

REVIEWS.

A Treatise on Crystallography. By W. J. Lewis, M.A., Professor of Mineralogy in the University of Cambridge, Fellow of Oriel College, Oxford. Pp. 612: 12 with 533 figures in the text. Cambridge: At the University Press, 1899.

At Cambridge alone of our Universities do any considerable number of students offer mineralogy as one of their subjects for a degree, and no doubt this treatise is primarily intended by Professor Lewis as a text-book for such students. Since few of them possess a very extensive knowledge of mathematics, no analysis, with the exception of the small amount of plane and spherical trigonometry necessary, is introduced in the body of the book, and geometrical proofs alone are adopted. The mathematician is, however, not forgotten, the analytical proofs being given in a chapter towards the end. In this way what is lost in elegance is gained in utility.

The greater part of the book is occupied with an exceptionally elaborate and exhaustive discussion of the thirty-two possible classes of crystalline symmetry, covering seven chapters—one for each of the systems into which the classes may be divided. The fully worked-out examples, of which there are a large number, will prove of invaluable service in rendering the principles of symmetry and the methods of measurement intelligible to the student. Like all recent writers on this subject, the author, following Gadolin, commences with the class devoid of symmetry, and gradually adds elements until the most complicated class is reached; and, following Groth, rejects all ideas of hemihedrism, since each class is in reality independent of any other. The nomenclature adopted involves the production of several new words; uniformity in nomenclature would be desirable, but seems unlikely to be realised. Gadolin's method of showing at a glance the symmetry of the several classes might have been used with advantage; the author's plan is ingenious, but the dots do not readily catch the eye. There is an excellent chapter on twin-crystals. The various types of goniometers and the methods of using them are given in the concluding chapter. Recognising the great importance of graphical methods for the proper understanding of the geometrical relations of crystals, the author quite early in the work introduces two chapters on crystal-drawings and on linear and stereographic projections.

The optical and other physical characters were probably considered outside the scope of the treatise, and are only very briefly dealt with. The numerous figures and illustrations add greatly to the value of the book. It is well up to the high standard maintained by the Cambridge Press, and makes a handsome addition to the Cambridge Science Manuals.

First Appendix to the Sixth Edition of Dana's System of Mineralogy.
By Edward S. Dana. Pp. 10 and 75. New York: John Wiley and Sons, 1899.

Every one interested in the study of mineralogy will be grateful to Professor Edward Dana for issuing this valuable appendix to the well-known *System of Mineralogy*, for it brings that work abreast of the progress of mineralogical science up to the beginning of last year, and contains in a convenient form a vast amount of important information which could only be arrived at hitherto by wearisome searches through numerous periodicals.

In the course of the seventy-five pages of which the book consists, no less than one hundred and sixty new species or varieties are described or referred to, and many important additions to our knowledge of common minerals are duly chronicled. The minerals are treated in alphabetical order, but a list of new names, arranged according to the chemical classification adopted in the 1893 edition of the *System of Mineralogy*, and the use of heavier type for the more important species, enables the reader to see at a glance the additions made to our knowledge of the various groups. In the case of minerals already known, references to the *System of Mineralogy* are provided. Among the new species of special interest discovered during the past few years Derbylite, Goldschmidtite, Lawsonite, Lewisite, Lorandite, Pearceite and Wellsite attract attention, and bear witness to the activity of mineralogists in America and elsewhere. The reader will, however, probably sympathise with the author when he laments that many new names have been introduced "which have little claim to recognition, either because of the incompleteness of the original examination or the unsatisfactory nature of the material investigated." A useful bibliography gives the titles of upwards of sixty important works bearing on mineralogy, published since 1891. The notation and abbreviations employed are the same as those used in the last edition of the "System." It is to be regretted that this uniformity of treatment was not extended to include the size of page.

Repertorium d. min. u. kryst. Literatur. General Register d. Zeitsch. f. Kryst. u. Min. Band XXI-XXX; Theil II von Dr. F. Grünling. W. Engelmann, 1890. 360 pp.

This valuable index to the papers on Crystallography and Mineralogy, published during the years 1891-6, will be welcomed by all workers in the two sciences; for though it is only an index to the papers and abstracts which appear in the ten volumes included, it is an almost complete catalogue of all the literature which has appeared during the period, for the *Zeitschrift* is careful to include full abstracts of all papers to which access can be got by the editors, and an author has only himself to blame if his work is overlooked by them.

This repertorium differs in one respect from the two preceding, for papers on the minerals of particular countries or continents are given *twice* under the geographical heading—the first time according to the mineral, the second according to the special locality. This geographical reference is undoubtedly very useful; but I venture to suggest that in future repertoria it should appear as a separate part, and that the division into districts should be a little more systematic. The advantage of the alphabetical index of subjects running on continuously is obvious. As an instance of the latter suggestion I may mention the interpolation of the reference to the Sandwich Islands between Queensland and W. Australia. This is a position where no reader would expect it, and there is no cross reference under the Sandwich Islands to help him. Again, it is somewhat perplexing to have small districts, such as Salzburg, Tirol, Sicily, and Utah, given separately. Few readers know their geography so well as to be quite sure whether a particular valley, *e.g.* the Zillerthal, lies in the Salzburg or Tirol province. Such districts, when forming portions of a particular country, would, it seems to me, best occur as sub-groups of the country.

At the end of the volume is an additional list of errata which occur in Vols. I—XXX. Most of those given for Vols. I—XX are due to Professor Goldschmidt. One regrets, however, that these corrections have been put in small print; their importance to the reader surely entitles them to the honour of larger type, and they are more likely to be correct if so printed.

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