chemical conversion and anodized coatings; special purpose coatings, ranging from slushing compounds to vitreous coatings; and corrosion inhibitors.

This edition has been substantially expanded from that of 1939, with all former chapters brought up-to-date in content and references. The chapters on sprayed coatings and inhibitors are new.

Other available works on corrosion, such as those by Evans, Uhlig, or Speller, contain sections that cover the same area as the present book. However, they treat this area much less fully, with primary emphasis on other aspects of corrosion. The present volume therefore does not duplicate these others but becomes a useful supplement to them.

A few typographic errors and minor errors of fact were noted, but on the whole the level of accuracy is high. The style is readable and explicit, and the quality of the printing and binding is good. The book is recommended to the chemist, corrosion engineer, metallurgist, or anyone concerned with selecting and specifying corrosion protective coatings.

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Biochemistry of the Aminosugars. P. W. Kent and M. W. Whitehouse. Academic Press, New York: Butterworths, London, 1955. ix + 309 pp. $6.80.

The need for a modernized version of Levene's monograph *Hexosamines and Mucoproteins* can hardly be exaggerated. A vast amount of information has accumulated in this very important field, which, up to now, has never been fully summarized and evaluated. The authors of this book deserve credit for having undertaken this difficult task. It is regrettable, however, that the first monograph in this field since Levene's book has not been prepared with greater care and critique.

The book is divided into two main chapters: (i) aminosugars in the biological environment, and (ii) the chemistry of the aminosugars and their derivatives. It seems obvious that the authors are more familiar with the subject of the second as compared with the first chapter. Following are some of the errors and misstatements that were quite obvious from my experience with part of the subject matter.

On page 13 appears the statement that the action of hyaluronidases leads chiefly to disaccharides. This statement is true only for bacterial hyaluronidases. In the scheme on page 13, crude hyaluronidases (containing β-glucuronidase and glucosaminidases) are represented as acting on the disaccharides produced by pneumococcal hyaluronidases. This statement is incorrect. On page 163, the statement is made that hyaluronidases degrade native hyaluronic acid to a disaccharide, hyalobiuronic acid. Hyalobiuronic acid is a deacetylated disaccharide, as is reported correctly on page 108, and even the yield of *N*-acetylhyalobiuronic acid in digests of purified testicular hyaluronidase is very low. On page 106, the statement is made that purified testicular hyaluronidase does not cause further degradation or rearrangement of the primary enzymic products, whereas on page 33, the transglycosidative action of testicular hyaluronidase is correctly reported.

On page 109, "mucosin" is reported to be hydrolyzed by β-glucuronidase, while on page 67, it is correctly quoted from the literature that deaminated mucosin is hydrolyzed by β-glucuronidase. The finding of urinary "mucoprotein" is credited to Gottschalk (1952); its prior isolation by Tamm and Horsfall (1950) is not mentioned. Likewise, the most careful work on the mucoids of human plasma, including the isolation of a crystalline acid mucoid by K. Schmid (1950) is not mentioned.

On page 135, the presence is reported of *N*-acetylglucosamine and galactosamine in type-I pneumococcal polysaccharide. The reference given does not contain any such statement. The same holds true for reference 151 on page 107. On page 189, the formula of altrose is erroneous. The formula on page 212 is not a derivative of dihydropyrazine but of a substituted piperazine. To me, the reproduction of the carbohydrate core of ovomucoid (p. 127) without critical evaluation appears unfortunate. The same applies to many other data reported from the literature. The term *aminodextrins* for oligosaccharide fractions derived from hyaluronic acid, which have very little in common with dextrins, seems unfortunate.

In spite of its shortcomings, the book represents a useful survey of the field, especially since it has no rival to compete with.

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Vitamins in Theory and Practice. Leslie J. Harris. Cambridge Univ. Press, New York–London, ed. 4, 1955. xv + 366 pp. Illus. $6.50.

This book is written in simple language that is easily understandable by and interesting to the lay reader. It is devoted to the discussion of the theoretical and practical aspects of both the water-soluble and oil-soluble vitamins. Thus, for each vitamin, the sources, the symptoms of deficiencies, the chemical structure, and the methods (chemical, microbiological, or animal) for the determination are treated briefly and concisely. The role of various vitamins as coenzymes is described only sketchily and perhaps inadequately for those who might be interested in the fate and mode of action of vitamin, *in vivo*. However, this book contains valuable illustrations and historical background to make it worth while for all students interested in vitamins.

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Autoradiography in Biology and Medicine. George A. Boyd. Academic, New York, 1954. xiii + 399 pp. Illus. + plates. $8.80.

Becquerel's monumental discovery of the radioactive phenomenon opened new vistas in our understanding of the structure of matter and also provided new tools for probing the distribution of imponderably small quantities of radioactive nuclei in stable systems. The pattern of the distribution, outlined on a photographic plate by the energetic radiations emitted in the decay of the radioactive material, termed an *autoradiograph,* found many fields of useful application. However, even 40 years after the basic discovery, a survey of the biological litterature would scarcely yield sufficient information for the assembly of a modestly sized review essay. This minor application of autoradiography in the medical field is largely attributable to the nature of the radioactive species, available as tracers during that period. The spontaneous disintegration of uranium and thorium provided the investigator with heavy metal tracers such as radium and polonium, which although of toxicological interest, could not be employed to study the migratory course of the lighter elements that play a predominant role in biochemical systems.

