The first chapter deals with the theory of x-ray generation and the properties of x-rays; this is followed by a chapter on x-ray detectors. The succeeding chapters deal with specialized fields of interest, including absorptiometry, film thickness determination, and x-ray emission spectrography. There is a chapter containing excellent descriptions of presently available equipment, and one on the elementary statistics of x-ray measurements. The final chapter deals with special topics which are closely related to the general field—for example, gamma-ray absorption and emission, x-ray point sources, and applications in the biological sciences.

The book is very clearly written and readable, and it will provide the analytical chemist with a considerable amount of the information necessary for entering the field. Especially useful are the discussions of sample preparation and sample handling.

The book's value is further enhanced by the tables of wavelengths and constants given in the appendixes as well as by a bibliography of element determinations.

BARRY W. MULLIGAN
National Bureau of Standards, Washington, D.C.

Physical Methods of Organic Chemistry. vol. 1, part 1 of *Technique of Organic Chemistry*. Arnold Weissberger, Ed. Interscience, New York, ed. 3, 1960. xii + 918 pp. $24.50.

The expansion of volume 1 of this excellent series on the technique of organic chemistry reflects both the volume's popularity and the editor's awareness of the need to include additional chapters on physical methods. The general excellence of format and printing has been retained, but I believe that fewer monographs should be included in each volume. The cost is high, but it is commensurate with the value of the monographs.

Part 1 has gained four new chapters and has lost five by transfer to Part 2. The new chapters are "Automatic control" by J. M. Sturtevant; "Automatic recording" by D. R. Simonsen; "Weighing" by A. Corwin; and "Determination of particle size and molecular weight" by G. B. Beyer. The first is a very concise introduction to the general principles of automatic control and includes most of the essential parts of the chapter on temperature control (by J. M. Sturtevant) which was included in the previous edition. The chapter on automatic recording presents a brief introduction to the general characteristics of various types of recorders. These two chapters, although they contain a judicious selection of material, are too brief to be of great practical value to the majority of chemists. The excellent chapter on weighing fills an evident gap in the earlier editions. The author has packed into 57 pages a great amount of valuable information on the design and testing of balances and on the procedures of weighing. Beyer's chapter on particle size and molecular weight fills in admirable fashion the need for a concise and systematic account of the methods used to characterize systems having broad distributions of particle size, as well as the need for a résumé of the type of results most characteristic of these methods.

Chapters retained from part 1 of the second edition are: "Density" by N. Bauer and S. F. Lewin; "Temperature measurement" by J. M. Sturtevant; "Determination of melting and freezing temperatures" by E. L. Skau, J. C. Arthur, Jr., and H. Wakeham; "Determination of boiling and condensation temperatures" by W. Swietoslawski and J. R. Anderson; "Determination of vapor pressure" by G. W. Thomson; "Calorimetry" by J. M. Sturtevant; "Determination of solubility" by W. J. Mader, R. D. Vold, and M. J. Vold; "Determination of viscosity" by J. F. Swindells, R. Ullman, and H. Mark; "Determination of properties of insoluble monolayers at mobile interfaces" by A. E. Alexander; "Determination of surface and interfacial tension" by W. D. Harkins, revised by A. E. Alexander; "Determination of osmotic pressure" by R. H. Wagner and L. D. Moore, Jr. Although these chapters are retained from the previous edition, the following are new contributors to them: Lewin, Arthur, Mader, Swindells, and Ullman. The chapter on viscosity is essentially new and is a much more satisfactory presentation than that of the previous edition. Alexander's chapter on insoluble monolayers at mobile interfaces replaces "Properties of monolayers and duplex films" by W. D. Harkins. It is limited to a presentation of the properties of monolayers at air-water and oil-water interfaces and a discussion of the use of the former to investigate processes taking place at interfaces.

The remaining chapters, although they incorporate new topics, tables, figures, examples, and some new discussion of theory, are essentially unchanged. The average increase in number of references is 25 percent, and the same increase holds for the length of the chapters. The authors are to be commended for bringing their work up to date.

FLOYD BUCKLEY
Division of Chemistry, National Bureau of Standards

Statistical Theory of Communication. Y. W. Lee. Wiley, New York, 1960. xvii + 509 pp. Illus. $16.75.

