groups cyclic, and the principal-ideal theorem of class-field theory transposed to group theory. Throughout the book there are short sets of approachable exercises.

The treatment here presented achieves a certain unity which the classical presentation lacked. It also exhibits the theory of abstract finite groups (infinite abstract groups are not discussed in much detail) against the background of modern algebra as that subject has developed in the past seventeen years. In the reviewer's opinion, this method of approach is likely to appear more coherent than the former to students approaching groups in detail for the first time. A considerable number of new technical terms must be kept in mind, but with either van der Waerden's book or Albert's as a preliminary course, the terminology and the ideas behind it will offer no serious difficulty.

E. T. BELL

*Axiomatische Untersuchungen zur projektiven, affinen und metrischen Geometrie.* By Eugen Roth. (Forschungen zur Logik und zur Grundlagen der exacten Wissenschaften, new series, no. 2.) Leipzig, Hirzel, 1937. 58 pp.

This work, incorporating the material of a doctoral dissertation, falls into three main subdivisions: (1) an axiomatic development of projective, affine, and euclidean geometry; (2) concerning the axiomatizing of geometries; (3) the monomorphism of the postulate systems of projective, affine, and euclidean geometry. The author uses formal logical symbols explained in a glossary, whose introduction renders the reading difficult without considerable study. The emphasis here is upon the logical structure, and because of this point of view certain problems are brought out which were largely ignored by earlier writers on postulates. The specializations required to obtain affine geometry from projective, and euclidean from affine, are shown to be postulational, not definitional (American readers may recall R. L. Moore's critical remarks on this score in reviewing Veblen and Young's *Projective Geometry*). The "simplifications" familiar in reducing postulates for projective geometry, by prescribing lines and planes to be sets of points, rather than wholly undefined symbols, do violence to the principle of duality, as this writer points out effectively. The author remarks that the complete postulates for projective geometry require continuity of points on a line, and hence the "incidence geometries" illustrated by finite geometries are not "projective." Critical remarks upon Hilbert's "completeness postulate" for euclidean geometry (as given prior to the 1930 edition, see 4th to 6th editions) incorporate much that is found in recent German literature on the subject. The author is apparently unaware of the work of H. G. Forder, *The Foundations of Euclidean Geometry*. He is aiming at certain logically vulnerable spots in modern axiomatic treatments, rather than giving a survey of the subject as a whole.

A. A. BENNETT