

sired. Overvoltage is represented only by a very brief discussion of the evolution of hydrogen, and undervoltage phenomena are not mentioned. It is true that excess indifferent electrolyte is usually present in electrodeposition procedures and usually accelerates the deposition, but if its only effect were the one given it would retard the deposition of a cation rather than accelerate it. A platinum electrode in an acidic solution containing chromous ion does not assume the potential of the hydrogen ion-hydrogen couple, but a mixed potential; however, mixed potentials are not mentioned and there is no discussion of the circumstances under which deviations from the Nernst equation are to be expected. In many procedures for electrogravimetric analysis both the electrolysis current and the potential of the working electrode are specified, although each must vary under these conditions if the other is fixed.

This reviewer strongly recommends the present book to those interested in the practical execution of electrochemical analyses, and suggests that its purchase be supplemented by that of the corresponding volume of the Kolthoff-Elving "Treatise on Analytical Chemistry," whose strong emphasis on basic principles will provide the analyst with the background that is essential to the rational and productive application of these techniques.

The book is well printed and bound. It contains remarkably few typographical errors, and at four cents a page its price is unexceptional.

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**An Introduction to Practical Infra-red Spectroscopy. Second Edition.** By A. D. CROSS, B.Sc., Ph.D., Research Laboratories, Syntex, S. A., Apartado 2679, Mexico, D.F., Formerly Lecturer, Imperial College of Science and Technology, London. Butterworth Inc., 7235 Wisconsin Ave., Washington 14, D. C. 1964. viii + 86 pp. 15 × 24.5 cm. Price, \$3.50.

The second edition of this book differs very little from the first edition, which has proved to be a very useful introduction to elementary theory of infrared spectroscopy, to the basic techniques, and to the application of the correlation charts and tables in the interpretation of spectra. The simplicity of the text has no doubt contributed greatly to the role this book has played in aiding organic chemists unfamiliar with infrared spectroscopy (for whom the book is intended, and in the light of which it must be assessed). Revisions of the second edition are largely restricted to Part I, which is devoted to simple theory and practical aspects. Part II of the book consists of correlation charts and tables of "group frequencies" which have not altered significantly since the first edition was published in 1960.

Part I of the book discusses elementary theory, uses of infrared spectroscopy, the construction and operation of instruments, cells and sampling techniques, phases and solvents, prisms and gratings, quantitative analysis, hydrogen bonding, and the interpretation of spectra. As in the first edition, a main feature of this section is a fascinating fold-out table giving specifications (under sixteen headings, and including prices) of commercial double-beam infrared spectrophotometers in production in June 1963. The seventeen "simplified spectrophotometers" and the twenty "precision spectrophotometers" represent American, British, Japanese, German, and Russian makes. It is unfortunate that a table like this rapidly becomes out of date.

Although the revision of the text was prompted by the many recent developments and refinements in practical technique, according to the author, a considerable number of important advances are not mentioned. Among these are attenuated total reflectance spectroscopy, minimum volume gas cells, and the methods which have been developed for handling minute samples from gas chromatography columns. The use of Irtran-2 cell windows for corrosive liquids and for aqueous solutions is not discussed. The exploitation of temperature dependence of infrared spectra, particularly in structural studies where conformational mobility is involved, is another feature which has been overlooked. The section on cells fails to point out that in the fundamental OH, NH, and CH stretching region quartz ("Infrasil") cells are ideal, and that path lengths of up to 10 cm. of carbon tetrachloride (a limit set by the sample compartment design in most spectrophotometers) can be used in double-beam operation, permitting spectral measurements on very dilute solutions or on difficultly soluble materials.

The correlation data in Part II are given both in frequency ( $\text{cm}^{-1}$ ) and wave length (microns), and a useful table of reciprocals is included.

Despite some shortcomings this popularly priced paperback deserves wide circulation and is highly recommended to amateur infrared spectroscopists.

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**Biochemistry of Phenolic Compounds.** Edited by J. B. HARBORNE, John Innes Institute, Bayfordbury, Hertford, England. Academic Press, Inc., Ltd., Berkeley Square House, Berkeley Square, London W1, England. 1964. x + 618 pp. 16.5 × 24 cm. Price, 126 s.

This is the first comprehensive account to be published which deals primarily with the biochemistry of natural phenolic compounds, and as such it is a useful contribution to the literature. The general standard of the fourteen contributions is good and several chapters are excellent. There is, however, one serious defect, but this criticism is not directed at the authors. Although the preface is dated March 1964, very few references are given to papers published after June 1962. This delay in publication of review textbooks is not unusual, but it is a matter which demands the attention of publishers. Some publishers are meeting this challenge, but others seem quite happy to produce high-priced textbooks which are already out of date when they are published. Perhaps the time has come when the date of receipt of manuscripts for textbooks should be recorded in the same way as it is for papers in journals.

The objective of this book was to present an account of the "current situation" concerning natural phenolic compounds which would appeal to the chemist, the biochemist, the plant physiologist, and the geneticist. Subject to the reservation that has already been mentioned, this objective has been achieved.

The introductory chapter (by R. H. Thomson) is excellent in that it provides a discussion of the reactivity of phenolic compounds in terms of the chemistry of a wide range of natural products. The treatment is novel and some of the less well-known facets of the behavior of phenols are included. The second chapter (by M. K. Seikel) discusses the isolation and identification of natural phenols but several serious deficiencies were noted. Color tests are discussed in detail, but there is practically no discussion of thin layer chromatography, and nuclear magnetic resonance is not even mentioned.

The phytochemical distribution of phenolic aglycones (by J. B. Harborne and N. W. Simmonds) and glycosides (by J. B. Harborne) is well reviewed, but the use of leading references rather than references to the original literature is likely to cause trouble when this book is used for direct reference. The study of chemical taxonomy in relation to genetics is now an important trend in the examination of natural products, and the chapter (by R. E. Alston) on the genetics of phenolic compounds is authoritative and lucid.

The wide coverage of this book is indicated by the fact that there are four chapters dealing with the *in vivo* behavior of phenolic compounds. The metabolism of phenolics in animals, in higher plants, and in microorganisms is discussed (by R. T. Williams and G. H. N. Towers), and the physiological and pharmacological effects of phenolic compounds upon animals are reviewed (by P. W. Ramwell, H. S. A. Sherratt, and B. E. Leonard). The role which phenolic compounds can play in connection with pathological conditions in plants, the resistance and susceptibility of plants to infection, and the host-parasite relationship is discussed in detail (by I. A. M. Cruickshank and D. R. Perrin).

Some of the most important advances which have been made recently in plant biochemistry have been concerned with biosynthesis. The reviews on the biosynthesis of phenolic compounds (by A. C. Neish) and on lignin and tannin biosynthesis (by S. A. Brown) are of the high standard now expected from these authors, but it is unfortunate that these excellent reviews have been subjected to a delay of nearly two years.

The natural products chemists who read this book—and many will—will be fascinated by the chapters on the enzymology of phenolic biosynthesis (by E. E. Conn) and the physiological study of phenolic biosynthesis (by H. W. Siegelman). These chapters clearly define areas of enquiry which will continue to attract the attention of the chemist, the biochemist, and the plant physiologist.