

REVIEWS.

Minéralogie de la France et de ses colonies. By A. LACROIX. Vol. IV, pp. iii+923. (Paris: Ch. Béranger. 1910. Price 35 francs; of the four volumes, 125 francs.)

The first part of this valuable work appeared in 1893 and was reviewed in volume X of this Magazine; and the several parts—eight in all—have appeared at irregular intervals during the last seventeen years. A long break in their publication was occasioned by the author's important researches in vulcanicity, and his visits to Mt. Pelée in 1902-3, Vesuvius in 1906, and Etna in 1908. The gifted author is to be congratulated on the final completion of this magnificent piece of work, which easily ranks as the most complete treatise on the mineralogy of any one country that has yet been written. The four volumes contain a total of 3,295 pages, and are well illustrated by outline drawings of crystals and photographic reproductions of actual specimens. Much of the material is the result of the author's own extensive work, undertaken both in the laboratory and in the field; and, moreover, in discussing the relations between and the limitations of species there are many brilliant and original suggestions. Not only are full details given as to the crystalline form, optical characters, and chemical composition of the several species, but much is also said as to their mode of occurrence, associations, and origin.

The last volume treats of the Manganites and Plumbites; Sulphates and Chromates; Molybdates and Tungstates; Aluminates, Ferrites, and Chromites; Borates; Antimonites; Phosphates, Arseniates, Vanadates, and Antimoniates; Niobates and Tantalates; and Organic Compounds. Finally, there is a supplement of 238 pages which brings the preceding volumes up to date. Here we find a full account of the many remarkable minerals which within recent years have been discovered in Madagascar, and which have for the most part been worked out by the author himself. The only point calling for adverse comment is a large number of misprints.

Los Minerales de España. By SALVADOR CALDERÓN. 2 vols., pp. viii + 416 + 561. (Madrid. 1910.)

This work has been issued under the auspices of the 'Council for the amplification of scientific studies and investigations'; and, as stated in the introduction, it is an amplification of the much smaller volume 'Die Mineralfundstätten der Iberischen Halbinsel' (Berlin, 1902), which was written conjointly by the late Professor C. A. Tenne, of Berlin, and the present author. It follows very closely on the same lines as this smaller work, but in rather greater detail and with the information brought up to date. Very little is given in the way of a general description of the mineral species; and after a brief introduction to each and a list of references to the literature, we pass to a description of the occurrences in the various provinces. To these are added a brief mention of occurrences in Portugal. There are 172 figures of crystals and specimens, which are mostly printed in the text, but some on separate plates.

Opuit opisatelnoi Mineralogii. [*Essay of Descriptive Mineralogy.*] By V. I. VERNADSKY. Vol. I, parts 1-3, pp. xi + 496. (St. Petersburg: Imperial Academy of Sciences. 1908-10. Price 5 roubles, 85 copecks.)

This is the commencement of what promises to be a very exhaustive treatise on descriptive mineralogy, but unfortunately being written in Russian it will not be generally accessible. The bibliography of 1,478 titles of books and papers, printed in their original languages and arranged under subjects, will, however, be found useful for reference; and especially so that portion (66 pages) relating to topographical mineralogy, in which the titles are arranged according to countries. There are, for instance, 44 titles relating to British minerals. In addition, numerous references to the literature appear in the footnotes in the descriptive portion of the work. The description of the native metals occupies 297 pages, and of the semi-metals 22 pages, while in the third part of the work the description of the non-metals (sulphur) is commenced. After the general description of each species, an account is given of its occurrence at various localities, more particularly those of the Russian Empire: for instance, 46 pages are devoted to the occurrence of gold in European and Asiatic Russia. Here we find mention of many Russian localities not given in the ordinary books of reference. The three parts of the work already issued are illustrated with 94 text-figures, giving drawings of crystals, pictures of specimens, maps, and local views.

