transform. Because of his awareness that many of the design calculations are carried out by unnecessarily tedious means, the author presents additional topics not usually found in servo texts, e.g., the remainder theorem in algebra. Many of the following chapters present material that has not yet appeared in any book. Indeed, much of it has been presented previously only in the form of doctorate theses. This material includes a chapter on the signal-flow diagrams of feedback theory, which make simple the derivation and proof of many theorems given by Bode. Another chapter considers methods for the synthesis of resistance-capacitance networks; no longer will there be any excuse for the servo engineer to design a three-pole network by the use of three sections separated by two isolating amplifiers. There is also a chapter on the synthesis of servomechanisms through pole-zero configurations, and discussions of Singleton's method of nonlinear synthesis and Newton's method of controlling saturation in servomechanisms. Other material that represents some of the most advanced design techniques in use today includes a chapter on the root-locus method, two chapters on statistical design theory, a chapter on sampled-data systems, and two chapters on the analysis and design of nonlinear servos.

The theoretical discussions are excellent, and at all possible points design is clarified and illumined with examples and appropriate line drawings. The author has a talent for presenting a broad theoretical picture and then filling in the important details.

There are very few misprints, and the reviewer found only one careless error, namely, in the definition of a function of a complex variable. The use of fine print in some parts of the book for the statement of important material was slightly disturbing to this reviewer. Also, inclusion of problems would have been an attractive feature. However, the last two recommendations, if followed, would probably have increased the size of the book to unwieldly proportions.

The book is highly recommended to all engineers. It will be found indispensable to both the student and the industrial research worker. Though it is intended for graduate-level courses, much of it will probably filter down into undergraduate teaching. The profusion of examples and the clarity of the writing also make the book suitable for self-study.

Introduction to Theoretical Mechanics. By Robert A. Becker. 420 pp. McGraw-Hill Book Company, Inc., New York, 1954. $8.00. *Reviewed by William Fuller Brown, Jr., Sun Oil Company.*

This book is designed primarily for juniors or seniors in engineering physics. There are fifteen chapters. The first twelve treat the statics and dynamics of particles and rigid bodies, the statics of strings, and general theorems about energy, momentum, virtual work, and stability. Vector notation is introduced in the first chapter and used throughout. The thirteenth chapter derives Lagrange's and Hamilton's equations; the last two chapters deal with vibrating systems, with occasional use of the Lagrangian method. There are five appendixes on mathematical topics.

As the author points out in his preface, he has included several topics important in modern applications: vibrations of nonlinear systems, motion of a system with changing mass, and three-dimensional motion of a rigid body.

The material is organized systematically, and I find the discussions of specific topics quite clear. Each principle is illustrated by an example or two, and each chapter is followed by a collection of problems. There are about 400 problems in all: some new, some taken from other books.

Each chapter begins with an introductory general discussion. These discussions I find less clear; they are so very general that the student will have to read the rest of the chapter to understand the introduction. Also, in introducing some concepts (e.g. center of mass and moment of a force), the author begins by defining the concept and only later develops physical relations involving it; thus the definition lacks motivation. For other concepts (e.g. moment of inertia), he delays the definition until the quantity to be defined has appeared in an equation; this method makes the value of the new concept much more evident. In self-teaching, the occasional from-abstract-to-concrete passages may be a bit troublesome; in the classroom, with a capable teacher, they should cause no difficulty.

On the whole, I think this would be a very satisfactory book from which to teach.

Atomic Energy and Its Applications. J. M. A. Lenihan. 265 pp. Pitman Publishing Corporation, New York, 1954. $4.00. *Reviewed by E. Creutz, Carnegie Institute of Technology.*

This book gives a simple treatment of the physical basis of nuclear science and a description of its application and possible future progress for the person with no special training in scientific fields.

The first chapters review a number of facts about atomic structure with essentially no equations, but some useful tables and numerous drawings touching on atomic structure, waves and atoms, radioactivity, and nuclear structure. In the chapter on detection of nuclear radiation most of the types of counters in use are discussed, although not particularly critically. For example, more space is given to crystal counters than to scintillation counters.

Particle accelerators are described, with even a brief discussion of phase stability, and the Birmingham proton-synchrotron. Various types of nuclear reactions are mentioned and tabulated. There is a short chapter on nuclear fission which squeezes in as much space for gaseous diffusion and the electromagnetic separation of isotopes combined, as it does for the mechanism of the chain reaction. A separate chapter on nuclear reactors