atomic form factors, for example, is taken from seven different sources, most of which represent the latest work in this field. An advantage of Dr. Sagel's book is that wave lengths and crystallographic data are given in angströms, rather than in X units.

One rather serious criticism of this book is that it does not present information relative to the Weissenberg and precession photographic techniques. For example, the Lorentz and polarization (PLG in the nomenclature of the book) factor is not tabulated for either the equi-inclination Weissenberg or precession methods. Furthermore, the trigonometric formulas are not given for these important methods.

The usefulness of tables and charts which are intended as aids in indexing powder and single-crystal photographs depends a great deal on personal preferences as well as the nature of the particular problem. Since the selection of material given by Dr. Sagel is somewhat different from that given in Internationale Tabellen, the advantage of having both books is apparent.

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An Introduction to the Chemistry of Fats and Fatty Acids. By F. D. GUNSTONE, PH.D., A.R.I.C., Lecturer in Chemistry, The University of St. Andrews. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1958. x + 161 pp. 16 × 25 cm. Price, $6.00.

In his foreword Professor Hilditch states the need for a good textbook on fat chemistry for the use of Honours students in organic or biochemistry and commends the present volume for this purpose. In his opinion the treatment is logical, concise and clear and in this the reviewer agrees.

In the United States there is perhaps less need for this book, since we already have in Deuel's Vol. I a very complete monograph on this subject, but perhaps it may be too detailed for the beginner. In this respect Gunstone's book seems suitable and may serve as an introduction to the more comprehensive monographs.

There are six chapters in the book with a good index making in all 161 pages. The first chapter is given to a discussion of the more important structural units of the fats—nomenclature, classification, saturated and unsaturated and branched chain fatty acids, with determination of structure and finally synthesis.

The second chapter is devoted to the chemical nature of the fats and other lipids with examination of the component fatty acids and the distribution of the various acids in the triglyceride molecule.

The third chapter deals with the physical properties of the fats and fatty acids while the fourth takes up the chemical properties such as hydrolysis, hydrogenation, oxidation and other properties.

Chapter five has to do with the synthesis and utilization of fats in living organisms—biosynthesis in plants and metabolism in animals.

Chapter six is concerned with the technical applications of fats—edible fats, soap and detergents, glycerol, paints, varnishes, etc., with other uses of fats.

Certain tables of composition, as for example on pages 32, 34, 36, in the reviewer's opinion would have been improved by titles or headings, but these are small matters and do not affect the general usefulness of the book

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Metals and Enzyme Activity. Biochemical Society Symposium No. 15 held at the University of Leeds on 13 July, 1956. Organised and Edited by E. M. CROOK. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. 1958. 102 pp. 16 × 25 cm. Price, $3.75.

This little collection of seven papers on the function of metals in enzymes is understandably not a comprehensive treatise. Furthermore, the reader who expects to peruse this book and learn something definite about what metals do in enzymic catalysis will be disappointed. Although many metal chelate compounds are known, we have relatively little precise knowledge of factors governing chelate stability and reactivity. Thus, the fundamental background for understanding the role of metals in enzymes is incomplete. Furthermore, enzymes contain many groups capable of coordination with metal ions and these bear an unknown spacial relationship to each other. It is, consequently, difficult to discuss the role of metals in enzyme function except in a vague and speculative way. Perhaps a subject is most exciting at this stage, and we can be sure that today's speculation will lead to future understanding. Discussions like the one recorded in this book are a very good way of letting the average chemist in on some of the excitement of a developing new field. Unfortunately, this book has been slow in publication, and the reader may well wonder what has happened in the field in the past two years.

A clear and very condensed introduction on metal–ligand bond types and stereochemistry of complexes by R. S. Nyholm opened the symposium. This was followed by a rambling, but interesting, discussion by L. E. Orgel, covering the dependence of chelate stability on the nature of the metal ion and ligand groups and variation of chelate stability with *p*H. Other topics considered were the possible roles of metals in bringing reacting groups together at enzyme surfaces and in generalized acid catalysis, and oxidation reactions of copper complexes including copper-containing oxidases and oxygen carriers. The third paper by B. R. Rabin dealt with metal–peptide complexes and proteolytic activity. This is a fine example of the kind of careful work required to arrive at unambiguous answers about the structure of simple chelate complexes, and of the great difficulty in extrapolating from these results to probable mechanisms of metal function in enzymes. Several hypotheses about the role of metal ion activators in peptidase action were considered.

