every polynomial ideal its "algebraische Mannigfaltigkeit" (AM), a term used here in a sense different from the customary. The AM of an ideal is to consist, namely, of its NG together with certain "infinitely near" loci. But the author does not go beyond a few suggestive remarks, and the main work on the idea remains to be carried out, if it can be at all.

The chapter on syzygy theory is an original contribution of Dr. Gröbner, and has appeared in the Monatshefte für Mathematik vol. 53 (1949) pp. 1–16. A part of this paper has been criticized by P. Dubreil in the Comptes Rendus, Académie des Sciences, Paris vol. 229 (1949) pp. 11–12, and the criticism applies also to some extent to the book. (Dubreil's and Gröbner's papers are reviewed in Mathematical Reviews vol. 11 (1950) p. 489.)

While illustrative examples are occasionally given in the footnotes, Dr. Gröbner could increase the usefulness of his textbook by including exercises and also further references to the literature.

A. SEIDENBERG

The variational principles of mechanics. By Cornelius Lanczos. (Mathematical Expositions, no. 4.) Toronto, University of Toronto Press, 1949. 25+307 pp. $5.75.

The most outstanding feature of this book is the enthusiastic style in which it is written. The enthusiasm is contagious to the extent that even the most iconoclastic reader can not but be intrigued by "Lagrange's ingenious idea" (on p. 39), by d'Alembert's stroke of genius (p. 88), by Gauss's "ingenious reinterpretation" thereof (p. 106), by the "amazing result" of Hamilton (p. 220), or by the biblical quotation at the head of the eighth Chapter: "Put off thy shoes from off thy feet, for the place whereon thou standest is holy ground."

The author gives on the whole an able exposition of the following topics: The Euler-Lagrange equations of the calculus of variations, d'Alembert's principle, the principle of least constraint, the Lagrangian equations of motion, principle of Hamilton, principle of least action, integration by ignoration of coordinates, the Legendre's transformation, the canonical equations of motion, integral invariants, canonical transformations, the brackets of Lagrange and Poisson, infinitesimal canonical transformations, the partial differential equation of Hamilton and Jacobi, solution by separation of variables, Delaunay's treatment of separable periodic systems, the significance of all this material in the development of both the older and more recent quantum mechanics.

In addition to the final chapter devoted to a brief historical survey,