the student, not the researcher, that this text is aimed and balanced coverage is vital. This is not achieved in many of the contributions, although the editorial choice of subject divisions makes such a failing unavoidable.

The opening five chapters unashamedly tackle the "hormones", largely in a biased and sometimes dogmatic manner. The material contained here may indeed be recent, but the philosophy is still that of Frits Went. These accounts are not without scholarship, some being good reviews, but they deal with relatively narrow areas often of marginal relevance to normal plant growth. Also there are slips in terminology which annoy rather than confuse (although some are misleading, such as the use of "vernalization" for "stratification"; some plants can be vernalized as a seed, but this is a very different phenomenon to dormancy breakage).

I did not greatly enjoy this part of the book but found the rest of it more satisfying, albeit with some exceptions. The discussions of growth movements, rhythms, water relations and mineral nutrition are well constructed. Photosynthesis, however, is covered in a peculiarly unbalanced manner with aspects as important as C_4 metabolism and photorespiration being squeezed into the last two pages. Another odd component is the chapter on phytochrome — the undergraduate basing his studies on this is going to need guidance as, I suspect, will many lecturers. If this chapter is meant to be balanced by that following, on photomorphogenesis, it fails; here are the views, and largely the work, of one laboratory with little regard for other opinions. In contrast, the rather neglected phenomena of juvenility, photoperiodism and vernalization are well described and reviewed in a readable fashion, and are followed by straightforward accounts of germination, senescence and abscission.

Parts of this book are very good. But those using it must be supported by teachers unafraid to dispute the written word, so readily accepted by students.

Hans Meidner has written *Class Experiments in Plant Physiology* for those who teach the subject. Over the years a number of laboratory guides in plant physiology have appeared, usually emanating from the United States and written for students. These have not proved popular in Britain where there are smaller classes and different pressures. This time the collected experience of successful teachers and the author's attention to detail will be gratefully received. Class experiments in plant physiology, within the constraints of the timetable, are notoriously difficult. The suggestions, advice and hints contained here will be of great use to both the experienced practitioner and the new lecturer — if there are any out there in these hard times! □

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Membrane biology moves on

M.J. Selwyn

Membranes and their Cellular Functions, 3rd Edn.

By J.B. Finean, R. Coleman and R.H. Michell.

Blackwell Scientific: 1984. Pp.227. Hbk \$19.50; pbk £9.80.

MEMBRANE biology has advanced rapidly in the five years since the appearance of the second edition of *Membranes and their Cellular Functions*, a book which covers a course in membrane biology at first- or second-year university level more completely and satisfactorily than most of its competitors. A revised edition is therefore both welcome and timely.

Much of the material is included in that excellent tome *Molecular Biology of the Cell* by Bruce Alberts *et al.*, but this is less convenient because of its weight and because the information is scattered through the book. Robertson's *The Lively Membranes* is stimulating but very much slanted towards bioenergetics, while Harrison and Lunt's *Biological Membranes* or Houslay and Stanley's *Dynamics of Biological*

Membranes are pitched at a more advanced level.

This edition has grown in length and content, and the need for growth can be readily appreciated by comparing the chapters "Recognition, Response and Communication", "Secretion, Endocytosis and Lysosomes" and "Biosynthesis and Turnover" with their counterparts in the second edition. Together with a new chapter on membrane variations and membrane pathology, these are where the most expansion has been made, to include, for example, extensive descriptions of receptor mechanisms and the biosynthesis and processing of proteins which are incorporated into or pass through membranes. The chapters on membrane structure, and composition, and on ion and solute movements have also been thoroughly up-dated, but the treatment of the physical chemistry of ionic equilibria still lacks rigour.

The authors' style is readable and the layout — a central text with wide margins containing topic titles on one side, diagrams and equations on the other — makes for easy reading, browsing or reference. Overall this is an excellent volume, accurately written and attractively presented.

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To start with . . .

Roger Hill

Genesis on Planet Earth: The Search for Life's Beginning, 2nd Edn.

By William Day.

Yale University Press: 1984. Pp.299. Hbk \$49, £35; pbk \$14.95, £12.95.

THERE is no better example of the inadequacy of a multidisciplinary approach to an interdisciplinary problem than in the search for probable origins of life. Progress depends as much on the breadth of understanding and synthetic abilities of individuals as it does on the design of relevant experiments or on sagacious observation. Such qualities are demanded in equal measure from commentators on the field, and William Day is clearly competent to provide us with a useful review of current results, theories and speculations.

The conceptual dimensions of the subject call for an iterative development, and the repetition of subject matter in new contexts is a welcome feature of the book. For example, Day has chosen the fossil record as his first substantive topic, and the prokaryote-eukaryote distinction introduced here is fully described again after much compressed information on the cellular and molecular basis of life. After two chapters on bioenergetics, the reader is ready for a scientific presentation of the problem, and a review of prebiotic syntheses of present-

day biomolecules follows. The crux of the matter, the interface between prebiotic chemistry and biochemistry, is seen to be the abiotic polymerization of preformed nucleotides. Encapsulation by lipid bilayers and rudimentary photosynthesis gives life in slow motion before the development of protein synthesis and the appearance of enzymes. Extraterrestrial life is considered briefly, and the twenty-seventh of 28 short chapters is devoted to the organic analysis of meteorites.

Inevitably, subject specialists will find much to disagree with in the detail of this wide-ranging review, and many chemical evolutionists will regard as implausible the claim that not only are present-day polynucleotides essential prerequisites for life of any kind, but also that they could appear spontaneously as the outcome of a sequence of highly probable prebiotic syntheses. But there is much enjoyable and stimulating reading here. Day's historical and statistical perspectives, his descriptions of possible pre- and early-life scenarios and his speculations on the nature of future evolution are more than sufficient to encourage the reader to persist through the occasional conceptual thicket.

One caution to students: the author frequently presents conjectures in the style of factual statements which, though easing the narrative, calls for an assiduously critical presence of mind. □

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