be expected, as in the recent numerical analysis methods of Roesler and Pearson. For following future developments, Professor Gross's book will be a most valuable guide.

The quality of paper and printing is excellent, and, even though English was presumably not the printer's native tongue, only three minor typographical errors have been found by the reviewer.

Basic Mechanisms in Radiobiology: II, Physical and Chemical Aspects. Highland Park Conference, May, 1953. Edited by John L. Magee, Martin D. Kamen, and Robert L. Platzman. 145 pp. Subcommittee on Radiobiology, Committee on Nuclear Science, National Research Council. Government Printing Office, Washington, D. C., 1953. $1.00. *Reviewed by J. G. Hoffman, Roswell Park Memorial Institute.*

Selling at one dollar per copy, this book is a real bargain. Its one-hundred and forty-five pages are indexed by author, subject, and institutions. If measured only by total wordage about radiobiology, it would be a good buy. There happens to be a remarkable kind of a discussion embodied in its pages. The editorial committee has put in writing what may be called a bull session. Perhaps the quickest way to convey the impression of the book is to have you imagine, if you can, the dialogues of Plato or one of Shaw's polemical plays written on radiation chemical effects pertaining to radiobiology.

There are five short chapters. The titles serve to indicate the formidable tasks undertaken by the conferees. The first deals with Initial Energy Transfer From Incident Radiation to Matter, which centers about the problems of measuring stopping powers. Chapter 2, called Energy Transfer From Secondary Electrons to Matter, tells of the life of an ionized electron among water molecules and how it becomes hydrated. About half way through the chapter, the discussion is turned to dry materials and other substances much more complex than pure water.

Chapter 3, entitled Mechanisms of Energy, Degradation and Chemical Change: Effects of Secondary Electrons, attempts to describe the movements of secondary electrons having energies in the vicinity of ten electron volts and lower. The various theories of the spatial distribution of radicals and the electric fields involved are discussed but the result is that there is no clear cut picture of events between the time at which an electron has ten electron volts energy and the final state in which ions are distributed throughout tissue space. Chapter 4 has the same title as chapter 3 except that its subtitle is: Effects of Electronic Excitation. The role played by electronic excitation in radiobiology has not been receiving the attention it merits. This chapter is a high light of the book and will certainly please students of basic radiobiology, especially those inclined toward physical analysis. The fifth and last chapter, called, Importance of Radiation Chemical Effects in Radiobiology, provides some excellent searching into the basic theories of biological action. Even the so-called "point heat" effects which underlie one of the earliest theories of radiation effects are brought under scrutiny. The ideas range from the oldest heat theories on up to the most recent findings in photo-reactivation which in turn seems to be comparable to the Herschel Effect in photographic emulsions.

The conversational discourse provides a means for communicating complex subject matter with an absolute minimum of words. As a result the density of ideas per paragraph runs unusually high. The very technical point of view taken throughout the conference makes this good reading for physicists and physical chemists. There are four tables and four figures supplementing an excellently documented text.

Nuclear Engineering

Introduction to Nuclear Engineering, by Richard Stephenson (387 pp.; McGraw-Hill, New York, 1954; $8.00), is another of the many texts on this topic published recently, this one in the excellent McGraw-Hill Chemical Engineering series. (Another book with the same title, authored by Raymond L. Murray, was published almost simultaneously by Prentice-Hall.) A widespread argument among engineering educators is raging at present regarding whether nuclear engineering should be established as a separate department in engineering schools, or whether the basis of the existing curricula should be broadened to give the average engineering graduate enough background to specialize in this field on the graduate level, or perhaps even later in his career. The present book is excellently suited to the latter procedure; it takes familiarity of the standard engineering operations for granted and discusses only such fairly advanced topics as nuclear fission and chain reaction, reactor theory, construction and control, isotope separation and processing, and other special techniques of nuclear engineering. This well-assembled and excellently indexed text will be useful both as a first introduction to the subject for the novice, and as a handbook for more experienced men.

Economics

Many of the phenomena encountered in the study of economic systems have remarkable analogs in control-system engineering. Such notions as feedback and stabilization (in the sense of preventing unwanted oscillations), originally developed for use in, say, automatic pilots for aircraft, can be profitably employed in economic analysis as well. This view is expounded by Arnold Tustin, Professor of Electrical Engineering at Birmingham University, in *The Mechanism of Economic Systems* (161 pp.; Harvard University Press, Cambridge, 1954; $5.00). His treatment is an interesting and convincing example of what happens when a complex problem in the social sciences is given an appropriate mathematical discussion. Economists traditionally construct "models" on paper of the operation