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

the concepts of rational and birational correspondences. Lüroth's theorem and the remaining Plücker formulas are then derived. Finally valuations are defined and their connection with places is established. The last chapter is given over to linear series, applying them first to obtain a nonsingular birational transform of an irreducible curve. Study of the canonical series then leads to the genus of a curve and to the Riemann-Roch theorem. Two further topics bring the book to a close: partial classification of curves under birational equivalence leading to appropriate canonical forms, and treatment of the nonsingular cubic including Salmon's theorem on the cross-ratio.

A great deal of the book is given over to purely algebraic topics, making possible an exposition of the theory of curves which is completely rigorous. Indeed many of the curve-theoretic proofs are valid for the more general situations to which the reader might progress in his further study. On the other hand the exposition of the algebra makes no such provision for the reader's education. It is so extremely concise and so thoroughly tailored to the special purposes of the book that this reviewer believes its study to be a most uneconomical use of the reader's time.

The quantity of out and out algebraic geometry is relatively small, by comparison with older treatises, but its quality is very high. A question might be raised on the propriety of having the resolution of singularities take place before the student has studied parametrizations, for without them the proof is unnecessarily hard and the achievement of only ordinary singularities is not easily appreciated. With a few such exceptions the individual topics which are treated are treated well. Nevertheless, the total impact of the book is disappointing. The book might be very illuminating as a companion volume to one of the older works, but the beginner in the subject is not likely to benefit from it. He is given no awareness of the rich body of knowledge to which it relates, and, although he is told from time to time that a certain item is important, he sees no systematic working out of a basic problem which could independently justify his activity.

HOWARD LEVI

Weltsystem, Weltäther und die Relativitätstheorie. By Karl Jellinek. Basel, Wepf, 1949. 15+450 pp. 45 Swiss fr.

The subtitle of this book on special and general relativity and on relativistic cosmology reads: *An introduction for the experimental natural scientist.*

The author's approach to the subject is often laborious, and there