Since the discovery of the neutron and the synthesis of radioactive isotopes representative of virtually the entire periodic system of elements, the application of tracer techniques in biology and medicine has been increasing at a seemingly exponential pace. Today this phase of the literature greatly exceeds all other applications of autoradiography in the combined fields of metallurgy, crystallography, and mineralogy, once the principal source of the experimental techniques. Investigators studying the localization of radioactive isotopes in biologi-

cal systems will therefore find in Boyd's volume on the subject a useful compendium on the properties of photographic emulsions, dealing with both their virtues and their ailments, and a detailed description of histological and photographic techniques best adapted to the study of diverse types of biological tissues. This section of Boyd's book should prove invaluable to investigators approaching the subject with a feeling of timidity and will prove a *vade mecum* to the experienced darkroom adept.

The book contains a comprehensive bibliography of the biological and medical literature containing descriptions of autoradiographic techniques. This section is rendered particularly useful by means of supplementary analytic indexes, which classify the several hundred publications according to the identity of the radioactive isotope employed and the nature of the tissue and animal studied. The book is well printed and handsomely illustrated with numerous autoradiographs.

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Organic Solvents: Physical Properties and Methods of Purification. vol. VII of *Technique of Organic Chemistry.* Arnold Weissberger, Ed. Interscience, New York–London, ed. 2, 1955. vii + 522 pp. $8.50.

The appearance of the revised and second edition of the book on organic solvents is, indeed, a welcome addition to the reference literature of organic chemistry. The first edition, although ably compiled and presented, has long been out of date, and this second edition increases the usefulness of the reference material. The collaboration of an organic and a physical chemist in the presentation of the material on organic solvents greatly enhances the usefulness of the volume.

Following a simple classification according to organic chemical principles of the compounds indicated as solvents, the authors present a discussion of the properties and criteria of the physical properties and purity of the solvents in question. An adequate discussion is given of the boiling point, vapor pressure, density, refractive index, viscosity, surface tension, heat of vaporization, critical temperature and pressure, freezing-point constant, electric properties, flash point, and spectroscopy as well as the toxicology of the solvents. There then follow the complete data on 254 organic compounds utilizable as solvents under various conditions. Following this, there are tables arranged according to boiling point, freezing point, dielectric constant, and dipole moment. A useful series of indexes based on increasing boiling points, freezing points, dielectric constants, and dipole moments are included. This type of cross reference will be of considerable help to the researcher.

There next follows a chapter on the criteria of purity of solvent and the drying and determination of water. This will be especially useful for the practicing organic and physical chemists as well as those engaged in industrial work. The chapter containing the methods of purification for the compounds described is again a reasonably complete compilation of the literature. Although no completely critical evaluation of methods for purification have been attempted, there being several references to each compound, there is sufficient information given so that the researcher can consult the original literature. Of equal importance with the data presented in the book is the complete bibliography at the end and before the index. The whole worth of the book may be summarized in the words of the original author, "the aim of this book is to make readily accessible the abundant material which has been accumulated by chemists and physicists in recent years."

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Fluoridation as a Public Health Measure. American Assoc. for the Advancement of Science, J. H. Shaw, Ed., Washington, D.C., 1954. v + 232 pp. Illus. $4.50; AAAS members, $4.

This monograph is opportune and timely. Many of the questions raised by certain opponents of fluoridation have been ably answered with incontrovertible evidence. Twenty-one different scientists from the fields of chemistry, dentistry, engineering, and medicine have collaborated in this effort.

Two chapters—one a 10-year study of the medical aspects of an excessive fluoride intake from a water supply, the other a long-term medical study of a population using a fluoridated water supply—provide valuable information on the frequently posed question of complete medical studies. In other chapters, such subjects as the metabolism of inorganic fluorides, the magnitude of the dental benefits, the public health aspects of water fluoridation, the relative merits of various fluoridation vehicles, and the engineering and water chemistry phases of fluoridation are capably discussed by workers with years of experience in their respective fields. One chapter is devoted to the external action of fluorides on teeth, the so-called "topical application," of much interest to that portion of the population not using a public water supply.

The book has been carefully edited, and these diverse subjects have been blended into a coherent whole. It is written in an easily readable style of interest to scientists, public health workers, civic officials, and interested laity alike. A second printing would seem to be assured.

In the closing words of the preface, the editor states ". . . through the providence of nature, no other public health procedure in the annals of history has been so thoroughly tested in field trials under the widest variety of controlled circumstances." This monograph ably summarizes this evidence.

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Manganese. Metallurgy of the rarer metals, No. 3. A. H. Sully, Academic, New York; Butterworths, London, 1955. xiv + 305 pp. Illus. $6.50.

This book, the third in a series, is a summary of the literature on one of the so-called "rarer metals," manganese. Personnel engaged in research or plant operation will find it a well-written and comprehensive reference book.

The book opens with a description of the history of manganese and the worldwide occurrence and distribution of its ores. Following this, the metallurgical processes for obtaining manganese from its ores are discussed. Included are the blast and electric furnace processes for preparing high- and low-carbon ferromanganese and also the electrolytic process for the commercial production of high-purity, 99.3 percent, manganese. Methods for the recovery of manganese from furnace slags and low-grade ores are described.

Research workers will find the chapter pertaining to the physical properties of manganese of much use. The section on the four allotropic modifications of this metal contains data on the crystal structure, lattice constants, and transition temperatures. The published data on melting point, vapor pressure, specific heat, thermal expansion, electric resistivity, magnetic and other properties of manganese have been compiled and reviewed.

For many years manganese has been used extensively as a minor alloying element in ferrous and nonferrous materials. The commercial production of high-purity manganese has extended its use