

book would provide not only a very fine introduction to these phases of chemistry but also present a coordination of much information which proves to be very interesting reading.

Of necessity the treatment of gases and of kinetic theory cannot differ too much from that given for many years. The material is carefully presented and the student who masters these chapters will be well grounded in fundamentals. The same can be said for the chapters on liquids and on solutions.

Thermodynamics is given in so many books, and in so many ways, that methods of presenting this subject often depend on personal preference, and in some instances the treatment lacks rigor. A well-written chapter on the First Law precedes a down-to-earth chapter on thermochemistry, which should be very useful for those who intend to do practical work in the field. The Second Law is very well discussed, and these authors avoid the many pitfalls into which authors can so easily wander. The applications of thermodynamics to chemical problems are very well presented and cover the time-honored phases of gas equilibrium, heterogeneous and solution equilibria, electrochemical reactions, and galvanic cells, including the activity coefficients of electrolytes and the Debye-Hückel theory. Then comes a chapter on ionic conductance in solution and another on ionic reactions in solution. These are very good chapters, but the approach is not likely to be called particularly novel.

I have only one serious criticism to make of the chapters on thermodynamics. Various international bodies have spent years arguing, often bitterly, about some of the symbols and have agreed on the symbol G for $H-TS$, the Gibbs free energy. Nearly all of the modern texts now use this symbol, but the present book continues to use F . At the present stage this seems to be inexcusable. Science will become indeed more and more chaotic if scientists do not follow agreed-upon rules so that they can understand each other as readily as possible.

The remaining chapters of the book cover phase rule, surface chemistry, and kinetics. As in most American texts, the authors leave kinetics to the end and seem to have included it to avoid feeling guilty. The subject is treated in a classical way, which has real merits for students getting their

first introduction to the subject, but let us hope that at some time before these students receive Ph.D. degrees they will be exposed to a more modern treatment.

To summarize: This well-written and very teachable book will provide students with a sound foundation in physical chemistry. It has the great advantage of teaching the subject in such a way that the students will not have to "unlearn" much of it later.

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Psychology: Conference Report

Stimulus Generalization. David J. Mostofsky, Ed. Stanford University Press, Stanford, Calif., 1965. viii + 389 pp. \$11.50.

This book constitutes the public record of the Conference on Stimulus Generalization, held at Boston University in June 1963. It contains 22 of the 25 papers presented at the Conference. Unfortunately, the papers by Margolius, Prokasy and Hall, and Razran were deleted.

All the papers were distributed prior to the meeting "in hope that it would give the participants ample time to digest the contents and enable them to devote the better part of the three-day meeting to frank discussion." A reading of the papers in their pre-conference form, however, gives little evidence that the "frank discussion" influenced their postconference publication in any significant way.

In order to contain the program within a reasonable scope and size, the focus, according to the editor, was restricted to the "traditional learning framework of stimulus generalization." On this criterion, verbal generalization and clinical applications were excluded. It will certainly come as a surprise to some that the recent exciting advances involving neurophysiological methods, some of which are reported here for the first time, have so rapidly become traditional, whereas the much older and still vigorous work in verbal generalization has so rapidly become atraditional. As an authoritative reference in this and other respects (for example, reversal relearning, separate subjects for each test point, the very idea of a law of generalization), this book, with a few nota-

ble exceptions, is but minimally effective in coming to terms with the uses of the past.

As a collection, the papers emphasize some important activity as well as new approaches to an old and persistent problem. In addition to presentations of empirical data and their interpretations, there are papers on definition, measurement (both S and R), experimental design, neurophysiological methods, and even a little on theory.

To the extent that this volume can be recommended as a current reference on stimulus generalization, several trends are indicated: (i) the restriction of single stimulus presentation is no longer a prerequisite, (ii) classical conditioning has largely been replaced by instrumental conditioning, (iii) operant techniques are very popular, (iv) there is an overly and perhaps dangerously heavy reliance on resistance to extinction as the index of generalization, (v) neurophysiological techniques are becoming increasingly refined and sophisticated, (vi) graduate students in particular had better know the work of Guttman and Kalish, (vii) a depressingly small number of researchers care to be influenced by theory, logical analysis, or definitional clarification, and (viii) a metric accommodation for the stimulus continuum is imminent.

Many of the chapters are well written by competent researchers with indications of promise to enrich the literature in new and ingenious ways. Meanwhile, there is enough variety here to supply Ph.D. dissertations for some time.

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Research Techniques

Methods of Animal Experimentation. vol. 1. William I. Gay, Ed. Academic Press, New York, 1965. xvi + 382 pp. Illus. \$13.50.

