other hand, the author says:—"The centre of the terrestrial" (orchids) "may, I think, be placed in Sydney, where, within the radius of a mile, I have obtained 62 species of orchids, 57 of which were terrestrial—a number that could not, I believe, be equalled in any part of the world within a similar area."

The plates are accompanied by full descriptions giving curious and interesting details as to the methods of insect-fertilisation, and describing localities, surroundings, conditions of growth, &c. Notwithstanding the help derived from this source, Australian orchids have not, with some few exceptions, proved readily amenable to cultivation in this country. While it is comparatively easy to reproduce climates resembling those of the damp, shady, and hot valleys of the Amazon or of Burmah, or of the moist, cloud-covered, and cool slopes of the Andes or the Himalayas, it is very difficult to reproduce the dry, hot, and sunny conditions favourable to most of the terrestrial orchids of Australia. We shall therefore probably continue to know these for some time at least mainly from Mr. Fitzgerald's book. We doubt whether, excellent and obviously faithful as his drawings are, and carefully as they are coloured, the use of toned paper is judicious. It imparts a muddiness to the tints, as, for example, in the drawing of the beautiful *Dendrobium*, *Phalaenopsis*, and *Superbiens*, part 7, vol. i., and part 1, vol. ii., where neither foliage nor flower have the clear bright colours natural to them.

Before concluding this notice of a work which devotes much attention to the curious and interesting study of orchid fertilisation, we might refer for a moment to the patience, care, and intelligence with which the raising of hybrid orchids is being prosecuted in this country, especially in the nursery of Messrs. James Veitch and Sons. In one genus, that of *Cypripedium*, the hybrids bids fair already to outnumber the known natural species, as well as to rival them in interest and beauty. The closely allied genera *Cattleya* and *Lælia*, which are distinguished only by the number of their pollen masses, have proved susceptible of cross-fertilisation, and have produced several intermediate hybrids of great beauty. It may well be said that patience is necessary for this work, for *Cattleya exoniensis*, the offspring of *Cattleya Mossia* and *Lælia purpurata*, did not flower until seventeen years after the seed had germinated. Even now it is only propagated by subdivision. The union of the genera *Calanthe* and *Limatodes* was more speedily fruitful; and the beautiful *Calanthe Veitchii*, especially valuable horticulturally, from its winter-flowering habit, is known in most gardens.

Few who have devoted themselves to the study or to the cultivation of orchids have failed to become greatly interested in this remarkable family. Their singular