feel that the authors have shown good judgment in delimiting their bibliography.

The standard of excellence and usefulness of this book by three capable authors is such that the book will be a valuable adjunct to libraries and to the research equipment of those who work with *OP*. It is appropriate that the book should be used as a model for future bibliographies in other subjects.

RALPH P. AGNEW

Theoretical Hydrodynamics. By L. M. Milne-Thomson. London, Macmillan, 1938. 552 pp. $11.25.

A very comprehensive mathematical treatment of the theory of fluid motion is contained in this text, which presents the lectures by the well known author on this subject to the junior members of the Royal Corps of Naval Constructors at Greenwich. The material presented consists mainly of the theory of the perfect fluid motion, for the first time based consistently on vector notation throughout the text, which thus becomes very concise and brief in the details of mathematical deduction. The great advantages of this form of mathematical writing for this field are obvious to anyone who surveys the wealth of material given in this text. In justice to the author not all the saving in space should be attributed to the use of vector notation; however, instead a considerable amount can be ascribed to the experienced and able use of the descriptive text which is brief but complete in all details. However, the physical interpretations given seem to be treated somewhat too briefly for engineers, and experimental and practical applications are outside of the scope of this theoretical treatment.

A brief review of the contents will bring out the structure of the book. Chapter I contains elementary problems of great variety based on Daniel Bernoulli's theorem. The mathematical tools are introduced in Chapter II on vector analysis, which is followed by the discussion of general properties of fluid motion and such phases of two-dimensional flow as can be treated without recourse to the complex variable. Chapter V introduces the latter and opens up the main part of the book, Chapters VI–XIV, dealing comprehensively with two-dimensional motion in all its aspects from the standpoint of the complex variable and conformal mapping. In addition to the chapter headings of streaming motion, aerofoils, sources and sinks, moving cylinders, theorem of Schwarz and Christoffel, the wake, rectilinear vortices, we find also jets and currents and waves treated extensively in this part. The succeeding four chapters are taken up with three-dimensional phenomena and related mathematical problems under the headings of Stokes' stream function, spheres and ellipsoids, solid moving through a liquid, vortex motion. The last chapter is devoted to the introduction of the equations of motion for viscous fluids and concludes with a brief description of boundary layer theory.

While this book can be recommended as a text in classical hydrodynamics for advanced graduate student engineers, it will take a more important place as a reference work and as a source of many original approaches in the manner of presentation for those teaching the subject. The over five hundred exercises ranging from easy to very difficult should prove very interesting since many were taken from the official examinations for Constructor Lieutenants at the Naval College and for the degree of M. Sc. at the University of London.

A. T. Ippen

Convergence and Uniformity in Topology. By J. W. Tukey. Annals of Mathematics Studies, no. 2. Princeton, University Press, 1940. 9+90 pp. $1.50.

The extension of metric methods to non-metrizable topological spaces has been a principal development in topology of the past few years. This has occurred in two directions: one through a rebirth of interest in Moore-Smith convergence due to results of Garrett Birkhoff, and the other through the concept of uniform structure due to André Weil. In this pamphlet these ideas and their interrelations are given a full and detailed treatment. Many of the results are new. This is likewise true of the point of view and much of the mechanism.

Chapters I and II are concerned with set theory, partially ordered sets, Zorn's lemma, and directed sets. In particular a *stack* (=the set of finite subsets of a given set, ordered by inclusion) is a directed set. Directed sets are classified into cofinally equivalent types, and these are found to be partially ordered. Chapter III introduces the *phalanx* (a function from a stack to a topological space T). It is proved that the topology of T is describable by the convergence of its phalanxes. Chapter IV considers compactness and equivalent properties in terms of phalanxes. The *biggest* compactification of a space is defined and constructed from ultraphalanxes. Chapter V is concerned with coverings of a space (by open sets), and the equivalence of the existence of families of coverings to the existence of metrics and pseudo-metrics. This leads naturally to the notion of *uniform structure* (Chapter VI). A uniform structure is a family $\{U\}$