The idea seems to the reviewer not without interest. Unfortunately the present booklet leaves the reader in doubt as to how far a general theory has or can be developed. The author confines himself here to a popular exposition of the more elementary aspects of the problem for small values of n and p and gives numerous special examples of diversified rows, diversified rings, etc. For a more complete account of his investigations he refers to a series of seven articles published in the SITZUNGSBERICHTE DER WIENER AKADEMIE DER WISSENSCHAFTEN beginning in 1915. The author, who is apparently a psychologist, should not be confused with the mathematician Gerhard Kowalewski.

J. W. YOUNG

Lehrbuch der Analytischen Geometrie. Zweiter Band: *Geometrie im Bündel und im Raum.* By Lothar Heffter. Leipzig and Berlin, B. G. Teubner, 1923. xii + 423 pp.

The first volume of this text on analytic geometry appeared in 1905, with L. Heffter and C. Koehler as joint authors. (See this BULLETIN, vol. 13, pp. 247–249.) In the preface to the second volume, the author expresses regret that the original plan of the first volume was modified and suggests that the first twenty articles be supplemented by his pamphlet, *Die Grundlagen der Geometrie als Unterbau für die analytische Geometrie* (1921).* He also states that in the present volume he has been especially concerned in trying to clear up the ambiguity that is often associated with the word "metric".

This volume opens with the geometry of the totality of lines and planes through a point. This completes Part II, *Geometry of two dimensions,* which was begun in volume I. Geometry in space of three dimensions occupies the remaining five-sixths of the book. The first seven chapters (125 pages) deal with projective geometry. Projective point and plane coordinates in space, projective theorems concerning points and planes, and projective coordinates of the straight line in space precede the general and special projective properties of the surfaces of the second order and second class and polarity. "Affine" geometry is disposed of in four chapters (75 pages) before the treatment of "Aquiform" geometry (seven chapters, 144 pages). This includes the principal axes and principal planes of surfaces of the second order, focal properties of central surfaces of the second order and of the paraboloid, systems of these surfaces, and biquadratic space curves.

Groups of exercises are inserted at intervals throughout the book. There are some references and there is a good index. The many figures are well drawn, and the subject matter is clearly presented.

E. B. COWLEY

* See this BULLETIN, vol. 28, p. 224.