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Book reviews

Scott, T.K. (ed.): Encyclopedia of Plant Physiology, New Series. Hormonal Regulation of Development II. The Functions of Hormones from the Level of the Cell to the Whole Plant, Vol. 10. Berlin, Heidelberg, New York, Tokyo: Springer 1984. xv + 309 pp., 42 figs. Hard bound DM 168.–

This book is the second of three in a series dealing with the current understanding of hormonal regulation of growth and development in plants. The three volumes are arranged with respect to advancing levels of organizational complexity. This first, volume 9, entitled "Molecular and Subcellular Aspects of Hormonal Regulation in Plants" was edited by J. Mac-Millan published in 1980. The present volume, edited by T. K. Scott, deals with hormones at the level of the cell up to and including the whole plant. Volume 11, in preparation, will be concerned with the interrelationships of hormones with factors in the environments of the tissues, the organs and the whole plants, within which the hormones are functioning.

There are 7 chapters in this book. Chapter 1, Hormonal Regulatory Systems in Plants, written by A. C. Leopold and L. D. Nooden, calls attention to the complexity of hormonal controls. Some new concepts are put forth, such as the concept of regulatory control involving an integrated system of multi-hormones, the complications arising from compartmentation, the evolutionary plasticity of hormonal controls. These concepts are helpful in analyzing the accumulating and confusing experimental data. The second, 4th, 5th and 6th chapters, written by M. L. Evans, W. P. Jacobs, A. W. Naylor and A. G. Matthyse and T. K. Scott, respectively, are concerned with the functions of hormones at the cellular, tissue, organ and whole plant levels, respectively. Chapter three, in between, is about the transport and other modes of movement of hormones. This arrangement is very logical, because it is the transport of hormones that enables them to exert their function throughout the whole plant. This chapter, written by H. Kaldewey, gives some space to discussing the methods of studying translocation which, in the reviewer's opinion, is very necessary.

The four chapters at successively higher levels are well organized and embrace most of the available literature, including many papers written in languages other than English.

The last chapter, chapter 7, by P. Zajaczkowski, T. J. Wodzicki and J. A. Romberger, touches a rather narrow subject, "Auxin Waves and Plant Morphogenesis" and is mainly concerned with the work of the authors in the last 10 years. The authors present evidence for a wave-like change or oscillatory phenomena associated with the polar transport of auxin. Models are proposed for auxin waves that can specify morphogenic positional information. Their work and their concept are new and not-so-well understood by most workers.

As a professor of plant physiology giving lectures to undergraduate and graduate students, the present reviewer finds this book very helpful; as a research worker especially interested in the physiology of sexual reproduction, she had expected to read more about the involvement of plant hormones in sex expression, pollen physiology and physiology of fertilization.

T. H. Tsao, Beijing

The Jackson Laboratory. 55th Annual Report 1983–1984. Bar Harbor, Maine: Jackson Laboratory 1985. 162 pp.

Illustrated with attractive girls and smartly-dressed men, the latest annual report of this famous research institute demonstrates that the recent year has been one of substantial accomplishment. The laboratory has refined and improved its long-standing position as the most reliable source of genetically pure mice (inbreds, hybrids, and mutants) for scientific work—an accomplishment which provides an income of more than 8 million dollars.

The past year was also successful scientifically. Barbara H. Sanford reports on the contributions to basic research. Within the substantial molecular genetics program, increasing attention is given to the role of the mammalian Y chromosome in sex determination. A specific substance has been demonstrated to be present in the follicular fluid surrounding the oocyte that inhibits its maturation. A genomic clone for the structural gene for glycerol-3-phosphate dehydrogenase with a crucial role in mammalian development has been isolated. A relationship between brain structure and "handedness" of mice has been demonstrated. Further genes have been added to the linkage map of the mouse and also to that of the rabbit. In the field of immunogenetics, the Jackson Laboratory's single gene models for immune dysfunction and the variety of specialized inbred lines available have made new approaches possible for the study of basic mechanisms controlling immunological reactions. Thirteen books and 65 papers demonstrate the productivity of and the prominent position of this institute in mammalian genetics.

H. F. Linskens, Nijmegen

Gustafson, J.P. (ed.): Gene Manipulation in Plant Improvement. 16th Stadler Genetics Symposium. New York, London: Plenum Press 1984. xi + 668 pp., several figs. and tabs. Hard bound \$ 75.00.

During the last 70 years plant breeding has changed from a practical art, that owed much to empirical experience and to love of plants, into a science-based technology. Genetics and cytology at first, and subsequently taxonomy, physiology, pathology, chemistry and mathematics, all developing strongly during this period, became the underlying sciences of plant breeding. Recently, molecular biology and molecular genetics have opened doors to new possibilities and developments for integration into plant breeding. To distinguish between gene manipulation at the molecular level (genetic engineering) and that at the plant level (selection on multi- or single-gene phenotype characteristics), the latter is described with the unfortunate term "conventional plant breeding". This term suggests that present-day plant breeding is a static technology. However, the present book clearly shows that plant breeding incorporates new techniques from the current sciences.

Twenty-four scientists (some of them with co-workers) from universities, research institutes and industrial companies were invited to lecture at the 16th Stadler Genetics Symposium about their special field of interest within plant breeding. The first twelve chapters of the symposium book deal with the plant-level approaches of plant breeding. The history of plant

breeding, the philosophy and practice of plant breeding programs, ideotype research, physiological aspects of varietal improvement, disease resistance, quantitative genetics, intergeneric hybridization, the role of evolutionary relationships and chromosome manipulations are reviewed and discussed from many practical examples.

