have been revised in the light of developments in the intervening years. A comparison of the two editions indicates that apart from advances in understanding of the role of phytochrome in photomorphogenesis, which now merits a separate chapter, and the control of flowering there have been no outstanding discoveries in this field during the 1970's. It must have been somewhat depressing for the authors to find that so many of their pious hopes of advances expressed in 1970 remain unfulfilled in 1978. I think that in the second edition I would have felt inclined to alter the form of words a little and explain why certain problems have remained surprisingly intractable. The picture is not perhaps quite so black as Wareing and Phillips have made it appear because they do less than justice to the not-inconsiderable advances that have been made in the intervening years in knowledge of control mechanisms at the enzyme level. Fortunately there are other books which remedy this deficiency.

One of the most difficult subjects to put over to students of plant physiology is water relations. Teaching this subject is not helped by the less than adequate treatment of it in many textbooks. Authors of such books would do well to read Milburn's stimulating book on *Water Flow in Plants* before revising this section of their works. Milburn begins by describing the properties of water and he gives a clear account of the concept of water potential before going on to describe various kinds of apparatus by means of which water movement can be studied. He then describes the water relations of cells and traces the pathways of movement through the soil-plant-air continuum. There is an interesting chapter on responses to water stress and a description of a new device "the oil bomb" which may prove helpful for studying effects of stress on growth.

There is a useful set of appendices containing lists of symbols, units, physical data etc., and a series of numerical problems which will exercise the minds of some university teachers and tutors as well as their students. □

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Vegetation productivity

Melvin G.R. Cannell

Vegetation Productivity. By G. Jones. Pp.100. (Longman: Harlow, UK, 1979.) Paperback £3.95.

THIS little book is an attempt by a geographer to introduce people without any knowledge of plant science to the subject of vegetation productivity in different environments and the ways in which that productivity can be measured. The book is easy to read and may satisfy geography students, but it adds nothing to the books already available on this subject.

Chapter 1 is a introduction to plant physiology, misleadingly entitled "The measurement of plant growth". None of the concepts of plant community productivity are discussed, and photosynthesis itself gets only a brief mention. Chapters 2 and 3 on vegetation productivity contain useful reviews, but readers wanting accurate, balanced and more comprehensive accounts will need to refer to Cooper's book (*Photosynthesis and Productivity in Different Environments.* International Biological Programme 3, Cambridge University Press, 1975) which is not mentioned. Also, anyone seriously interested in measuring forest or grassland productivities will need the handbooks prepared by Newbould (*Methods for Estimating the Primary Production of Forests.* International Biological Programme, Handbook No. 2, Blackwell: Oxford, 1967) and Milner and Hughes (*Methods for the Measurement of Primary Production of Grassland.* International Biological Programme Handbook No. 6, Blackwell: Oxford, 1968) which form the bases of chapters 4 and 6, respectively. Chapter 5 describes the author's work on forest growth in relation to soils, and chapter 7 offers some conclusions.

It is a pity that this book was not co-authored or edited by a plant scientist: vegetation is said to "produce" calories (page 14), transpiration is confused with respiration (page 19), a linear regression is said to follow a curve (page 55), and so on. Many figures and tables are poorly explained and both metric and imperial units are used. Furthermore, the thesis of the book, that a natural plant community provides a measure of the upper limit of vegetation productivity in a given environment, is, at best, highly contentious. □

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Plant diseases

I.M. Smith

Epidemiology and Plant Disease Management. By J.C. Zadoks and R.D. Schein. Pp.427. (Oxford University Press: Oxford and New York, 1979.) £13.50.
Atlas and Manual of Plant Pathology. By E.H. Barnes. Pp.325. (Plenum: New York and London, 1979.) £12.35.

IT is a pleasure to welcome Zadoks' and Schein's textbook. Plant disease epidemiology has developed enormously in theory and practice in the last twenty years, and the ideas of management in plant protection are spreading from pests to diseases. No university plant pathology course can now fail to tackle these new developments. This new text, though possibly not quite a primer for students with only basic knowledge, provides an excellent introduction to the subject for advanced students. As the authors suggest, the student can choose to benefit from any of the attractive self-contained chapters. They will at all times find clarity of exposition and an interesting and engaging style.

The work builds from the basic level of single infection cycles (monocyclic processes), through population phenomena (polycyclic processes), to the whole pathosystem and its management. It builds from the basic methods of disease control to their integration, from the familiar to the less familiar. It is realistic and critical, and pleasantly free from mysterious jargon.

The core chapter on the essential concepts of epidemiology and their mathematical background is clearly developed and well illustrated, presenting few problems to the not very mathematical reader. There is an excellent chapter on disease and crop loss assessment. Chapters on "Ecological concepts in plant pathology" and "Matters of scale" bridge the sections, the former providing useful comparisons with general ecological concepts.

The text does not make any attempt to deal with the techniques or apparatus of epidemiology, which are perhaps somewhat beyond its scope. However, practical considerations are well in evidence, especially in the assessment chapter, and a most useful feature is the inclusion of simple argued examples from the literature. Many chapters conclude with a useful set of exercises. In conclusion, this is an excellent reasonably priced textbook which will certainly find very wide use in advanced courses in plant