Höhere Algebra. By Helmut Hasse. Volume 2: *Gleichungen höheren Grades.* (Sammlung Göschen.) Berlin, de Gruyter. 1927, 160 pp.

This second part of Hasse's algebra is still more interesting than the first. The contents are apparently the same as in most textbooks on higher algebra: the theory of general algebraic equations, Galois group theory, leading up to the condition for a solution by radicals.

This algebra is however no textbook in the common sense of the word, but a modern scientific review of the fundamentals of algebra, in particular the Galois fields, wherein the last traces of the theory of functions in algebra are eliminated.

The definition of the abstract rings and fields and the fundamental properties of them were already given in vol. I. A feature of the present volume is the introduction of the ideas of Steinitz developed in his famous paper *Algebraische Theorie der Körper* (Journal für Mathematik, vol. 137). Steinitz's classification of the abstract fields, fields of characteristic 0 and fields of characteristic p, is introduced: to the last class belong for instance all finite fields, and all fields having a finite subfield. All fields containing the rational field have the characteristic 0. By construction of successive adjunction fields a Galois field is obtained, and the main theorems on the connection between groups and equations are proved for all perfect (vollkommen) fields, that is, all fields with characteristic 0 and fieds with characteristic p having certain properties. l

It is difficult to give a satisfactory account of this excellent little book in a few lines, but it can be warmly recommended to *all* mathematicians interested in algebra.

OYSTEIN ORE

Compléments de Géométrie Moderne. By Charles Michel. Paris, Vuibert, 1926. 317 pp. Price (unbound) 35 frs.

The name *Modern Geometry* is used by different writers to cover a vast and varied body of doctrine, from, say, the Simson line and up to the Lie theory, or anything else. What may be meant by "compléments" is still less certain. The preface of the book might be expected to throw some light upon the vague and unassuming title, but the book has no preface. Thus reduced to use the publisher's announcement as a substitute, one soon becomes convinced that a more ambitious caption would come much nearer to be descriptive of the contents of the work. For the author presupposes on the part of the reader a familiarity with the more elementary projective properties of conics, quadrics, and algebraic curves and surfaces in general, with the use of imaginaries in geometry, etc. In other words, he expects his reader to have mastered the advanced parts of a French *Traité de Géométrie*, like Hadamard's, or Rouché et Comberousse's, and in addition a book like E. Duporcq's *Premiers Principes de Géométrie Moderne.*

With this much as a background the author treats pencils and nets of conics and quadrics, the cubic curve both in the plane and in space, Steiner's surfaces. The method of presentation throughout the book is almost exclusively synthetic, except for the first chapter, where the author