

cellular space markers. The objection is not that these points are unimportant but that they have been treated in an unsystematic fashion.

There is also a tendency to describe ion movements in cells rather than ion movements across cell membranes. No one would deny the importance of ion-binding in certain tissues in producing concentration gradients which are not all they seem. The description of such phenomena should obviously find a place in any book concerned with ion transport. What we get, however, is a description of calcium binding in relation to excitation-contraction coupling and relaxation (ion movements in heart muscle). Elegant as this description is, its relevance to membrane transport is minimal. Ion movements in mitochondria and across the nuclear envelope have been dealt with adequately. The importance of selective transport of ions across the nuclear envelope has still to be established, but what is known was presented in such a way as to encourage one to find out more about the processes involved.

There is much in this book of value to the animal physiologist who is prepared to sift through the occasional irrelevances. The sections on ion transport in nerve, skeletal muscle and red blood cells, as well as the articles on subcellular organelles, are well worth reading, but the student of plant physiology will find little of interest in this volume.

M. W. SMITH

Anatomical Information

New Research in Plant Anatomy. Edited by N. K. B. Robson, D. F. Cutler and M. Gregory. (Supplement to the Botanical Journal of the Linnean Society, Vol. 63.) Pp. xii+250. (Academic: London and New York, January 1971.) £6.00.

THIS collection of twenty papers is a tribute to Dr C. R. Metcalfe on the occasion of his retirement from the Keepership of the Jodrell Laboratory at Kew. It is also the first report of a Linnean Society Symposium to be published as a Supplement to the Botanical Journal of that Society.

In the introduction, Dr Metcalfe remarks on the contribution which studies of internal morphology using the light-microscope have made to the increase of knowledge in fields as varied as physiology, ecology, morphogenesis and systematics. As might be expected on this occasion, the majority of the papers illustrate the value of anatomical information in systematics and taxonomy. Five of them deal with relationships between species: Ayensu (*Dioscorea*), Brittan (*Thysanotus*), Kukkonen (*Carex*), Stace (*Juncus*), Stern (*Ribes*); and four of them with relationships between families: Cheadle (xylem of Liliales *sensu* Hutchin-

son), Clifford (numerical taxonomy of anatomical and other characters in Monocotyledones), Philipson (Umbellales), Stant (affinities of the monogeneric Petrosaviaceae). Another four papers are concerned with wood anatomy: Carlquist (xylem of subdendroid spp. of *Euphorbia*), Chalk (xylem fibres of *Fraxinus*), Findlay and Levy (scanning-beam electron-microscopy of wood) and Greguss (Araucariaceae). The remaining papers are of a more specialized nature. Those by Vaughan and by Chowdhury and Buth deal with the identification of seed fragments in feeding-stuffs, reminding us of the applied aspects of plant anatomy. Scott and Bystrom give some information on the mucilage cells of *Hibiscus* while the paper by Fahn and Rachmilevitz describes the ultrastructure of the nectariferous hairs of the hypanthium of *Lonicera*.

There is something in this collection for everyone who has an interest in plant anatomy or systematics. A few examples must suffice. Who can doubt the close relationship between the predominantly tropical and arborescent Araliaceae and the largely temperate and herbaceous plants taxonomists have designated as the Umbelliferae in the light of Philipson's contribution? Clifford's suggestion that grasses may have arisen from the palms by way of the bamboos particularly intrigued me. The same notion had occurred to me, when visiting the Palm House at Kew, on the evidence of *gestalt* coupled with Cornerian intuition. Evidence which confirms one's prejudices is always welcome!

Stace's caution against seeing interspecific hybrids of *Juncus* in every wet meadow is admittedly controversial but his anatomical evidence accords with their reluctance to be hybridized in cultivation. On the other hand, I was startled by Greguss's suggestion (p. 85) that thin-walled marginal cells of the wood rays of *Agathis* produce more ray cells in the manner of a cambium. His plates do not convince me, and a rapid examination of prepared slides of the wood of two other species from the collection of the late Professor Jane serves to further increase my doubts. I am also inclined to disagree with Carlquist's premise (p. 182) that *Euphorbia* is a "basically herbaceous genus, several sections of which have become woody under various circumstances". The other genera of the family are predominantly woody and less specialized than *Euphorbia*. Consequently, it is probable that the subdendroid euphorbias which survive on island refuges or in xeric environments represent relatively archaic elements while the more numerous and widespread herbaceous species have been derived by neoteny.

The contributors to the symposium offer us some stimulating ideas as well as new information. The editors and pub-

lishers have also played their part by ensuring that the text and illustrations are well presented. The volume reflects the progressive attitude of the Linnean Society of London today and makes a fitting retirement present for the eminent botanist to whom it is dedicated.

B. M. G. JONES

Animal Behaviour

Comparative Animal Behavior. By Richard A. Maier and Barbara M. Maier. (Core Books in Psychology Series.) Pp. viii+459. (Brooks/Cole, a division of Wadsworth: 1970. Distributed in the UK by Prentice Hall International, Hemel Hempstead.) £5.50.

THIS latest addition to the long line of textbooks on animal behaviour brings together in a compact form some useful and interesting information from various areas of the subject. But there are a number of weaknesses in this book which would seem to render it unsuitable for teaching purposes at almost any level.

First of all, the book totally fails to mention a large number of major papers in areas that it specifically covers. For example, the first section is called "Structural and physiological foundations of behaviour" and we might reasonably expect this to include important work in physiology relevant to behaviour. Under the heading of "Vision", however, there is no mention of Hubel and Wiesel's work on the physiology of the mammalian visual system; surely knowledge of this work is essential to any student of behaviour. In a section entitled "The Role of Sensory Cues in Migration and Navigation" (p. 255) there is no reference to G. Matthew's theory of Sun navigation by birds, and only a brief mention of the fact that the Sun may be important in bird orientation at all. In a discussion of the effect of early deprivation on sensory processes (p. 321), Held and Hein's work on the development of visuo-motor coordination is not included. These three examples are not obscure, nor are they simply illustrations of points made with reference to other material. They are serious omissions from a text that claims to be comprehensive, and they are by no means the only ones.

This apparent neglect of the literature often leads to statements being made on the basis of old work which we now know to be incorrect or wrongly interpreted. On p. 325 we read that "When rats are raised in environments without access to anything that can be manipulated, e.g. straw, paper, or even their own faeces, the results are more extreme: these animals fail to build nests at all (Riess, 1950, 1954)". As long ago as 1963, Eibl-Eibesfeldt showed that this failure of Riess's rats to build nests was probably due to their being tested in a strange cage,