

ferential equations we find use made of some of the important ideas of the Lie theory of continuous transformation groups and an application of these notions to obtain an important result in the special theory of relativity. In the section on probability theory we find discussed certain central topics in the mathematical theory of statistics, such as frequency distributions and correlation theory.

The book is thus seen to be thoroughly modern in the best sense of that sometimes abused term. The great variety of mathematical methods that are used in various theoretical discussions in the physical sciences, and the constant shift in emphasis resulting from the rapid development of the present century in the field of physical theory makes it no light task to select from the wealth of material available the topics that are of first importance, and to give to each its proper share of attention. Hadamard has accomplished this difficult undertaking in admirable fashion. If one wished to prescribe an ideal mathematical training for a future physicist who had already in his possession the fundamentals of calculus, I do not know of any better course of study to advise than the mastery of the two volumes of this *Cours d'Analyse*.

For those familiar with other writings of Hadamard it is perhaps needless to add that from the standpoint of exposition the work lives up to the best traditions of the long series of French works appearing under the titles *Traité d'Analyse* or *Cours d'Analyse*. One cannot say more in the way of recommending a book as a path to the mastery of new domains of mathematical theory. The conscientious student of the present work will find that he has not wasted his time in overcoming unnecessary difficulties, or used it to little advantage in the study of topics of minor importance. One might alter some of the details of the book without disadvantage; but, given the aim of the writer, it is difficult to see how the general plan of the work could be appreciably improved

C. N. MOORE

Einführung in die Theorie der zähen Flüssigkeiten. By Wilhelm Müller. Leipzig, Akademische Verlagsgesellschaft, 1932. 367 pp.

Owing largely to the work of Prandtl, Oseen, and Zeilon the motion of a viscous fluid is now being studied by approximate methods of solution which require a type of mathematics quite different from that used in the classical theory. The student of hydrodynamics is faced, then, with a situation like that which has arisen in the study of radiation owing to the growth of the quantum theory, and so should welcome this scholarly, abundantly illustrated book in which the author shows a mastery of the many ramifications of his subject.

The potential problems arising in Oseen's theory of the wake are particularly interesting, and a noteworthy inference from the analysis is that the lift of Joukowski's theory is to be supplemented by a force whose lift and drag components can both be calculated by means of integrals, over the cross-section of the wake, of expressions depending on the wake-function $X(y)$, whose gradient in a transverse direction is a measure of the vorticity. The book closes with a discussion of the stability of a steady motion of a viscous fluid and some general remarks relating to turbulence.

H. BATEMAN