exposition is remarkably clear and easy to follow, and illustrated by numerous and well-chosen numerical examples and exercises. Several topics, for instance the arithmetical reduction of bilinear forms, are presented here in a more lucid and accessible form than in any other work known to the reviewer.

T. H. GRONWALL.

Lecons sur la Théorie générale des Surfaces et les Applications géométriques du Calcul infinitésimal. Par GASTON DARBOUX. Première partie: *Généralités. Coordonnées curvilignes. Surfaces minima.* Deuxième édition, revue et augmentée. Paris, Gauthier-Villars, 1914. vii + 618 pp.

AFTER having been out of print for some time, the first volume of Darboux's classical treatise now appears in a second edition. Since the general features of this admirable work are undoubtedly familiar to the majority of the BULLETIN'S readers, it will be sufficient to mention, in this review, the new matter added in the second edition and taken mostly from Darboux's own papers in the *Bulletin des Sciences mathématiques* and the *Comptes rendus*.

In Book I, Chapters 5 and 6 deal with the kinematics of motions dependent on any number of parameters, and the integration of the corresponding total differential equations for the direction cosines. Chapter 7, dealing with the special case of two parameters, brings some new developments regarding the Plücker conoid. Chapter 10 gives a new solution, which is both elementary and elegant, of a problem first proposed and solved by Sophus Lie: to determine all surfaces which can be generated in more than one way by the translation of a rigid curve. It seems, however, to have escaped the notice of the distinguished author that a similar solution has been previously given by Scheffers ("Das Abelsche Theorem und das Liesche Theorem über Translationsflächen," *Acta Mathematica,* volume 28 (1904), pages 65–91).

In Book II, there has been added to Chapter 1 a study of a special conjugate system formed by plane curves, which leads to a class of surfaces applicable on quadric surfaces and discovered by Peterson. Chapter 4 contains an exposition of Gauss's method for the conformal representation of the terrestrial ellipsoid on a sphere, as well as a solution of a problem