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BOOK REVIEWS

Plant Physiology—A Treatise, Vol 9: Water and Solutes in Plants: edited by F. C. STEWARD, J. F. SUTCLIFFE and J. E. DALE, Academic Press, Orlando, 1986. xvi + 611 pp. £79.

This volume constitutes an updating of the previous volume in the series on these topics, Vol. 2. It contains seven chapters: water relations of plant cells (J. E. Dale and J. F. Sutcliffe), transpiration and the water balance of plants (W. J. Davies), the physiology of stomata (T. A. Mansfield), salt relations of cells, tissues and roots (D. H. Jennings), salt relations of intact plants (J. F. Sutcliffe), phloem transport (J. E. Dale and J. F. Sutcliffe) and solutes in cells (F. C. Steward). As recalled in the introductory explanatory note, Dr. J. F. Sutcliffe was a co-editor of this volume, but his untimely death prevented him from completing the task and Dr. J. E. Dale took over more or less in mid-stream. This obviously was a very difficult task. It clearly led to this volume being very long in the production line. In most of the chapters the most recent references are for 1983 with a few from 1984. This is a distinct disadvantage for a treatise of this kind, especially as the topics covered are currently the subject of lively and fruitful research.

The treatment in all the chapters is extremely thorough and detailed up to the date of submission of the manuscript which appears to have been about 1983. For this reason reference to important recent results is lacking. For example there is no reference to the progress on isolated vacuoles. The section on halophytes and salt tolerance is rather sketchy and does not seem to refer to enzymes and salt tolerance. Growth substances are not very extensively considered, e.g. IAA effects on H^+ extrusion. The amount of information on biochemical processes connected with water and solutes is rather disappointing. In the analyses of stomata some of the recent important results of Zeiger are not mentioned. Water relations of seeds are not mentioned at all. It is inevitable that some of the chapters overlap with those in recent volumes of 'Encyclopedia of Plant Physiology' on the one hand and with some articles in 'Advances in Botanical Sciences' on the other hand.

Despite these blemishes this is a very valuable and comprehensive volume, which will be used as a source of reference and information by all those interested in water and solutes in plants. The production maintains the high standard expected from the series. For this reason it is a pity that the index is so poor—it should be far more detailed. As book prices go this is not an exceptionally expensive book, but I doubt whether the average plant physiologist will rush out to buy it at £79. It is clearly a must for all libraries, if only to maintain the completeness of the series.

Department of Botany,
Institute of Life Sciences,
Hebrew University, Jerusalem, Israel

A. M. MAYER

Nuclear Magnetic Resonance: Basic Principles: by ATTA-UR-RAHMAN. Springer, New York, 1986. 358 pp. £42.40.

This book, aimed at undergraduates, represents a praiseworthy and largely successful attempt to summarize and illustrate in 350 pages the basic theory and practice of NMR spectroscopy, at the same time embracing up-to-date techniques in 2D NMR and adding a few problems in spectral interpretation. The coverage is limited to ^{13}C and ^{1}H as nuclei, and is uneven. The longest chapter deals comprehensively with 2D NMR spectroscopy, including references to the literature of 1985. The approach is commendable in that the emphasis is on clear explanations of the appropriate pulse sequences. The discussion is not always as critical as it could be; for example, the limitations of homonuclear 2D *J*-resolved spectroscopy of second order spin systems are not mentioned.

In contrast to the 100 pages devoted to 2D NMR, a mere 8 pages involve the solid state; the very brief section on NMR imaging could and should have been expanded, with the inclusion of more recent references. Dynamic effects also receive a barely adequate treatment. However, the description of pulse Fourier transform NMR is admirable, as are the qualitative explanations of the nuclear Overhauser effect and relaxation times, although p. 126 implies that carbons with long relaxation times will give rise to inverted signals in a normal ^{13}C spectrum. More fundamental aspects, covering the basic theory of chemical shifts and coupling constants, are well written and include many useful tabulations. There is also a section dealing with the analysis of spin-coupled systems, but the brief treatment has led to errors and omissions. The ambiguities associated with the analysis of ABX spin systems are not fully explained, and the discussion on p. 53 wrongly implies that it is impossible for an AB spin system to resemble a 1,3,3,1-quartet with equal separations. There are a number of unfortunate errors. In Figure 1.2 the direction of the applied magnetic field B_0 is in error, and in Figure 1.6 the drawing is confusingly labelled and presented. Figure 3.3 appears to indicate equal populations of the two spin states in the presence of the applied magnetic field.

According to the Preface, the book is written "for students of chemistry and biochemistry as well as for biology students who have chemistry as a subsidiary".