The modern curriculum in electrical engineering is distinguished from its predecessors by an emphasis on fundamental theory rather than on the details of "hardware." This is as it should be; fashions in electronic circuitry change so quickly that a concentration on detail rather than on principle would render any engineering education obsolete within a very few years. One of the major basic subjects to receive attention recently is the theory of communication. While there have been several texts on modulation theory, theory of noise, and information theory, all except Middleton's weighty volume are fairly specialized and are not suitable for a general introduction to the subject. In many ways this book fills the need for such an introductory text.

This book begins with an account of Wiener's theory of generalized harmonic analysis. The account, though heuristic, is well written and shows the author's thorough mastery of the subject. Good motivating arguments are given for the introduction of the autocorrelation function, spectral density, and related functions. The discussions are accompanied by numerous illustrative examples. The chapters on harmonic analysis are followed by several chapters on the theory of probability, but the latter are less well written than the former. With the current emphasis on the formulation of engineering problems in probabilistic terms, little less than a complete course in the subject can adequately cover the basic concepts.

The next several chapters, an excellent feature of Lee's book, are devoted to discussions of a number of the practical problems encountered in adapting "hardware" to make use of theory. The many pictures of experimental correlograms lend interest to the theoretical

discussion. Wiener's theory of optimum filters and some ramifications due to the author are then discussed. The criteria of fidelity are all of the mean-square-error type. The resulting Wiener-Hopf equations are discussed, *mirabile dictu*, without once mentioning analytic continuation. However, this is possible if one restricts the discussion to rational spectra. Within this limitation the author has done a fine job of presenting the elements of the theory of filtering and prediction. The final chapters are on the representation of correlation functions by orthonormal functions, a method pioneered by Norbert Wiener and the author.

It is regrettable that no account is given of at least the definitions of information theory. Otherwise this book has much to recommend it as an introduction to work in the theory of communication.

GEORGE WEISS
Institute for Fluid Dynamics and Applied Mathematics, University of Maryland

Glossary of Atomic Terms. U.K. Atomic Energy Authority, London, 1960 (order from H.M. Stationery Office, London). 54 pp. 3s. 6d.

This pocket-size compilation contains about 400 brief definitions of chemical elements and compounds, reactor components, materials and accessories, instruments, and units of measurement frequently used in nuclear science and technology. Many of the entries are names and abbreviations of atomic and electric power plants in the British Commonwealth; for example, Calder Hall, HERMES, HIFAR, NRX —reactors in Great Britain (at Harwell), Australia, and Canada, respectively—and S.S.E.B.—South of Scotland Electricity Board.

The need for selectivity in a glossary of this size may account for some of the gaps, but hardly warrants the omission of relevant terms such as annihilation, atomic absorption coefficient, bubble chamber, californium, elementary particles, positronium, radiocarbon, nuclear magnetic resonance, and many others.

Nevertheless, this is a handy, inexpensive tool keyed to the needs of the nonspecialist who has some familiarity with science and technology.

T. W. MARTON
National Bureau of Standards

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Agricultural Problems in Arid and Semiarid Environments. Alan A. Beetle, Ed. Agricultural Experiment Station, Univ. of Wyoming, Laramie, 1960. 64 pp. A symposium held at the 35th annual meeting of the Southwestern and Rocky Mountain Division of the AAAS and the 30th annual meeting of the Colorado-Wyoming Academy of Science, 6–7 May 1959 at the University of Wyoming.

A Bibliography of Fossil Man. 1845-1955. George E. Fay, pt. 1. Southern State College, Department of Sociology and Anthropology, Magnolia, Ark., 1960. 100 pp.

Chemical Aspects of the Structure of Small Peptides. Dorothy Wrinch. Munksgaard, Copenhagen, Denmark, 1960. 194 pp. Kr. 24.

La Chimie electronique et ses applications industrielles. Andree Goudot. Presses Universitaires de France, Paris, 1960. 126 pp.

Drawings of British Plants. Stella Ross-Craig. Being illustrations of the species of flowering plants growing naturally in the British Isles. pt. 14, *Adoxaceae, Caprifoliaceae, Rubiaceae, Valerianaceae, Dipsacaceae.* Bell, London, 1960. 40 pp. 10s. 6d.

Educators Guide to Free Filmstrips. Mary Foley Horkheimer and John W. Diffor, Eds. Educators Progress Service, Randolph, Wis., ed. 12, 1960. 172 pp. $6.

The Electron. Alfred Bender. Sentinel Books, New York, 1960. 128 pp. $1.

