

acquaintance with the geological facts which guide mining operations. Mr. Smyth modestly says of himself: "I wish it to be distinctly understood that I am merely a compiler." But his book abundantly proves that he has a thorough knowledge of what practical mining is, and that he is no mere tyro in geology. A tolerably good test of the accuracy of a man's geological knowledge is often furnished by the way in which he draws a section. He is compelled to put down definitely the notion which he has formed of the structure of a district, or of the relations of certain rocks to each other, and the manner in which he does this may be usually regarded as an indication of the extent of his acquaintance, not merely with the locality in question, but with the fundamental laws of geological structure. At the same time, too, he unconsciously betrays whether or not Nature has gifted him with any trace of the artistic faculty. Now Mr. Smyth's sections are singularly excellent. He procured them from miners, mining companies, geologists, and private friends, and no doubt, in many cases, from his own observations. Everybody who has ever tried to collect sections in this way knows that they come in every conceivable style and scale, usually grossly exaggerated either in length or height. Such were doubtless the sections which arrived at the Victorian Office of Mines. But Mr. Smyth has recast them after his own pattern, and they now appear in a uniform kind of drawing, which reminds one of the artistic finish introduced many years ago into geological section-drawing by the late Sir Henry De la Beche.

It is hardly possible to over-estimate the advantages which must accrue to mining interests in the colony when the Government department of Mines possesses a secretary who is evidently most thoroughly in love with his work, and who is endowed with so much sound scientific knowledge and experience. This book is an eminently practical one. Yet it offers every now and then glimpses into geological questions of the highest interest. To some of these reference will be made in a subsequent article.

ARCH. GEIKIE

OUR BOOK SHELF

Terrestrial Physics.—*Probleme der vergleichenden Erdkunde.* By Oscar Peschel. (Leipzig, 1870.)

THE fundamental thesis of the author, involving his conception of the true province of the science of comparative terrestrial physics, appears to be this:—If a series of maps of the globe, or any part of it, drawn at different times during several centuries, be compared, there becomes obvious a radical want of truthfulness in the older representations; such coast-lines, such mountain-chains, such river-courses are utterly impossible. On the other hand, a modern map convinces us at once of its internal truth. This truth must be founded on some general laws, which must be discoverable by studying the resemblances in the external features of countries; and finally a series of such resemblances distributed over different localities must lead to the discovery of the conditions of their origin.

One example, taken at random, will be sufficient to indicate the author's method of procedure. A comparative study of the localities, where fiords occur, shows—(1) that they are mostly to be found on west coasts, and appear generally associated, rarely single; (2) that they are limited to high latitudes, and excluded from the region confined on both sides of the equator by the isothermal line of 10° C.; (3) that they are all within the region of rainfall during the whole of the year. Hence the general

law is deduced, that fiords owe their origin principally to certain climatic conditions, viz. a low temperature, a maximum amount of aqueous deposition, and protection from the drying influence of easterly winds.

Now, we can well admit the possibility, or even probability, that continued actual observations may lead to similar conclusions; but in the mean time we are at a loss to understand how rain or isothermal charts, representing most recent conditions, can be applied to explain phenomena which the author himself thinks must have happened so long ago, that the time would have to be reckoned by hundreds of thousands of years.

M. Peschel, as it appears from his own admissions, has never left his study to observe the phenomena on which he reasons. He has collected, extracted, compiled, compared, and—generalised. This is not the legitimate approach to Nature's secrets, and consequently the author's work, although written in a masterly style, leaves us comparatively in the dark. It is the ingenious pleading of a lawyer for the cause he has undertaken, rather than the transparent and triumphant language with which the genuine student of Nature proclaims his discovery to the world.

B. L.

Cinchona Plantations in Java. *Die Chinacultur auf Java.* Von J. W. Van Gorkom, ans dems Holländischen übertragen von C. Hasskarl. (Leipzig, 1869.)

THE efforts of the English Government to establish the quinine-producing plants of South America in our Indian possessions have excited very general interest. Other European Governments are, however, not less alive than our own to the danger of depending any longer solely upon the chance products of the forests of South America for supplies of the most indispensable of medicines. Our neighbours, the Dutch, have for more than twelve years devoted much attention to the regular cultivation of cinchona trees in Java, and although the results obtained hitherto are not so favourable as we should have hoped, there is good reason to believe that the experience now gained will lead to great success in the future. The scale on which the Dutch experiments are being made will be best indicated by the fact that on the 31st March last there were in Java in nurseries and regular plantations nearly a million cinchona plants under cultivation. Besides these; more than 900,000 have been planted in the jungles, but have, unfortunately, owing to a variety of causes, already mostly disappeared. In the present pamphlet M. von Gorkom gives the experience of the Dutch cultivators, as well as a general review of the literature of the subject. Appended to the pamphlet are tables showing the present state of cinchona-culture in Java, the rate of growths of the plants, and the results of chemical analyses of the various species cultivated. Monsieur van Gorkom has had the advantage of having his work rendered into the more generally accessible German language, by a gentleman who has himself taken so distinguished a part in cinchona-culture as to induce a jury of the French International Exhibition of 1867 to confer a gold medal upon him, while assigning to Markham, McIvor, and others silver medals only.

Transactions of the Bremen Scientific Association.—*Abhandlungen des naturwissenschaftlichen Vereins zu Bremen.* Vol. 2. part i. (Bremen, 1869.)

AN article by Dr. Foske on the late Professor Trevirarus points out that in some of his works the fundamental ideas of Darwinianism were clearly expressed, long before the theory was explicitly propounded by Mr. Darwin.

We would direct the attention of biologists to a paper in the same volume, by M. Luerksen, "On the influence of red and blue light on the plasma-stream in the hairs of *Urtica* and *Tradescantia virginica*." It appears that the action of red light is to disturb the molecular structure of the protoplasm, and finally to destroy it entirely, while blue and white light act similarly; the blue, however, with somewhat less energy.

B. L.