
The seventh volume of this luxuriously published books (glossy paper, many illustrations including colour ones, good Author and Subject Indexes) brings five rather long and comprehensive reviews in the field of plant physiology. They were written by seven authors from Australia, England, France, and the U.S.A.

R. Douce and J. Joyard deal with the plastid (mainly chloroplast) envelope, its origin and structure, relation to other plant cell membranes, isolation methods, chemical composition (lipids, peptides, pigments) and enzyme activities (metabolite and proton transport, lipid synthesis). The role of sodium in plant metabolism is analyzed by P. F. Brownell: the effects of low concentrations of sodium on flowering, dry matter accumulation, photosynthetic and respiratory metabolisms, chlorophyll and biliprotein contents, etc. The history of sodium research in plant physiology is also briefly outlined, as well as the basic conditions of experiments with sodium. The principles and modelling of aeration in higher plants, which is necessary to sustain respiratory activities throughout the plant body, are reviewed by W. Armstrong. In this paper mainly the internal movements of oxygen in wetland plants (special attention to roots) are modelled. The dynamics of fungi, their populations and communities in decaying wood are the topic of paper by A. D. M. Rayner and N. K. Todd. The last review on the physiology of orchids (J. Arditti) is the longest (235 pp.) and largest (707 references!) in the volume. It describes the morphology, anatomy and germination of seeds, contents, biosynthesis and role of phytoalexins, photosynthesis and photorespiration, flowers and their pollination, and tissue cultures of various orchids. All parts of the review contain a brief history of the respective research.

The experienced editor, Prof. H. W. Woolhouse from Leeds, ensured a homogeneous character of individual articles of this very interesting volume.

Z. ŠESTÁK (Praha)


The Long Ashton Symposia have been devoted to the selected topics in physiology, biochemistry and pathology of plants and microorganisms of direct importance in agriculture and horticultural crop production. The sixth meeting held at the Long Ashton Research Station (University of Bristol) in September 1977 has not been exceptional in this respect.

In addition to the editors' Preface, Inaugural Lecture (L. Fowden), and to the Concluding Remarks (D. Boulter), the Proceedings are divided into six Sections: (I) Utilization of Atmospheric Nitrogen, (II) Fixed Nitrogen Utilization, (III) Regulation of Nitrate Assimilation, (IV) Ammonium to Protein, (V) Relationship to Carbon Metabolism, and (VI) Efficiency of Nitrogen Usage. Each of the Sections includes several more or less comprehensive reviews by the most experienced scientists, discussion and a few short specialized contributions.

Section I is given predominantly to the work of the “Sussex” group (ARC Nitrogen Fixation Unit, Brighton) ranging from the chemistry of abiological dinitrogen complexes (J. Chatti) through nitrogenase biochemistry (R. N. F. Thorneley et al.) to the regulation and genetics of nitrogen fixation (C. Kennedy, R. K. Eady). Other genetic aspects of the specificity in the Rhizobium-legume symbiosis are summarized by A. W. B. Johnston and J. E. Beringer, and N2-fixation in associations of procaryotes with lower and higher plants is discussed by W. D. P. Stewart et al.

In contrast to the N2-fixation, there is less comprehensive information available in Section II. Nevertheless, mainly the survey of the practical aspect of, and plant breeders' attitude to nitrogen usage and assimilation by P. B. H. Tinker and P. J. Goodman, respectively, are very interesting.

A series of papers in Section III gives an insight into the purification procedures, structure, mechanism of action and regulation of nitrate reductase and nitrite reductase from lower and higher plants. Despite great differences between organisms, considerable progress has been made in all these fields (L. P. Solomonson, A. Oaks, E. J. Hewitt et al.) as well as in the molecular genetics of both the enzymes, which is discussed here with emphasis on Aspergillus nidulans by D. J. Cove. Several other aspects of nitrate metabolism in the relationship to photosynthesis, light wavelengths and phytohormones (S. H. Lips, R. W. Jones and R. W. Sheard, J. S. Knypl and others) are given in Section V.

