The second part is concerned with details of applications of various instrumental methods to industrial products, to medicine, and to pollutants. The topics are largely the same as those treated in the second part of volume 2, with the emphasis in this case on instrumental procedures. The variation in quality and depth of treatment is much more pronounced in this second section of volume 3 than in the first. For example, in some chapters sufficiently detailed instructions are found for the performance of a given analysis so that recourse to the original literature may be unnecessary. Other chapters are quite general in their treatment and largely serve as a catalogue of literature references.

In my opinion, the attempt to separate the application sections in this edition into two parts based on instrumental and noninstrumental procedures is regrettable. The artificiality of this division becomes apparent in a perusal of the two sections. In volume 2 (noninstrumental), for example, one finds procedures based on potentiometric or spectrophotometric measurements. In volume 3, frequent references must be made to details found in volume 2. If indeed a separation must be made (which I doubt), might not this separation be better based on "standard" and "nonstandard" methods? The so-called instrumental methods then fall primarily though not exclusively in the latter category; however, the distribution will undoubtedly change with time. The sixth edition of *Standard Methods* is a useful reference work and belongs in technical libraries.

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Stroboscopy

The stroboscopic, or pulsed-image, principle has been exploited, if not understood, for hundreds of years. A variety of mechanical devices have utilized this optical illusion to titillate the human observer. With the advent of the practical electronic flashtube some 35 years ago, stroboscopy entered a new era of practical application, including speed measurements, motion studies, photography, and stimulation of photosensitive materials. Pulsed light is a versatile tool of enormous potential value in a broad range of fields, yet few books have been written on the subject. Jerzy Rutkowski's **Stroboscopes for Industry and Research** [translated from the Polish *Stroboskopy* (Warsaw 1961) by E. Lepa. Pergamon, New York, 1966. 278 pp., illus. $12.50] brings together for the serious researcher a wealth of material on the theory of stroboscopy and the construction of stroboscopic instruments.

The presentation assumes a grasp of undergraduate mathematics, and the material is treated from a theoretical rather than a practical standpoint. The book will serve admirably as a text because of its in-depth treatment. For example, the discussion of the photometric properties and perception of the pulse image will be welcomed by disciplines ranging from engineering to physiology.

The still-useful mechanical stroboscope is described in detail, and there is exhaustive coverage of the electrical circuits and components employed in flash stroboscopes. Considerable attention is paid to circuit functions, which are explained in terms of their complex interrelationships in practical stroboscopes.

The important subject of synchronization is well covered, as are the characteristics of various accessories. But the material on applications is weak, and the tabulations of available equipment with their abbreviated characteristics around 1960 are already dated. It seems unlikely that the book will receive the universal acceptance suggested by inclusion of "industry" in the title.

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Chemistry of a Functional Group

The Chemistry of the Carbonyl Group [Interscience (Wiley), New York, 1966. 1039 pp., illus. $32.50] is the second in a series of volumes produced under the editorship of Saul Patai which attempt to deal exhaustively with the chemistry of functional groups. Its predecessor, which dealt with the alkenes, was enthusiastically received in these pages a year ago; I cannot accord a similar welcome to the present volume. This volume seems to be the victim of two current conceptions regarding the production of scientific books: that of publishers which holds that libraries will acquire willy-nilly anything presented to them regardless of price or quality, and that of editors which maintains that their task is complete when signed contracts have been secured for a reasonable number of chapters. All in all, the book is not really bad; neither is it nearly as good as it might have been.

This treatise, which attempts "to encompass all facets of a functional group and to give up-to-date descriptions of the nature of the carbonyl group, of the main pathways leading to its formation, and of its main modes of reaction," consists of 17 loosely coordinated chapters contributed by a total of 26 authors. Admittedly, organizing the efforts of so many to produce a coherent whole is an ambitious goal; it is one which is not realized in the present case. The scope of the volume is so broad that, despite its length, important topics are dealt with superficially, redundantly, or not at all. For example, a topic so basic to carbonyl chemistry as the reaction of these substrates with amines nowhere receives a thorough discussion. The forward reaction is discussed in one chapter, the microscopic reverse in quite another, and the analytical uses of these reactions in yet another. Of course, the entire subject is to be completely rehashed in an upcoming volume, so perhaps one is expected to forgive the present inadequacies. The closely related reactions involving the addition of oxygen nucleophilic reagents to carbonyl compounds seem to have escaped attention altogether. Similarly, the reasonable entry "eneamines" appears nowhere in the index; this is not the fault of the index.

