

WAREING, P. F., PHILLIPS, I. D. J.: *GROWTH AND DIFFERENTIATION IN PLANTS*. 3rd Edition. — Pergamon Press, Oxford—New York 1981. 343 pp. (F) £ 9.—; \$ 20.—; (H) £ 20.—; \$ 40.—.

The reedition of this popular textbook (formerly *The Control of Growth and Differentiation in Plants*) should be welcomed. Since it first appeared in 1970 it became a source of readily available complex information on all main aspects of plant development for a whole generation of students in botany. The text of the second edition has been extensively revised and rearranged. Most changes appear in the part dealing with plant movement, which was practically rewritten and a new chapter on molecular aspects of differentiation has been added. The whole material is now treated within the following sections: I. Structural and morphological aspects of development, II. Internal controls in plant development, III. Environmental control of development, IV. Molecular and general aspects of differentiation. Each part is subdivided, enabling easy orientation in the subject matter. Some new, highly instructive illustrations have also been supplemented.

The features which made the former editions so successful are even more pronounced this time. The book is written clearly, avoiding subjects too much speculative and the extrapolation of general theories (e.g. molecular biology) to the fields where they are not warranted by experimental data. The topics are presented in a balanced way and the equilibrium between structural, ecological and intrinsic aspects of developmental control is maintained whenever possible. The illustrations often make the developmental processes easy to visualize. A list of well selected literature is provided at the end of each chapter.

The book does not pretend to be sophisticated and "en vogue" in every aspect of development. Its excellency is rather in the attractive and at the same time didactic exposure of what we really know. I do not hesitate to recommend it to undergraduate students, to general biologists as well as to plant physiologists who like, from time to time, their respective field to be overhauled. I doubt whether such good book needs any recommendation.

J. KREKULE (*Praha*)

GIBSON, A. H., NEWTON, W. E. (ed.): *CURRENT PERSPECTIVES IN NITROGEN FIXATION*. — Elsevier/North-Holland Biomedical Press, Amsterdam—New York—Oxford 1981. 534 pp. US \$ 95.00; Dfl. 195.—.

The reviewed book contains the Proceedings of the Fourth International Symposium on Nitrogen Fixation that was held in Canberra, Australia, in December 1980. In the last decades the question of biological fixation of atmospheric nitrogen has been the centre of attention of many biologists, biochemists, microbiologists and geneticists. At present, the progress in molecular biology and genetic engineering brings new perspectives in this field, which seem to be promising in many respects, especially in solving basic problems of mankind, such as ensuring a sufficient amount of human nutrition. It is necessary to say, however, that to realize many of the ideas discussed, e.g., in connection with integration of nitrogenase genes into plant genom is as yet impossible. But great progress has been made in theoretical studies on nitrogen fixation. The participants of the Canberra Symposium summarized present knowledge of this subject. The proceedings of the Symposium were divided into the following sections: Chemistry of Nitrogen Fixation, Mechanism of Nitrogenase Action, Energetics of Nitrogen Fixation, Genetics of Symbiotic Microorganisms, Molecular Genetics of Nitrogen Fixation, Regulation of Nitrogenase Activity, Host Determinants in Symbiotic Nitrogen Fixation, Microbiology and Physiological Ecology of Diazotrophs, Infection and Recognition Processes, Free Living and Associative Nitrogen Fixation, Measurement of Nitrogen Fixation. The book contains 44 papers, 178 poster papers and 19 discussion reports. Owing to the efforts of the Symposium organizers and Proceedings editors, the published papers have a high standard. Discussion reports are very instructive and illustrate the present tendencies in nitrogen fixation research, its problems and prospects. Comparing the contents of the Symposium in Canberra with the previous Symposia on this topic (Pullman, Salamanca, Madison), it is possible to see the rapid progress which has been achieved in understanding nitrogen fixation mechanisms.

To summarize, the book reviewed will be of very much importance to all specialists in any field connected with nitrogen fixation. Scientists working in related branches and students of biology and biochemistry will find a lot of interesting information on the topic discussed.

J. ŠATAVA (*Praha*)

LEHNINGER, A. L.: PRINCIPLES OF BIOCHEMISTRY. — Worth Publishers, Inc., New York 1982. 1011 pp.

Lehninger's textbooks of biochemistry have been among the most famous works in this field for a long time. This year Prof. Lehninger has published the book to be reviewed — Principles of Biochemistry.

The text of the book is divided into four principal parts: (I) Biomolecules, (II) Bioenergetics and metabolism, (III) Aspects of human biochemistry, and (IV) The fundamentals of molecular genetics.

Introductory chapters of Part I contain basic information from general and organic chemistry, which is necessary for understanding chemical processes in living organisms, and acquaint the reader with the composition and construction of cells. Detailed treatises on proteins in general, proteins with enzyme activity, and on enzyme activity control mechanisms follow. This Part is closed with chapters on vitamins, coenzymes, carbohydrates, lipids, and on biological membranes. In Part II, cell bioenergetics and glycolysis are explained, and the citric acid cycle, electron transport, and oxidative phosphorylation are discussed in detail. The other chapters deal with catabolism of fatty acids and amino acids, biosynthetic pathways and photosynthesis. Regulation of metabolic pathways is discussed in detail. Part III deals with human biochemistry. Relations between organs during metabolism, endocrine regulation, and human nutrition are explained in the individual chapters. Part IV is devoted to the problems of molecular biology and genetics. A compendious survey of basic information in this field is given. Moreover, a great deal of very recent knowledge has been incorporated in the text — *e.g.*, the techniques of DNA cloning.

