influence of organic chemistry in this field resulted in heavy reliance on results that may not be entirely useful to the inorganic chemist. The chapter appears to have been hurriedly written, the illustrations poorly chosen and the references not sufficiently recent, making it rather inferior to several older discussions of the same topic. The major deficiency of this chapter, however, is the preoccupation with organic chemistry rather than an orientation toward inorganic gas chromatography.

The second chapter deals with electron microscopy and represents a well written, logically constructed adventure into this complex field. The subject is introduced by a fast-moving section on the theory of electron microscopy which is illustrated by well-conceived drawings and diagrams. A discussion of photographic effects reflects the interest of the author, and is of particular value to those not familiar with the foibles of the readout process from electron microscopy. Features of the instruments and applications to specific requirements are followed by a discussion of the applications of electron microscopy to a variety of tasks. The excellent section of applications appears to cover the field completely, with particular emphasis to inorganic systems. The section on applications is profusely illustrated with exceptionally fine examples of results obtained by a variety of workers. The chapter closes with an extensive bibliography which should provide the necessary starting point for anyone interested in the application of electron microscopy to inorganic problems.

The two final chapters cover experimental techniques applicable to radioactive materials. The third chapter deals with techniques applicable to work with high levels of beta- and gamma-emitting materials. The subject is clearly a very complicated one, but the author has succeeded in preparing an excellent survey. Since relatively little theory underlies the specific techniques operable under the difficult conditions encountered, most of the chapter deals with examples of reported techniques and equipment designs. An introduction covering units, standards, legal regulations and health-physics aspects is valuable in that sufficient references to the published literature are cited to permit the reader to pursue facets of this discussion. The section describing shielded facilities and their unique aspects gives the reader an excellent guide for further search. It is perhaps regrettable that the section on radiation effects, decontamination and waste disposal is brief since these problems constitute a most annoying and unrewarding part of working with radioactive materials. In general, however, the field has been surveyed adequately, and the reader will find references to any of the problems likely to be of importance.

The final chapter deals with glove-box techniques and is highly recommended to everyone who has occasion to use these devices. The author has made a significant contribution by assembling under one reference a wealth of experience in specialized techniques used in glove boxes. The chapter includes a section on glove-box construction of interest to the novice and also to the veteran experimenter. The section on specific experimentation probably represents the most useful portion of the chapter and can serve as a reference even to those with considerable experience in glove-box manipulations.

The book is generally well assembled, appears to be free of typographical errors, and should serve adequately as a companion to its well known organic-chemistry counterpart.

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About the Reviewer: Dr. Martin J. Steindler received his Ph.D. in inorganic chemistry from the University of Chicago in 1952, working on boron hydride chemistry under the late Professor H. I. Schlesinger. In 1953 he joined the Chemical Engineering Division of Argonne National Laboratory as an Associate Chemist, where he has engaged in research in the general area of nuclear fuel processing. He has been particularly interested in the nonaqueous chemistry of uranium and plutonium fluorides, and has also been concerned with problems accompanying work in glove boxes.

Perturbation Theory and the Nuclear Many Body Problem. By K. Kumar. North-Holland Publishing Co. - Amsterdam; Interscience Publishers, Inc. - New York. 235 pp. $9.75.

The study of the properties of systems of interacting particles makes up a large part of physics and an even larger part of its applications. At sufficiently low temperatures, quantum effects become important and finally dominate those problems which require finding the detailed energy spectrum or other properties of the stationary states of a system. The theory of such quantum mechanical systems has advanced tremendously and on a very broad front in the past ten years, largely through application of the techniques of quantum field theory which had been developed in the forties and early fifties.

One of the outstanding many-body problems has been to overcome the difficulty produced by a strong interaction between particles at short distances. This problem arose in nuclear physics when high-energy nucleon/nucleon scattering experiments seemed to require the presence of a strong repulsion at close range. Largely through the work of K. M. Watson and K. A. Brueckner, it was shown that one could reformulate many-body perturbation theory to replace expressions involving the very large matrix elements of the two-body interactions by expressions containing the much smaller elements of two-body reaction matrices. The concept of a reaction matrix had been familiar in radiation and scattering theory, chiefly through work of Heitler. The method was used by Watson for treating the scattering of a particle by a many-body system and later by Brueckner for the bound states of many-fermion systems. The lowest approximation for the ground state involves a collection of independent quasi-particles in a self-consistent single-particle potential. This is a generalization of the Hartree-Fock self-consistent field theory and promises to provide a theoretical justification of the nuclear shell model. So far this promise has only been realized in principle. The computations for actual nuclei are quite complicated and tedious, and the results, even for doubly closed shell nuclei, are not as yet in very close agreement with experiment. Rather more effort has been expended in testing the approximations on the fictitious infinite medium of nucleons referred to as nuclear matter.

Kumar's book is a systematic exposition of the literature on the Brueckner theory. An attempt has been made to maintain a critical spirit. The first two chapters present several forms of many-body perturbation theory. The next chapter introduces reaction matrices and shows how the energy shift may be reexpressed in terms of them. The long fourth chapter is devoted mainly to the Brueckner - Gammel calculations for nuclear matter. A brief report of how these have been used for actual nuclei by means of the local density approximation is included. An alternative approach to real nuclei by Eden and Emery is sketched. Unfortunately there is no treatment of the separation method of Moszkowski and Scott, which provides considerable insight into various physical effects described by the Brueckner theory. A six-page discussion of the relation between the normal states given by perturbation theory and the states described by the BCS pairing theory presents many interesting problems.

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About the reviewer: Richard L. Becker is in the Physics Division at the Oak Ridge National Laboratory where his research interests center on applications of many-body theory in nuclear physics. He also regularly teaches a course of advanced topics in quantum theory in the Oak Ridge program of the University of Tennessee.

Methods in Computational Physics, Vol. I. Edited by B. Alder, Sidney Fernbach, and Manuel Rotenberg. Academic Press, 111 Fifth Avenue, New York 3, New York. 304 pp. $10.00.

TABLE OF CONTENTS

This book is the first of a series to be published by the Academic Press. It is not a single unified work but, instead, a collection of disconnected papers on various topics. It will be seen from the Table of Contents, above, that these papers deal with statistical problems in several fields and that three of the papers have no direct connection with reactor analysis. Nevertheless, according to the preface, authors contributing to this volume have been directed to focus their