

*Introduction to Biophysical Plant Physiology.* By P. S. Nobel. Pp. xii+488 (W. H. Freeman: San Francisco and Reading, 1974.) £7.10.

THIS excellent book has been written essentially for advanced undergraduate and postgraduate study and is an extension of an earlier publication by the same author (*Plant Cell Physiology: A Physicochemical Approach*: Freeman, 1970). Its aim is to show how basic physical and chemical principles can be applied to whole plant and plant cell physiology.

The first three chapters are extended and improved versions of the corresponding chapters in the original book and give thorough descriptions of the quantitative and experimental aspects of water and ion distribution and move-

ments in plant cells. These phenomena are discussed in terms of both classical and irreversible thermodynamics. As in the earlier edition, Chapter four gives an outline of the properties of light and its absorption by molecules and serves as an introduction to chapters five and six. These deal with the light reactions of photosynthesis and the main features of energy conversion in the chloroplast and mitochondrion.

The remaining chapters are additions to the original book and cover various aspects of leaf and whole plant interaction with the environment, concentrating particularly on water, gase-

ous and energy fluxes within and at the surfaces of the plant.

The book contains a number of numerical examples for the reader to test his understanding of the concepts presented.

The text itself is fairly readable, although to some extent there is inconsistency in the degree of explanation of some of the concepts presented. Overall, I would like to congratulate the author for producing a unique and valuable text-book. It is reasonably priced and I thoroughly recommend it to all those interested in a quantitative approach to plant physiology—both at the teaching and research level—who wish to place this aspect of plant biology on a firmer physical and chemical basis.

**J. Barber**

*The Vanishing Lichens: Their History, Biology and Importance.* By D. H. S. Richardson. Pp. 231. (David and Charles: Newton Abbot, London and Vancouver, 1975.) £5.25.

THE title of this book is unfortunately very apt. No other major group of plants has suffered so much from the effects of atmospheric pollution. The area of distribution of many species has contracted dramatically during the past century and all but the few pollution-tolerant species really are vanishing—and not all that slowly.

But this is not a book about the effects of pollution on lichens. Rather, it gives a readable and enjoyable account of the group as a whole; because it is deliberately aimed at a popular audience, there is a necessarily heavy emphasis upon the importance of lichens to man and how he uses them.

The book is assuredly successful in achieving its objective. Furthermore, there is much even to intrigue specialists such as myself. Would that more scientists took time off to write books which are genuinely entertaining yet keep within the bounds of scientific accuracy. In the long run it will be books like this which will help the cause of conservation amongst the public at large, rather than patronising diatribes in the Sunday colour supplements. People need to develop affection for wild life, not just a dutiful respect.

There is a slight air of zaniness—characteristic of quite a number of other books published by David and Charles; one can't help feeling that James Thurber selected some of the line drawings. It is a pity, though, that the need to save money has forced the publishers to use poor or just bad reproduction of plates which were very good in the original. The picture of lichens colonising power-station cooling-towers on page 7 means little.



*Lichenologists at work; from Richardson's book.*

Curiously, the farther the author gets away from explaining science, the better he is. Particularly fascinating are the many little side-trips away from lichens, that occur in the narrative. Thus, a description of the use of lichens for dating Easter Island megaliths goes on, out of sheer interest, to say something about megaliths in their own right.

Dr Richardson is to be congratulated on writing the most entertaining book on lichens to date.

**D. C. Smith**

*Crop Physiology: Some Case Histories.* Edited by L. T. Evans. (Cambridge University Press: London, February 1975.) £8.00; \$23.50.

IN a world in which a depression in the crop yield of one major food-producing country can have international repercussions or even result in mass starvation, books which critically evaluate important aspects of current knowledge of agricultural crops are to be welcomed.

In this book, authoritative contributors from Australia, the USA and Japan examine the physiological basis of yield in nine important crops: maize, sugar cane, rice, wheat, soybeans, pea, potato, sugar beet and cot-

ton. The introductory chapter deals with some more general aspects of world food supply, crop evolution and the origins of crop physiology. In the final chapter Dr Evans discusses and collates the information obtained about individual crops and considers possible applications to agronomic techniques and plant breeding. Each chapter is followed by an extensive list of references.

The crops chosen illustrate the diversity of 'yield' in the agricultural sense: the tubers of the potato, the sucrose content of the sugar cane stem, grains of the cereals, and fibres of the cotton boll are all considered. The physiological pathways and limitations to attaining maximum yields are equally diverse and the separate chapters discuss these topics from rather contrasting viewpoints, ranging from the largely agronomic (maize) to the more theoretical approach of crop modelling (sugar beet). Most chapters are not confined to purely physiological aspects and include useful sections on origins, evolution, adaptability and distribution of the crop and on many aspects of growth from sowing to harvest. There is a strong awareness throughout the book of the potential applications to plant breeding arising from current knowledge of crop physiology. This is emphasised by Dr Evans who stresses the value of the production of new ideotypes, discusses the bases of yield assessment—he considers that the efficiencies of water use and of phosphate use will become more important in the future—and briefly examines the efficiency of energy use in agriculture.

The book is extremely readable and well presented and can be recommended not only to crop physiologists but also to agronomists and plant breeders.

**David Wilson**