

interaction, which together make informative reading and a very useful addition to any biochemical library. These articles include a general introduction by the late E. J. Cohn; a discussion of "Special Problems in the Formation of Metal Complexes" by C. D. Coryell, which includes recent physicochemical information on the specificity in complex formation of hemoglobin and ferrihemoglobin; thorough and valuable reviews by J. Schubert on "Interactions of Metals with Small Molecules and Ions"; and a paper by G. Schwarzenbach giving a theoretical foundation and pertinent experimental data for "The Specificity of Metal Complex Formation" with special reference to proteins. Other papers deal with radiation injury (by S. Warren), physicochemical properties of steroids (by R. B. Turner), clinical studies of steroid hormones (by T. F. Gallagher), purification and analysis of hormones of the posterior pituitary gland (by V. du Vigneaud), and are related to varying extents to the general theme of the symposium.

The book is well indexed both for subject and author, and is in other respects as well a technically handsome publication.

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Cellulose and Cellulose Derivatives. Part I. High Polymers, Volume V. Second completely revised and augmented edition. By EMIL OTT, HAROLD M. SPURLIN and MILDRED W. GRAFFLIN, Research Department, Hercules Powder Co., Wilmington, Delaware. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. xvi + 509 pp. 16 X 24 cm. Price, \$12.00.

Subsequent to the appearance of the first edition in 1943, "Cellulose and Cellulose Derivatives" has become the standard reference work in its field. The first of the three parts planned for the second edition appeared in 1954. The high quality of Part I indicates that the standards of the first edition will be maintained in the revision.

The new first part covers essentially the material of Chapters I-V of the first edition, and the emphasis is placed on the basic chemistry and properties of cellulose. The space devoted to this phase of the subject is slightly greater than in the first edition. Evidently the principal expansion of 500 pages planned for the entire work will be devoted subsequently to the more practical and technological aspects of cellulose.

Although not expanded significantly, the presentation of the basic aspects has been reorganized and definitely improved. The coverage of related subjects such as the hemicelluloses and lignin is brief but is adequately handled by competent specialists. Although sixteen specialists contributed to Part 1, the necessary integration has been successfully accomplished by the editors.

The individual contributions vary somewhat in the quality and extent of revision. The important section on End Groups was changed only in minor details from that of the first edition. The coverage of cellulases is inadequate, and a special section should have been included. A more adequate coverage of biochemical aspects might be expected of a book with such a general title. More references to the old work might have been given in some sections. This problem is difficult but cannot be solved simply by the elimination of old work.

The editors and publishers are to be commended for this revision and for maintaining the standards of the first edition. The format is good, the illustrations excellent (particularly the frontispiece in color), and the editorial work superb. Librarians and catalogers may be confused, however, by the listing of three editors on the title page and two on the cover. Confusion also might be avoided by the elimination of this work from its artificial classification as Volume V of the High Polymer Series.

The revised book is one that will be needed personally by all chemists and technologists in the field, even those with copies of the first edition, and is a required addition for all chemical and technological libraries with any coverage of the field.

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New Instrumental Methods in Electrochemistry. Theory Instrumentation and Applications to Analytical and Physical Chemistry. By PAUL DELAHAY, Louisiana State University. Interscience Publishers, Inc., 250 Fifth Avenue, New York, N. Y. 1954. xvii + 437 pp. 16 X 23.5 cm. Price, \$11.50.

Dr. Delahay deserves the gratitude of electrochemists and of chemists in general for his having been willing and able to provide them with such a clear and detailed survey of the new instrumental methods of electrochemistry in a period during which he has been so thoroughly busy making his own important contributions to the subject.

This is not just another book on electrochemical instrumental analysis but a complete theoretical and practical treatise on the various methods which have been developed since the pioneering electroanalytical contributions of Cruikshank, in 1801, and with particular intensity and richness during the years which have followed Heyrovsky's discovery of polarography in 1922.

After a flattering Foreword by I. M. Kolthoff, a brief Preface by the author and a very detailed Table of Contents occupying nine pages, the text begins with a historical sketch and a general review of electrochemical methods, 27 pages which clearly settle the confusing jargon which the subject requires (coulometry, potentiometry, voltammetry, polarography, amperometry, etc.). This constitutes Chapter 1 of Part One ("Voltammetric and Related Methods") and includes six sections divided themselves into a total of eighteen sub-sections. This four-stage systematization of the subject holds throughout most of the book, the numerous mathematical formulas being numbered in a separate sequence in each chapter. Chapter 2 gives a brief sketch of the theory of electrode potentials and a fairly detailed treatment of electrode kinetics (27 pages again, but a more fundamental approach to the still very fluid theory of electrode kinetics would have been desirable). The so-called European signs of electrode potentials are adopted, as is natural in a presentation of electrochemical phenomena, but Dr. Delahay has chosen the unusual convention of giving a negative sign to anodic currents and a positive sign to cathodic currents. If overvoltages are taken (as is done in this book) equal to the differences between European electrode potentials under current and at zero current, anodic overvoltages are positive and cathodic overvoltages negative. Currents and overvoltages should have the same signs, making their products positive in accordance with the requirement that these irreversible electrode processes must create entropy. Chapters 3, 4 and 5 (of, respectively, 25, 14 and 27 pages) have a common main title, "Voltammetry and Polarography at Constant Voltage" ("potential" replaces "voltage" in the title of Chapter 5), the sub-titles being "Reversible Processes," "Irreversible Processes" and "Kinetic and Catalytic Processes." On pages 52-55 the author gives a particularly satisfying derivation of the classical formula of polarography relating the potential to the logarithm of the $i_a - i/i$ ratio in place of the intuitive approximate proof of other books. Chapter 4 presents the very interesting advances of the last few years in the interpretation of irreversible waves. Here and elsewhere in the book one is struck by the continued vitality and high-level productivity of the Prague school founded by Heyrovsky. It also is remarkable to notice how frequently different groups of workers have made the same or similar contributions simultaneously, an obvious indication of the great activity which electrochemistry displays at present throughout the world. Dr. Delahay is to be congratulated for the care with which he has assembled his bibliography and for his complete fairness in giving full credit to his competitors in these pioneering investigations. Chapter 6 of 30 pages treats "Voltammetry and Polarography with Continuously Changing Potential," while Chapter 7 of 32 pages treats the same techniques with "Periodically Changing Potential" and contains a detailed presentation of recent developments on the faradaic impedance (a term coined by Graham) of an electrochemical process and on the component parts of this impedance, the polarization resistance and the pseudocapacity. Here again the numerous contributions originating in different countries amount to an impressive total. Chapter 8 of 37 pages treats "Voltammetry at Controlled Current," a method whose theoretical literature dates back to 1879, and includes numerous contributions from the turn of the century. The use of its main feature, the transition