SHORTER NOTICES

Mémoires sur la Mécanique Ondulatoire. By E. Schrödinger. Paris, Alcan, 1933. xxvi+234 pp.

An English translation of Schrödinger's collected papers on undulatory mechanics was reviewed in this Bulletin (vol. 35 (1929), p. 403). This French translation, by Al. Proca, has some additional notes, prepared by the author for this edition, and M. Brillouin contributes an interesting preface. A subject and author index has been added.

E. P. ADAMS

Darstellende Geometrie, Vierter Teil: *Freie und gebundene Perspektive, Photogrammetrie, kotierte Projektion.* By Robert Haussner and Wolfgang Haack. Berlin-Leipzig, Sammlung Göschen, 1933. 144 pp.

The fourth part of this treatise is written by Professor Haussner of the University of Jena and Dr. Haack, Privatdozent at the Technische Hochschule at Danzig-Langfuhr. Like other continental authors they use the rather superfluous terms free (freie) and restricted (gebundene) perspective. The first is made to differ from central projection, or perspective collineation, by adding auxiliaries as the distance-circle, so that from the projection it is possible to reconstruct the figure in space. The second is concerned with the construction of perspectives (artistic perspectives) from plan and elevation of the object.

The third section gives a short account of photogrammetry, the art of reconstructing a true topographical situation from several perspective views (photographs). The last part treats of contour-line representations as represented by topographical maps. In the fifth part we find some remarks on linear mapping, cyclography, etc. The booklet is well done and clearly written.

ARNOLD EMCH

Einleitung in die höhere Geometrie. By L. Bieberbach. Teubner's Mathematische Leitfäden, vol. 39. Leipzig, Teubner, 1933. iv+128 pp.

This introduction to higher geometry by Bieberbach, published as volume 39 of Teubner's well known expository texts, complements the author's preceding volumes on analytic and projective geometry, which latter I have reviewed earlier in this Bulletin. The general remarks which I have made there also apply to this volume.

The principal purpose of the author is to bring out the isomorphism between certain geometries in the spirit of Klein's famous Erlanger Programm which leads to Cayley's unique dictum: "all geometry is projective geometry."

In addition to a rather careful axiomatic development of projective geometry, the little treatise contains chapters on line-geometry, circle-geometry according to Möbius and Lie, projective metrics, non-euclidean geometry, etc.

It is thus seen that the contents form important parts of an introduction to higher geometry. They are very ably and rigorously presented.

ARNOLD EMCH