Elementary Physiology. A laboratory guide. Oscar E. Tauber, Robert E. Haupt, and Delma E. Harding. Macmillan, New York, 1960. 190 pp. $3.50.

ESP in Relation to Rorschach Test Evaluation. Gertrude Schmeidler. Parapsychology Foundation, New York, 1960. 89 pp.

Factors Influencing the Institutionalization of Mentally Retarded Individuals in New York City. Gerhart Saenger. Interdepartmental Health Resources Board, Albany, N.Y., 1960. 163 pp.

Germany between East and West. Wolfgang F. Stolper. National Planning Assoc., Washington, D.C., 1960. 92 pp. $1.75. This report, seventh in the series entitled "The Economics of Competitive Coexistence," analyzes the postwar economic growth in the two parts of Germany. Stolper notes that in West Germany the gross national product by 1958 was 90 percent above the 1936 level, while in East Germany it rose only 20 percent, but he points out that recently the gap has narrowed. Despite the East German gain, he concludes that "over the long run it is unlikely that gross national product will rise faster in the East than in West Germany." He also concludes that West Germany is of value in the Cold War struggle because it is a really good market for raw materials and foodstuffs produced by many of the less developed nations and it does not carry the burden of a recent colonial past—thus, it is an attractive trading partner for the uncommitted nations.

Les Globulines sériques du système gamma. Leur nature et leur pathologie. J. Heremans. Editions Arscia, Brussels, Belgium; Masson, Paris, 1960. 340 pp.

History of the Primates. An introduction to the study of fossil man. W. E. LeGros Clark. British Museum (Natural History), London, ed. 7, 1960. 119 pp. 5s.

Index to Theses Accepted for Higher Degrees in the Universities of Great Britain and Ireland. vol. 8, 1957–58. Magda Withrow, Ed. Aslib, London, 1960. 173 pp. 25s.

Laboratory Manual for Medical Bacteriology. M. J. Pickett and Eric L. Nelson. Burgess, Minneapolis, Minn., 1960. $3.50.

Lithofacies Maps. An atlas of the United States and Southern Canada. L. L. Sloss, E. C. Dapples, and W. C. Krumbein. Wiley, New York, 1960. 108 pp. $5.50.

The Manufacture and Testing of Durable Book Papers. Based on the investigations of W. J. Barrow. Randolph W. Church, Ed. Virginia State Library, Richmond, 1960. 63 pp.

The Marine Fishes of Rhode Island. Bernard L. Gordon. Book and Tackle Shop, Watch Hill, R.I., 1960. 147 pp. $4. Annotated list of marine fishes of Rhode Island.

The Mechanism of Heterogeneous Catalysis. J. H. De Boer, Ed. Elsevier, Amsterdam, Netherlands, 1960 (distributor for U.S. and British Commonwealth, Van Nostrand). 189 pp. Proceedings of a symposium held 12–13 November 1959 in Amsterdam.

Reading: Its Creative Teaching and Testing, Kindergarten through College. Frances Oralind Triggs. The Author, New York, 1960. 150 pp.

Selected Bibliography of Contraception: 1940–1960. Christopher Tietze, Ed. National Committee on Maternal Health, New York, 1960. 76 pp. $1. Covers the medical and sociological literature, including books, chapters of books, conference papers, and journal articles, published in languages of Western Europe from 1940 to early 1960.

Spectrochemical Abstracts, vol. 6, 1954–1955. Ernest H. S. van Someren and F. Lachman. Hilger and Watts, London, 1960. 100 pp. 25s.

Statistical Design (reprints from *Industrial and Engineering Chemistry*). W. J. Youden. American Chemical Soc., Washington, D.C., 1960. 72 pp. $2. A collection of the bimonthly articles by Youden, published during his 6 years as contributing editor for the journal.

Tested Demonstrations in Chemistry. Journal of Chemical Education, Easton, Pa., 1960. 168 pp. $3. Reprinted from the *Journal of Chemical Education*; the 1955–56 series edited by Hubert N. Alyea, the 1957–60 series edited by Frederic B. Dutton, and "Demonstration abstracts" edited by Hubert N. Alyea.

U-2 and Open Skies. A. G. Mezerik, Ed. International Review Service, New York, 1960. 45 pp. $2.50.

U.S. Office of Education. *Bulletin*, No. 16, "Cooperative research projects." U.S. Office of Education, Washington, D.C., 1960. 53 pp. $0.25.