

Following are the reviews of three monographs published by the British Plant Growth Regulator Group (BPGRG). The objective of this body, founded in 1977 is the promotion of closer links between fundamental and applied research. Among other activities the group organizes scientific gatherings and selects appropriate topics which cover the field of the potential application of growth regulators. The Proceedings of the meetings and/or symposia are published as full-length papers in a series of monographs. The choice of qualified speakers makes the monographs not only a realistic evaluation of the current state of the use of plant regulators, but also outlines the theoretical background of their effects. The monographs may be obtained from Dr. M. B. Jackson, ARC Letcombe Laboratory, Wantage, Oxfordshire, OX12 9JT, England.

GEORGE, E. C. (ed.): DIFFERENTIATION AND THE CONTROL OF DEVELOPMENT IN PLANTS — POTENTIAL FOR CHEMICAL MODIFICATION. — Monograph 3, British Plant Growth Regulator Group, Proceedings of a Meeting held in London, Wantage 1980. 143 pp., £ 5.00.

This volume consists of nine contributions, four of which are focused on some aspects of apical meristem organization and activity as related to growth substances. R. F. Lyndon and W. W. Schwabe tackle the problem of lateral organ initiation at the apical meristem. Redirection of growth and changes in polarity are stressed as the starting points of new organogenetic activity. Auxin is considered as a candidate for supplying positional information for new primordia initiation. The phenomenon which has so far been dealt with at a descriptive level thus became a physiological event. P. F. Wareing discusses the high degree of stability of structure and organization of the shoot apical meristem and points to the existence of alternative stable states of the shoot apex. This is an idea which differs from the generally accepted notion of totipotency of plant cells and tissues. A. J. Trewavas presents the control of meristematic activity as one aspect of his challenging concept of plastic development. The contribution of D. H. Northcote is concerned with enzymatic changes involved in cell-wall composition during differentiation. Two papers are devoted to a survey of new data recently obtained in *Acetabularia* (J. Brachet, S. Peteromichelskis). L. Wolpert has presented an excellent article on the pattern formation in animal morphogenesis. M. W. Bayliss reviews the targets of chemical modification of development in crop plants. The most valuable feature of this booklet lies in tackling old problems from new points of view and in posing provoking questions. The Symposium programme committee is to be congratulated on the choice of topics and authors. This is an important reading for students of plant development and for general biologists, and inspiring material for those who attempt to improve yield and plant habits using morphoregulators.

CLIFFORD, D. R., LENTON, J. R. (ed.): RECENT DEVELOPMENTS IN THE USE OF PLANT GROWTH RETARDANTS. — Monograph 4, British Plant Growth Regulator Group, Proceedings of a Symposium held in London, Wantage 1980. 97 pp., £ 5.00.

This booklet certainly puts into practice the idea of closer links between fundamental and applied research. The introductory paper by J. W. Dicks gives a list of currently used chemical classes exhibiting plant retarding activity, outlining their mode of action. There exists circumstantial evidence that some retardants (e.g. ancymidol) may inhibit both the precursors pathway and GAs conversion. Four other contributions deal with the use of retardants on vegetable and arable crops (T. H. Thomas), glasshouse crops (R. Menhenett), as "anti-bolting" agents in sugar beet (T. O. Pocock and J. R. Lenton), and in improving yields in oilseed sunflower (A. D. Baylis and J. W. Dicks). All these papers not only summarize data on the successful practical use of growth retardants but also give examples of fundamental research in crop physiology. It is a pity that the use of plant retardants in cereals, which has recently received increased attention, has not been included. Two papers are devoted to new regulators.

With more and more new compounds emerging on the market and with narrowing economic limits for their use, the time has come to evaluate realistically their further prospects in agriculture. This booklet will be helpful in this.

LENTON, J. R. (ed.): GIBBERELLINS — CHEMISTRY, PHYSIOLOGY AND USE. — Monograph 5, British Plant Growth Regulator Group, Proceedings of a Meeting held in London, Wantage 1980. 143 pp., £ 5.00.

