ing the reader to find more detailed treatments of the scores of topics necessarily presented very briefly. Approximately 150 exercises, many with several parts, present the student with practical problems of circuit design and well illustrate the principles discussed. Graphic as well as analytic methods are analyzed in detail. The hundreds of clearly drawn line diagrams of circuits, curves, wave-forms, and so forth add materially to the vigor and clarity of the presentation.

After an introductory chapter on fundamental concepts, including those of elementary network analysis, a discussion is given of the characteristics of vacuum tubes, gas tubes, transistors, and magnetic amplifiers as elements of active networks. The next six chapters give a comprehensive treatment of low-pass and band-pass amplifiers, transient response, negative feedback amplifiers, special types of small signal amplifiers, and power amplifiers. A chapter on oscillators is followed by three on modulation and frequency conversion, frequency, phase and pulse modulation, and detectors and demodulators. The last three chapters discuss wave-shaping circuits, relaxation oscillators and trigger circuits, and noise and information theory. There are three appendixes on Fourier analysis, Laplace transforms, and tube and transistor characteristics. Relay circuits, amplidynes, and the like are not discussed at all, although positioning servosystems are briefly discussed. The book is highly recommended as a course textbook or for self-study and deserves great popularity. If this book is typical of what the author can do, and the uniformly high level indicates that it is, it is greatly to be hoped that further books will be forthcoming from his pen.

JEROME ROTHSTEIN
Signal Corps Engineering Laboratories

Cellulose and Cellulose Derivatives. pt. I. Emil Ott, Harold M. Spurlin and Mildred W. Grafflin, Eds. Interscience, New York–London, ed. 2. 1954. xvi + 509 pp. Illus. $12.

This is the first of three volumes designed to replace and modernize a much larger single-volume treatise which appeared about 12 years ago. The practical advantage of easier handling will be welcomed by those who use the book frequently. All three volumes of the new edition will be necessary ultimately for easy use, since indexes are to be located only in the third volume.

This volume comprises five main chapters, each sectionalized according to a pattern that had been set up in the original edition. In general, the same authors have participated, although new authorship now includes McBurney, Howsmon, and Lewis.

The chapters for the most part have been completely rewritten. The approach differs from that of the 1943 edition, with more emphasis on the objective and critical, rather than the historical, viewpoint and with consequent improvement. This must now be considered definitely a reference work rather than a textbook for undergraduates.

As is stated in the introductory chapter, principal emphasis is on the chemistry of cellulose and its derivatives. There is deliberate omission of many aspects of cellulose technology, such as those that pertain more specifically to industry.

The section dealing with crystalline and accessible cellulose has undergone major changes, which is not surprising in view of the great amount of experimental work done in this field in the last decade. Considerable emphasis is placed on new methods for measuring and controlling orientation of cellulose structure and on its influence on the important physical properties of the cellulose in question. All this invites and stimulates further effort toward a better understanding.

The discussion of the significance of "alpha cellulose" is timely and, although not conclusive, adds greatly to earlier speculations on the same subject.

Degradation of cellulose is comprehensively reviewed, and new attempts are made to correlate such breakdown by various methods with the resulting changes in physical, as well as chemical, properties. The present-day importance of cellulose plastics and cellulose base textiles adds further importance to this critical approach.

A major revision was found necessary in the field of chemical structure of cellulose where the weak-link theory was thoroughly discredited.

This first volume of the revised edition is excellently assembled, authoritative, and well written and if, as is to be expected, the following volumes are equally well prepared, they will become an important addition to both private and public libraries that specialize in advances that have been made in fundamental and applied science.

GEORGE A. RICHTER
Wood Cellulose Development Division,
Eastman Kodak Company

Chemical Specificity in Biological Interactions. Harvard Memoirs, No. 3. Frank R. N. Gurd, Ed. Academic Press, New York, 1954. 234 pp. Illus. $6.

These memoirs are the permanent record of the third of a series of symposiums at the laboratory of the late Edwin J. Cohn and the last he attended. The chapters, with one exception, were derived from the seminars but were written by the speakers afterward in order to permit each to include any ideas suggested by the others during discussion or in summaries that were prepared and distributed.

