

MATHEMATICAL CRYSTALLOGRAPHY.

An Amateur's Introduction to Crystallography (from Morphological Observations). By Sir W. P. Beale, Bart. Pp. vii+220. (London: Longmans, Green and Co., 1915.) Price 4s. 6d. net.

THIS exposition of crystallography has been written by "an amateur" with the intention to help "other amateurs." Amateurs differ, however, very widely in the variety and extent of their interests and also in their keenness. The author has evidently had a mathematical training, and it is this aspect of the subject that specially appeals to him. Very few amateurs, such as those possessing a collection of minerals, would, we imagine, be anxious to begin by calculating the axial ratios of their crystals. They would rather wish to gain some insight into the general relations of the external forms and symmetry of crystals; and they would be repelled by pages of mathematical discussion and formulæ. Having produced such a work on crystallography, the author must no longer regard himself as a mere amateur, but as a serious crystallographer. For these reasons the book cannot be recommended to amateurs; it should, in fact, be carefully kept out of the reach of anyone who displays the slightest curiosity respecting crystals, otherwise the spark will surely be extinguished. On the other hand, the book will be of real value to the serious student who has already made some start in crystallography, for it will present the subject to him in a somewhat different light from that given in the ordinary text-books; and taking the two together the subject will no doubt be studied more intelligently.

The author plunges into his theme by regarding a crystal as a geometrical polyhedron, and selecting three edges as axes of reference, he explains clearly how the positions of all the other surfaces of the solid are fixed in terms of the Millerian system of notation. Commencing with the most general (and difficult) case, namely that of the anorthic system, he leads the unfortunate reader through the maze of spherical triangles necessary for the calculation of the angles of inclination and the relative lengths of the axes of reference. The remaining systems of crystals are logically treated in turn, ending with the cubic. Here the important idea of symmetry is only incidentally touched upon. This is, however, treated rather more fully in the succeeding description of the merohedral forms belonging to each system. There is a long appendix on methods of calculation, and another on the drawing of crystals from the calculated elements.

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The 136 illustrations (several of which are repeated for convenience of reference) are a special feature and are entirely original. These are well and clearly drawn, and the method of giving the axes of reference in red adds still more to their clearness. There is a slight slip in fig. 64, whilst fig. 65 is quite wrong. The book is clearly printed in large type, and there are but few misprints; $\{hko\}$, etc., instead of $\{hko\}$, etc., however, recurs throughout the volume.

L. J. S.

OUR BOOKSHELF.

The Medical Annual. A Year Book of Treatment and Practitioner's Index. Thirty-third year, 1915. Pp. cxx+830. (Bristol: J. Wright and Sons, Ltd.; London: Simpkin, Marshall and Co., Ltd., 1915.) Price 10s. net.

THIS, the thirty-third annual issue of this publication, contains a summary of the year's (1914) contributions to medicine and surgery by a number of competent authorities. The exceptional lateness of the issue is accounted for by the strain and distraction of a great war, all the contributors, fully occupied as they are in normal times, having been working under exceptional stress from military duties and contingent work. The list of contributors is a sufficient guarantee of the accuracy and up-to-dateness of the information given. Thus we find an account of the latest work on typhus and cerebro-spinal fevers, both of topical interest at the present time. Trypanosomiasis is dealt with by the competent hand of Sir Leonard Rogers, and the article gives full information of the latest work on the parasitology and treatment of this important condition. About twenty pages are devoted to the important subjects of radio-activity, X-rays, and electro-therapeutics, and useful sections deal with the changes in the new British Pharmacopœia of 1914. Special articles on naval and military surgery are included, together with references to personal experience in the treatment of wounds. A number of full-page and other illustrations are included, and form a special feature of the volume; they illustrate various disease conditions, details of surgical technique, surgical appliances, pathological features, etc. The two plates of skin eruptions in pellagra are beautiful examples of colour photography. The "Medical Annual" is a book eminently suited to the needs of the busy practitioner who desires to keep abreast with modern progress.

Wisconsin Geological and Natural History Survey. Bulletin No. xxxiv. Economic Series, No. 16. Limestone Road Materials of Wisconsin. By W. O. Hotchkiss and E. Steidtmann. Pp. viii+137. (Madison, Wis.: Published by the State, 1914.)

THIS bulletin has been published for the purpose of helping to conserve the expenditure of the "vast