The afternoon session was introduced by Adrien Albert who discussed the significance of heavy metals in biological systems. F. C. Happold and R. B. Beechey provided a stimulating discussion on "univalent metals and other nonspecific activations." Data on tryptophanase were presented and interpreted as indicating a role of K^+ and NH_4^+ ions in "organizing the protein" in some way. The activation of enzymes by univalent ions clearly deserves much future study. F. Bergel and R. C. Bray considered metalloflavoproteins with special reference to the role of molybdenum in xanthine oxidase and in nitrate reductase. In the final paper of the day, E. C. Slater lucidly reviewed the chemistry of the cytochromes. Cytochrome nomenclature and the composition of the main cytochrome chain in the small particles of heart muscle preparations were discussed at length. Briefly considered were the cytochrome chain of intact mitochondria, the oxidation and reduction of cytochrome c, the properties of cytochrome oxidase and the kinetics of its action.

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The Terpenes. Volume V. The Triterpenes and their Derivatives. Hydroxy Acids, Hydroxy Lactones, Hydroxyaldehydo Acids, Hydroxy-keto Acids and the Stereochemistry of the Triterpenes. By the Late SIR JOHN SIMONSEN and W. C. J. ROSS, D.Sc., D.I.C., F.R.I.C., Reader in Chemistry, Institute of Cancer Research, University of London. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. 1957. ix + 662 pp. 14.5 × 22 cm. Price, $15.50.

This book represents the last volume of the late Sir John Simonsen's treatise on terpenes. It contains an extensive and very detailed discussion of the chemistry of the triterpene acids and their derivatives. The bulk of the original work on these complicated natural products was done in the laboratories of Barton, Halsall, Jeger, Jones, Ruzicka, Spring and Wieland. The authors were able to do justice to the excellent researches of these investigators. The topics in general are clearly presented and anybody who wishes to learn some good chemistry or refresh his memory should read at least a few of the chapters. Besides reviewing the contents of previously published papers the authors propose structures for some transformation products of bassic acid, ursolic acid and particularly quinovic acid. The book contains also a most welcome 100-page addendum

to Vol. III in which P. de Mayo discusses the more recent work on sesquiterpenes and diterpenes. Second addenda to Volumes I and II which were last prepared in 1950 are now desirable and we hope that the junior authors who have contributed so admirably to Simonsen's work will continue the task.

In the reviewer's opinion, Volume V can be criticized on only one count. It contains a large number of formula errors. A partial listing of incomplete or incorrect formulae includes these: p. 34, XXV; p. 57, XIII; p. 88, XLVI; p. 92, LVI; p. 146, XVIII; p. 153, III; p. 161, XXVI; p. 201, LXXVIII should be LXX; p. 520, VIII and XI; p. 523, XXV; p. 525, XXX; p. 535, V; p. 538, II and XIX; p. 551, IV; p. 554, XIX; p. 555, XXIV; p. 566, VII; p. 567, XII to XV; p. 569, VII and VIII; p. 570, XVI; p. 573, XXVIII; p. 574, XX; p. 576, II; p. 577, IV; p. 578, II; p. 579, VIII; p. 582, X; p. 586, VII and VIII should be interchanged; p. 592, VIII; p. 608, XXII. The sufferings of that lovely province Alsace-Lorraine never seem to end (J. Pharm. Elasass-Lothnagen, p. 593). It is hoped that the incorrect formulae will be replaced in future printings.

Regardless of these errors the book is excellent and can be recommended highly to any chemist.

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Semiconductors and Phosphors. Proceedings of the International Colloquium 1956 "Semiconductors and Phosphors" at Garmisch-Partenkirchen. Edited by Prof. DR. M. SCHON, München, and Prof. DR. H. WELKER, Erlangen. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1958. viii + 684 pp. 16.5 × 24 cm. Price, $16.50.

This volume contains approximately 100 papers which were presented, a foreword by the editors, and accompanying remarks by Dr. Walter Shottky. Seven of the papers are in French; the remainder are approximately equally divided between English and German.

Because of the numbers involved, it is obviously impractical to review them individually, or even to list the names or authors of the papers. The volume begins with a paper on Growth and Defects of Semiconductor Crystals and ends with a paper on Glasartige Halbleiter. The topics cover a wide range; most of them are concerned with semiconductors rather than phosphors. There appears to have been little attempt to group the papers according to subject matter; one observes, for example, that the 6th and 98th papers are concerned with surface states. The lengths vary from less than one page (abstract) to 50 pages, the longest being on "The Role of Low-Frequency Phonons in Thermoelectricity and Thermal Conduction." In general, the figures and references are adequate.

This volume will serve as a permanent record of this 1956 Colloquium, but the two-year delay in publication detracts considerably from current interest. It is to be hoped that the Proceedings of the subsequent International Conference held at the University of Rochester during August, 1958, will appear more promptly.

