logarithmic, trigonometric, and hyperbolic functions, one which incidentally robs Euler's formula, $e^{i\theta} = \cos\theta + i\sin\theta$, of its mystery.

Finally, the book is in the form of lectures. Somewhat informal, it is all the more vigorous and interesting. We hear Klein as he addresses his class, explains a drawing or a model, or hands them an early book for examination; we feel the inspiration that comes from listening to a great teacher.

The paper, printing, and binding are of high quality. The reader will notice a number of minor typographical errors, but they are largely misspellings of words that do not cause any inconvenience.

This book is familiar to many already in the original, and this review is written in the hope of introducing it to a still wider circle of readers among our students and teachers of high school and college mathematics. Our thanks are due to Professors Hedrick and Noble, who have rendered a service to mathematics by making this valuable book accessible to all who speak English.

G. B. PRICE

L'Hydrodynamique et la Théorie Cinétique des Gaz. By Y. Rocard. Paris, Gauthier-Villars, 1932. 160 pp.

The fluid of hydrodynamics is a continuum, while the kinetic theory views a fluid as formed of discrete molecules. Maxwell, Boltzmann, and Lorentz laid the foundation for bringing these two different methods of approach into harmony, and, more recently, their work has been carried on by Brillouin, Chapman, Enskog, and others. The two principal problems are to obtain the equations of hydrodynamics for real fluids from the kinetic theory, and to calculate the coefficient of viscosity by considering the molecular encounters.

The author has made important contributions to this subject himself, and has performed a very useful service in collecting into a single volume the results of all these investigations. This book is based upon lectures by the author in 1929 and upon a memoir published in the Annales de Physique in 1927.

E. P. ADAMS

Caractéristiques des Systèmes Différentiels et Propagation des Ondes. By Tullio Levi-Civita. Leçons rédigées par G. Lampariello. Traduction de l'italien par M. Brelot. Paris, Librairie Félix Alcan, 1932. x+114 pp.

In 1930 Professor Levi-Civita published two papers on the characteristics and bicharacteristics of Einstein's gravitational equations, and it was probably during the preparation of these papers that he realized the need of a clear and concise account of the theory of characteristics such as is given in his little book in the Italian language which was reviewed in this Bulletin of May, 1932.

Judging from the papers of Racah and Lampariello, Levi-Civita's work has been very stimulating to Italian mathematicians and so it is good news to find that his lucid and timely exposition has been made available to a greater number of readers by M. Brelot's excellent translation.

The use of large print for names of authors, heavy type for vectors, and a familar notation, all make the book very readable.

H. BATEMAN