This booklet consists of 11 contributions which can be grouped with those dealing with GAs biosynthesis and analysis, their mode of action and physiologically meaningful states in plants, and with GAs effects related to yield increase. In the first group, the comprehensive survey of

the present knowledge of GAs biosynthesis written by J. E. Graebe and his colleagues and a critical evaluation of gibberellins analysis by A. Crozier should be mentioned. The principles of the recently developed valuable separation technique—droplet counter-current chromatography are described and some examples of its use are given (J. R. Baerder and J. MacMillan). A paper by D. L. Laidman which re-examines the responses of endomembrane systems to gibberellins in cereal aleurone tissues deserves attention as it formulates a new common hypothesis of GAs action in a wheat and barley aleurone layer. The papers on GAs effects in wheat are concerned with the similarity of gibberellins and long-day action (P. D. Hutley-Bull and W. W. Schwabe) and with the evaluation of low-dose application in field trials, when tiller production is decreased but tiller survival and ear number raised. The booklet will contribute to a more rational application of gibberellins which have so far failed to fulfill the expectations of agriculturalists.

J. KREKULE (*Praha*)

O'BRIEN, T. P., MC CULLY, M. E.: *THE STUDY OF PLANT STRUCTURE. PRINCIPLES AND SELECTED METHODS*. — Termarcarphi Pty. Ltd., Melbourne 1981. 348 pp., hardcover Aust. \$ 35.—, paper-cover Aust. \$ 20.—.

I think that the best introduction to this remarkable manual are the authors' words: 'We believe that before embarking on any study of plant structure, the investigator should first think about what the problem will need for its solution, evaluate the methods available, and then in general choose the one that should give the answer in the shortest time at the lowest cost. To be able to do this one must have information available about what is involved in any particular method and whenever possible, a good idea of how it works and what its limitations are.'

The authors issue from the fact that in last two decades a close link between structure and function in biological objects (molecules, organelles, cells, tissues and organisms) has been recognized among plant scientists. On the other hand, they have learned in their university teaching praxis that "... a few graduates of Botany or Agricultural Science course receive an adequate grounding in simple methods for studying plant structure". They divide their book into six chapters.

The first one is very useful "Introduction to the Study of Structure in General". The second chapter "Microscopic Methods" deals with individual instrumental methods of light and electron microscopy. In the third chapter, named "Morphological Methods", various replicas, whole counts *etc.* are treated. The fourth chapter, "Anatomical Methods" refers on fixation, dehydration and infiltration, embedding and sectioning, and finally, staining of plant objects for both light and electron microscopy. The fifth chapter comprises "Photographic Procedures" for photomicrographic uses. The last chapter, named "Formulary" has the greatest extent (103 pp.). It summarizes, under headings such as *e.g.* Hand Sections, Microtome Sections, Fixation, or Staining, practical laboratory recipes and experiences. Some special advices are then explained in the "Appendices" (26 pp.; include *e.g.* The Purification of Glutaraldehyde; The Handling of EM sections; Making Coated Grids). The "References" comprise 45 pages; moreover, quotations of the most important literature sources form Appendix 3 (Useful Films, Books and Journals). The whole text is decimally divided, which, together with its clear language, makes the orientation and the understanding easier to the reader. The book is well and instructively illustrated. It may be recommended to all those interested in the study of plant structures and functions as well as to the students of related branches.

J. KUTÍK (*Praha*)

ATKINS, P. W.: *PHYSICAL CHEMISTRY*. — Oxford University Press, Oxford—London—Glasgow—New York—Toronto 1982. Pp. 1095.

This is the second edition of the very successful comprehensive textbook of physical chemistry with a non-traditional arrangement. The text is divided into three parts: "Equilibrium", "Structure" and "Change". The first of them deals with the properties of gases, the first and the second laws of thermodynamics, the physical transformations of pure materials and simple mixtures, chemical reactions, thermochemistry and electrochemistry. Part 2 starting with the quantum theory is focused on the atomic, molecular and macromolecular structure (symmetry, rotational and vibrational spectra, resonance and diffraction techniques, electronic spectroscopy), the electric and magnetic properties and the statistical thermodynamics. The last part concerns the kinetic theory of gases, the ion transport and the molecular diffusion, the rates of chemical reactions, the processes at solid surfaces and electrochemical processes. In several cases more

particular subjects are treated from two aspects: as "Concepts" establishing the ideas and emphasizing the underlying physics and as "Machinery" extending and developing them more mathematically. The text of each chapter is accompanied by many figures, computer graphics, tables and worked examples. They stimulate reader's imagination and interest and help him in better understanding the subject. In addition, at the end of each chapter there are the "Problems" (the simple ones as well as those requiring more time and effort, and occasionally a small computer) with the answers at the end of the book. "Boxes" serve to summarizing handy information and "Appendices" contain detailed developments. The conventional summaries are replaced by "Learning Objectives" (the lists of problems which readers are able to decide after studying the relevant chapters). The text is well-arranged also by using the different printing types and grey colour to express the important relationships. Although the second edition preserves the approach and style of the first edition, the modern material has been introduced in each chapter and the text has been modified so as to be maximally simple without loss of exactness.

