grossly inadequate. Since the book is not a unified treatment of just a few topics it is, however, difficult to do otherwise in a reasonable compass. To sum up, this is a superb book, and a delight to read. The gathering together of so much material in so brilliant a manner represents a prodigious amount of labor for which the mathematical public is greatly indebted. The reviewer congratulates the author; he has set a lofty standard for would-be writers of similar books to attain.

J. Wolfowitz

Theoretische Mechanik. Eine einheitliche Einführung in die gesamte Mechanik. By G. Hamel. (Die Grundlehren der mathematischen Wissenschaften, vol. 57.) Berlin, Springer, 1949. 16+796 pp. 161 figs.

In writing this book, the author had the following aims: to give a unified treatment avoiding the usual separation into mechanics of particles and mechanics of continua, and, following Lagrange, to present a deductive treatment based on the principle of virtual work, d'Alembert's principle, and Lagrange's "liberation principle" (Befreiungsprinzip). According to the author, Lagrange has used this last principle consistently even though he never formulated it explicitly. The author states this principle as follows: "if a constraint imposed on a mechanical system is relaxed, the corresponding reaction becomes an applied force which depends primarily on the deformation previously prevented by the constraint." For example, in the transition from an incompressible to a compressible perfect fluid, the Lagrangian multiplier of the condition of incompressibility becomes the pressure and this depends on the density variations which were originally excluded by the condition of incompressibility.

In this reviewer's opinion, the author has been entirely successful in carrying out his intentions. It goes almost without saying, that the resulting treatise is not suitable for beginners in spite of the fact that the subject is developed from first principles. In fact, the author's remark concerning Hertz' *Mechanics* ("geistreich, aber schwer zu lesen") applies equally well to his own book which is also rich in ideas but hard to read. To the reader who has already achieved mastery of the field along conventional lines, however, the work will open new horizons.

An unusual feature for a book written at this level is an extensive collection of Problems and Solutions (pp. 527–789).

The space available for this review does not permit detailed comments on the contents; the following list of chapter headings (with particularly significant section headings added in parentheses) will have to suffice. The concept of force and Newton's law (with an appendix on special relativity theory). Statics of constraint systems with a finite number of degrees of freedom (Lagrange's liberation principle). Statics of systems with infinitely many degrees of freedom (Theory of thin shells and plates. Foundations of the theory of elasticity. Viscous fluids and gases). Basic principles of kinetics (Vortex theorems of Lagrange and Helmholtz). Holonomic systems of a finite number of degrees of freedom—Lagrange's equations (Dirichlet's theorem on stability). Mathematical elaboration (Canonical equations. Canonical transformations). Minimum principles (Minimum principles of elasticity). The rigid body in space. Nonholonomic systems of a finite number of degrees of freedom.

W. PRAGER

Algebraic curves. By R. J. Walker. Princeton University Press, 1950. 10+201 pp. $4.00.

Modern algebraic geometry is one of the very active fields of mathematical research and there is a genuine need for a textbook on the elements of the subject. Up to now there have been available in English only sets of lecture notes, which while the work of the leaders in the field, themselves testify to the need for a more formal and elaborate publication. The volume under view is clearly an attempt to meet this need, and while this reviewer does not believe that it is wholly satisfactory, the book is a considerable contribution to the problem.

The first two chapters of the book are devoted to algebraic and geometric preliminaries. It is in the third chapter that the author begins the study of his subject matter, algebraic curves over an algebraically closed field of characteristic zero, starting with a discussion of multiple points of such curves. A weak form of Bezout's theorem is derived and used to relate the order of a curve with the multiplicities of its singular points. The chapter also contains a proof of the theorem on reduction of singularities, followed by a sketchy treatment of neighboring points. The first part of chapter four is devoted to formal power series, leading to the notion of a place of a curve. The basic algebraic result here, the algebraic closure of a certain fractional power series field, is handled in great detail. This material is then applied to a formulation and proof of Bezout's theorem and to the derivation of some of Plücker's formulas. The chapter ends with a proof of a simple case of Nöther's $AF+BG$ theorem. Chapter five opens with more algebraic material, this time on ideals and field extensions. The field of rational functions on a curve is discussed and used to obtain satisfactory formulations of