fessor Judd's book offers a welcome balance of careful mathematics and suggestions for practical applications; it should serve for several years as a useful nucleus of an introduction to the interpretation of the experimentally accessible and frequently, clearly delineated spectra of lanthanides and actinides in ionic crystals.

**Encyclopedia of Physics, Volume VIII/2, Fluid Dynamics II.** S. Flügge and C. Truesdell, eds. 696 pp. Springer-Verlag, Berlin, 1963. DM 198.
*Reviewed by Jacques Romain, Centre de Recherches Routières, Brussels, Belgium.*

As would be expected in this collection, the volume under review is made of careful review articles by experts in their respective fields. This is the second volume devoted to fluid dynamics. In view of the quality of the contributions and of the presentation, it is well worthy of Flügge's *Handbuch*.

The first half of the book consists of a thorough and extensive review by R. Berker (in French) of the integration of the equations of motion of an incompressible viscous fluid. The author gives a systematic presentation and analysis of the exact and approximate solutions of the Navier-Stokes equations and of the simplified Stokes or Oseen equations, which are dispersed in the literature. This work is more oriented toward applications than Ladyzhenskaya's book recently reviewed in this journal.

A shorter German paper by J. Weissinger synthesizes the essentials of wing theory in the case of stationary motion in a frictionless incompressible medium.

The remainder of the book is written in English. Two papers deal with turbulent flow. One, by C. C. Lin and W. H. Reid, is a mathematical exposition of the statistical theory of turbulent flow, with the emphasis on the basic concepts and relations and on the so-called homogeneous turbulence. The second turbulent flow paper, by S. Corrsin, is concerned with a description of experimental methods and their limitations, including the generation of some "classical" turbulent flows; experimental details are omitted.

S. A. Schaaf deals with the mechanics of rarefied gases (low density, perfect gas effects) with the emphasis on problems of aerodynamic interest.

Finally, A. E. Scheidegger writes a paper (largely based on his recent book) on hydrodynamics in porous media, another field in which pieces of information are widely scattered. The article presents the general features of flow and hydrostatics in porous media and discusses the theories produced to fit the experimental facts and their limitations.

The bibliographical references are abundant. Most of the articles appear to be up to date as of 1960, which is the probable actual date of completion of the manuscripts. The reviewer has not been able to determine the motivation of the editors in providing a bilingual English-German subject index for the English and German contributions, and a separate French index for the first article.

**Advanced Computer Programming.** A Case Study of a Classroom Assembly Program. By F. J. Corbató, J. W. Poduska, J. H. Saltzer. 170 pp. M. I. T. Press, Cambridge, Mass., 1963. $5.00.
*Reviewed by William Siler, Memorial Hospital.*

The remarkable infiltration of computers into the universities and laboratories has brought about an increasingly sophisticated attitude towards them on the part of scientists. Now that these electronic beasts are readily available, the problem of communicating with them is now almost as well known as the problem of communicating with Martians. Familiarity with the algebraic compiler languages such as Fortran, Algol, and Mad has become sufficiently widespread so that the deficiencies of these languages as well as their power are becoming known to more than a few. In consequence, development of new languages has become almost a parlor sport among the cognoscenti. For those cases in which existing languages are unsatisfactory and the development of a new language to solve a particular class of problems must be seriously considered, a working knowledge is needed of the inner mechanisms of compilers and assembly routines, the translators which convert a problem-oriented source language into the machine language of the computer itself. For those who expect to become involved in the creation or modification of a computer language, *Advanced Computer Programming: A Case Study of a Classroom Assembly Program* will serve as a more than adequate introduction. The official title, "Advanced Computer Programming", is a bit misleading; the reader who expects to find a general text on an advanced level will indeed be disappointed. The subtitle, "A Case Study of A Classroom Assembly Program", is highly accurate. The book contains 45 pages of text in which are explained in tightly written but comprehensible form the main features of an assembly program developed for use in formal courses at MIT using the IBM 7090 computer. For the teacher who wishes to use the book as a text, Appendix A gives in 120 pages a complete listing in FAP and machine language of the complete assembly program, an assembly output and a sample CAP language program, as well as a number of FAP assembly listings of "Programs to Allow Use of CAP in the Laboratory". Finally, there is an appendix with a number of suggested modifications to CAP for use as student problems.

The material is tied somewhat too closely to the particular system described, and an additional ten pages or so of text orienting the reader would have been valuable. Nevertheless, the reader seriously interested in compilers but with little or no experience will find the book very helpful. All others beware!

**The Solar Corona.** John W. Evans, ed. Internat'l Astronomical Union Symp. Proc. (Cloudcroft, N.M., Aug. 1961). 344 pp. Academic, New York, 1963. $14.00.
*Reviewed by E. J. Öpik, Armagh Observatory and University of Maryland.*

The corona accounts for only $10^{-15}$ of the sun's mass; yet, being the sun's external frontier, it controls corpuscular, short-wave ultraviolet, and x-ray radiations which permeate interplanetary space and play a decisive part in the physics of planetary ionospheres and in the phenomena of comet tails. The interplanetary gas is but an extension of the corona, blown away steadily or in gusts of the "solar