The second edition of this excellent textbook will be highly appreciated by the university teachers, students and researchers in many fields.

JANA POSPÍŠILOVÁ (*Praha*)

MÜLLER, E., LOEFFLER, W.: MYKOLOGIE. Grundriss für Naturwissenschaftler und Mediziner. — Georg Thieme Verlag, Stuttgart—New York 1982. 366 pp., DM 34.00.

This paperback book is the fourth German edition of the well-known pocket manual on mycology, the Polish edition of which was published in 1972, and English and Spanish editions in 1976 (*cf.* review in *Biologia Plantarum* 19 : 390, 1977). The book may be useful especially to students of natural sciences and medicine, mainly to those interested in various fields of applied mycology, and as a source of general information to plant scientists. The text of the individual chapters has been thoroughly revised, especially the classification of fungi. In this edition there are, first of all, included the ecological aspects of mycology, the conditions of fungal growth and manifestations of fungi, minimal requirements for fungal growth, fungal associations — symbiosis, parasitism and saprophytism, specific requirements — nutrients, temperature, light and other factors. In the chapter "Quantitative aspects of mycology" the estimation of total biomass of fungi is presented. Morphology and ultrastructure are reviewed together. The utilization of nutrients and the pathways in primary metabolism, as well as the macromolecules of a fungal cell and secondary metabolism are included in the chapter "Chemism of fungi" (in previous editions in the chapter "Metabolism"). The chapters "Genetics" and "Applied mycology" are complemented with new knowledge of these problems, with new figures and tables. In this edition greater attention is paid to fungi causing diseases of man, the new international classification of fungi is offered in a comprehensive chapter.

VLASTA ČATSKÁ (*Praha*)

GRIFFIN, D. H.: FUNGAL PHYSIOLOGY. — A Wiley-Interscience Publ., John Wiley and Sons, New York—Chichester—Brisbane—Toronto—Singapore 1981. 383 pp., £ 24.25.

Fungi represent an important group of organisms. Their significance in the cycling of nutrients, in the health of plants, animals and people not only by their direct attack and invasion, but also indirectly through the secretion of toxins, is evident. The fungi are able to synthesize various compounds significant in deleterious activities and also in food, drug and chemical industries. The first chapter gives a general introduction to fungal physiology. The mycological terminology, the fungal structure, reproduction and classification is here explained. The chemistry of the fungal cell — the composition and molecular structure are described in chapters 2 and 3, respectively. The metabolism and its regulation — the role of enzymes, their activity and regulation, glycolysis, fermentation, respiration in fungi, the pathway in nitrate and sulphate metabolism are examined in chapter 4. In the following four chapters, the measurement, kinetics and regulation of growth, nutritional requirements, absorption of nutrients, the effects of physical environment on growth and other various aspects of fungal growth are described. Chapters 9 through 12 are concerned with the physiology of development, the environmental factors influencing spore formation, biochemistry of spore formation, the spore dormancy and germination, and the physiology of sexual interactions of fungi, especially the hormonal regulation of fertilization. In chapter 13, the bioassay, practical use and mechanism of action of synthetic fungicides, microbial antibiotics and antifungal compounds from plants are described. The interactions between fungi and other microorganisms, the physiological aspects of the progressive behaviour of fungi towards some host, plant and animal, the various symbioses and the production of mycotoxins are included in the last chapter.

The field of fungal physiology and biochemistry is important not only to teachers but also to students. Numerous illustrations, tables, and up-to-date experimental data provide graduate students in mycology, fungal physiology and plant pathology with an excellent overview of knowledge in this field.

VLASTA ČATSKÁ (*Praha*)

MONCUR, M. W.: FLORAL INITIATION IN FIELD CROPS. An Atlas of Scanning Electron Micrographs. — CSIRO, Melbourne 1981. 135 pp., \$A 6.00.

The book was prepared with the purpose to assist particularly in identifying the early stages of the transition from vegetative to reproductive development and in detecting the potential yield of flowers or floral branches. The vegetative shoot apex and differentiation of the reproductive apex are demonstrated in 57 crop species. The photographs are taken with a scanning electron microscope providing a clear three-dimensional picture with a large depth of field. Seven arbitrary stages of apical development are shown for each species. The first changes in size and shape of the shoot apex as well as the very beginning of floral differentiation are demonstrated in each case. Each series of pictures is terminated by the stage of differentiation of floral parts and enlargement of floral structures that can be observed with a naked eye. A description of developing structures and the most important bibliography are given for each species presented. The techniques of sampling and examining field-grown plants are described.