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Zeitschrift für physikalische Chemie. Sonderheft. Internationales Polarographisches Kolloquium im Institut für Elektrochemie und Physikalische Chemie der Technischen Hochschule Dresden vom 3–7 June, 1957. Edited by K. SCHWABE. Akademische Verlagsgesellschaft Geest und Portig K.-G., Sternwartenstrasse 8, Leipzig C 1, Germany. July, 1958. 302 pp. 15.5 × 23.5 cm. Price, DM 32,—.

It has become customary to publish in a special issue of a journal papers presented before a Symposium on a particular subject. The above issue of the "Z. Physik. Chem." is especially welcome to polarographists as it makes available in German (only one brief paper is in English) progress in polarographic research in the eastern European countries. Eighteen of the 28 papers originate in Czechoslovakia, 2 in Poland, 1 in Russia, 4 in East Germany, 1 in West Germany, 1 in Japan and 1 in Australia. Some of the papers are of theoretical and some of more practical importance. No detailed discussion of each paper can be expected in this column. An exception may be made for the first paper by J. Heyrovsky, the originator of polarography. Much has been written on polarographic maxima of the first and the second kinds, but the former are still incompletely understood. Heyrovsky reports interesting experiments from which he concludes that the surface of the mercury drop is not in motion. Maxima of the first kind are attributed by him to the inhomogeneous electric field around the growing drop of mercury. Other papers deal with experimental studies of maxima, tensammetry, abnormal polarographic reduction of iodate and bromate, oscillography, current–time curves, elimination of residual current, hydrogen overvoltage, chronopotentiometry, polarography of aluminum, thorium, cobalt dipyridyl and other complex ions, phenylglyoxal, tropon, tropylium ions, sydnone, azulene, pyridine derivatives, and aromatic hydrocarbons. Of particular interest to biochemists are Brdicka's review paper on the polarographic protein reaction, a paper on the use of this reaction in sulfosalicylic acid filtrates of blood sera and a description of an application of the polarographic method in respiration studies of tissues.

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Advances in Cancer Research. Volume V. Edited by JESSE P. GREENSTEIN, National Cancer Institute, National Institutes of Health, U. S. Public Health Service, Bethesda, Maryland, and ALEXANDER HADDOW, Chester Beatty Research Institute, Institute of Cancer Research, Royal Cancer Hospital, London, England. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. ix + 463 pp. 16 × 23.5 cm. Price, $10.80.

The fifth volume in the series "Advances in Cancer Research" may, in very general terms, be considered to cover two major areas, carcinogenesis and tumor–host relationships. Under carcinogenesis may be grouped the chapters, Primary Carcinoma of the Liver by Charles Berman; Chemically Induced Tumors of Fowls by P. R. Peacock; Chemistry, Carcinogenicity and Metabolism of 2-Fluorenamine and Related Compounds by Elizabeth K. Weisburger and John H. Weisburger; Tumor–Host Relations by R. W. Begg; Protein Synthesis with Special Reference to Growth Processes both Normal and Abnormal by P. N. Campbell; The Newer Concept of Cancer Toxin by Waro Nakahara and Fumiko Fukuoka; Anemia in Cancer by Vincent E. Price and Robert E. Greenfield; and Specific Tumor Antigens by L. A. Zilber comprise the chapters pertaining more or less to aspects of events initiated by a tumor growing in a host. It might be anticipated that the chapter by the Weisburgers on the fluorenamines would by its nature be of more interest to chemists; however even the more clinically oriented chapters have sufficient biochemical bases and implications to attract quite a few other chemists. The review of the fluorenamines has included: the relationship of chemical structure to carcinogenesis among the considerable number that have been synthesized and tested biologically, the wide variety of sites of production of cancer from this class of carcinogen, the influence of dietary and hormonal factors on the process, and the metabolism of N-2-fluorenamine.

Berman, in addition to discussing clinical and pathological aspects of liver cancer, has presented thought-stimulating considerations on geographic and demographic distribution and the possible role of environmental factors in the disease. Peacock mentions resemblances of the induced tumors of the fowl to those of mammals and has discussed questions of the relationships of viruses to such tumors.

Begg has surveyed the biochemical and morphological changes in tissues without obvious cancer cells in the tumor-bearing host. Effects of host on the tumor have been omitted. The ability of tumors to concentrate metabolites has been reviewed as has been the production of substances by the tumor. One such material, Toxohormone, is the subject of an entire chapter by Nakahara and Fukuoka. This material, apparently with characteristics of a polypeptid, is a toxic substance produced by cancer cells and causes certain systemic changes in the cancer host. One such change