of almost linear systems, and the book concludes with a discussion of discontinuous problems, such as relaxation oscillations, and again describes recent contributions (the topological theory of Vogel, the asymptotic methods of Cartwright and Littlewood, and the piecewise linear method) as well as the by now classical work of Van der Pol and Haag.

The format is clear and attractive and there do not appear to be any significant misprints except for the title page. The style and presentation are clear and complete, and make for interesting and informative reading, while the contents are so comprehensive (geographically and temporally) as to make it a very valuable survey (handicapped, however, by a rather skimpy index). This book will undoubtedly become the standard reference on nonlinear oscillations in the coming years.

Shock and Vibration Handbook. Cyril M. Harris and Charles E. Crede, eds. 2029 pp. McGraw-Hill Book Co., Inc. $47.50. *Reviewed by H. M. Trent, US Naval Research Laboratory.*

THE subject of mechanical vibrations has been a significant part of physics ever since Lord Rayleigh devoted such a large fraction of his two-volume treatise on sound to the subject. However from the appearance of Rayleigh's books until the outbreak of World War II not too much attention was paid to the subject. On occasion some physicist might worry about creating a vibration-free environment for some critical experiment and infrequently an environment might be so obnoxious that even the man on the street might complain about it. These instances were rare, however, and as a result few papers appeared dealing with the subject, and few textbooks were published.

Early in World War II Great Britain suddenly awakened to the fact that she was in danger of losing the war through the loss of shipping. The trouble here arose from noncontact underwater explosions and, interestingly enough, these explosions did not necessarily sink the vessel under attack. Instead vital equipment inside the ship was rendered inoperative by the mechanical shock induced by the explosion and thus the vessel could no longer fulfill its mission. Since that time, the number and severity of problems that have arisen as a result of mechanical vibrations and shock has been on an increase, a situation which reflects our ever increasing speeds of travel and our ever more powerful propulsion devices. Indeed, no physicist today can consider conducting an experiment concerning, say, the Van Allen radiation belt without being prepared to deal with the vibration environment existing in a modern rocket.

Professors Harris and Crede have assembled an imposing list of seventy authors who have joined with them in writing the three volumes of the *Shock and Vibration Handbook*. As a handbook, it must be viewed as representing the state of the art at the time that the various articles were written.

The first volume devotes eleven chapters to a summary of those theoretical techniques which are available now. The remaining nine chapters describe those instruments which have been developed for observing and recording vibration and shock phenomena.

The second volume takes up several subjects. For example, the first three chapters discuss the question of data analysis, the next three cover test specifications together with machines for performing the tests, and the next three concern scaling techniques and methods of analysis, both analog and numerical. The remainder of the volume is devoted to pertinent aspects of the isolation problem with two chapters being devoted to theoretical concepts, one to the design and use of isolators and five to descriptions of various isolating devices and materials.

The final volume is devoted almost exclusively to a presentation of what is to be expected in a wide variety of environments. Two of the chapters are worthy of special comment for they provide the only known self-contained sources of information on machine-tool vibration and on the effects of shock and vibration on man. This volume will be of particular interest to any physicist who is anticipating running an experiment in a severe environment such as in a rocket.

The editors have done a good job in assembling a lot of pertinent information and in keeping errors to a minimum. It must be realized, however, that any compilation such as this, which concerns a rapidly expanding field of science and technology, will be out of date in some respects by the time it appears in print. On the other hand, it will be valuable for several years to come for it provides, in one place, access to most of what is known about the subject.

Experimentation: An Introduction to Measurement Theory and Experimental Design. By D. C. Baird. 198 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1962. $6.00. *Reviewed by J. Arol Simpson, National Bureau of Standards.*

HOPE springs eternal in the human breast. For years now I have been reading the new books on precise measurement and experimental design in hopes of finding the magical formula which would make all *my* measurements precise and my experiments successful.

My search is over. Professor Baird has not, unfortunately, given me the formula but has convinced me that further search is in vain. Of course, this result does not surprise me, really, but I do wish I had had the opportunity to study this book as an undergraduate so that my false dreams would have been strangled at birth.

What we have here is a text designed for first- and second-year laboratory courses for scientists and engineers which includes among its chapters a realistic study of the nature of measurement, the propagation of uncertainties, and the nature of experimenting, as well as experiment planning, experiment evaluation, and writing the scientific report.