

psychologists, Dr. Taton nevertheless manages to make it quietly clear that such investigations must needs be conducted by the methods commonly employed in the physical sciences, and that all generalizations and schematizations, derived from no matter what brilliant flights of intuition, had best be avoided unless they are solidly based on factual data.

Naval Hydrodynamics: Symp. Proceedings (Washington, D.C., Sept. 1956). Edited by F. S. Sherman. 444 pp. NAS-NRC Publication 515. Nat'l Academy of Sciences-Nat'l Research Council, Washington, D.C., 1957. \$5.00. *Reviewed by R. E. Street, University of Washington.*

These proceedings present in book form a broad survey of the problems in hydrodynamics which are of interest to the US Navy. The authors are well-known and outstanding research scientists in fluid dynamics, oceanography, and ship design. It seems worthwhile to list the titles and authors of the papers, since some of them should be of considerable interest to anyone whose work is at all concerned with the problems of fluid flow. Each paper is followed by a sometimes extended discussion which contributes to the value of the paper.

The first paper is a review by Milne-Thomson of some problems and methods in hydrodynamics. It is mathematical in nature and requires a knowledge of the papers reviewed, as well as his *Theoretical Hydrodynamics*, for a complete understanding. Quite a bit of the review is concerned with free surfaces in liquids. This is followed by a similar review by Lighthill of some of the problems in the theory of river waves.

The third paper is an experimental-theoretical analysis of the ocean wave spectrum off the coast of La Jolla by Munk, Tucker, and Snodgrass. It is followed by Weinblum's discussion of the contribution of ship theory to the seaworthiness problem and Wehausen's mathematical survey of wave resistance of thin ships. The next paper by Niedermair on hydrodynamic barriers in ship design reiterates the necessity for the empirical approach to ship design.

In the seventh paper Lerbs discusses the problem of the theory of marine propulsion. The next one by Parkinson is on the hydrodynamics of high-speed water-based aircraft. Following are reviews of recent work on the problems of water entry by projectiles by Cox and Maccoll, the sources of underwater sound by Fitzpatrick and Strasberg, free streamline theory and steady-state cavitation by Gilbarg, physical effects in cavitation and boiling by Plesset, and of the hydrodynamics of underwater explosions by Snay.

The last three papers are on the problem of turbulence in fluid dynamics in general. One by Lin is on the stability of the laminar boundary layer, the second by Corrsin covers some current problems in turbulent shear flows, and in the last one Batchelor presents an approach to the problem of the scattering of sound in a turbulent medium.

Theoretical Astrophysics. Edited by V. A. Ambartsumyan. Translated from Russian by J. B. Sykes. 645 pp. Pergamon Press, London & New York, 1958. \$22.50. *Reviewed by Cecilia Payne-Gaposchkin, Harvard College Observatory.*

A systematic treatment of astrophysical theory, intended for advanced students and research scientists, first published in 1952, has now appeared in an excellent English translation. As the only advanced book of this scope available in English, it will be of the greatest value.

Mustel contributes a thorough, standard treatment of the theory of stellar spectra and of the solar envelope. Sobolev's discussion of the theory of bright-line objects is of especial interest because it embodies his original approach to many problems, and accordingly differs from the standard discussions. Severnyi's treatment of stellar structure seems brief in view of the current importance of the subject, and, regrettably, does not discuss applications to the problems of stellar evolution with which so many theoretical astrophysicists are currently concerned. Ambartsumyan contributes chapters on scattering in planetary atmospheres and on interstellar matter.

The scope of theoretical astrophysics is emphasized by a comparison with Unsöld's 850-page *Physik der Sternatmosphären*, unfortunately not available in English translation. Unsöld treats only the outer layers of stars, presenting theory and extensive practical applications; the book under review also includes stellar interiors, interstellar matter, and planetary atmospheres. Its treatment is understandably less complete, and in particular we miss the discussion of the interplay of theory and observation. The two books can profitably be studied side by side in areas where they overlap and illustrate the current divergences of viewpoint between Soviet and Western scientists. The Russian volume contains useful references to recent Soviet work on astrophysics. However, its ten-page bibliography is far less exhaustive than the 50-page bibliography of the Unsöld volume, especially in view of the greater scope of the Russian work.

The excellent format and typography are typical of the productions of the Pergamon Press.

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ADVANCED MECHANICS OF FLUIDS. Edited by Hunter Rouse. 444 pp. John Wiley & Sons, Inc., New York, 1959. \$9.75.

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