*Darstellende Geometrie.* By TH. SCHMID, associate professor
of geometry at the technical school of Vienna. (Sammlung
Schubert, LXV.) Berlin and Leipzig, G. J. Göschen, 1912.
vi + 279 pp., and 107 figures.

LIKE the other volumes in the Schubert series, this book
is written for beginners, and does not attempt to be an exhaus-
tive treatise. It begins with the ordinary double orthogonal
projection, but proceeds rather rapidly, so that only forty
pages are required for the usual presentation of rectilinear
figures. Considerable emphasis is laid on proportion, and the
criteria for determining which of two perspective objects hides
the other. A generous number of exercises is added at fre-
quent intervals. At the end of this first part is a good intro-
duction to the theory of shades and shadows, and its applica-
tion to polyhedra. The second and third chapters treat of
the sphere, cylinder, and cone; they comprise two thirds of
the volume. The discussion begins with polarity as applied
to the circle. Much of the text is divided into two columns,
one describing polarity, and the other antipolarity, the product
of polarity and a reflection. The first twenty pages are very
elementary, but the subject is so presented that problems of
considerable complexity are disposed of as easily as the simpler
ones. An elementary knowledge of plane analytic geometry
is presupposed, but most of the properties of conics that are
wanted later are established. In connection with the dis-
cussion of curvature use is made of the derivative, and in the
rectification of the ellipse a foot-note is provided which ex-
presses the length of arc as an elliptic integral. Mechanical
devices for drawing conics are described, and the theory of
each explained. A section on the illumination of the sphere is
delightful reading. Not only does it present the theory in a
clear and concise way, but enlivens it with a discussion of the
reasons for including the theory in the discussion; both prac-
tical and esthetic grounds are presented that are quite con-
vincing. Different degrees of illumination are expressed
quantitatively, and directions given for preparing washes to
procure them.

An unusual feature is the extent to which the developments
of various space curves on the cylinder and cone are discussed.
We meet the conchoid, cardioid, cissoid, serpentine, sine curve,
and a number of less well known plane curves as developed
from an algebraic intersection.