The chain of reactions from the primary steps of NH3 assimilation (GS/GOGAT, GDH), biosynthesis of amino acids and amides to protein synthesis and deposition in the harvested
plant parts is covered by several papers in Sections IV and V. There is, however, little or no
information on nitrogen uptake phenomena.

Section VI logically summarizes current knowledge of nitrogen assimilation in terms of
economy, efficiency, energy, yield formation, losses, and so on.

Let us agree with the editors that the Proceedings will provide ample reference material for
specialists in all the above mentioned subjects, and also for others engaged in related aspects
of biochemistry, plant nutrition, and the wider problems of fertilizer use.

V. Našinec, V. Škrdleťa (Praha)

Thimann, K. V.: HORMONE ACTION IN THE WHOLE LIFE OF PLANTS. -- The University of Massa-

Fourteen chapters of this volume deal with the problem of how phytohormones initiate and
control the growth and development of plants. The whole sequence of events in the individual
life of plant is followed, starting with the hormonal control of germination and closing with
senescence and abscission of fruits and leaves. Polarity and the transport of auxin, geotropism
and phototropism are treated in detail. The book ends with the critical evaluation of concepts
of the mechanism of hormonal action at cellular level, based mostly on examples taken from
auxin studies. A chapter on chemical aspects is intercalated. It deals with the occurrence of
natural hormones and with the relationship between structure and activity. The author stresses
on many occasions that perhaps all growth and developmental phenomena are the result of
interaction and balance between several hormones, and an attempt is made to demonstrate the
multitudinous ways in which hormones act. Special attention is paid to elucidating how a given
growth reaction established with a plant segment and/or at the tissue level will be performed
within the whole plant.

There are some special reasons which distinguish this book from many other written on plant
hormones during the last decade. Professor Thimann himself has been actively engaged in
phytohormone research since 1930 and has made many outstanding discoveries in this special
field. Thus, he uses personal experiences and experiences of his students when dealing with
most of the topics and is certainly entitled to draw a generalizing picture of hormonal action in
complex phenomena. Professor Thimann also aptly evokes professional contacts with his colleagues
and the atmosphere of some discoveries, which makes the book an especially interesting reading.
This, together with his sense of humour (for example he tells us the story of Daphne and Apollo
when tackling the problem of rooting) and abundant usage of to own knowledge as a general
botanist stresses the personal traits he gives to the writing. Many parts of the book are written
as a witty disputation with all possible for and against and with technical details being kept at
minimum. This is a especially valuable feature since it provokes creative thinking. As professor
Thimann devoted himself mostly to studies in auxin, the book is certainly "auxinophilic", which
is reflected both in proportion and number of situations auxin is dealt with. I found this no
disadvantage since it only stresses the coherent character of the book.

There is a selection of literature presented at the end of each chapter and a list of titles is added
for general supplementary reading. The style is clear and the illustrations are excellent. An
inspiring reading for all botanists and plant physiologists with some general background of
plant anatomy, morphology and physiology.

J. Krejčíře (Praha)

Scott, T. K. (ed.): PLANT REGULATION AND WORLD AGRICULTURE. -- Plenum Press, New

This volume summarizes an attempt of those working in plant biological sciences, both basic
and applied, to review how efficiently is photosynthesis used as a means of production at present,
and what strategies may be suggested for meeting the demand for more food, forage, fiber and
energy at the end of our millennium. It might well be the first book where the present knowledge
of plant regulation, based mostly on phytohormone research, is used to tackle problems related
to increasing yields.

The volume deals with a wide range of complex processes: photosynthesis, seed germination,
flowering and fruit setting, source-sink relationship, plant nutrition etc., which are believed to
limit crop productivity. P. F. Wareing, K. V. Thiman, Y. Vardar and some other equally promi-
nent physiologists are among the authors. Besides, the subjects of genetic manipulation, of modern
methods to investigate phytohormones and of the use of growth retardants are also outlined.
Some of the 28 contributions treat crop production as a complex issue within the scope of eco-
logical and sociological aspects.