

in comparison to 700,000 pure-blood whites. So that if the Government of Cape Colony can conduct its native affairs with little or no difficulty, scandal, or injustice, the same thing ought to be possible for the Transvaal and Natal.

H. H. JOHNSTON.

ENCYCLOPÆDIC PHOTOGRAPHY.

Cassell's Cyclopaedia of Photography. Edited by Bernard E. Jones. Pp. viii+572. (London: Cassell and Co., Ltd., 1911.) Price 10s. 6d. net.

THE encyclopædic arrangement has both advantages and disadvantages. One important advantage is the possibility of including out-of-the-way matters that could scarcely be referred to in a systematic treatise without devoting an unjustifiable amount of space to their consideration. The editor has made the very most of this possibility, for we find such headings as "Bicycle" and "Contact Breaks," the connection of which with photography is rather remote, and others, such as "Tea-tray Landscapes" and "Thought Photography," which must occur very rarely indeed in photographic or any other literature. Of the few headings that we have sought for to test the inclusive character of the volume, the only ones that we fail to find are "Metallography," a common enough word that stands for a very important branch of photography at the present time, and "Rainbow," to which the reader is specifically referred at the end of an article on "Cosmical Photography."

An advantage often claimed for the alphabetical arrangement is facility of reference, though this can scarcely be greater than in the case of a treatise with a good index. The editor appears to have been unduly anxious with regard to this matter, for in some cases he has, in our opinion, failed by reason of the excessive subdivision of the subjects. For example, some shutters are described under the heading "Shutters," where we expected to find the whole subject treated of. But other shutters are given under "Flap Shutter" and "Focal Plane Shutter," and before we get all that is given on this subject, we must read also the various sections, "Instantaneous Shutters," "Shutters, efficiency of," "Shutters, testing," and possibly others that we have not come across. And this is not exceptional, for spectroscopy appears to be distributed among nearly a dozen headings, and astronomical photography and the use of polarised light, among other subjects, are similarly subdivided.

The editor has been perhaps rather too ambitious, at least in his preface, for he refers to the volume as "surveying the whole field of photographic knowledge," and being "at once authoritative and complete." The work "is intended not only for the practical photographer, but also for the scientific student" who will find articles "valuable, because authoritative." "The manufacturer, too. . . ." The authoritative character of an article depends upon the author and upon him alone, and the real student always desires to know upon whose authority the statements that he reads depends. A very few articles are signed, but there are many and among them very excellent articles that are not only not signed,

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but to the authorship of which there is no clue, even in the list of chief contributors and the nature of the subjects with which they deal. The authorship in some cases is obvious enough to those acquainted with photographic literature, and some of the articles would have gained rather than lost by having their source clearly indicated.

When a volume is written by nineteen "chief contributors," and presumably other contributors in addition, it is impossible that its sections shall be equally "authoritative," and, as a matter of fact, they are of very various degrees of merit. Many are all that could be desired within their limits, giving a concise, clear, and inclusive summary of the subjects with which they deal. But in some the subject is evaded, as in "Shutters, testing," where, after a quarter of a page of information, we read that "there are numerous other methods, most of which, however, call for special apparatus," and the reader is left in the dark with regard to these "numerous other methods." Some are obscure, and we doubt whether Mr. Dallmeyer himself would have recognised the "Adon" lens that he invented from the description given of it. "Polarisation" is defined as "The splitting up or division of a ray of light into two distinct refracted parts," and here the student is left to ponder the matter with no diagram to help him, though there are "hundreds of line drawings in the text" (as stated on the title-page), and some, such as those of a "porcelain evaporating dish" and a "clamp for general use," might well have given place to others more helpful. As might be expected, the volume is not free from errors. Cedar-wood oil is not volatile; the Abbe two-lens condenser is not of low numerical aperture; and it is not correct to say that "the focal lengths of the microscope objectives in general use range from 3 in. to 1½ in.," even if we add that "lenses of both lower and higher power are manufactured." We do not understand how a photograph taken on an isochromatic plate with a "six-times" yellow screen can be "over-corrected," nor how "beads of dried paste, made with magnesium powder and distilled water," could be used instead of limes for the limelight. But looking at the book as a whole we can safely say that the discriminating student will find in it a great fund of information, and that a reference to it will sometimes save him prolonged if not fruitless search among rare, little-known, and old records.

C. J.

MATHEMATICS FOR TEACHERS.

Lectures on Fundamental Concepts of Algebra and Geometry. By Prof. J. W. Young. Prepared for publication with the cooperation of W. W. Denton. With a note on the Growth of Algebraic Symbolism by Prof. U. G. Mitchell. Pp. vii+247. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1911.) Price 7s. net.

THIS book contains a series of lectures on some of the fundamental principles of mathematics, treated from the most recent and scientific point of view; that is, mainly with reference to their consistency and the nature of the assumptions involved.