

can be shown that stone of the various horizons possess characteristics of their own it would seem that the question of position in the geological scale was wholly of minor importance. Kind, quality and accessibility are the only questions in which the man of affairs is interested or need concern himself.

In the appendices is given a list of the principal quarries, together with a bibliography, the latter confessedly incomplete and containing no reference to the important reports published in America by the geological surveys of Georgia, Maryland, Missouri, New York and North Carolina.

The work represents a laudable attempt to make certain information available to students of architecture. Whether successful or not the future must decide. At present the average architect seemingly contents himself with the purely decorative feature regardless of climate and incidental or consequential durability. Witness the proposed construction of one of the most elaborate ecclesiastical structures in America from one of the cheapest and least durable of natural materials. And this for no other reason than that the elaborate detail of ornamentation, the effect of light and shade, can not be produced in a better stone at what is considered a reasonable outlay of time and money!

GEO. P. MERRILL

Crystallography and Practical Crystal Measurement. By A. E. H. TUTTON, D.Sc., M.A. (Oxon), F.R.S., A.R.C., Vice-president of the Mineralogical Society; Member of the Councils of the Chemical Society, and the British Society for the Advancement of Science. New York, The Macmillan Company; London, Macmillan & Company, Limited. 1911. 8vo. Pp. xiv + 946, 720 figures in the text. \$8.50.

This work aims to present a complete survey of the science of crystallography from the most modern point of view, including both the theory and practise of the study of crystals and their manifold properties. Avoiding the forbiddingly mathematical treatment of his English predecessors in the field the author

has succeeded admirably in giving a living interest to crystallography such as is to be found elsewhere, if at all, only in von Groth's "Physikalische Krystallographie." The method of presentation differs however widely from von Groth's in that theoretical considerations generally follow on detailed descriptions of actual crystallographic investigations drawn from the author's wide experience. These practical details occupy a large part of this large volume and in many respects are its most distinctive and valuable feature. Tutton's work has been remarkable for the careful attention to detail which has rendered his results extraordinarily accurate; and for the completeness of his studies, made chiefly on artificial crystals. So that in the detailed records of measurement and the full description of structure and use of instruments and methods employed we have the best guide-book to actual crystallographic practise which has yet appeared. Concerning the actual measurement of crystal angles little that is new is claimed for the book; and indeed it is much to be regretted that the author treats so slightly the use of the two-circle goniometer. But the descriptions of methods in density, optical, thermal and elasticity investigations form a most welcome contribution to the scanty literature in this domain of peculiar difficulty, and the author speaks here with the authority of an undoubted leader.

The chapters in which are traced out the historical development of the theory of homogeneous crystal structure are particularly well done and are of the greatest interest. The idea of molecular distance ratios is also fully worked out and its application abundantly illustrated.

The illustrations of the book are abundant and good; the crystal drawings almost all new, the figures of instruments very clear wood-engravings and the interference figures reproductions of the author's photographs.

In all respects the work is to be regarded as of unusually high excellence and of the first importance in the field of crystallography.

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