I would not call this an elementary book and yet I believe it could profitably be placed in the hands of the young student of geometry very early in his career.

C. L. E. MOORE

Principes Géométriques d'Analyse. By Gaston Julia. Paris, Gauthier-Villars, 1930. vi+116 pp., 35 figures.

The present volume has for its purpose the development and explanation of those geometric concepts which are employed in connection with rational, and particularly linear, transformations of a complex variable z, and the consequent transformations of uniform and of multiform functions of z.

The first chapter is concerned with circles of convergence, and is then extended to infinite regions by means of spherical stereographic projection and circular inversion, with special reference to domains including invariant points. The second chapter contains a systematic geometry of the circle, including a number of interesting particular cases. To make the treatment uniform a number of pages are employed to interpret the results in terms of non-euclidean (hyperbolic) geometry. In the third chapter these ideas are applied to (l, m) correspondences. The treatment here seems to the reviewer rather too restricted; in the preceding discussion free use was made of projectivity, of fixed points—distinct or coincident—but in this one no corresponding use is made of the involutions, branch points, coincidences and neutral elements that play such an extensive role in algebraic geometry. It is true that the geometry of the circle furnishes only a limited interpretation of these ideas, but the extension to the projective field would add considerably to its interest without entailing any digression greater than that employed in the preceding chapter.

Applications of the principles already established are made to solve a large number of problems in mapping. Free use is made of the lemma of Schwartz, which the author states in the form: Given a function $f(z)$ holomorphic within the unit circle and vanishing at the origin and with modulus less than unity, then $|f(z)| \leqq |z|$. If for $|z| = 1$ the equality sign holds, then $f(z) = e^{i\theta}z$.

The last chapter is devoted to the theory of the modulus and to the mean, both linear and of order p, of moduli of analytic functions, extended to multiply connected regions. This part is to be further extended in a later volume.

VIRGIL SNYDER

Cours de Géométrie, Pure et Appliquée. By M. d'Ocagne. Paris, Gauthier-Villars, 1930. vi+429 pp., 180 figures.

This work is a printed revision of the author's earlier mimeographed course in two volumes, designed primarily for students of the technical schools of France. It is introduced by a very rapid review of projective geometry of one to three dimensions, mostly from the analytic standpoint. This is followed by some fifty pages on differential geometry of curves and surfaces; a large number of properties are derived, almost all from the standpoint of infinitesimals, as employed by Bertrand in his treatise, but with many proofs replaced by simpler and more direct ones supplied by the author or by students who have taken the course in recent years. This part contains the essence of the entire course. Although no differential equations are derived or employed, the characteristic features of lines of curvature, asymptotic lines, conjugate systems and geodesics are derived and applied to various surfaces, including a detailed study of developable and other ruled surfaces. A fairly full chapter on line geometry, both algebraic and differential, and one on the geometry of motion complete the part of the treatise concerned with pure geometry. References are frequent, but too many of them refer to alternate proofs provided by l'École Polytechnique, a large part of the original ones not being mentioned at all.

The second part includes the general theory of machines, a comprehensive treatment of roulettes and glissettes, general composition of motions and the general geometry of motion, with application to graphical kinematics, graphical statics, mechanical integration, description of various integrating machines and of the theory of graphical integration. This part, comprising about half of the volume, is well done; each step is explained in detail, with a discussion of mechanical limitations as well as of the geometric theory.

The book closes with a very condensed account of the theory of nomography, which is less successful. The author has attempted to reproduce the substance of his well known treatise on the subject in about forty pages.

For the general purpose of providing technical students with the theory and use of differential geometry in two and three dimensions, the book is a very valuable one.

VIRGIL SNYDER