

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