In the introductory chapter, Cohn emphasizes conclusions that "metals react reversibly with a great variety of proteins in very specific ways." He relates this to the processing of proteins and points out the necessity of avoiding oxidation and changes of *p*H in isolating tissue constituents. A translation of a specially prepared article by Gerold Schwarzenbach, on the "Specificity of metal complex formation," makes the results of his studies available for the first time in English. Charles D. Coryell discusses "Special prob-

lems in the formation of metal complexes," including a section concerning complex formation of hemoglobin and ferrihemoglobin. In other approaches to the broad problem, George Scatchard, Walter L. Huges, Jr., Frank R. N. Gurd, and Phillip E. Wilcot present "The interaction of proteins with small molecules and ions," and Jack Schubert discusses "The interactions of metals with small molecules." In this latter chapter an interesting section concerns "Metal chelates in relation to drug action." Richard B. Turner directs attention to "Physical and chemical properties of the steroids related to protein binding." Thomas F. Gallagher in "Biochemical problems of the steroid hormones" points out, with some possible answers, the question of why large amounts of a hormone are often necessary to produce an effect, even though great rapidity of disposal leaves only a small amount in the tissues. Shields Warren notes that "The effects of x-ray and other radiation on proteins and living tissues" may be attributed to the hitting of some sensitive volume of the cells.

In chapters that record progress of work, in each instance later carried much further, Vincent du Vigneaud describes the purification and analysis of oxytocin and vasopressin, and Waldo E. Cohn discusses the application of ion-exchange chromatography to the isolation of *a* and *b* nucleotides and further studies on the structure of nucleic acids.

This book, in a fascinating way, shows how contemporary hypotheses and techniques are being applied to the study of the nature, until recently very obscure, of the chemical forces involved in the long-known specificity of biological interactions.

RALPH C. CORLEY
Department of Chemistry, Purdue University

Organic Peroxides. Their chemistry, decomposition, and role in polymerization. Arthur V. Tobolsky and Robert B. Mesrobian. Interscience, New York–London, 1954. x + 197 pp. $5.75.

The appearance of this book, which was inspired by the desire to elucidate the interesting role of organic peroxides in catalyzing chain reactions such as observed in vinyl polymerizations, dealing as it does with one phase of this broad subject, is convincing evidence of the widespread interest that has developed in high-polymer science in recent years. The excellent review of the chemistry and decomposition of these materials should be of equal interest to many readers. One welcomes this work by these well-known authors, since it serves to draw together many scattered treatments of this subject and to regiment the data into an orderly pattern.

The authors elected to treat their subject under three major headings. The first section deals with the preparation, properties, and structural classification of organic peroxides, which include the hydroperoxides, dialkyl and diaralkyl peroxides, peroxy acids, peroxy esters, diacyl and diaroyl peroxides, and the peroxy derivatives of aldehydes and ketones. The authors have drawn quite freely upon published information in preparing this section and do not attempt to treat the subject in a comprehensive manner in terms of complex organic chemical reactions. In the preface they indicate that this was their intention. Much of the information would have to be augmented by study of the original papers to be useful in the preparation of some of these materials.

The second portion dealing with the physical chemical aspects of the cleavage of the peroxide molecule is discussed as thoroughly as knowledge of the subject will permit. Because the general chemical reactivity between members of this family of compounds is so similar, certain parts of this review seemed repetitious. The mechanism for the decomposition of peroxides by amines proposed by L. Horner and E. Schlink was taken from their early work published in 1949 and does not completely reflect their recent views on the subject, which they published 2 years later. Aside from this, the literature on this phase of the subject seems to have been well covered.

The third section, dealing with the initiation of vinyl polymerization by peroxide decomposition, is treated in a thorough, quantitative manner. Since Tobolsky has been very active in the study of polymerization kinetics, a large portion of this material is taken directly from his work. It could not have been written by a person with a more appropriate background, and it reflects his sincere interest in this field.

The value of this book is greatly enhanced by an appendix of 28 pages in which data are presented on the physical constants of selected organic peroxides, the explosive nature of peroxides, some commercially available organic peroxides, and catalyst efficiency. Several errors in chemical structure appear throughout, but I was well pleased with the format and the adequate author and subject index.

E. R. LANG
Rohm & Haas Company

Biochemistry of Cancer. Jesse P. Greenstein. Academic Press, New York, ed. 2, 1954. xiii + 653 pp. Illus. $12.

This book by Jesse Greenstein of the National Cancer Institute is far more than a second edition of a routine textbook. It is a critically prepared, carefully written, and precisely documented presentation of the reliable facts concerning an important and complex topic. Too frequently books of this type become routinized compilations without order of the facts accumulated since a previous edition, but whether perused by a worker in the field or one seeking basic information, this one can scarcely be laid down. The language is clear and simple. The material is conclusive and orderly. The conclusions are cautious and reliable.

It is pleasant indeed to be able to recommend the book to anyone actually or potentially concerned with the problem to which it is addressed. To Greenstein and his many collaborators, great credit is due.

C. P. RHOADS
Sloan-Kettering Institute for Cancer Research