

work is outlined, there follow nine chapters devoted to characteristic aspects of the problem of abundances. These arise largely from the different methods of observation and analysis that are employed; e.g., the geochemist uses the tools of the laboratory, whereas the astrophysicist must rely on optical and radio telescopes, spectrometers, and photometers. Appended to each chapter is a list of selected references.

Although "qualitatively the composition of the most distant regions of the universe yet observed with the spectrograph resembles that of our local region", yet there are regions—stars and nebulae—where deviations from normal abundances occur. For example, the artificial element technetium has been found in some stars although it does not occur in most stars, including the sun. Other "abnormalities" might be cited. Problems of this sort require further investigation, for which the need and inspiration are found in Aller's book.

Physical Chemistry in Aerodynamics and Space Flight. Conf. Proc. (U. of Penna., Philadelphia, Sept. 1959). A. L. Myerson and A. C. Harrison, eds. 288 pp. Pergamon Press Inc., New York, 1961. \$17.50. *Reviewed by Henry Wise, Stanford Research Institute.*

IN September 1959 a conference was held at the University of Pennsylvania on the subject that bears the title of this book. Because of technological advances, the interplay of chemical kinetics and fluid dynamics under extreme conditions of high temperature and low pressure offers a new challenge to the physical chemist. From a chemical viewpoint, the reacting species are simple, such as atoms and diatomic molecules, ions, and electrons. Their reactions with solid surfaces, their interaction with each other in the gas phase, and the transport properties of a reactive system form the subjects discussed at this conference. A total of 35 papers were presented. They ranged in scope from short papers to lengthy reviews. It is difficult to avoid heterogeneity in such an undertaking. Indeed, this volume contains an assemblage of loosely related papers such as one finds in a scientific journal. However, a common denominator appears as one glances over the various contributions; that is, the lack of fundamental information available on the properties and chemical kinetics of systems encountered in the upper atmosphere.

What scientific purpose is served by binding these papers together into a rather expensive hard-cover book? The printed discussions attached to some of the papers are meager, the symbols used are as different as the authors, and the publication of this book required more than one year. Because of the scope of the papers presented and the problems involved it would be desirable to circulate the contents of this book not only among the specialists concerned with space flight but also among the molecular physicists, the spectroscopists, the physical chemists, etc. The prohibitive cost of this publication may defeat such a distribution.

Lectures in Theoretical Physics, Volume 2. (Summer Institute, U. of Colo., Boulder, 1959). Wesley E. Brittin and B. W. Downs, eds. 483 pp. Interscience Publishers, Inc., New York, 1960. \$9.00. *Reviewed by H. Mendlowitz, National Bureau of Standards.*

EIGHT articles representing most of the seminar lectures given the summer of '59 at the Summer Institute for Theoretical Physics held in Boulder make up this volume. It is quite clear that the levels of the various lectures were not uniform although, in such an institute, the same audience would probably attend most of the lectures. The reports on the lectures were not always prepared by the lecturer, but presumably they do represent the type and contents of the lectures.

The lectures that were most easily followed, partly because of the nature of the subject and partly because of the method of presentation, were those by W. E. Lamb, Jr., on quantum-mechanical amplifiers. A student with a year of quantum mechanics could very easily study this article. At the other extreme, were the lectures by A. Salam on invariance properties in elementary-particle physics and those by J. Sakurai on symmetry laws and elementary-particle interactions. An advanced student would require much hard work to master the contents of their reports. The others varied somewhat between these two extremes. Some were more complete than others, but, in general, an advanced graduate student in theoretical physics should not have too much difficulty in deriving a pretty clear picture of the various fields reported upon. I want to add a remark here regarding Dresden's lectures on aspects of abstract field theory. It is that one gets a feeling of excitement running through many portions of this report, and one feels that he is standing on the brink of either "boom or bust". Overall, I do think that this book is a worthwhile addition to the literature on contemporary physics.

General Relativity and Gravitational Waves. By J. Weber. Vol. 10 of Tracts of Physics and Astronomy, edited by R. E. Marshak. 200 pp. Interscience Publishers, Inc., New York, 1961. Clothbound \$4.50, paperbound \$2.50. *Reviewed by R. Bruce Lindsay, Brown University.*

ONE of the important issues in the general theory of relativity which is attracting much current interest is the question of gravitational radiation. The author of the book under review has recently devoted a great deal of attention to the problem of detecting and generating gravitational waves and has been one of the leaders in this line of research. Nearly a third of the book is devoted to this topic, the rest being a brief review of the fundamental principles of general relativity as employed for text purposes in Professor Weber's course on this subject at the University of Maryland.

Though the mathematical treatment of the fundamentals follows conventional lines, the book is somewhat unusual in the emphasis placed on experimental