Book Reviews

Plant Growth Substances. Folke Skoog, Ed. Madison: Univ. Wisconsin Press, 1951. 476 pp. $6.00.

During the centennial celebration of the founding of the University of Wisconsin in 1949 two important plant science conferences were held. The present volume contains 39 papers presented in general meetings and round-table discussions of one of these. This symposium was attended and participated in by a good portion of the world's foremost students of growth substances.

The scope of the book is much broader than that of any other in its field and shows how rapid has been the increase of knowledge and its application during the quarter century since the general acceptance of the concept of plant hormones as correlating agents. As is well shown, interest in plant-growth substances has developed from a simple laboratory curiosity to numerous very practical applications upon which a multimillion-dollar agricultural chemicals industry is now based. In addition, while sifting the thousands of papers that have appeared, the authors show that a good hard core of information of theoretical value useful in interpreting growth reactions is now available.

Because of the many ramifications of the field and the large number of papers included here, certain organizational difficulties had to be solved. Dr. Skoog has met this editorial problem very well. The book is divided into 7 major sections: a general discussion of plant growth substances, "Growth Substances in Plant Metabolism," "Tissue Response to Growth Substances," "Practical Applications of Growth Regulators," "Growth Substances in Vegetative Development," "Growth Substances in Reproductive Development," "Growth Substances in Pathological Growth," and "Vitamins and Amino Acids as Growth Factors." Although this is a logical and satisfactory arrangement, some readers may find fault with the placement of certain papers and even whole sections. Some may wish, for example, that the excellent survey of the development of ideas in the field of growth substances given by Went had been used as the opening instead of the sixth chapter. Others may think, because of structural make-up, that greater continuity could have been achieved if the section on "Growth Substances in Vegetative Development" had followed the one on "Growth Substances in Reproductive Development."

On the whole the chapters represent a distillate of clear thinking. Inevitably, however, there is unevenness in scholarship, some of the papers being more painstakingly done than others. Much of the book retains the flavor of spoken presentation, which tends to give vitality, spontaneity, and freedom from stilted and involved language. In a few instances contributors revised their talks very little for publication, and some failed to document their papers at all. In several cases citations are incorrect, and occasionally papers are cited that do not appear in the individual bibliographies. Those who wish to use this as a reference book will be disappointed at the omission of an index. This is sure to result in less use than the book deserves.

Among the stimulating features of the symposium is the clear expression of differences in viewpoint that might be missed in a book written by a single author. In a field still in a state of flux, this method of treatment is very desirable. Owing to Dr. Skoog's careful editing, repetition is at a minimum, and what does occur neither detracts from nor weakens the text.

In several chapters new and previously unpublished material is presented. For example, R. H. Roberts' chapter, "The Induction of Flowering with a Plant Extract," is wholly new. Those interested in the physiology of flowering will look forward to confirmatory reports on the purification of the six "florigens" said to have been crystallized.

Valuable as some of the new information is, many will find the numerous suggestions of lines along which future investigations can profitably proceed of even greater importance. Certainly, numerous graduate students, as well as others, will find abundant inspiration here. All those interested in having a well-rounded and balanced presentation of information on growth substances, together with some speculation about things to come, will find it worth while to own and use this book.

AUBREY W. NAYLOR

Osborn Botanical Laboratory
Yale University

L'Evolution Biologique: Les Faits, Les Incertitudes. Lucien Cuénot, with collaboration of Andrée Tétry. Paris: Masson et Cie, 1951. 592 pp. 2,500 fr.

This last work of the late Professor Cuénot is a document of his amazing mastery of biological facts, his love for out-of-the-way information, and his great erudition in history and philosophy. The major part—actually 529 pages—contains an orderly and well-organized catalogue of facts pertaining to the study of evolution, both in animals and in plants. This section will be especially useful to the writer on, or the teacher of, evolution who looks for examples to illustrate definite points. He will find not only much material pertaining to practically every aspect of evolution but also many gems of forgotten information. The author predominantly reviews the facts of ecology and physiology that pertain to adaptation, selection, fertility, and survival. He emphasizes, of course, phenomena especially studied by him—such as the complicated tool-like organs (e.g., pedicellaria), the asymmetrical structures of crustacea, and the facts that have been used in discussions of the so-called heredity of acquired characters.

It is not quite clear why this very remarkable catalogue of adaptations, cases of selection, facts concerning the consequences of change of environment, etc.,

also includes a condensed review of elementary genetics and cytogenetics, as well as long chapters on nonhereditary variation. The explanation may be inferred from the last chapter. Here the author, although fully aware of the genetical study of evolution and its results, confesses rather cautiously, reiterating that most evolutionists will not follow him, that he is not satisfied with modern evolutionary ideas. He still thinks that a modified kind of doctrine of inheritance of acquired characters of the type proposed by Baldwin and Schmalhausen will be needed, and he feels the additional need, expressed in a noble spirit of self-criticism, for a finalistic philosophy in order to understand evolution.

