

REVIEWS.

An Introduction to the Study of Petrology: The Igneous Rocks. By F. H. HATCH, Ph.D., F.G.S., of the Geological Survey of the United Kingdom, with forty-three illustrations. London: Swan, Sonnenschein and Co., 1891.

English students and teachers have long felt the want of a convenient text-book dealing with the characters of the common rock-forming minerals and the chief types of rocks; and this want has now been admirably supplied by the publication of Dr. Hatch's little manual. In its general plan and in some of its details the book recalls many of the excellent features of the *Einleitung in die Petrographie*, the publication of which was one of the last among the great services rendered to geological science by the late Dr. A. von Lasaulx. In describing the means by which the rock-forming minerals may be distinguished from one another, Dr. Hatch wisely considers the requirements of the beginner, and dwells chiefly on those peculiarities which can be recognised without special optical appliances; the diagnosis which he gives with each species, being at the same time terse and accurate, is admirably adapted to the wants of the student. For the special optical characters, which are less easy of determination in ordinary thin sections, the reader is referred to more elaborate treatises on the subject, like that of Rosenbusch.

In the vexed question of rock nomenclature the author, while following the most recent German authorities, does wisely in referring also to the names employed by French and other authors. We think that something more might have been done with respect to those terms which are employed by modern German writers with significations different from those which were originally given them by their authors.

Dr. Hatch very properly points out that "Syenite" and "Gabbro" are now employed in a sense totally different to that in which they were understood by the older geological writers: he might have done the same with Vogelsang's names "Granophyre," "Felsophyre," and "Vitrophyre," the old French names "Minette" and "Kersantite," and several of Gumbel's names, which have been re-defined by Rosenbusch. The policy of taking old names and changing their definition is at best a very

doubtful one; but it unquestionably entails upon the writers of text-books the duty of making clear the exact nature of the change and the date at which it has been made. If this be not done, the student who consults any geological paper written before the date of the proposed change is liable to be betrayed into serious errors. The book is admirably printed, with clear and useful drawings, taken for the most part from Fouqué and Lévy's admirable work, and it may be recommended to all beginners in this interesting study.

J. W. J.

Asbestos: Its Properties, Occurrence and Uses. By R. H. JONES. Crosby, Lockwood and Sons. London, 1890.

This volume is an extension of a pamphlet issued by the author some three years ago on the same subject, which is here expanded into a treatise on the nature, sources, production and uses of asbestos, with supplementary chapters on its substitutes, and on fibre-spinning.

The term asbestos is used to include all substances which are commercially understood by that name; and under varieties of asbestos the author gives brief descriptions of the fibrous amphiboles, pyroxenes and serpentines. We are glad to note that he is here careful to distinguish between the Canadian "asbestos," or Chrysotile, and the Italian asbestos proper, a distinction which was by no means made clear in the above-mentioned pamphlet. As regards the production, mode of occurrence, and commercial uses of these minerals, the author deserves considerable praise for the manner in which he has treated the subject. The book contains a large amount of useful and interesting information, not easily accessible elsewhere, and is adorned by some excellent plates.

It is written, no doubt, to satisfy the wants of the general reader, who does not look for much accurate scientific information, and is obviously intended to call special attention to the Canadian "asbestos," perhaps somewhat to the disparagement of its Italian rival.

In a scientific journal we may be pardoned if we direct attention to the defects of what professes to be the scientific part of the book.

In this section the unscientific reader must be on his guard lest he accept the following as a history of the production of chrysotile:—"When first formed the serpentine is probably in a soft or pasty state, and contracts as it hardens (as if from drying), and in thus contracting breaks into thin, irregular, usually nearly parallel plates, incurving; and in the intervals between these plates the serpentine crystallises in the fibrous form we call chrysotile;" neither are "precious stones" generally sup-

posed to be "volatilised in the clefts of the igneous rocks, and there turned into brilliant crystallisations."

Why, again, should the elevation of Griqualand West above the sea level lead to the expectation that asbestos will be found there?

Cat's-eye is described as a chalcedonic quartz; the tensile strength of crocidolite is attributed to the large amount of iron in its composition; and "pikrite" is described as a "bitter fibrous variety of serpentine."

The book, in spite of such blemishes, contains a really interesting account of the Canadian mines.
