biaxial crystals by means of observations on total reflection. It would scarcely be possible to find a more detailed or simpler presentation of all this material. Many works on analytical or physical optics hardly mention these subjects at all except in the most general way. Several chapters further on in the work, the author takes up the physical basis for these results and develops the formulas from the electromagnetic conditions at the interface of two media.

There is little need of prolonging this review with the recitation of the course of the various chapters. Enough has been said to show the method upon which the author has constructed his book and the detail with which he has written. There is one point in which an improvement might be suggested. The plates which exhibit the elaborate and intricate phenomena of interference are all in black and white. This is a great pity; the beautifully modulated color schemes are the chief attraction of the figures and the author's detailed tables of the colors that are found in some special cases by no means take the place of the actual colors on the plates. If the coloring of the plates had to be done by the eye and hand, there might be good excuses for omitting it; but natural color photography is now so well developed that very good photographs of these effects can be obtained and reproduced.

The student of optics, who frequently finds it very hard to lay his hand upon a large and accurate presentation of the phenomena of crystalline optics, will refer constantly to this work and will feel under deep obligations to its author for the pains taken in preparing it.

E. B. WILSON.

NOTES.

THE July number (volume 10, number 3) of the *Transactions of the American Mathematical Society* contains the following papers: "Projective differential geometry of curved surfaces (fifth memoir)," by E. J. WILCZYNSKI; "On the osculating quartic of a plane curve," by W. W. DENTON; "Note on a system of axioms for geometry," by A. R. SCHWEITZER; "Irreducible homogeneous linear groups in an arbitrary domain," by W. B. FITE; "On the integration of the homogeneous linear difference equation of second order," by W. B. FORD; "On Cantor's theorem concerning the coefficients of a convergent