FRIDETA SEJDLVÁ (*Praha*)

ELLENBERG, H., ESSER, K., KUBITZKI, K., SCHNEPF, E., ZIEGLER, H. (ed.): FORTSCHRITTE DER BOTANIK. MORPHOLOGIE. PHYSIOLOGIE. GENETIK. SYSTEMATIK. GEOBOTANIK. VOL. 43. — Springer-Verlag, Berlin—Heidelberg—New York 1981. 382 S. Geb. 129,— DM. Approx. US \$ 60.10.

Der 43. Band der bewährten Fortschritte der Botanik bringt 22 Literaturübersichten aus den oben genannten Teilgebieten der Botanik. Im morphologisch-cytologischen Abschnitt sind es diesmal Kapitel über Plastiden- und Mitochondrienstruktur und -funktion (von A. W. Robards), über Zellentwicklung und Struktur und Funktion einiger spezialisierten Zelltypen bei höheren Pflanzen wie z.B. Nektarien, Sekretionszellen, Idioblasten, Schliesszellen, Endospermzellen (von E. Schnepf), über mittels Raster-Elektronenmikroskop untersuchte Oberflächenstrukturen bei höheren Pflanzen (von W. Barthlott und R. Schill) und weiter über die Struktur der Fortpflanzungsorgane von Blütenpflanzen (P. K. Endress). Der physiologische Abschnitt behandelt den Aufbau der photosynthetischen Reaktionszentren und die sich darin abspielenden Primärreaktionen der Photosynthese (J. Ames), den Malastoffwechsel und dessen Bedeutung bei CAM-Pflanzen und im Stickstoff- und Aminosäurenmetabolismus (M. Kluge), den Stoffwechsel organischer Stickstoffverbindungen (E. Kessler) und einiger von Tyrosin und Phenylalanin abgeleiteten Alkaloide (H.-R. Schütte), und weiter die neuesten Erkenntnisse über Wachstumsstoffe und deren Einfluss auf das Pflanzenwachstum (N. Amrhein). Die Literaturübersichten des Teiles Genetik fassen die neueste Literatur und Schlussfolgerungen über Replikation (W. Nagl), Rekombination (H. Binding und R. Nehls) und Mutationen in höheren Pflanzen (W. Gottschalk) zusammen; weiter werden einige Gen-Enzym-Beziehungen in höheren Pflanzen und die Genetik der Reserveproteine (R. Blaich), die extranukleare Vererbung am Beispiel der Plastidengenetik (R. Hagemann und T. Börner) und einige Fragen der Populationsgenetik (K. Wöhrmann und J. Tomiuk) behandelt. Die Systematik und Evolution der Samenpflanzen (H.-H. Poppendieck und K. Kubitzki) und die Paläobotanik (F. Schaarschmidt) bearbeiten die Artikel im Abschnitt Taxonomie. Im geobotanischen Teil wird von B. Frenzel die wichtigste sowjetische Literatur der Jahre 1975–1981 über die Geschichte der Flora und Vegetation des Quartärs zusammengefasst. Es folgen Reviews über soziologische (R. Knapp) und ökologische (W. Schmidt) Geobotanik. Angeschlossen sind zwei Übersichten über spezielle Themen: die Blütenökologie (S. Vogel) und die Proteine in der Pflanzenevolution und Systematik (U. Jensen). Der Band ist mit einem ausführlichen Sachregister ausgestattet. In den einzelnen Übersichten wird nicht nur auf die neuesten Originalmitteilungen, sondern auch auf Review, historische Zusammenfassungen u. ä. hingewiesen. Die meisten Literaturübersichten sind in englischer Sprache, nur zwei in Deutsch verfasst worden.

Die Form der Literaturübersichten wird von den Wissenschaftlern immer mehr begrüsst und gesucht, da es ja kaum noch möglich ist die Fülle der Originalliteratur eingehend zu studieren. Nur auf dem Gebiet der Photosynthese erscheinen z. B. 3000 bis 4000 Arbeiten pro Jahr! Unser Dank gebührt deshalb den Herausgebern der Fortschritte der Botanik, Prof. H. Ellenberg, Prof. K. Esser, Prof. K. Kubitzki, Prof. E. Schnepf und Prof. H. Ziegler sowie dem Springer-Verlag dafür, dass sie das Erscheinen dieser Bände ermöglichen.