The Mineralogy of Arizona. By F. N. GUILD. Pp. 103. (Easton, Pa.: The Chemical Publishing Co. 1910.)

This small volume gives a brief account of the 120 species of minerals that have been recorded from Arizona. The information given respecting some well-known and important occurrences is somewhat meagre, and can only be regarded as a first sketch. Of special interest are the silicified wood and onyx-marble, the beautifully crystallized vanadinite and wulfenite, the secondary copper ores, the garnets and peridot of gem-quality found in ant-hills, the rare species spangolite and connellite, and the new species coronadite, morencite, and arizonite. We notice that lettsomite is erroneously described as a silicate.

Die Anlauffarben, eine neue Methode zur Untersuchung opaker Erze und Erzgemenge. By MAX LEO. Pp. 74, with coloured plate. (Dresden: Theodor Steinkopff. 1911. Price 2 Marks.)

Working on the lines indicated by J. Lemberg in 1894 and 1900 in his papers on the micro-chemical reactions of opaque minerals, the author has determined the action of various reagents in solution on metallic minerals. The reagents used include acids, potassium bromate, potassium cyanide, copper sulphate, &c., and the minerals so far examined are iron, copper, and nickel sulphides. By these means it is often possible to obtain a brilliantly coloured tarnish on a polished surface of the mineral. The surface so prepared is examined under the microscope in reflected light. Good tarnishes may also be obtained by an electrolytic method. The mineral specimen is wrapped round with platinum wire so that this is in contact at the sides but arches over the polished surface: this forms the cathode, while platinum foil forms the anode in a solution of copper sulphate or other metallic salt, through which an electric current of 3.5 to 5 volts is passed.

By such a method it is possible to distinguish one metallic mineral from another in a mixed ore; and it is claimed that pentlandite and horbachite are mixtures rather than simple minerals. Faces of different crystal forms acquire differently coloured tarnishes; and when no faces are present, a crystal individual can be orientated by means of the tarnishes on various areas. Positive and negative crystals of iron-pyrites can also be distinguished. The method is the same as that known as heat-tinting, which has recently been developed by metallographers, though this is apparently unknown to the author.

Wachstum und Auflösung der Kristalle. By ARRIEN JOHNSEN. Pp. 27, with 10 text-figures. (Leipzig: Wilhelm Engelmann. 1910. Price 0.60 Mark.)

In this separately-published paper the author develops a theory of the growth and solution of crystals. Starting from the 'point of origin' in the crystal, which may or may not coincide with the point of symmetry and the centre of gravity, he distinguishes between 'real' and 'virtual' faces. The latter are small faces on the edges and corners of a crystal which are constantly changing their inclination to the real faces during the process of growth or of solution. The rate of growth or of solution in any one direction is given by the velocity with which a face moves parallel to itself. In the case of solution, the faces of the final form are those in which this velocity is a maximum, whilst in the case of growth the faces are those for which this velocity is a minimum.

Experiments were made on the growth and solution of cleavage cubes and spheres of rock-salt; these being immersed in large volumes of solution so that the concentration does not materially change. In a solution supersaturated to the extent of 2 per cent. the faces of the final form of growth are those of a very low tetrakis-hexahedron, whilst in one with a supersaturation of 4 per cent. the final form is the octahedron. The concentration of the solution thus has an influence on the habit of crystals. In a solution which is 2 per cent. under-saturated the final form of solution is also a vicinal tetrakis-hexahedron. The faces of growth and of solution are unstable and have in general complex indices, being vicinal faces. Only when the solution is exactly at the point of saturation do faces with rational indices occur.

Elementary Crystallography, being part one of General Mineralogy. By W. S. BAYLEY. Pp. xii + 241. (New York: McGraw-Hill Book Co. 1910. Price \$2.00 or 8s. 6d.)