In these days of standardization of scientific ideas it is wholesome to listen, at least occasionally, to different views if presented so well by a first-rate scholar.

RICHARD GOLDSCHMIDT

Department of Zoology
University of California, Berkeley

Selected Topics in X-Ray Crystallography from the Delft X-Ray Institutes. J. Bouman, Ed. Amsterdam: North-Holland Pub.; New York: Interscience, 1951. 375 pp. $11.00.

The Delft X-Ray Institutes, located at the Technical University of Delft, comprise three x-ray laboratories with a total of 62 years of experience in fundamental research and in the application of x-ray structure determination to metallography, biology, and rubber. Although each laboratory has its own special interests, results are mutually exchanged, and this cooperation is clearly reflected in the present publication, which consists principally of reports of research carried out during the past decade. The subject matter is divided into a series of eight interrelated monographs, each of which is complete in itself. Credit for authorship goes chiefly to J. Bouman, but many others, including W. G. Burgers, J. M. Goppel, and J. A. Prins, have contributed major sections.

The volume is primarily concerned with the study of materials in which deviations from the ideal lattice structure occur, rather than with the direct investigation of crystal structure. Nevertheless, Part A is devoted to the latter problem and briefly discusses pertinent points, such as termination effects in Fourier syntheses and the increase in breadth of Debye-Scherrer lines produced by small crystal particle size. The subject of lattice distortions is first approached by a study of the results of metallographic investigations (Parts B and C), and a general theory is presented to explain the decrease of intensity and broadening of the lines in powder films. Macromolecular substances with lattice deviations, such as rubber, waxes, and starch, are examined in Parts G and H, where new data is presented to discount Fields' original work on rubber. Controversial problems still persist in these two fields, and satisfactory correlation between the results from different methods are difficult to obtain. Part H, on biological compounds, contains a well-detailed account of a micromethod for x-ray diffraction.

Applications of chemical interest are included in Part D, dealing with the photographic process, and in Part F, where an exhaustive account of quantitative analysis by x-rays is given. Part E, concerned with problems relating to liquids, glasses, and amorphous substances, is the most readable section, probably because of the fine sense of humor portrayed by the author.

Because of the wide diversity of topics presented, each monograph is necessarily concise, but nevertheless surprisingly complete—as a critical survey of contemporary developments is generally included along with a number of well-chosen references for those who wish to pursue the subject further. Although much of the material has been published previously, it was in various European journals not readily accessible during the war. This is corrected in the present volume. In addition, later data and new aspects have been included, particularly in the sections on the investigations of rubber and biological compounds.

Being a first edition, the book contains a number of misprints and notations that are inadequately defined. There are also spellings and abbreviations that will be unfamiliar to the American reader. This is not surprising for a book printed in the Netherlands. Nevertheless, these do not impair the usefulness of the volume to those who wish to broaden their concepts and increase their knowledge of the applications of x-ray techniques. This comprehensive book will add to the fame of the Delft X-Ray Institutes.

W. P. BINNIE

Department of Physics, Purdue University

Scientific Book Register

Organic Reactions, Vol. VI. Roger Adams, Ed. New York: Wiley; London: Chapman & Hall, 1951. 517 pp. $8.00.

Introduction to the Theory of Algebraic Functions of One Variable. Claude Chevalley. New York: American Mathematical Society, 1951. 188 pp. $4.00.

Sexual Behavior in Penguins. L. E. Richdale. Lawrence: Univ. Kansas Press, 1951. 316 pp. $5.00.

Radioisotopes: Industrial Applications. G. H. Guest. New York–London: Pitman, 1951. 185 pp. $4.50.

Practice of Wildlife Conservation. Leonard W. Wing. New York: Wiley; London: Chapman & Hall, 1951. 412 pp. $5.50.

Annual Review of Medicine, Vol. 2. Windsor C. Cutting, Ed. Stanford, Calif.: Annual Reviews, 1951. 485 pp. $6.00.

Studies in Oenothera Cytogenetics and Phylogeny. Ralph E. Cleland, Ed. Bloomington, Ind.: Indiana Univ. Pubs., 1950. 348 pp. $4.00.

Musical Acoustics. 3rd ed. Charles A. Culver. Philadelphia: Blakiston, 1951. 215 pp. $4.25.

A Concise History of Astronomy. Peter Doig. New York: Philosophical Library, 1951. 320 pp. $4.75.

Ferromagnétisme et Antiferromagnétisme. Colloques Internationaux du Centre National de la Recherche Scientifique, Vol. XXVII. Paris: Service des Publications, C. N. R. S., 1951. 360 pp.