INGRID TICHÁ (Praha)

JACOB, F., JÄGER, E. J., OHMANN, E.: KOMPENDIUM DER BOTANIK. — VEB Gustav Fischer Verlag, Jena 1981. 494 S. 194 Abb. 32 Tab. DDR 28,50 M. Ausland 35,— M. und Gustav Fischer Verlag, Stuttgart 1981. 494 S. 194 Abb. 32 Tab. Kartoniert 32,— DM.

Gute Lehrbücher kann es nie genug geben! Deshalb begrüsse ich das neue Hochschul-Lehrbuch der Botanik, welches für Studenten der Biologie, Biochemie, Pharmazie und Landwirtschaft bestimmt sowie für Wissenschaftler und Pädagogen als Nachschlagbuch gedacht ist. Das Lehrbuch behandelt nach einer kurzen Einführung in die Botanik und deren Teilgebiete den chemischen Aufbau der Pflanzen, die Grundlagen der Cytologie und Histologie der Pflanzen, die Anatomie und Morphologie des Pflanzenkörpers (Samen, Sprossachse, Blätter, Wurzeln, Blüten und Früchte), weiter die Grundlagen der Systematik und Evolution des Pflanzenreiches mit einer Übersicht des Systems, wo die wichtigsten Merkmale und Vertreter dargestellt werden. Der folgende Teil des „Kompendiums“ ist der Pflanzenphysiologie gewidmet, die in Stoffwechselphysiologie (Bioenergetik, assimilatorischer und dissimilatorischer Stoffwechsel, Membrantransport, Wasser- und Mineralstoffhaushalt, Sekundärstoffwechsel, usw.), Entwicklungsphysiologie (Wachstum, Differenzierung, Organbildung, Rhythmik bei Pflanzen) und Bewegungsphysiologie auf gegliedert ist. Der Text des Kompendiums ist kurz gefasst, übersichtlich gegliedert, die Schwerpunkte auch graphisch betont und reich mit schwarz-weißen Abbildungen, Tabellen und graphischen Darstellungen ausgestattet. Das Buch enthält ein Verzeichnis weiterführender Literatur und ein ausführliches Sachregister.

In einer Neuausgabe des Kompendiums der Botanik sollten verschiedene Fehler vermieden werden, wie z. B. auf S. 303 in der doppelt reziproken Darstellung der Michaelis-Menten-Gleichung nach Lineweaver und Burk, auf S. 451 Němec, und ich würde das konsequentere Benutzen der SI-Einheiten empfehlen (also keine bar, cal mehr).

Das Kompendium der Botanik umfasst die botanischen Kenntnisse, die ein Student besitzen sollte, um gute Grundlagen auf diesem Gebiet zu haben. Für ein tieferes Studium muss der Leser dann natürlich zu speziellen Lehrbüchern oder Monographien greifen. Dieses Kompendium der Botanik bietet also eine sehr gute allgemeine Übersicht über die gesamte Botanik (ausser Genetik, Ökologie, Geobotanik und Paläobotanik, wo weitere Bände der Kompendienreihe vorgeesehen sind), bevor der Student den Weg zur Spezialisierung einschlägt. Dieses Buch werden ausser den Studenten bestimmt auch Pädagogen der botanischen Richtungen mit Dank begrüssen.

INGRID TICHÁ (Praha)

ECKERT, G.: DAS SCHLESWIG-HOLSTEIN-WANDEBUCH. Nordsee—Ostsee—Binnenland mit Holsteinischer Schweiz. — BLV Verlagsgesellschaft, München—Wien—Zürich 1981. 159 pp. + 96 pp. in the additional booklet. Hard cover DM 39,—; öS 298,—; SFr. 39,—.

The reviewed guidebook has appeared in the series BLV-Combi-Travelguides (Kombi-Wanderbücher). It is devoted to the northern part of the F. R. of Germany neighbouring with the G.D.R. and Denmark. The author suggests and describes 166 trips in 50 regions discovered only in the last decade for tourism. For a biologist, those trips are certainly of most interest being devoted to natural parks and other places with preserved natural communities. These are the Natural Park Lauenburgische Seen in the region of the Old Salt Road, the Natural Park Westensee and the Natural Park Aukrug. All the trips are described in detail and illustrated with many maps and magnificent colour pictures. Very helpful is the inserted pocket-size booklet presenting the most useful information on individual trips.

This guide will surely be as successful and popular as all the other guides of the Series.

J. ČATSKÝ (Praha)