transfer; the statistics necessary for calculating the accuracy and sensitivity of static and continuous gauges for alpha gauging, and for beta thickness, density, and back scattering gauging.

The fifteen laboratory experiments vary widely in their difficulty. The first few on detector response and pulse measurement are relatively simple. Later experiments on particle size determination, beta particle transmission, beta particle scattering for two-component gases, salt solution density, solid density gauging, and characteristics of continuous radiogauges are relatively complex experiments which, as the authors say, could serve as subjects for term papers.

This reviewer concludes that the book should be particularly useful for teaching students in hydraulic, civil and chemical engineering about radiotracers and their application. It should also prove valuable for use by individuals interested in those applications listed above, the fundamentals of which are thoroughly covered in this book.

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About the Reviewer: Jerome Kohl is currently manager of marketing at ORTEC Incorporated, Oak Ridge, Tennessee. He obtained his BS degree in applied chemistry from the California Institute of Technology and was formerly affiliated with Tracerlab Incorporated and was coordinator of special products of the General Atomic Division of General Dynamics Corporation. Mr. Kohl has been an instructor in extension courses in radioisotope applications and engineering at the University of California in Berkeley and San Diego. He is the senior author of Radioisotope Applications Engineering *and author of a chapter on industrial uses of radioisotopes in* Modern Nuclear Technology.

Modern Control Systems. By Richard C. Dorf. Addison-Wesley Publishing Company (1967). 387 pp. $12.50.

In his Preface, the author expresses an intention to assist the reader in discovering feedback control theory and practice. This is done by encouraging the inductive learning process with examples and problems interspersed among lucid explanations. Members of the pedantic deductive school must seek elsewhere for their formula derivations. Hence, the author admirably achieves his goal of instilling a creative learning process in the reader.

A double clichéd opening, "Chapter 1, Introduction to Control Systems; Section 1, Introduction," is followed by a chapter on mathematical models used in describing control systems. After explaining the fundamentals of feedback,

the book treats performance specifications and stability criteria in successive chapters.

With this background, the remaining two-thirds of the book contains specific methods for system analysis: the root locus method, Bode plots, the Nyquist criterion, and time-domain analysis. A final chapter examines methods of compensating control systems to achieve desired performance.

Mason's signal flow graphs are prolific, occurring in many chapters. Perhaps this is in the hope of obtaining converts to their use. On the other hand, no space is devoted to control-related concepts of correlation and random processes.

Also perhaps conspicuous by its absence is any discussion of analog computer applications. The emphasis on digital computer usage in time-domain analysis is good. Perhaps some exposition of the time-honored usage of analog computers in control system analysis would have had educational appeal, especially to those readers who prefer electrical to algebraic thinking.

The non-matrix-oriented reader may shy away from the time-domain analysis chapter. This would be unfortunate because, as the author points out, digital computer matrix calculations facilitate this type of analysis. Hopefully, most readers will either have matrix algebra at their fingertips or will use the thoughtfully provided Appendix on the subject.

An upper-level undergraduate will have no difficulty understanding the explanations of principles, especially since a numerical example follows each. The author goes to considerable length to find fascinating control problems at the end of each chapter: Telstar, lunar landing craft, student grades, and status seeking are typical subjects. The interests of "spacemen" more than "nuclear men" receive attention, for there is scarcely more than one reactor control problem. To be sure, everyone's interest is reached at least somewhere; for example, a problem on foxes vs rabbits is even included for the child prodigy.

In summary, this book is an excellent aid to the control-theory student toward which it is aimed. It may also interest those who occasionally seek elucidations of control analysis topics.

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