films could be expected to derive much instruction or inspiration from reading this portion of the book. Difficulty in sustaining interest in Part I is still evident not only as a result of the authors' repeated emphasis on the difficulties and obscurities of the subject, but also because of the authors' tendency to present ideas in involved sentences requiring several readings and to add numerous and sometimes lengthy footnotes. Nearly all of the footnotes of the first edition are still retained. Despite the obvious unbalanced presentation in Part I and, at times, the uninteresting writing style used, a diligent reader will find some rewarding sections, such as excellent discussions of aqueous micelles, solubilization, flocculation, deflocculation, precipitation, nucleation, foaming and defoaming.

Part II ("Technical Applications of Synthetic Surface-Active Agents") represents an expansion of about 38 pages. In the added material will be found discussions of the effect of intensive mixing on the dispersions of solids in liquid media, on detergent builders, fluorescent brightening agents, public health aspects of the use of synthetic detergents, brief comments on the flotation of ores, effect of surface-active agents on the mass transfer at interfaces (including the effect on the evaporation of water), and briefer discussions of applications to metallurgy, geophysics, engineering construction and fire fighting. On the whole, Part II is authoritative, interesting and up to date. Portions which deserve particular attention are the excellent reviews on water proofing, emulsification and demulsification, dispersion of solids in liquid media, bactericides and emulsion polymerization.

Although Part III ("The Chemical Constitution of Synthetic Surface-Active Agents") exhibits an expansion of only 20 pages, it represents various improvements with respect to coverage over the first edition. Much effort has been made to make the literature and patent references up to date, and new material has been added on topics such as non-ionic agents, aliphatic sulfonates, perfluoro compounds and their surface activity, sequestering agents, and the water-soluble surface-active polymers such as polyvinyl pyrrolidone.

Like the first edition, the revised book is not suitable for teaching or for newcomers to the field. It is a valuable reference for specialists and especially for chemists interested in applications of surface-active agents. The new edition should be a useful addition to any technical library concerned with applied chemistry.

CHEMISTRY DIVISION
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Uranium Dioxide: Properties and Nuclear Applications. Edited by J. BELLE. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 1961. xiii + 726 pp. 15 × 23 cm. Price, $2.50.

This book is one of a series of books sponsored by the Naval Reactors group of the Atomic Energy Commission as "a comprehensive compilation of the more significant aspects of reactor technology developed in the Naval Reactor Program and the Shippingport Pressurized Water Reactor Project." As might be expected, then, this book is not a comprehensive discussion of all areas of knowledge concerning uranium dioxide, but rather deals with those properties of uranium dioxide which affect its use as a reactor fuel.

The contents of the book are perhaps best indicated by a listing of the nine chapter titles: Uranium Dioxide and its Application to Nuclear Power Reactors; Preparation of Uranium Dioxide; Characterization of Uranium Dioxide; Fabrication of Uranium Oxide; Physical Properties of Uranium Dioxide; Phase Relationships in the Uranium–Oxygen and Binary Oxide Systems; Solid State Reactions of Uranium Dioxide; Oxidation and Corrosion of Uranium Dioxide; and Irradiation Effects in Uranium Dioxide.

Because of the orientation of this book toward reactor applications, certain topics receive rather cursory treatment, while other topics of no greater interest to chemists are treated in painstaking detail. For example, Chapter Two—"Preparation of Uranium Dioxide"—fills fifty pages with descriptions of various mechanical details involved in large scale production of uranium dioxide, while the topic "Chemical Characteristics of Uranium Dioxide" is given seven pages at the end of Chapter Three. Chapter Nine—"Irradiation Effects in Uranium Dioxide"—is a lengthy (220 pages) and comprehensive review of this subject.

The bibliographies following each chapter are extensive and include a great deal of the recent literature. The book includes a large number of diagrams, photographs, and electron micrographs, and the printing is of good quality. Because of the paper binding, the volume may have a rather short "half-life"; however, the resultant low price of $2.50 should make this book available to anyone even remotely interested in the field.

In general, this book will be of interest chiefly to nuclear engineers, but may well be a worthwhile investment for chemists interested in uranium.

DEPARTMENT OF CHEMISTRY
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Chemistry in Non-Aqueous Solvents. By HARRY H. SISLER, Head Professor of Chemistry, University of Florida. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1961. vii + 119 pp. 12.5 × 18.5 cm. Price, $1.95.

