

REVIEWS.

Edelsteinkunde, eine allgemein verständliche Darstellung der Eigenschaften, des Vorkommens und der Verwendung der Edelsteine, nebst einer Anleitung zur Bestimmung derselben, für Mineralogen, Edelsteinliebhaber, Steinschleifer, Juweliere. By Dr. MAX BAUER. 2nd edition. Pp. xvi + 766, with 21 plates and 115 text-figures. (Leipzig: Chr. Herm. Tauchnitz. 1909. Price 80 Marks.)

The first edition¹ of Professor Max Bauer's well-known work on precious stones, which appeared in 1896 and was translated into English by Mr. and Mrs. L. J. Spencer in 1904, has come to be recognized as the standard work on the subject. The author is to be heartily congratulated, not only on the reception that the first edition has met with, but also on the completion of the still more exhaustive work now before us. The general plan of the book remains exactly as before; that it has been extensively revised and brought up to date is at once evident from an increase of 55 pages of text, and the addition of 21 new text-figures and one new plate (representing the 'Cullinan' diamond, which has been discovered since the first edition appeared).

Besides collecting all the available information respecting precious stones from the rather scattered mineralogical literature of the last thirteen years, the author has obtained at first hand, from workers in the trade and from persons acquainted with the gem-mining districts, other information of practical importance and of scientific interest. We find, for example, much that is new concerning the emerald mines of Muzo, in Colombia; the diamond mines of South Africa; the tourmaline mines of San Diego Co., in California; and the occurrence of the variously coloured gem-minerals in Minas Geraes, Brazil. We also find mention of the new Californian gem-mineral benitoite; the occurrence of peridot in the Island of St. John in the Red Sea; and the interesting artificial rubies and other colour-varieties of corundum, which are now made in large quantities.

More importance is now very rightly given to the determinative value of the optical characters of gem-minerals, and in the introductory portion of the book we find illustrations explaining the use of the refractometer, with the aid of which the refractive indices of faceted stones can be so

¹ A review of the first edition appeared in this Magazine, vol. xi, p. 220.

readily determined. On the other hand, the useful optical phenomena to be observed in convergent polarized light are not made use of; but this, it is explained, is because no simple and convenient instrument is available for the use of jewellers and persons other than the mineralogist.

There is only one point which perhaps calls for criticism. The coloured plates, which have been reproduced for the new edition, do not quite reach the high standard of excellence of those issued with the first edition.

The book is very clearly printed on good paper, and is issued in fifteen parts at the price of 2 Marks per part.

La Vallée de Binn (Valais). Étude géographique, géologique, minéralogique et pittoresque. Par LÉON DESBUISSONS. Pp. viii + 328, with 24 plates and maps, and 34 text-figures. (Lausanne: Georges Bridel & Cie. 1909. Price 10 francs.)

The author is to be congratulated on the production of this most fascinating volume, descriptive of a district which has long been of especial interest to mineralogists. Instead of being merely a dry catalogue or list of minerals and mineral localities, it is clothed with a living interest, and it may very well serve as a model for future works on topographical mineralogy. The charming views of scenery, for the most part reproduced from the author's photographs and sketches, add much to the interest of the volume, and give the reader a vivid idea of the conditions under which the minerals are found. We find chapters devoted to the geography, geology, and history of the valley, the manners and customs of the people, of excursions that may be made in the neighbourhood, together with hints to collectors, a glossary of local names, and, in an appendix (by Dr. A. Binz), a list of plants found in the valley. Professor A. Lacroix, in the preface he writes for the volume, expresses regret that the increasing technicalities of mineralogical science have the tendency to discourage the natural history study of minerals by amateurs and keen collectors of the now rare type to which the author belongs.

Chapter III is devoted to mineralogy, 42 pages being occupied with a description of the several localities, and 96 pages to a description of the individual species (65 in number) which have so far been recorded. These descriptions are not burdened with too much technical detail, but full references to the literature are given under each species. Instead of idealized geometrical drawings of crystals, we have excellent photographic reproductions of actual specimens. The most remarkable and

widely known occurrences are those in the white, crystalline dolomite quarried in the bed of the Lengenbach, and in the mica-schist and gneiss of the Alpe Lercheltini. In the Lengenbach quarry 46 species have been found, 23 of which are peculiar to this spot; nowhere else have such beautifully crystallized but highly complex minerals of the sulph-arsenite group been found. Many of the discoveries here have been made by Mr. R. H. Solly and Professor H. Baumhauer, both members of this Society. Since Mr. Solly commenced, in 1898, his annual visits to this spot he has by his enthusiasm and energy reaped a rich harvest, no fewer than 28 species new to the locality, and many of them new to science, having been collected.

A very complete index adds much to the usefulness of the volume for purposes of reference. The full bibliographical lists are rather scattered throughout the volume under the different sections, and it would perhaps have been more convenient had they been duplicated in one general list.

