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BOOK REVIEW

NOBEL, P. S.: **An Introduction to Biophysical Plant Physiology.** — W. H. Freeman and Company, San Francisco 1974. 488 + XII pp., 68 illus., 9 tables. Cloth \$ 13.50, £ 7.10.

The reviewed book which appeared in "A Series of Books in Biology" (ed. D. KENNEDY and R. B. PARK) covers certain biophysical and physicochemical fields of plant and cell physiology for "the student at an advanced undergraduate or beginning graduate level". In spite of this, a detailed perusal of the text reveals that it contains a lot of new information, and particularly new approaches to classical problems of plant and cell physiology. This makes the book useful also for research workers especially in plant and crop physiology and ecophysiology. The text is an expansion of the author's *Plant Cell Physiology: A Physicochemical Approach*, published in 1970, to which chapters on environmental interactions of the leaf and the whole plant have been added. In these chapters, the author relates biophysical models of cell interaction to the whole plant.

The book aims at presenting an up-to-date physicochemical explanation of the traditional areas of plant physiology, such as water relations, mineral nutrition, metabolism and photosynthesis. The author's modern approach also is reflected in a non-conventional arrangement of the text into 8 chapters: Cells, Water, Solutes, Light, Photosynthesis, Bioenergetics, Leaves, Plants. The first part of the book presents the physical description of water relations and ion transport involving plant cells. The concept of diffusion and the physical barriers to free diffusion caused by cellular and organelle membranes and the cell wall are discussed in Chapter 1. The movement of water through cells in response to physical forces is treated in Chapter 2. Chapter 3 deals with the solute movement into and out of cells, leading to an explanation of electrical potential differences across membranes, and to the development of formal criteria for distinguishing diffusion from active transport.

The second part of the book deals with the interconversion of various forms of energy. Absorption of photosynthetically active radiation by photosynthetic pigments and its conversion into other forms of energy are the subject of Chapter 4. Particular features of chlorophyll and accessory pigments are discussed in detail in Chapters 5 and 6. Chapter 7 deals with energy and mass (water vapour, carbon dioxide) fluxes for a single leaf. In Chapter 8, gas and energy fluxes and concentrations within a plant community are analysed. Each chapter ends with several problems to be solved by students. The text is supplemented with subject index and with appendices presenting frequently used variables, constants, units, conversion factors, abbreviations, symbols, elementary calculus *etc.*

It is not possible to discuss each chapter in detail within the space of this review. Surprising in an excellent book like this is the inconsistent use of the units, their symbols and other nomenclature recommended by SI and obligatory for several international programmes (*e.g.* IBP), namely sec, hr, °K, °, mole, day, dyne, SO_4^- , mv, 1,000 instead of s, h, K, °C, mol, d, dyn, SO_4^{2-} , mV, 1 000. This shortcoming becomes important mainly in various constants presented and in their numerical values. Especially the calorie, not recognised by SI, should be replaced by dimensions using watt (W) or joule (J). Nevertheless it is hoped that the author will use SI terminology in his future works.

This text-book is unique in its physicochemical approach to biological processes *in vivo*. It will be useful for special courses in plant physiology, biochemistry, photochemistry, ecophysiology *etc.* and even research workers will undoubtedly profit from it.

A wide distribution of this book and its translations into other languages, would surely be desirable.

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