fascination. What that fascination is, and why there should be any at all, is hard to say. . . . Papua is a land of disappointment, a land where nothing happens as you anticipate, where the unexpected usually happens, and the impossible is achieved."

An introductory sketch by Dr. Haddon gives a short biography of the author, who was killed at Polygon Wood, in France, in September, 1917. His death deprived ethnology of a keen and intelligent observer, and the Papuan Government of a most zealous and successful magistrate, loved by his fellow-officers, and trusted by the natives, whom he understood and with whom he sympathised.

SIDNEY H. RAY.

FIG. 2.—Babiri man from near Dutch boundary. From 'Unexplored New Guinea."

## ALPINE PLANTS FOR ROCK-GARDENS.[1]

"PROCLAMATIONS of purpose are often confessions of failure to achieve it," is the opening sentence of the Introduction of Mr. Farrer's book. His volume is "vast," and from the nature of the subject justly so. Mr. Farrer has not only given an account of the rock-garden plants which now figure in the nurserymen's catalogues, but has also unearthed from botanical treatises a large number which no doubt will some day come into cultivation, so that his book is of more than present-day value. In addition to this, he has been at great pains to discover the correct names of the plants he records, which has entailed considerable research into botanical literature, and for this valuable labour he is deserving of high praise. He also gives some useful information as to rock-garden construction, and throughout the volumes there are good practical instructions as to the cultivation of the various plants.

But Mr. Farrer has unfortunately failed to sink either his own individuality or idiosyncrasies in the volumes before us, so that instead of presenting us with a lucid and useful account of rock plants suitable for English gardens easy to be understood, he has expressed his own ideas and opinions with an exuberance of persiflage that is very irritating. In his Introduction of eighty-four pages and throughout the book the author seems far more interested in striving to commit extravagant excesses with the English language than in conveying useful information about Alpine plants, and in consequence many of the really valuable portions of the book tend to be overlooked. With regard to his descriptions of the plants, moreover, we cannot say that his work is very helpful. After his diatribes on the wearisome jargon of botanists one does not feel that the following description of *Dianthus arenarius* is either very intelligible or informing: "Related to *D. squarrosus,* is much laxer in the habit with fewer flower stems, taller and frailer and larger, with very fringy whirligigs of white or pale pink." Nor is this seven-and-a-

[1] "The English Rock-Garden." By Reginald Farrer. Vol. i., pp. lxiv+504+52 plates; Vol. ii., pp. viii+524+50 plates. (London and Edinburgh: T. C. and E. C. Jack, Ltd., 1919.) Price 3*l.* 3*s.* net two vols.

half-line sentence on *Primula Winteri* particularly illuminating: "It is unfair to say that the name of *P. Winteri* is a base and unpardonable pun, yet true it is that in midwinter always seem to emerge the crowded new rosettes of powdered, rounded, toothed leaves on their firm footstalks, and in their heart an interminable cabbage of these glorious, wide, lavender-lilac flowers with their fringed lobes and noble outline, succeeding each other for many months, in a rivalry of beauty, against the grey and mealy beauty of the robust leaves, if only the weather will allow. There is no other fault than this—which perhaps is merely due to the plant's inexperience—to be brought against this unparalleled introduction. . . ." A barren superfluity of words indeed!

Many extracts from this riot of verbiage might be made, but only one or two can be given. Of "the moonlight radiance of *Roscoea cantlioeides*," Mr. Farrer remarks: "Its nearest match is in the lucent citrons of *Meconopsis integrifolia*, but here the tone is yet blander and more serene, shining with a solemn and unearthly radiance as the blossoms, like ghostly butterflies of light, hover pale and vivid upon the background of dark pine-branches."

Then, again, when he speaks of *Aster lichiangensis* as "a bonus of the gods," or of *Anemone alpina*, almost blasphemously, as "the Great King of Glory," or of a double form of this species as "windmill-whirling," one feels tempted to relegate the book to "the dust and silence of the upper shelf."

Yet despite these adverse criticisms, which perforce bulk largely in a notice of the book, it is a real compendium of sound information and learning, though unduly biased in certain respects. On the genus Primula, for instance, which occupies nearly 100 pages, and on Saxifrage and many other genera, Mr. Farrer speaks as an authority, and we welcome his useful marshalling of information. Why he should dismiss Rhododendron in half a page because he says it "asks for a book" we fail to see. He appears to forget both here and elsewhere that only certain species in a genus are rock or Alpine plants. In a few pages ample accounts could have been given of *Rhododendron intricatum, R. fastigiatum, R. hippophaeoides*, and the few other Alpine forms, whereas he alludes to *R. praecox, R. dauricum*, and *R. ciliatum*, which are certainly not "rock-garden" plants in the usually accepted sense.

FIG. 1.—*Gentiana Farreri*. From "The English Rock-Garden."

