ferential equations and membrane and conducting sheet analogies.

The book begins with chapters on mechanical and electrical computing elements which are followed by a description of machines for simultaneous linear algebraic equations and a chapter on nonlinear equation solvers, harmonic analyzers, and the conduction sheet analogy for the complex plane. The mechanical and electrical differential analyzers are each treated in a chapter. The concluding chapters develop the analogies between dynamical and electrical systems, the analogies on which the finite difference solutions of partial differential equations are based, and the above mentioned analogies for the membrane and conducting sheets.

As an engineering text book this appears to be excellent. The derivations are specific to the application and at the mathematical level associated with college elective courses on differential equations. This book would also be a good introduction to analogies for the mathematician interested in the myriad mathematical problems associated with this field.

FRANCIS J. MURRAY

The kinematics of vorticity. By C. Truesdell. Bloomington, Indiana University Press, 1954. 20+232 pp. $6.00.

This is a work packed with theorems of a general type concerning the vorticity of a fluid. The author uses freely the classical theory of vectors in three dimensions, the theory of dyadics and, to some extent, the tensor calculus. After various geometrical preliminaries, and the definitions of velocity, acceleration, expansion, deformation, etc., of a fluid motion, the vorticity is defined and its various interpretations are given. The vorticity field and the notions of vortex lines and tubes are next discussed, with their bearing on circulation. The measure of vorticity is given a chapter to itself and this is followed by one on vorticity averages. Bernoullian theorems are then investigated, by which are meant formulae for the squared speed of the fluid and the scalar potential of the flow. The two final chapters deal with the convection and diffusion of vorticity and with circulation-preserving motions.

I have attempted to estimate the number of theorems contained in the book and have concluded that there is probably an average of two per page, making a total of perhaps 400. Though they are expressed in the terminology of hydrodynamics, they are essentially theorems in pure mathematics, expressing relations between vectors and their integrals over volumes and surfaces. That the vectors are called velocity, acceleration, vorticity, etc., is not an essential feature