extensive, yet follows the same line as in the Italian text. The traditional treatment of surfaces of revolution follows the derivation of the general equation and of a number of characteristic properties, including illustrative examples of the ring surface.

The volume closes with a discussion of helicoids, each problem being introduced by a detailed analytic treatment.

No applications to shades and shadows or to other technical uses are made, the authors pointing out that such things would only act as a digression from the purpose of the book, which is to provide a theoretical development, suitable for teachers rather than for practitioners. A generous number of foot-notes give the origin of the important theorems and considerable other interesting information. A third volume is in preparation, which will give a systematic history of the development of the subject, and is to contain a detailed index of all three volumes.

VIRGIL SNYDER.

Vorlesungen über Differential- und Integral-Rechnung. Von EMANUEL CZUBER. Dritte, sorgfältig durchgesehene Auflage. I Band, xiv + 605 pp., II Band, x + 590 pp. 8vo. Leipzig, Teubner, 1912. 12 Mks. each.

IT is scarcely necessary to review these well known volumes at great length. Professor Czuber writes in a clear and convincing style and his treatment of the processes of the calculus and the applications is classic.

The second volume of the second edition was reviewed for the BULLETIN by the present writer, May, 1909 (volume 15, pages 392–395). No occasion has since arisen for changing the views there expressed.

The two volumes contain much more material than is ordinarily included in the elementary and advanced courses in the calculus as given in this country. The first volume contains an excellent basis for an elementary course in differential geometry and nearly one third of the second volume is devoted to differential equations and their applications.

The principal changes from the second edition may be briefly noticed. The first volume of the third edition contains a treatment of roulettes, focal lines, or caustic curves in the plane, and loxodromes on surfaces. These curves were not considered in the second edition. The first volume is also