The Geology of Ore Deposits. By H. H. THOMAS and D. A. MACALISTER.
Pp. xi + 416, with 65 text-figures. (London: E. Arnold. 1909.
Price 7s. 6d. net.)

The scientific study of ore-deposits has within recent years been much cultivated in the United States and in Germany, and several books on this important subject have appeared; but in England the only books we have are the larger treatise of J. A. Phillips (1884, and 2nd ed. by H. Louis, 1896) and the much smaller 'Text-book of Mining Geology' by J. Park (1906 and 1907). A brief and readable account of the subject showing the present state of its development would therefore be particularly acceptable. The present work fulfils this purpose up to a certain point, but beyond that we find it rather disappointing. The opening portions of each chapter give an excellent general account of the matter in hand; but these are followed by a mass of minute detail which is very tedious reading. An attempt has been made to give descriptions of the more important ore-deposits of practically all countries; these are necessarily brief, and rather suggestive of rough notes made for one's own use; further, in the absence of a complete index to the volume, they are useless for purposes of reference.

The subject is treated from the point of view of genesis (which causes much repetition), the headings of the several chapters being:—

Ores due to the differentiation of igneous magmas.
Pneumatolysis.

Hydatogenesis—Deposits formed by after-eruptive actions which are not pneumatolytic.

Ores due to metasomatic replacement.

Bedded ores due to precipitation.

Metamorphic ore deposits.

Secondary changes in ore deposits apart from metamorphism.

Detrital and alluvial deposits.

The proof-sheets do not appear to have been very carefully read, and there are several shortcomings in mineralogical detail (e.g. the chemical formula of enargite is given differently in two places, and in both instances incorrectly). There is a considerable want of uniformity in the names of minerals (e.g. chalcopyrite and copper pyrites); while 'copper and iron pyrites and zinblende', 'bog iron ore', 'bog-iron ore', 'bog iron-ore', and 'bog-iron' are quite studies in hyphens. The text-figures are not well reproduced, and in many cases are not clearly referred to by their numbers in the text.

Second Appendix to the Sixth Edition of Dana's System of Mineralogy.

By EDWARD S. DANA and WILLIAM E. FORD. Pp. xi + 114.

(New York: John Wiley & Sons; and London: Chapman & Hall. 1909. Price 6s. 6d.)

The indispensable sixth edition of Dana's 'System of Mineralogy', published in 1892, was brought up to date by a first appendix in 1899, and the second appendix, now issued, gives a résumé of the descriptive mineralogical literature of the last ten years. This new appendix is written on exactly the same plan as before, but, covering a rather longer period, it is proportionally longer (being 114 pages instead of 75).

The work of compilation was done by Professor Dana himself at intervals down to 1906, when, most unfortunately, owing to ill-health he was obliged to relinquish the task. We are relieved, however, to hear that he has now so far recovered that he is able to resume a part of his duties. Since 1907 the somewhat arduous work has been carried on by the junior author, who is the late Professor Penfield's successor at the Sheffield Scientific School of Yale University.

In a much condensed work of reference of this kind it is difficult to avoid errors; and, unfortunately, in the new appendix they are quite abundant. There is, indeed, not a single page in the whole volume without one or two obvious errors, and on some pages there are as many as half a dozen. A want of consistency in the spelling of the names of Russian authors and localities might be passed over, if only the names

of the minerals themselves were correctly spelt. There is considerable confusion in geographical details: Moravia and Mähren are used indiscriminately; we read of chrysoberyl 'from Smaragd, Urals', chrysolite 'from Flysch', and zircon 'from Hautefeuille' (i.e. a mineral name, a geological formation, and an author's name respectively). Mention is made of the note by Professor Goldschmidt which cleared up the confusion in the statement of the locality for iron-pyrites in the Csetrás mountains in Hungary; but on the very same page we find 'Csetras', 'Csetras mountains', and 'Csetrásgebirge'. It is curious to find a mineral, of which an analysis appeared in the fifth edition of the 'System' (1868), figuring in the new appendix as a new species ('loaisite').

Igneous rocks. Vol. I, Composition, texture and classification. By JOSEPH P. IDDINGS. Pp. xi + 464, with 130 text-figures, 2 coloured plates, and tables. (New York: John Wiley & Sons; London: Chapman & Hall. 1909. Price 21s. net.)

This is a companion volume to the author's 'Rock Minerals',¹ which was published in 1906. The second volume on the igneous rocks is to deal with their description and occurrence; and when this appears, we shall have a handsome set of volumes, treating the subject more exhaustively than has been hitherto attempted in the English language. If only a fourth volume on the crystalline schists and sedimentary rocks could be included in the series, something like completion would be arrived at.