One wonders whether chapters such as that dealing with general and theoretical aspects of the carbonyl group really belong in a book of this type. The chapter is competently done, but those interested in quantum mechanical treatment of carbonyl compounds are not likely to resort to a volume aimed principally at synthetic organic chemists. A similar question may be raised concerning a chapter on chemical and physical methods of analysis. The space occupied by such material might better have been employed to provide additional depth to topics central to the main theme of the entire work. Lack of really adequate coverage is ac-

centuated by the failure of two authors to deliver promised manuscripts in time for publication. The editor wisely chose incompleteness in preference to obsolescence, but, despite the omission of the two late chapters, much of the material was clearly written nearly two years prior to the date of publication. Many chapters contain no late-1964 or 1965 references at all.

This volume contains some good chapters and one or two that are excellent. They deserve better company. The editor notes in the preface that his work was carried out "in a period of hardship and calamity." Perhaps under improved circumstances succeeding volumes will be improved.

The ready availability of this book in the laboratories and on the desks of those who work in the field is precluded by its price. It will be largely confined to the shelves of reviewers and scientific libraries. Perhaps not all of the latter will find its acquisition a necessity; it cannot be considered a bargain.

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Reflection Measurements

There are all too many spectroscopists—particularly those working in the infrared region—who consider that the only way to record the spectrum of a material is to put it into solution and measure its transmission. For this group, as well as the analytical chemists who have samples that cannot be handled in the conventional manner, and for those interested in reflection measurements in general, **Reflectance Spectroscopy** [Interscience (Wiley), New York, 1966. 306 pp., illus. $12], by Wesley Wm. Wendlandt and Harry G. Hecht, will prove to be well worth studying. Included are fairly lengthy treatments of the theory of specular and diffuse reflectance, together with chapters on applications and instrumentation, a discussion of internal-reflection spectroscopy, treatments of high-temperature and dynamic-reflectance spectroscopy, descriptions of color-measurement methods, and a section on the integrating sphere. The descriptions of commercially available instrumentation are especially good.

Perhaps because most reflection work has been done in the visible and ultraviolet regions of the spectrum, relatively small portions of the book are devoted to the infrared region. Much of the information pertaining to visible and ultraviolet wavelengths can be extrapolated into the infrared, however.

Since the current trend in infrared analysis is more and more toward the examination of samples *in situ* by specular reflection, internal reflection, and emission techniques, *Reflectance Spectroscopy* will serve as a highly useful introduction to these new methods for the infrared spectroscopist. In addition, it provides a summary of classical reflection procedures for those working in the visible and ultraviolet.

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New Books

Mathematics, Physical Sciences, and Engineering

Advances in Analytical Chemistry and Instrumentation. vol. 5. Charles N. Reilley and Fred W. McLafferty, Eds. Interscience (Wiley), New York, 1966. 408 pp. Illus. $14. Six papers: "Determination of molecular weights by ebulliometry" by Clyde A. Glover; "Automation of the analytical process through continuous analysis" by W. J. Blaedel and R. H. Laessig; "The solvent extraction of metal chelates" by George K. Schweitzer and W. Van Willis; "Interpretation of K-edge x-ray absorption spectra of transition metal compounds" by Richard M. Levy and John R. Van Wazer; "Analytical applications of microwave spectroscopy" by David R. Lide, Jr., and "The determination of molecular structure by single-crystal x-ray diffraction methods" by Robert F. Bryan.

Advances in Astronomy and Astrophysics. vol. 4. Zdeněk Kopal, Ed. Academic Press, New York, 1966. 358 pp. Illus. $14. Five papers: "Objective prisms and measurement of radial velocities" by Ch. Fehrenbach; "The figure and gravity field of the moon" by C. L. Goudas; "The relativistic degenerate gas" by A. W. Guess; "Exchange of matter and period changes in close binary systems" by A. Kruszewski; and "The stray bodies in the solar system" pt. 2, "The cometary origin of meteorites" by Ernst J. Öpik.

