

## REVIEWS.

*Tables of Minerals: including the Uses of Minerals and Statistics of the Domestic Production.* By SAMUEL LEWIS PENFIELD. Pp. vi + 88. 2nd edition. (New York: John Wiley & Sons; London: Chapman & Hall. 1907. Price 4s. 6d. net.)

THE first edition of this book appeared in 1903, and the present edition has been prepared after the author's death by his successor, Professor W. E. Ford, in the Sheffield Scientific School of Yale University. All the important minerals, to the number of 450 species, are tabulated (1) according to their system of crystallization, (2) according to the elements they contain, and (3) with reference to their geological occurrence and associations. There is also a short section dealing with various useful minerals under the headings abrasives, gem-minerals, ornamental stones, &c. The relative importance of the minerals listed is distinguished by differences in type, the names of the more common being printed in heavy capitals. The chemical formulae are given, and the page-references to Dana's 'Textbook' and 'System' are added for the convenience of the student. The brief statements as to the uses, amounts of production, and commercial values of different minerals emphasizes the importance of the study of mineralogy and makes the subject of more general interest. With reference to values, attention may be called to the valuation of one-carat stones, in three qualities, of each of the species of gem-minerals, this information having been supplied by Dr. G. F. Kunz. The book is primarily intended for students, but it will also be found useful for reference and as a refresher to the memory when determining minerals.

*Synopsis of Mineral Characters, alphabetically arranged for laboratory and field use.* By RALPH W. RICHARDS. Pp. v + 99. (New York: John Wiley & Sons; London: Chapman & Hall. 1907. Price \$1.25.)

*A Pocket Handbook of Minerals, designed for use in the field or class-room with little reference to chemical tests.* By G. MONTAGUE BUTLER. Pp. ix + 298, with 5 tables and 89 text-figures. (New York:

John Wiley & Sons; London: Chapman & Hall. 1908. Price 12s. 6d. net.)

THESE are small and handy books of reference which will be found useful to students and amateurs. They are neatly bound in leather, and can be conveniently carried in the pocket. The essential characters of the more important minerals are briefly stated, and simple tests by which they may be distinguished are given. In the first of them the arrangement is alphabetical, whilst in the second it is that of Dana's 'System'.

*A Key for the Determination of Rock-forming Minerals in thin Sections.*

By ALBERT JOHANNSEN. Pp. ix+542, with 107 text-figures, 1 coloured plate, and 24 diagrams. (New York: John Wiley & Sons; London: Chapman & Hall. 1908. Price 17s. net.)

THE bulk of this volume is largely accounted for by the presence of a considerable number of blank pages and by frequent repetitions in the tables. For instance, the summaries of the characters of antigorite, cordierite, and phlogopite, which each occupy one-third of a page, are repeated in exactly the same form no less than seven times. Before the book can be used it is intended that the edges should be cut along guidelines, whereby tabs are left to indicate the grouping adopted in the determinative tables; elaborate instructions are given as to the method of so cutting the book, and coloured gummed labels are provided. Probably few persons will laboriously cut the hundreds of pages, and certainly library copies will not be cut, in which case the book is practically useless, especially in the absence of any other key to the tables than that given by the tabs.

Lengthy determinative tables of the kind attempted savour rather too much of rule-of-thumb methods, and it is extremely doubtful whether they are of much value to students, whilst it is possible that they may sometimes lead to error. Determinative tables to be of any value should be clear and concise, and for the present purpose they might very well have been condensed into a dozen pages. The lists of refractive indices, birefringences, specific gravities, and of minerals arranged according to crystal-systems, which are given at the end of the volume, are much more useful. The statements in the text of the general portion of the book are often too brief to be perfectly clear, and the student would be better advised to read J. P. Iddings's excellent *Rock Minerals* issued in 1906 by the same publisher. Several errors are to be noticed; to quote only one (or rather a double one): methylene iodide is referred to as 'Braun's solution'.

*Rocks and Rock Minerals, a manual of the elements of petrology without the use of the microscope, for the geologist, engineer, miner, architect, &c., and for instruction in colleges and schools.* By LOUIS V. PIRSSON. Pp. v+414, with 36 plates and 74 text-figures. (New York: John Wiley & Sons; London: Chapman & Hall. 1908. Price 10s. 6d. net.)

THE scope of this elementary treatise on macroscopic petrography is fully set out in the title quoted above, and the author's name is alone sufficient guarantee that the subject has been well handled. The matter is presented in an attractive and readable form, and the numerous illustrations, for the most part representing American occurrences, add to the interest of the volume. In addition to the descriptions of the rocks themselves, particulars are given of the forms and relations of the rock-masses from a geological point of view, and much information is added on the petrological side as to their genesis. About 100 pages are devoted to the rock-forming minerals, 150 to igneous rocks, and about 70 each to sedimentary and metamorphic rocks respectively.

The following classification, based mainly on texture and colour, is adopted for igneous rocks. It is said to be essentially the same as the 'quantitative classification' proposed in 1903 by Messrs. Cross, Iddings, Pirsson, and Washington, and if so it has clearly the advantage over the latter in its freedom from the burden of so many uncouth names.

A. Grained rocks.

(a) Felspathic rocks (with or without quartz: non-porphyrific or porphyritic).

(b) Ferromagnesian rocks (with or without felspar: non-porphyrific or porphyritic).

B. Dense rocks.

(a) Light-coloured (non-porphyrific or porphyritic).

(b) Dark-coloured (non-porphyrific or porphyritic).

C. Glassy rocks (non-porphyrific or porphyritic).

D. Fragmental material.

The main types included in this classification are: A(a), granite, granite-porphry, syenite, and syenite-porphry; A(b), diorite, gabbro, dolerite, diorite-porphry, peridotite; B(a), felsite and felsite-porphry; B(b), basalt and basalt-porphry; C, obsidian, pitchstone, and vitrophyre; D, tuffs and breccias. Under each of these heads several related rocks are mentioned as varieties, though in many cases various kinds are grouped together (e. g. rhyolite, trachyte, andesite, and phonolite come under felsite).

*Kristalltafeln.* By MAX SCHWARZMANN. (Karlsruhe: G. Braunsche Hofbuchdruckerei. 1907. Price 24 Marks.)

A USEFUL set of wall-diagrams for demonstrating the forms of crystals and minerals has been prepared by Dr. Max Schwarzmänn. The sheets measure  $2\frac{1}{4} \times 3\frac{1}{4}$  feet ( $70 \times 100$  cm.), and are mounted on linen with wooden rollers. The subjects on the nine sheets are: cubic system; systems other than the cubic; hemihedral forms; elements and sulphides; oxides; oxides, haloids, aluminates, and borates; carbonates; sulphates, molybdates, tungstates, and phosphates; silicates. Altogether, there are 113 enlarged diagrammatic sketches similar to those of the textbooks. Brief explanations of the figures are given in a small eight-paged pamphlet.