of elasticity in three dimensions. It bears some resemblance (in its own field) to the expositions of electromagnetic theory by Smythe and Stratton, though it is somewhat more oriented towards research and reference than is a textbook. Many problems are discussed in the text, covering equilibrium, stress concentration, and deformation of infinite, semi-infinite, and finite media and of contact (punch), but no examples are set for the reader, though he should be able to find some for himself after completing those given in the text. The main features of the treatment include the systematic use of the two-dimensional Laplacian in an operational treatment of plane stratified problems, and the utilization of the so-called Papkovich-Neuber potentials (corresponding roughly to vector potentials) to enable the general form of solutions to be written down more systematically. Each chapter is followed by an interesting series of bibliographic and historical notes, though the author does not claim completeness either in the history or in the technical coverage. Nevertheless, this book should prove very useful to anyone needing a precise and careful approach to a problem of classical type, and the author has also indicated the first steps of a numerical approach.

Sedov's book, on the other hand, belongs to the third class cited above. It is a general and careful description of the underlying foundations of continuum mechanics. It covers somewhat similar ground to Prager's *Introduction to Mechanics of Continua* but the accent is on the bases of the theory, and on the construction of underlying models, and no specific examples are discussed or set. In accordance with such an approach, the book opens with an extensive and clear treatment of tensor analysis, including tensor functions and invariants, with a very neat introduction of the Christoffel symbols quite early. The exposition is done in such a way that the vectorial (dyadic) and tensor notations are continually displayed in parallel, making it easier for the reader to maintain familiarity with the physical background. A minor, but nevertheless annoying, defect is the use of the Russian letter э (eh) for unit basis vectors. Since the book was printed in the Netherlands (and attractively, at that) it seems pointless to introduce an unfamiliar symbol for such an important quantity.

This mathematical background is then applied to the kinematic and dynamic equations of the medium. This leads in a natural way to the discussion of thermodynamics of multicomponent systems, of equations of state, and of reactions and irreversibility. There is also a brief discussion of turbulence. These ideas are then brought to bear on the problem of constructing models of elastic bodies, including questions of thermoelasticity, dissipation, and plasticity. The relation between purely elastic and plastic behavior is carefully discussed (including the changes in the mathematical restrictions which apply), and various models examined in that light. There is a quite extensive (but not exhaustive) bibliography of typical references, of which fully two thirds is not of Russian origin.

Sedov's book should certainly be on the shelf of anyone who's interested in working seriously in applied mechanics.

Motion of Charged Particles in the Earth's Magnetic Field. By Joseph W. Chamberlain. 33 pp. Gordon and Breach, New York, 1964. Cloth $3.95; paper $1.95. *Reviewed by Charles S. Roberts, Bell Telephone Laboratories.*

Concisely packaged in the thirty-three pages of this small book is an illuminating basic treatment of the features of charged particle motion in a magnetic field which are of particular interest to space physics and geophysics. The subject is developed starting with the basic laws of classical mechanics, and although liberal use of mathematics is made throughout, the emphasis is upon a physical understanding of the basic equations rather than on mathematical elegance or rigor. The treatment is fairly self-contained, and most of the intermediate mathematical steps are shown in detail. The level of presentation is about that for a second or third year graduate student in physics, and the book should serve as a good introduction for a physicist who is just entering the field of space research. It should also serve as a useful reference

for more experienced workers in the field who want to review the mathematical treatment of concepts already familiar to them.

The book is one of a series termed *Documents on Modern Physics* published by Gordon and Breach. The material contained in this book, as well as several of the other selections in the series, was first presented at the 1962 session of the Les Houches Summer School of Theoretical Physics, University of Grenoble. The proceedings of that gathering, also published by Gordon and Breach under the title *Geophysics, the Earth's Environment*, contain the exact manuscripts now offered as individual books as well as some additional articles. One should consider purchasing the proceedings volume instead of the book under review if the additional selections are of interest.

Although the topics covered in *Motion of Charged Particles in the Earth's Magnetic Field* are done quite nicely, the book is definitely limited in scope. The Stormer problem of motion in a dipole magnetic field is covered first. The author then goes on to discuss the guiding-center approximation to charged particle motion and the origins of the various drifts. A good discussion of the first two adiabatic invariants for motion in the earth's field is then given along with a section on adiabatic invariance in general mechanical systems. An explanation is also given of McIlwain's L coordinate, which is widely used in trapped particle investigations. The last section of the book deals with hydromagnetic theory of drift motions and could well have been omitted since more illuminating treatments are available elsewhere.

This book is not a treatise on the subject of charged particle motion in the earth's magnetic field, nor was it ever intended to be one. Such important topics as the breakdown of the adiabatic invariants or motion in the earth's field distorted by the solar wind are not even touched upon, and the reader who expects to be brought up to the forefront of current research will be disappointed. However, this book should find considerable use as an introduction to a field of research receiving a great deal of current attention.