Advances in Cryogenic Engineering. vol. 11. Proceedings of a conference (Houston, Texas), August 1965. K. D. Timmerhaus, Ed. Plenum Press, New York, 1966. 728 pp. Illus. $19.50. Seventy-six papers on the following topics: Insulation (9 papers); Refrigeration (8 papers); Space Technology (10 papers); Cryogenic Properties (7 papers); Phase Equilibria and Thermodynamics (7 papers); Mechanical Properties (9 papers); Heat Transfer (10 papers); Equipment (6 papers); Superconductivity and Magnets (8 papers) and Invited Papers (2 papers).

Advances in Inorganic Chemistry and Radiochemistry. vol. 8. H. J. Emeléus and A. G. Sharpe, Eds. Academic Press, New York, 1966. 375 pp. Illus. $14.50. Six papers: "Substitution products of the group VIB metal carbonyls" by Gerard R. Dobson, Ingo W. Stolz, and Raymond K. Sheline; "Transition metal cyanides and their complexes" by B. M. Chadwick and A. G. Sharpe; "Perchloric acid" by G. S. Pearson; "Neutron diffraction and its applications in inorganic chemistry" by G. E. Bacon; "Nuclear quadruple resonance and its application in inorganic chemistry" by Masaji Kubo and Daiyu Nakamura; and "The chemistry of complex aluminohydrides" by E. C. Ashby.

Aerospace Telemetry. vol. 2. Harry L. Stiltz, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1966. 271 pp. Illus. $10.95. Prentice-Hall Space Technology Series. Five papers: "Satellite and space probe telemetry" by Robert W. Rochelle; "FM data systems" by J. H. Crow; "Single sideband FM telemetry" by Walter O. Frost; "Adaptive telemetry—data compression" by Daniel Hochman and Donald R. Weber; "PACM-pulse amplitude/code modulation" by Warren F. Link.

Analysis of the New Metals: Titanium, Zirconium, Hafnium, Niobium, Tantalum, Tungsten and Their Alloys. W. T. Elwell and D. F. Wood. Pergamon, New York, 1966. 287 pp. Illus. $9.50.

Analytic Geometry. Murray H. Protter and Charles B. Morrey, Jr. Addison-Wesley, Reading, Mass., 1966. 328 pp. Illus. $6.75.

Analytical Instrumentation: A Laboratory Guide for Chemical Analysis. Galen W. Ewing. Plenum Press, New York, 1966. 171 pp. Illus. $7.50.

Annual Review of Astronomy and Astrophysics. vol. 4. Leo Goldberg, Ed. Annual Reviews, Palo Alto, Calif., 1966. 521 pp. Illus. $8.50. Fifteen papers: "Abundance determinations from stellar spectra" by R. Cayrel and G. Cayrel de Strobel; "The long-period variable stars" by Józef I. Smak; "Problems of close binary systems that involve transfer of angular momentum" by Su-Shu Huang; "The accuracy of trigonometric parallaxes of stars" by S. Vasilevskis; "Absolute intensity calibrations in radio astronomy" by J. W. Findlay; "Magellanic clouds" by B. J. Bok; "The structure of radio galaxies" by Alan T. Moffet; "Evolution of protostars" by Chushiro Hayashi; "Astronomical measurements in the infrared" by Harold L. Johnson; "Hydrogen molecules in astronomy" by G. B. Field, W. B. Somerville, and K. Dressler; "The polarization of cosmic radio waves" by F. F. Gardner and J. B. Whiteoak; "Magnetic stars" by P. Ledoux and P. Renson; "Pulsation theory" by R. F. Christy; "Superdense stars" by John Archibald Wheeler; and "Spectral classification through photoelectric narrow-band photometry" by Bengt Strömgren.

Antenna Analysis. Edward A. Wolff. Wiley, New York, 1966. 532 pp. Illus. $25.

Applied Climatology: An Introduction. John F. Griffiths. Oxford Univ. Press, New York, 1966. 128 pp. Illus. $6.

Applied Mechanics for Engineers. vol.

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