This book is one of a new series called "Selected Topics in Modern Chemistry." An attractively designed paper-back, the book is a well-written treatment of its subject. It "is intended to present to the undergraduate chemistry student some of the basic concepts which relate the chemical and physical characteristics of a solvent to the chemical processes which may be carried out in that solvent, and which determine the usefulness of a given liquid as a solvent."

After an excellent introductory chapter, "The Role of the Solvent in Chemical Reactions," four solvents are considered in some detail: liquid ammonia, 100% sulfuric acid, liquid dinitrogen tetroxide, and liquid sulfur dioxide. The final chapter briefly discusses many other non-aqueous solvents. Each chapter concludes with a concise summary and a brief list of Selected Readings.

DEPARTMENT OF CHEMISTRY
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The Radiation Chemistry of Water and Aqueous Solutions. By AUGUSTINE O. ALLEN, Ph.D., Senior Chemist, Brookhaven National Laboratory. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1961. xi + 204 pp. 16 × 23.5 cm. Price, $6.00.

Energy absorption from incident ionizing radiation by the various components of a mixture is determined largely by the electron fraction which each contributes. Consequently, the understanding of the radiation chemistry of a dilute solution requires a knowledge of the number, nature and spatial distribution of the entities produced by the action of the radiation on the solvent. This fact and the large aqueous component in living cells and many inanimate systems, which are, or could be, irradiated, endow the subject of this book with special importance. Surprisingly, in view of the fact that many of the reactions in this book have been known for many decades, a reasonably full understanding of their nature has only very recently been achieved. This monograph by one who has played a major role in this development over almost two decades is therefore especially welcome, and its perusal is both rewarding and pleasurable.

The arrangement is much as would be expected, being dictated by the logic of the subject. The author first describes briefly the mechanism of energy deposition. Then after a hint as to methods of experimentation launches into the free radical theory and the diffusion model which now provide the intellectual framework for much of the research in this field. Wisely, Dr. Allen marshals the evidence in support of this model and discusses the dependence of molecular and radical yields on experimental variables such as *p*H, LET, temperature, dose-rate, etc., *before* describing features of interest in individual systems. This has the advantage that after studying the first six chapters the reader is then adequately prepared to appreciate the discussion of any one of the particular systems, the description of which occupies roughly the second half of the book.

The amount of work published and in progress in this subject is prodigious and increasing so rapidly that the problem of selection and compression to produce this relatively short book is difficult. Each knowledgeable reader will have his regrets at omissions. Solid and gaseous aqueous systems receive no mention, the origin of the radicals is mentioned only briefly, one gains the impression that $G(Fe^{3+})$ for α-particles of initial LET equal to 9 eV/Å. is securely established around 5.5 and so on. In my opinion these criticisms are trifling in comparison with the great merit of the book, namely, that the newcomer to the field who reads it will gain a unique synoptic view of a fascinating area of physical chemistry which is approaching maturity. Indeed, in some ways, the personal and testamentary nature adds to the interest. Moreover the author's prose style is extremely agreeable and makes the book a pleasure to read, and a "must" for chemists and biologists interested in the effects of ionizing radiations. The occasional slip, as for example in the middle formula on page 11 and the expression for the dimensionless parameter on page 69, reminds us, perhaps reassuringly, of how even the expert may falter.

DEPARTMENT OF PHYSICAL CHEMISTRY
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Potenciometrie. By Doc. DR. JAROSLAV ČÍHALÍK, kandidát chemických věd. Nakladatelství Československé akademie věd. Nové Město, Vodičkova 40, Praha 1, Czechoslovakia. 1961. 770 pp. 18 × 24.5 cm. Price, Kčs. 86.50.

This Czech book on potentiometry gives a rather complete description of the use of this physical chemical technique in analytical chemistry. The only serious omission is the use of non-aqueous solvents; this technique is mentioned only in passing.

The book is divided into a theoretical part and a practical part. The theory is given for acidimetry, alkalimetry and for titrations involving the formation of insoluble precipitates, slightly dissociated and complex compounds and oxidation–reduction reactions. The discussion is not as complete in some instances as that which appears in English texts.

In the practical part the description of apparatus and electrodes is followed by application of the various titrations to analytical chemistry. For each of these applications specific determinations are discussed. The references in this part cover the literature through the early part of 1961 and would be the only part useful to a person not acquainted with the Czech language. The names of the anion or cation listed as headings of each section resemble rather closely the English names in most cases and could be recognized easily by the English reader.