Part I, on the chemical and mineral composition and constitution of igneous rocks, is divided into the following chapters: I, chemical composition, and the diagrammatic representation of analytical results. II, chemical composition of pyrogenetic minerals; here, under each chemical element in turn, we have a useful list of minerals containing the various elements, with a brief statement of the formula, percentage composition, and the rocks in which they occur. III, principles of physics and chemistry applicable to rock-magmas, in which is given an excellent account of the theory of solutions. IV, chemical reactions in rock-magmas. V, separation of substances from solution, treated from the standpoint of physical chemistry. VI, texture of igneous rocks, illustrated with an excellent series of text-figures. Here we are sorry to see the introduction of a large number of highly artificial and curiously constructed words descriptive of different kinds of texture; but as many

¹ Reviewed in this Magazine, vol. xiv, p. 416.

of these do not appear in the index, they may be overlooked and thus die a natural death. VII, differentiation of rock-magmas. VIII, modes of occurrence.

Part II, on the nomenclature and classification of igneous rocks, gives an interesting historical sketch and summaries of the qualitative or mineralogical (47 pp.) and the quantitative or chemical systems (61 pp.) of classification. Considering that the author is one of the propounders of the new quantitative system, the summary he gives of the qualitative system is most fairly stated; indeed, in no other English book do we find such crisp and clear definitions of so many rock names (together with their authors and date).

Handbook for Field Geologists. By C. W. HAYES. 2nd edition. Pp. ix + 159. (New York: John Wiley & Sons; and London: Chapman & Hall. 1909. Price 6s. 6d. net.)

The first edition of this little book was written, in 1908, specially for members of the United States Geological Survey, but the demand for it was much wider than was anticipated. The new edition has therefore been prepared for the use of field-geologists in general, though the good influence of the model survey of the United States still predominates throughout. The book is full of useful instructions and hints, and it contains detailed schedules indicating how special investigations should be carried out. It may with advantage be consulted by all field-geologists and prospectors, more particularly those in South Africa and Australia, where larger tracts of country have to be covered than at home. Amongst the numerous points dealt with there are sections on collecting and the systematic method of duly labelling specimens of rocks, minerals, and ores. As to the collecting of minerals, no very specific instructions could of course be expected, but 'the geologist should not neglect opportunities to collect new, rare, or finely developed minerals, even if they have no immediate bearing on his work'.

The volume is neatly bound in morocco, and of a size suitable for carrying in the pocket. Its only drawback appears to be its rather high price.

Crystalline Structure and Chemical Constitution. By A. E. H. TUTTON. Pp. viii + 204, with 54 text-figures. (London: Macmillan & Co. 1910. Price 5s. net.)

This is the first volume in a new series of 'Science Monographs', which promises to be of considerable interest and utility. As clearly

stated in the preface of the present volume, the object has been to give a connected account of the author's own researches carried on during the last twenty years, the full results of which have already been published in a long series of important papers well known to chemists and crystallographers. Some indication of this object might with advantage have been given on the title-page; for only one branch of the wider subject suggested by the title is touched upon, namely, that of isomorphism, and even this is limited to the relations shown by just two series of isomorphous salts. In addition, we find descriptions of the several elaborate instruments designed by the author for his special work; some of which instruments are now finding important applications in other directions. In the historical introduction the year 1890 is repeatedly mentioned, but we cannot quite agree with the author that that year marks a turning-point in the history of crystallography.

We cannot help but admire the extreme care in observation, and the endeavours to obtain the highest degree of accuracy, displayed by the author, and express our wonder at the marvellously delicate instruments of research which, with such mechanical skill, he has designed. The present book may well serve as a model of how a carefully premeditated piece of scientific research should patiently and laboriously be carried out; and to the specialist it gives a distinctly useful summary of the rather lengthy original papers. The constants which have been so accurately determined for fifty-four different salts in the two isomorphous series are not all quoted in full in the book, and when these are wanted it will still be necessary to refer to the original papers.

Introduction to the study of minerals and guide to the mineral collections in Kelvingrove Museum. By PETER MACNAIR. Pp. 70, and 1 plate. (Glasgow, 1910. Price 3*d.*)

As the title suggests, this guide-book is modelled on much the same plan as the one written by Mr. L. Fletcher in 1884 for the Mineral Gallery of the British Museum. While the introductory portion gives a brief summary of the general characters of minerals, instead of an historical sketch, the descriptive portion is much the same, except that only the more common minerals receive mention.

Both the introductory collection and the general collection appear to be very well arranged and carefully labelled; and with the assistance of this little guide-book (which, at its very moderate price, is within reach of everybody) an attentive student should very soon acquire a good elementary knowledge of minerals. In a district like that of Glasgow,

within easy distance of which many minerals can be collected, such a collection and guide-book offer a strong inducement to boys to take a keen interest in collecting. And when once the collecting instinct has been gratified by a few good finds, a desire for a more intimate knowledge of minerals is sure to be aroused.

There are a few small points which require correction; and this applies more particularly to the text-figures, sixty-one in number, which have been very roughly traced from the textbooks.