The book is admirably illustrated with an excellent series of some 200 photographs. In reproducing the picture of *Gentiana Farreri*, a plant for the introduction of which gardeners will always hold Mr. Farrer's name in grateful remembrance, we cannot refrain from quoting his exuberant description: "*G. Farreri*, which sends out many flopping, slender shoots from the stock, clad in very narrow foliage, and ending each in a single huge, up-turned trumpet wide-mouthed, and of an indescribably fierce, luminous Cambridge blue within (with a clear white throat), while, without, long vandykes of periwinkle-purple alternate with swelling panels of nankeen, outlined in violet, and with a violet median line." *Non equidem invideo; miror magis!*

The publishers have also assisted to increase

the reader's irritation with the book, which, in spite of its too obvious faults, has many excellent qualities, by leaving the pages uncut and untrimmed—surely an unreasonable offence in a book of this character.

## A NEW COPPER-REFINING INDUSTRY IN GREAT BRITAIN.

IN the last year of the eighteenth century Great Britain produced about 75 per cent. of the world's output of copper. The Cornish miners supplied most of the ore, and the Swansea smelters extracted and refined the metal. In the United States of America only a few tons were made. In 1913 the positions were reversed. Great Britain smelted and refined barely 6 per cent. of the world's production of this metal, and all but an insignificant fraction was derived from imported ores, matte, blister copper, and precipitate or cement copper. In the same year the United States of America furnished more than 55 per cent. of the world's total, and by far the greater part of this was obtained from home supplies of ore.

Whether in peace or war, copper is, and has long been, second in importance only to iron, not only in the various types of the commercial metal, but also in its numerous alloys. The enormously greater extent to which it is now used is not, however, generally realised. In 1800 the world's production did not exceed 10,000 tons, and that was probably the high-water mark of the annual production up to that time; in 1900 it had risen to about 500,000 tons, and in 1912 to about 1,000,000 tons. Thus, in little more than a hundred years, the production had increased a hundredfold.

During the war the whole question of the future of the copper-smelting and refining industries of this country was examined and considered by the Non-Ferrous Metal Trades Committee of the Board of Trade under the chairmanship of Sir Gerard Muntz. In due course the Committee reported, but the report has not been published. The announcement is now made in a recent issue of the *Times* that a syndicate has been formed to set up a large copper refinery in Devonshire, and has chosen a site near Newton Abbot, and that it is proposed to spend nearly 10,000,000*l.* on the scheme. The chairman of the syndicate is Sir Gerard Muntz. It is stated that Mr. H. J. Wilson, who originated the scheme, at first intended to harness and utilise the water-power of the Dartmoor plateau, but so much opposition was shown in some quarters that this proposal has been abandoned, at any rate for the time being. It has been decided to utilise a large deposit of lignite, of which it is estimated that more than 800,000,000 tons are available for the generation of the electric power required. At the site chosen there are tide-water facilities. By-products will be collected and marketed. The power generated will be mainly devoted to the electrolytic refining of copper, but it is considered that it will be so cheap as to enable current to be supplied in bulk to all the towns in South Devon, as well as to the industries which may be attracted to the neighbourhood.

The lignite deposits have only been used locally to a small extent. The *Times* states that a few months before the outbreak of war a party of Germans conducted a series of experiments and acquired a considerable tract with the evident intention of developing it on a large scale.

In the years immediately preceding the war the United States of America refined electrolytically more than 90 per cent. of the world's output of crude copper. Most of this production was absorbed by the electrical industry. Great Britain, accordingly, was obliged to obtain the bulk of this type of copper from America, and in 1913 imported about 100,000 tons. In view of the great importance of the home electrical industry, it will be obvious that the proposal to establish a large electrolytic refinery in a suitable locality possesses value which it is not easy to exaggerate. It should be pointed out, however, that the refinery will have to depend mainly upon imported blister copper for its raw material, since only a small amount of this metal is smelted in Great Britain at the present time. There are no longer any considerable home deposits of copper ore, and the few smelters who do exist have found it more and more difficult to obtain smelting materials. The United States of America, by virtue of the extent of its control of its own deposits and of those in Chile, is able largely to influence the price of copper, and the policy pursued by the works there is to attract smelting materials from other countries for treatment. The Americans can afford to pay high prices for imported ores, because the remainder of this raw material is produced at home at a price which is so low that a low average selling price for the whole serves to secure an adequate profit. In Great Britain only a few copper manufacturing firms and one or two companies owning mines abroad can afford to operate smelting works under these conditions. This consideration has no doubt been given its due weight by the syndicate, but it has not been made clear upon what sources they will rely for their blister copper.

In conclusion it must be stated that in this country a small amount of electrolytic refining is carried on, and that there are a large number of manufacturers who are engaged in the furnace-refining of blister, Bessemer, and other varieties of the crude metallic copper, and in producing the "tough" and "best selected" brands of the metal. The "tough" quality is used chiefly by the engineering and shipbuilding industries, and the "best selected" for the manufacture of alloys. In the production of this class of material the works in Great Britain are, and have long been, pre-eminent. If, therefore, the plans of the syndicate are successful in providing British manufacturers with sufficient supplies of electrolytically refined metal for their purpose, the production of this commodity in Great Britain will be placed on a much more satisfactory footing than it has been for many years.

H. C. H. CARPENTER.