DEPARTMENT OF CHEMISTRY
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Progress in Medicinal Chemistry. Volume 1. Edited by G. P. ELLIS, B.Sc., Ph.D., F.R.I.C., Research Department, Benger Laboratories Limited, Holmes Chapel, Cheshire, and G. B. WEST, B.Pharm., D.Sc., Ph.D., School of Pharmacy, University of London. Butterworth, Inc., 7235 Wisconsin Ave., Washington 14, D. C. 1961. ix + 262 pp. 16 × 25.5 cm. Price, $11.25.

This excellent book consists of six chapters of about forty pages each: "Pharmacological Screening Tests," W. G. Smith, Sunderland Technical College; "Hypotensive Agents," R. Wien, May and Baker; "Tranquilizers," M. W. Parkes, Roche Products Ltd.; "Diuretic Drugs," H. Heller, University of Bristol; "Oral Hypoglycemic Drugs," J. D. H. Slater, Postgraduate Medical School, London; "Antifungal Agents," E. P. Taylor and D. F. D'Arcy, Allen and Hanburys Ltd. It invites comparison with the much larger book by Goodman and Gilman, although the arrangement is considerably different. Each chapter contains a summary of all the drugs having the specified end effect irrespective of mode of action, whereas Goodman and Gilman list the drugs acting on specific centers so that the same drug may be mentioned in various chapters, while drugs having similar medicinal effects may be dealt with in different parts of the book because their mode of action is different. The present arrangement gives a concentrated summary of the literature with good bibliographies up to the middle of 1960 at the end of each chapter. American chemists will envy their British colleagues when Dr. Smith records that a pharmacologist carries out 22 tests with 200 mg. of material, most of which is used in the toxicity tests. The adoption of *in vitro* tests is to some extent necessitated by British vivisection laws which make it extremely difficult to get permits for experiments on dogs. In the U. S. a single experiment on a dog can, by automatic registration of blood pressure, respiration, EEG, EGG, etc., indicate most of the *in vitro* effects described in Dr. Smith's chapter. At the end of the chapter a summary of the costs of each test calculated by assuming a technician is continually carrying it out on a series of compounds shows that U. S. costs per animal are about twice those in England and salaries are considerably lower. Most subsequent chapters contain experimental procedures used for determining the particular action studied, including a few unpublished observations, *e.g.*, blood pressure recording (page 42) or the blocking action of chlorpromazine (page 62). Drugs are discussed from the research rather than the practical point of view, with no indication of which drugs are most widely used, although their disadvantages are also recorded. The relative importance of drugs in Britain and the U. S. would not be the same, but many agents lauded in pharmacological publications have never appeared on the market. The list of proprietary and non-proprietary names given by Dr. Wien contains many which are unfamiliar in the U. S., but structural formulas are clearly given throughout the book. In his review of the different classes of tranquilizers, Parkes critically evaluates the methods of studying effects in animals and the hypotheses used to "explain" the mode of action of different types of tranquilizers. The less important drugs in the diphenylmethane series, as well as tetrabenazine and benactazine are discussed. A discussion of blind tests with placebos or dummies having a different pharmacological effect is to the point. The chapter on diuretics contains an 8-page discussion of the causes of edema and the renal mechanisms affected. Mercurials, xanthines, pyrimidines and triazines are summarized and the work on carbonic anhydrase inhibitors finally leading up to the Diuril series is followed by a description of aldosterone antagonists and inhibitors, drugs which act as osmotic diuretics and finally the plasma expanders. Dr. Slater's chapter appropriately devotes most space to the consideration of the sulfonylureas and their metabolism, duration and mode of action, side-actions and historical development. The diguanides and biguanides are included and the limitations of all classes summarized. The final chapter starts with a description of superficial and systemic fungal infections and then contains a list of quaternary ammonium compounds, phenols, including hydroxyquinolines and salicylamides, diamidines and mercury compounds. aralkyl alcohols and glycols and their ethers, undecylenic acid, and antihistamines having antifungal activity. The use of sulfonamide therapy and broad-spectrum antibiotics as well as specific ones against candida and histoplasmosis, emphasizing Amphotericin B, Nystatin, and oral use of Griseofulvin and the limited use of estrogens and work on artificial immunity is summarized, leading to the conclusion that new oral agents are urgently needed.

In spite of the chapters being written by different authors, they are equally well and interestingly written; full acknowledgment is given to American work, references to which predominate in the bibliographies.

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