In the next nine chapters attention is paid to the *in vitro* approaches of gene manipulation. Manipulation of organs, tissues and plant cells, the production and use of double haploids, somaclonal variation, selection at the cellular level and the nuclear architecture are all reviewed. Further, molecular DNA techniques, genetic aspects of nitrogen fixation and chloroplast-gene manipulation as possible goals for plant improvement are discussed. Two chapters towards the end of the book deal with gene expression and the perspectives of genetic engineering. A summary of the general trend of opinions about the place and the nature of gene manipulation in plant improvement concludes the book. In this last chapter, N. W. Simmonds provides a good survey on the scientific context of plant breeding and its relationships with biotechnology and genetic engineering.

Each chapter is furnished with many references. These references, approximately 1750 in all, are mostly relevant and up to date. However, some of the authors seem to love referring to their own work. The book ends with a list of 49 posters exhibited during the symposium and in a useful ten-page long index.

This edition contains enough relevant information to increase the mutual understanding between plant breeders and molecular scientists. However, the lack of illustrations, the colloquial and abundant use of language, the differing lay-outs of several chapters and the high price do not encourage purchase of this voluminous book.

L. J. W. Gilissen, Wageningen

Groeben, C. (ed.): Reinhard Dohrn 1880–1962 – Reden, Briefe und Veröffentlichungen zum 100. Geburtstag. Berlin, Heidelberg, New York: Springer 1983. 91 pp., 21 figs. Soft bound \$ 8.70.

A collection of letters and reports by various authors on the occasion of a great man's centenary can be dry stuff – either because it doesn't say enough (or conversely too much) about the commemorated person or because it illuminates only one aspect of his work, or even because only his personal merits are discussed without taking into consideration the context of this time and world.

The book in question is not prosy at all. It shows a man, his time, his problems, his performance, but especially his humanity, and, what Reinhard Dohrn showed in his lifetime to a high degree: his charm. The discourses reflect at the same time the charm of an unique institute, or even more – an institution – and at the same time the charm of the most impossible town in Europe: Naples.

With respect and comprehension, with humor and love, the authors, many of them scientists of high rank and repeated guests of the Stazione Zoologica at the Villa Comunale on the board of the Mediterranean sea, describe the history and life of this station from their personal point of view. Every contribution demonstrates clearly how completely this institute and its internal life were formed and guided by the human dignity of its director.

Reinhard Dohrn took over the ingenious creation of his father, Anton Dohrn, just before old Europe was shattered by

World War I. During all his life he had to defend "his" Stazione Zoologica, this delicate and sensitive nucleus of true European spirit, against the outbursts of nationalism, facism and racism. The preservation of this small island of humanity is his personal merit and surely comparable to his famous father's achievement.

The merit of this compilation as a collection of personal confessions to Reinhard Dohrn and to the Stazione Zoologica is that it tries to pull his patient work out of the shadows into the full light. At the same time, it reminds us that behind the Europe of technocrats and politicians, of economic compensations and financial competition, there was a spiritual and intellectual Europe (which may still exist) for which Reinhard Dohrn stood, and fought for all his life.

This book of commemoration should be in the hands of each young biologist who still is conscious of the fact that he (and we all) are standing on the shoulders of our scientific and intellectual ancestors. Let's be grateful for the fact that Reinhard Dohrn was one of them.

G. Richter, Frankfurt

Liebermann, M. (ed.): Post Harvest Physiology and Crop Preservation. NATO Advanced Study Institutes Series, Series A: Life Science. New York, London: Plenum Press 1983. xiii + 572 pp., several figs. and tabs. Hard bound \$ 67.50.

In the last two or three decades, man's knowledge of post-harvest physiology has been considerably advanced and modern post-harvest technology allows consumers in the industrialized countries to enjoy year-round access to a wide range of perishable fruits and vegetables. However, worldwide post-harvest losses of crops can not be ignored. This problem has drawn more and more attention in recent years with the realization that the population of the world is outstripping the food supply. An international congress, "the Proceedings of NATO Advanced Study Institute on Post-Harvest Physiology and Crop Preservation" was held at Sounion, Greece, April 28–May 8, 1981. This book records the presented lectures, which include contributions from leading international researchers. Topics ranged from such diverse scientific disciplines as biochemistry, plant physiology, plant pathology, horticulture, agronomy, physics, engineering and agricultural economics. The chapters emphasize the basic aspects of biochemistry and physiology of crop senescence and include broad coverage of such topics as genetic controls, hormonal controls, respiratory controls and membrane alterations. Practical considerations of manipulation of post-harvest atmosphere, post-harvest disease control and quality maintenance receive extensive coverage. Explorations into theoretical aspects and applications of such new technology as hypobaric storage are also included. Furthermore, special attention is paid in this book to the Third World nations and their problems of post-harvest losses, quality maintenance and economic aspects of post-harvest planning.

With its up-to-date information, "Post-Harvest Physiology and Crop Preservation" will be of interest to researchers and teachers and of great value to those in the areas of horticulture, agronomy, food science and in related fields. A knowledge of post-harvest physiology and crop preservation will certainly contribute to an increase in the volume of crops saved after harvest.

Zhang Hong-qi, Beijing