The material of this book was originally intended to form the introductory portion of an elementary textbook on Mineralogy, and in issuing it separately the hope is expressed that it may be of use to chemical and physical students of Crystallography. A second volume on minerals is to follow, so that the two together may be used by students of Mineralogy. The first part, headed 'Geometrical Crystallography', occupies the greater portion of the volume: this works through the several crystal systems and their hemihedral divisions. The Naumannian notation for crystal faces is used in preference to the Millerian, since it is

believed that the former is more readily grasped by elementary students. Part II (47 pp.) on Physical Crystallography includes short chapters on the mechanical, optical, thermal, electrical and magnetic properties of crystals, and on etched figures. Part III (7 pp.) gives a brief outline of Chemical Crystallography.

A special feature of the book is the very clear printing on good paper, and the clearness of the 311 text-figures. There are a few misprints, and the descriptions of the figures especially require revision.

Tables for Calculation of Rock-analyses. By ALFRED HARKER. Single sheet $17\frac{3}{4} \times 11\frac{1}{2}$ inches. (Cambridge: University Press. 1910. Price 1s.)

This is a compact and ingeniously arranged set of tables for calculating in a very simple manner the percentage mineralogical composition of a rock from the percentage chemical analysis. It is printed on thin cardboard, with the tables on one side and instructions how to use them on the other. A German translation has already appeared in the 'Centralblatt für Mineralogie, &c.' (1911, pp. 108-105, with folding table).

Mineralogisches Taschenbuch der Wiener Mineralogischen Gesellschaft, 1911. Pp. 192. (Wien. 1911. Price 10 Kr. = 8 Marks 50 Pfg.)

The flourishing Mineralogical Society of Vienna, founded in 1901, and now numbering 150 members, is a happy combination of the several scientific workers in the University and the Hofmuseum, and of interested amateurs and keen collectors. Its proceedings are published in 'Tschermak's Mineralogische und Petrographische Mitteilungen'. The pocket-book now issued by the society is edited by A. Ritter von Loehr, and contains contributions from Prof. F. Becke, Dr. R. Koechlin, Prof. C. Doelter, and O. Rotky. Rather more than half of the volume is occupied by a very complete alphabetical list of mineral names, about 6,000 in number, giving brief descriptions and synonymy, and a table giving the essential characters of about 1,000 well-established species of minerals. These have been compiled by Dr. R. Koechlin. Other items of useful information include: an account of the several public and private mineral collections in Vienna; history, statutes, and list of members of the society, and some particulars of the mineralogical societies of other countries; lists of mines in Austria of the various metallic ores and other minerals of economic importance; determination of gem-stones; radio-activity of minerals; address-lists of guides, collectors, and dealers. Excellent portraits are given of the two honorary members of the society, the

veteran Gustav von Tschermak, and Isidor Weinberger. The volume is issued in a small and handy form, and its only drawback appears to be its rather high price.

Introduction to the study of rocks, and guide to the rock collections in Kelvingrove Museum. By PETER MACNAIR. Pp. 79, with 6 plates and 52 text-figures. (Glasgow. 1911. Price 3d.)

This is a companion guide-book to that on the mineral collections which appeared last year (noticed in this Magazine, vol. xv, p. 383); both have been prepared by the curator of the natural history collections. In the collection, three cases are occupied by the rock-forming minerals; three cases by forty-five common types of igneous, sedimentary, and metamorphic rocks, illustrated by thin sections so placed that they can be examined with a lens, and by photomicrographs (scarcely microphotographs, as stated in the guide-book); and two cases by rock structures; while thirteen cases are occupied by the systematic collection of rocks, which are mostly from Scotch localities. The guide-book consists for the most part of a description and explanation of the contents of the first eight cases, thus forming a simple introduction to the study of the rocks. The book is a marvel of cheapness, and it should do much towards the encouragement of the study of geology in a geologically interesting district. It is well illustrated, but the drawings of crystals, though better than those in the mineral guide, still leave room for improvement.
