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.

Most of the references are to the older classical literature and no mention is made of the frequent use of similarity solutions of the compressible laminar boundary layer in almost all of the papers published in the last twenty years.

Up to this point we have had a good introduction to the classical methods. The remainder of the book, over one half, is devoted to the one-dimensional unsteady motion of an ideal gas and is based almost entirely upon the work of Sedov and his research group in Moscow.

Although dimensional and similarity methods still play a role, more space is devoted to finding mathematical solutions in closed form and their tabular and graphical presentation. Here we are presented with such problems as detonation, flame propagation, intense explosions, etc., for which Sedov and his school are justly famous. Although G. I. Taylor and others developed a similar theory of intense explosions during the war, Sedov published his first so we have only his version of the theory, although he gives Taylor's experimental check, the New Mexico atomic explosion of 1945. What is so interesting here is the success of theories based upon an ideal polytropic gas under conditions where we would assume real gas effects might be more significant than they apparently are. Finally in Chapter 5 these gas dynamical solutions are extended to the cosmological field to give models of stellar flare-ups and pulsations. This is only one approach to gas dynamical problems in astrophysics, restricted to unsteady one-dimensional motion of an ideal gas; other problems involving turbulence and magnetohydrodynamics have not apparently been subjects of investigation by Sedov or his students. Hence, no mention of them is made in this book.

This then is a most valuable book for fluid dynamicists who have not had the advantage of reading the original Russian version. It is not a textbook nor a treatise in the usual sense, but is really a collection of worked examples in various special fluid flows. In this wealth of examples is its value, and although there could be many more, we are glad to have these for the present.

Theory of Elementary Particles. By Paul Roman. 575 pp. (North-Holland, Amsterdam) Interscience Publishers, Inc., New York, 1960. $12.00. *Reviewed by M. E. Rose, Oak Ridge National Laboratory.*

THIS presentation of the theory of elementary particles is an extremely elegant and well-written account of the more formal aspects of theory. The reader will find in this volume a detailed and thorough treatment of modern developments insofar as these are based on symmetry concepts and related matters. The five main headings in this book are: The Four-Dimensional Orthogonal Group, Field Equations, The Quantization of Fields, Invariance Properties and Selection Rules (which make up almost 40 percent of the book) and Isobaric Space. These, however, constitute only a