BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

AN EXCELLENT REFERENCE

Title Chemical Reactions of Polymers

Editor E. M. Fettes

Publisher Interscience, Division of John Wiley & Sons, 1964

Pages 1304

Price $40.00

Reviewer Arthur A. Armstrong, Jr.

This book gives a general survey of the various types of chemical reactions that have been carried out in the entire field of polymeric materials. The editor and contributors have done an excellent job in covering this broad field. Forty-seven authors from the United States, England, Scotland, France, and Belgium, who are specialists in their particular fields, contributed to a balanced treatment of the subject.

This treatise covers the general chemical reactions of polymeric materials. Of particular interest are the sections on the effects of morphology and physical factors on the chemical reactivity. The work covers the degradation reactions that limit the use of polymeric materials as well as the beneficial reactions that improve the utility of polymers. Particular attention is given to cross-linking and graft polymerization initiated by chemical, mechanical, and radiation techniques.

This volume is an excellent reference book on the field of chemical reactions of polymeric materials. It should be of interest to the polymer chemist as well as those in the field of applications of polymers. The textile chemist and textile finisher should find in this book a wealth of information for his applications.

Arthur A. Armstrong, Jr. is Head of the Radiological Laboratory at the School of Textiles, North Carolina State University, Raleigh, where for the past five years he has directed research on the modification of textile fiber properties by radiation-induced graft polymerization. He was Associate Professor of Chemical Engineering at the University of South Carolina and Associate Professor of Engineering Research and Textile Chemistry at N.C. State. His industrial experience includes research and development positions with General Electric, Duke Power, Chemstrand, and Celanese. Author of 17 publications, he received the BS, MS, and PhD degrees (chemical engineering) from North Carolina State College in 1947, 1949, and 1957, respectively.

A CASE STUDY IN REAL-TIME DATA PROCESSING

Title Real-time Data-Processing Systems: Introductory Concepts

Author William H. Desmonde

Publisher Prentice-Hall, 1964

Pages xii + 186

Price $7.95
One of P-H Series in Automatic Computation

Reviewer Ronald E. Williams

This book is of interest as a case study of the American Airlines Sabre system for reservations. The problems encountered in designing, installing, and operating the system are described in considerable detail. Computer systems for the Mercury and Gemini programs are also discussed, but the author's main interest and concern is with the airline system.

The book is frustrating in that the real-time "concepts" are discussed largely in relation to specific pieces of equipment, namely the IBM 7080, 7094, 7750, and 1301. A broader survey, including applications of competitive equipment would have provided more useful concepts and principles for the real-time systems designer. Too much emphasis is placed on techniques related to these IBM computers, and too little, on concepts useful with present or future generations of equipment.

This is not to say that the book will be of no interest or value. As a study of the types of problems that are encountered in real-time processing, it will be most useful. The solutions described, while related to specific machine configurations, can assist in resolving similar problems on other equipment. Some of the techniques described, such as polling, trapping, enabling, queuing, and nesting will be of much interest to the batch-system oriented programer and systems designer.

This is not an easy book to read, especially for those unfamiliar with the jargon and trappings of programing. It is suggested that nonprogramers read Chapter 1 and 10 first, and then attempt to plow through the remaining chapters, if they have the time and the patience. In the chapter on disk file organization, the author states, "It is assumed that the reader has some familiarity with the IBM 1301 disk file". It would also be helpful if the reader were experienced in using the IBM 7094 system.

The problems involved in selecting hardware for real-time systems are not discussed, nor are the substantial software requirements of real-time processing listed. No checklist of "do's" and "don't's" is offered the would-be systems designer.

Two problems described in the book require comment. One is that of reliability, which was resolved in the Mercury system by utilizing duplicate 7094 systems. This must certainly draw a shudder from budget-pressed systems managers. Very few installations can afford this redundancy. Strong exception must also be taken to the implications that airline agents had to learn how to use the system for it to operate effectively. This is solving hardware or programming problems by manual procedures. There is too much of this sort of thing, and its extension should be discouraged.

Ronald W. Williams, Systems and Data Processing Manager for Brookhaven National Laboratory, has been involved in commercial and administrative data processing 1951. He programed for the first UNIVAC installation at the Bureau of Census and worked as Computer Applications Officer on one of the early commercial installations at the Chesapeake and Ohio Railway Company. After conducting the feasibility study for the General Tire and Rubber Company, he managed the design, programing, installation, and operation of an RCA 501 system there. He joined the Brookhaven staff in February of this year to establish the new Systems and Data Processing Division. His BA and MA degrees (both in economics) are from the University of Akron ('48) and the University of Chicago ('51), respectively.

LOW FREQUENCY SIGNALS

Title Whistlers and Related Ionospheric Phenomena

Author Robert A. Helliwell

Publisher Stanford University Press, 1965

Pages viii + 349

Price $12.50

Reviewer Erwin R. Schmerling

The author, whose group at Stanford University has long been associated with pioneering work in this area, gives an account of some of the rather remarkable phenomena observed in the kilocycle region of the radio spectrum. He discusses in some detail, from the viewpoint of geometrical optics, how low-frequency signals can enter the ionospheric duct and be propagated nearly along a line of force of the earth's magnetic field. Both ducted and nonducted propagation are treated. He shows how the dispersion of ducted whistlers generated by lightning flashes may be used to obtain both the latitude of origin and the electron density at the top of the path. This treatment is entirely from the ionospheric viewpoint, although the same theory is also applicable to plasma diagnostics in the laboratory.

A number of other types of very low-frequency emission, with entirely different dispersive characteristics, is also discussed, and the evidence is summarized for the triggering of periodic emissions by whistlers. This section is particularly well illustrated by numerous sonograms.

The viewpoint is mostly that of ground-based observations. It is unfortunate that is was not possible to include the phenomena recently discovered in satellites which appear to depend on the ionic composition of the medium, and it is hoped that a later edition will include a full discussion of proton whistlers, hybrid resonance effects, and subprotonosphere whistlers.

The style is readable and clear, and the historical introduction is excellent. This book can certainly be recommended to any reader who wishes to obtain a good start in this area.

Erwin R. Schmerling is Chief of Inospheric Physics, Office of Space Science and Applications, NASA. A consultant on ionospheric and radio physics, he has taught electrical engineering at Pennsylvania State University. He is a fellow of the Physical Society of Great Britain, a member of the Geophysical Union, of Sigma Xi, and a senior member of the Institute of Electrical and Electronic Engineers. His BA (1950), MA (1954), and PhD (physics, 1958) degrees were won at Cambridge.

TWO GROUPS: PRAGMATIC APPROACH

Title Two-Group Reactor Theory

Author J. L. Meem

Publisher Gordon and Breach Science Publishers, 1965

Pages xiii + 417

Price $20.50
Text edition available

Reviewer Frederick J. Shon

A *whole book* about two-group theory? Well! Not really. This book, like many short-story anthologies, takes its title from what its author considers the most important of its facets. It is, in fact, a rather complete introduction to elementary reactor theory.

The first six chapters cover a broad range of subjects, including One Group and Fermi Age Theories, with a brief treatment of reactor kinetics and a nod at transport theory in the bargain. The reason for the title is that the two-group theory has been selected for detailed treatment. Indeed, the treatment is far more detailed than is available in any other text to my knowledge. The author's reason for selecting two-group theory as his calculational mainstay is that it represents an approach of sufficient sophistication to give useful resluts, but sufficient simplicity to permit hand calculations. Dr. Meem feels in fact that, since two groups are about as far as one can