sents for the advanced reader a valuable history of the slow and painful development of modern concepts. However, it may be argued that this treatment, together with the choice of subject matter, presentation, and experimental examples, may at times misguide rather than enlighten the elementary reader with limited background.

The difference between the contents of this edition and those of the first (1949) edition lies principally in the considerable rearrangement of the subject matter and new work with which the author has been connected, for example, the "teapot effect", and normal stress phenomena in liquids and in air. Much of this work is still controversial. Nevertheless, the volume represents the sole attempt by a competent rheologist to present in extenso the fundamental concepts of rheology for an audience of limited mathematical and mechanical background. In spite of these drawbacks and reservations the present work should be of value to such an audience wishing to obtain a first look into the field of modern scientific rheology.

Paramagnetic Resonance in Solids. By William Low. Suppl. 2 of Solid State Physics: Advances in Research and Applications, edited by Frederick Seitz and David Turnbull. 212 pp. Academic Press Inc., New York, 1960. $7.50. *Reviewed by Mendel Sachs, Lockheed Missiles and Space Division.*

THE study of solids, by means of the paramagnetic resonance technique, has been a very fruitful one in providing an extremely accurate determination of many of the macroscopic properties of materials which are (even slightly) paramagnetic. This field of research, which has developed since World War II, has provided much information to complement the results of earlier experimental techniques (such as the low-temperature experiments) as well as much new information about paramagnetic solids. The quantity of work done in this field since 1946 has been enormous and Dr. Low is certainly correct in his remarks that it is time for a text to appear, designed primarily to discuss those basic principles which underlie the interpretation of all of these data. Such a text should collect, synthesize, and expand upon the development of the pertinent results which have appeared in the literature.

The book under review definitely fulfills part of this need. It provides an excellent survey of much of the important work which has appeared in the literature (with adequate references) and synthesizes the experimental observations with the theoretical results.

An outline of the theory of crystalline fields and a large cross section of corresponding data are followed by a review of the theory of relaxation times and line width, a short but lucid discussion of the action of the solid-state maser, a very brief summary of important work which has appeared in the literature on the subject of the paramagnetic resonance of color centers and defects in crystals, and finally an outline of the tools of this field of research, i.e., the various types of

paramagnetic resonance spectrometers. Included is a short discussion of the recently developed electron nuclear double resonance spectrometer. A convenient feature in the book is an index to the extensive list of compounds whose properties are discussed in the text.

On the other hand, the book does not, in this reviewer's opinion, expand sufficiently on the development of the basic principles. It outlines, rather than discusses more fully, pertinent theoretical work which appears in the literature. Many of the important formulas, tables of calculated coefficients, group theoretical predictions of energy level splittings, etc., are displayed without a sufficient discussion of their derivation. Such an outline of the theoretical work is indeed useful to those who are already involved in research work in this (or in a very closely allied) field, and who have a feeling for the background of the theory. However, the book does not provide sufficient insight into the basic principles for those who are interested in studying this field of research ab initio.

Similarity and Dimensional Methods in Mechanics. By L. I. Sedov. Translated from 4th Russian Ed. by Morris Friedman. Translation ed., Maurice Holt. 363 pp. Academic Press Inc., New York, 1959. $14.00. *Reviewed by R. E. Street, University of Washington.*

EXCEPT for a short discussion of Newton's second law and one or two simple examples, this is hardly a treatment of mechanics in the usual broad sense. Instead it is an excellent and thorough treatment of dimensional methods in fluid dynamics. While almost anyone who wishes to learn dimensional analysis and similarity methods could find the first chapter and parts of the second an introduction to this subject, which is intuitive, physical, and concise, a good preparation in fluid dynamics is pretty much a prerequisite to get the most out of the rest of this book. A knowledge of Landau and Lifshitz's *Fluid Mechanics,* for example, would be desirable.

After presenting the basic rules of dimensional analysis in the first chapter, the second chapter sets the tone of the remainder of the book by considering numerous classical problems of modeling and scaling which are well known in the hydrodynamics of a nonviscous, incompressible fluid. What is good about Sedov's approach to these examples is his acute physical reasoning in which he combines similarity methods with general physical assumptions and sufficient mathematical relations to lead to solutions ready for experimental confirmation. He points out errors and misunderstandings in the use of dimensional methods which have in the past led to paradoxes and confusion; in particular, Rayleigh's conclusions on heat emission from a body in fluid flow.

Chapter 3 also is in the same vein but is concerned with examples in the motion of viscous fluids, especially with the problem of isotropic turbulence where solutions are so difficult to find. The chapter is rather too brief and includes only the known simplest cases.