the group theoretical properties of the system under consideration. Although workers have usually proceeded quite successfully by intuitive methods, it adds much to one's understanding to see these connections. As Birkhoff is careful to point out, very little is known theoretically, except in special cases, about the stability of solutions obtained in this way, and for this reason, it is not always true that the solution observed in experiment has the same symmetry properties as the problem itself.

The last chapter, on virtual mass and groups, deals with a subject that has some practical application but is of much more interest because of the conceptual relations involved. These relations are of such generality that they are likely to have application to wider fields than the subject dealt with, and the author quite properly stresses their generality and abstractness by appeal to the Lie theory of continuous groups, the Lagrangean formulation of the equations of motion involved, etc. If a rigid body is moved in accelerated motion, of translation or rotation or both, through an ideal, incompressible, nonviscous fluid, forces must be exerted on the body, in addition to those necessary to accelerate the body itself, to set the fluid in motion. The simplest case is the familiar one of the induced mass of a sphere moving through water, but, in general, translational acceleration may result in sideways forces or a torque, and conversely. Paradoxically enough, a ship's propeller is *not* a case in point, because if the fluid really moved as an ideal one (irrotationally), rotation of the propeller would not produce either thrust or torque! The induced mass and other coefficients in the expression of the total kinetic energy as a quadratic form in the generalized velocities, constitute, in general, a tensor or matrix of thirty-six elements, and the general properties of the resulting equations of motion are studied in detail. In spite of the abstractness (at one point the author finds himself discussing the motion of fluids in non-Euclidean spaces!), there are applications to such problems as the initial upward acceleration of a gas filled balloon, the small-bubble method of photographing velocity fields in liquids, and wing-flutter.

In summary, this book, though it would not serve as a text or reference book in the ordinary sense, gives the study of hydrodynamics a stimulating and vital quality that the reviewer has not seen elsewhere, and it would seem likely that studies of this sort might have much more bearing on the ultimate progress of the science than the conventional treatise.

R. D. Richtmyer

## Briefly Noted

**Proceedings of the First National Pollution Symposium.** 149 pp. Stanford Research Institute, 1950. $2.50.

**Proceedings of the Second Annual Northern California Research Conference.** 66 pp. Stanford Research Institute, 1950. $2.00.

The National Pollution Symposium, held in November, 1949 at Pasadena, California, was sponsored by Stanford Research Institute in cooperation with the California Institute of Technology, the University of California, and the University of Southern California. The second North California Research Conference was held in San Francisco January 1950 and was sponsored by SRI in cooperation with San Francisco Chamber of Commerce, the University of California, and Stanford University. A limited supply of both sets of proceedings is available upon request to the Public Relations Office, Stanford Research Institute, Stanford, California.

**American FIAT Review of German Science.** 88 Volumes. 22,000 pp. Office of Technical Services, U. S. Departpartment of Commerce, Washington, D. C., 1950.

A compendium of German achievements in physics, biology, chemistry, mathematics, medicine, and the earth sciences started at the war's end has now been completely translated into English for the American researcher. Supplementing the information contained in the FIAT volumes is a collection of some 50,000 "PB" reports in the German technological collection of the Office of Technical Services. A free catalog describing the titles covered is available from the Office of Technical Services and interested persons may place their names on the waiting list for loan copies of individual titles.

**A Survey Report on Basic Problems of Underwater Acoustics Research.** 137 pp. National Research Council, Washington 25, D. C. 1950.

The Panel on Underwater Acoustics of the NRC Committee on Undersea Warfare prepared this report surveying the present status of research and suggesting further work still required in the field. The six chapters of the report consider the generation and reception of underwater sound, including transducer types; standards and calibration methods for measurements; ambient noise, soniferous marine life, and noise from ships; transmission and scattering of underwater sound; fluctuations in underwater sound; and the recognition of underwater sounds. The report is available without charge from the NRC Publications Office.

## Books Received

Survey of Modern Electronics. By Paul G. Andres. 522 pp. John Wiley & Sons, Inc., New York, 1950. $5.75.

Dirichlet's Principle, Conformal Mapping, and Minimal Surfaces. Pure and Applied Mathematics Series, Vol. III. By R. Courant. 330 pp. Interscience Publishers, Inc., New York, 1950. $4.50.

Electricity for Students of Science and Engineering. By T. Townsend Smith. 410 pp. International Textbook Co., Scranton, Pa., 1949.

Wave Motion and Sound. By R. W. B. Stephens and A. E. Bate. 448 pp. Edward Arnold & Co., London, 1950. $9.00.

Tv Installation Techniques. By Samuel L. Marshall. 330 pp. John F. Rider, Inc., New York, 1950. $3.60.

Security, Loyalty, and Science. By Walter Gellhorn. 300 pp. Cornell University Press, Ithaca, N. Y., 1950. $3.00.

Response of Physical Systems. By John D. Trimmer. 268 pp. John Wiley & Sons, Inc., New York, 1950. $5.00.

Chemical Thermodynamics. By Frederick D. Rossini. 514 pp. John Wiley & Sons, Inc., New York, 1950. $6.00.

Heat Insulation. By Gordon B. Wilkes. 224 pp. John Wiley & Sons, Inc., New York, 1950. $4.00.

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**Correction:** The publishers of Physics, by G. Shortley and D. Williams, Prentice-Hall, Inc., New York, 1950 (noted in the Books Received section of *Physics Today* for December, 1950), have informed us that they erroneously quoted the trade prices of $6.00 and $7.35 for volumes I and II respectively of this work. The cost for college people is $4.50 and $5.00 instead of the higher book store prices.