For some time we have needed a comprehensive text on experimental methods that involve the use of animals. This book, the first of two volumes, is an indexed collection of nine articles in which different authors describe topics concerned with the use of experimental animals—techniques

related to the collection and withdrawal of body fluids and infusion; anesthesia and sedation; the care of animals during surgical experiments; radiography; methods of euthanasia and disposal of laboratory animals; methods of parasitic infection; methods in germfree animal research; aerosol challenge of animals; and principles in drug administration. The second volume will treat 11 other areas of interest to the research investigator.

Although the text contains more typographical and other errors than one would expect, these errors do not, in most cases, distort the meaning of the content, and one hopes they will be corrected in subsequent editions. The quality and usefulness of the different chapters is quite uneven, as one would expect in a volume with papers by a number of contributors.

The chapters on the collection of body fluids, radiography, and the aerosol challenge are extremely well done. These three chapters alone make the book worthwhile. The aerosol challenge section is very timely in view of the increasing amounts of research that involves this experimental technique. The chapters on anesthesia and sedation, the care of animals during surgical experiments, methods in germfree animal research, and principles in drug administration are well organized and filled with information that should be

of immense value to research investigators.

In the chapter on methods of euthanasia and disposal of laboratory animals, two of the methods listed—euthanasia by decompression and euthanasia by carbon monoxide—have no place in a modern research laboratory. It is probable that they were mentioned only for the sake of completeness, and they do not impair the quality of the rest of the chapter.

The chapter on methods of parasitic infection contains a mass of documented information on specific parasites, but the material does not seem to conform too well to the chapter title. Many factual statements are put together with references in a not very interesting style. It is difficult to look up answers to specific questions concerning methods of parasitic infection.

In the other chapters, however, the material is well organized and specific material can be found by using the index, which seems to be adequate. This book will be valuable to medical students, veterinary medical students, zoology students, research investigators who work with animals, instructors who teach experimental methods courses, and probably to many others.

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Applications of Radioactive Isotopes

Industrial Isotope Techniques. Lars G. Erwall, Hans G. Forsberg, and Knut Ljunggren. Wiley, New York, 1965. iv + 338 pp. Illus. \$19.50.

In a short introduction to this book George de Hevesy unequivocally states that "Several books have appeared during recent years about the technical uses of radioisotopes, but none as instructive and well laid out as this work." The book can be highly recommended as a textbook (the purpose for which it was written) suitable for self-education in the field of industrial applications of radioactive isotopes. It will also be of limited use as a handbook and a reference work in this field. The title is somewhat misleading because the coverage is limited entirely to radioactive isotopes without discussion of the uses of concentrated stable isotopes.

The book may be divided naturally into three sections which are of approximately equal length. In the first three chapters, the first section, the elements of nuclear physics, nuclear chemistry, and radiation measuring techniques are briefly but adequately described. The authors have "... tried to limit the account to items which are of direct and primary importance for applied radioisotope techniques."

In chapters 4 through 7 specific applications of radioactive isotopes, and the precautions that must be observed, are discussed. Uses as radiation sources include radioactive gauges, radiography, and applications based on the effects of radiation. The latter section together with the preliminary treatment in the first chapter gives a very good, basic, descriptive account of the interaction of the various forms of nuclear radiation and matter. The

next chapter is devoted to industrial tracer techniques. A large number of examples are given in order to show typical applications. A useful discussion of the general aspects of tracer methodology is also given. Radioactive methods used in chemical analysis are grouped together in the next chapter. The coverage here is comprehensive and includes the following topics: natural radioactivity, analytical checking methods, radioactive indicators and precipitants, chemical exchange, isotope dilution, radiometric activation, and nuclear reaction analysis. The final portion of the second division is a brief discussion of the various aspects of radiation protection.

The third division of the book, five appendices, constitutes a useful handbook that contains data on the important radioactive nuclides (including decay schemes for 73 isotopes) as well as data that is useful in radiation measurement, activation analysis, and radiation protection. The fifth appendix presents detailed plans for three different types of investigations in which radioactive isotopes are utilized and illustrates the use of data contained in the previous appendices.

In my opinion this is an excellent book—necessarily brief and factual, but quite comprehensive, clear, and accurate. It is well documented with a bibliography of some 140 monographs, survey articles, and other similar publications, in addition to 416 direct literature references. The index is divided into two parts: the first contains the nuclear science terms, the second, specific isotope applications grouped under separate industrial areas.

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Sea Goose of the Pacific Coast

Black Brant: Sea Goose of the Pacific Coast. Arthur S. Einarsen. University of Washington Press, Seattle, 1965. xviii + 142 pp. Illus. \$5.

This is the first full-length book devoted to the black brant, a favorite game bird along the Pacific coast. The author, who writes in a style that seems to lie somewhere between strict science and literature, has brought together a