Interpretation of biochemistry in this book is clear and comprehensible. About 850 figures, photos, and tables make the biochemical processes understandable and interesting even for laymen. Students of biochemistry and other life sciences will highly appreciate Lehninger's Principles of Biochemistry.

J. ŠATAVA (Praha)

BATES, R. C., JACKSON, J. A. (ed.): GLOSSARY OF GEOLOGY. SECOND EDITION. — American Geological Inst., Falls Church, Virginia 1980. US \$ 60.00.

In the Foreword to the first edition of the Glossary it is remarked that an authoritative glossary should serve two purposes: to achieve standardization of terms and to record changes and development of the science. The book being revised meets both these conditions satisfactorily. In compiling a lexicon containing 36 000 terms, the editors have made an important step towards the highly needed standardization. To attain an easier and more accurate exchange of ideas it is necessary that a word has its well evidenced standard meaning and not "to mean just what a particular author wants it to mean". The enlargement by more than 3000 entries relative to the first edition reflects the rapid growth of knowledge since 1972.

The scope of the book comprises many branches of earth sciences, including climatology, biology, palaeobotany, palynology and pedology. Statistical and mathematical terms and terms used in the application of computers are also included. If two or more synonyms exist, the definition is given with the word italicized. Some background information, as *e.g.* pronunciation of names of foreign origin, and cross-references are added at the end of definitions. The bibliography is voluminous, containing some 2000 entries.

Although the main subject of the Glossary is geology, those working in other fields of natural sciences will appreciate the wealth of useful information it provides.

HELENA ZÁRUBOVÁ (Praha)

SIMPSON, T. L., VOLCANI, B. E. (ed.): SILICON AND SILICEOUS STRUCTURES IN BIOLOGICAL SYSTEMS. — Springer Verlag, New York—Heidelberg—Berlin 1981. 587 pp., 515 figs. Cloth DM 240,—; approx. US \$ 111.80.

Silicon, one of the most common elements of the lithosphere has been long considered to be of little importance from the biological viewpoint. For this reason the ability of diatoms, *Chrysophyceae*, testaceous rhizopods, radiolarians, *Choanoflagelata*, siliceous *Porifera*, and of some higher

plants to use amorphous silicon dioxide for the formation of cell walls or skeletal elements has long remained experimentally untouched and unexplained. This volume was inspired by a symposium at the Centennial Meeting of the American Microscopical Society held in Richmond in 1978, and contains contributions of 28 authors. It represents the first breakthrough into the problem of silicon metabolism. The volume does not deal with biomedical aspects or with the total Si cycle in nature. Attention is paid to the antagonism between silicon and germanium. Ge inhibits Si uptake which may be of use when studying Si metabolism. Silicon cell metabolism has been most profoundly studied in diatoms. Diatoms which represent 1/4 of the total plant production are completely dependent on the presence of silicon in the surrounding medium. The uptake mechanism of silicon in diatoms is an active transport process across biomembranes coupled with Na^+ gradient. The development of silicon compounds was followed by means of electron microscopy. The mechanisms of the formation of diatom frustules, chrysomonad scales, tests of shelled rhizopods, sponge spicules, and others, differ in some details. Silicification and calcification may represent different solutions of a similar biological problem. Silicon deposition in higher plants is of a somewhat different character. Silicic acid penetrates with the transpiration stream the entire plant and the deposition of insoluble opal (phytoliths) can occur in every organ. So far it has been shown that Si is relevant for normal growth of horsetails (*Equisetum*) and grasses (*Poaceae*). Investigation of Si role in crop grasses is now considered to be of economical importance. It has also been shown that higher Si deposition in rice and sugar cane correlates with higher yields. The volume represents an example of a modern, complex approach to the problem enabling both a broad generalization and stimulating further investigations.

T. KALINA (*Praha*)

BORMANN, P. H., LIKENS, G. E.: *PATTERN AND PROCESS IN A FORESTED ECOSYSTEM*. — Springer Verlag, New York—Heidelberg—Berlin 1979. 253 pp. Cloth bound DM 42,—; US \$ 23.10.

Being in fact a continuation of the well-known treatise *Biochemistry of a Forested Ecosystem* by Likens, Bormann, Pierce, Eaton and Johnson (Springer-Verlag 1977) this book brings in a similarly experienced way and with a fruitful combination of authoritativeness and criticism the results from the famous Hubbard Brook Ecosystem Study. This time it evaluates the disturbance, development and steady state in this ecosystem, of course, with the aspiration after generalization.

The first chapter brings information on the particular Hubbard Brook model ecosystem and is followed by the description of energetics, biomass, hydrology and biochemistry in the second, *i.e.* in s.c. aggrading phase of the development after clear cutting. Its stability and integrity is discussed in particular, since this phase is the clearest and most predictable and may be described as a solid basis for understanding other phases including the first one. The first phase, referred to as reorganisation phase, means an abrupt loss of biotic regulation not only due to the destruction of vegetation, but also due to regrowth prevention. In the both first phases plant strategies and plant community dynamics determine further development, primarily regaining biotic regulation followed by gradual reaching the steady state. The steady state is further discussed as a component of the landscape and possible outlines for further management, resulting from the ecosystem study, such as *e.g.* acceptability of clear cutting, are examined.

The Hubbard Brook ecosystem studies have become classical. They have been not only technically and methodologically successful but also, which is of greater importance, ideologically well prepared and focussed, evaluated with criticism and ambition.

The book yields quantitative data, yet is not overfilled with figures. Each chapter has a precisely formulated summary. It is always clear which is which and to what extent the conclusion may be generally valid. Hubbard Brook Project was a mature one and so is the book.

B. SLÁVIK (*Praha*)