

seemingly at the periphery of global economic interests are most vulnerable. Thus UNEP itself is threatened (see *Nature* 3 June pp.348–350). Its budget is declining in real terms and it has failed to co-ordinate the efforts of the various UN agencies, jealous to protect their own sand boxes.

Sadly, this extremely valuable book is symbolic of the failure of UNEP. It is detailed and scientific, steering clear of tackling head on the political necessities for action: it looks backward most of the time but when it peers into the future it only sees uncertainty and ambiguity — two qualities that are readily exploited by politicians living for short term expediency. Finally, the book is an expensive encyclopaedia and as such inaccessible to those lay people who would most want to read it. Those wanting a more accessible document covering much the same material, though in a more political context, should read Erik Eckholm's *Down to Earth* (Pluto Books, 1982). □

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## Yeast biography

J.M. Mitchison & P.A. Fantes

*The Molecular Biology of the Yeast Saccharomyces: Life Cycle and Inheritance.* Edited by Jeffrey N. Strathern *et al.* Pp. 751. ISBN 0-87969-139-5. (Cold Spring Harbor Laboratory: 1982.) \$75 (US), \$90 (elsewhere).

FOR at least a century, yeast has been as interesting to the biologist as it has been important to the brewer, the wine maker and the baker. This interest has increased markedly in recent years as it has become clear that yeast can provide a good model for events taking place in other and higher eukaryotic cells. In particular, genetic manipulation has become relatively easy because of the "good" genetics of yeast, the development of hybrid plasmids which will grow both in yeast and *E.coli*, and efficient methods for transformation.

This excellent book is a sign of the times — perhaps only half a sign, since the second, companion volume on metabolism and gene expression is not due until the autumn. The two books will not provide a comprehensive survey of the biology of yeast since they omit a number of topics, including the applied aspects; but they do cover many of the exciting areas of modern yeast research and there is no question of the value of this first volume. The articles are written by experts and will remain definitive statements for at least

several years, even in fast moving fields. They are a good deal more than references hung on a thin thread of text, and many of them include "overviews" which will be especially valuable to the non-specialist.

The longest article is a comprehensive account by Dujon of the dense and complex field of mitochondrial genetics. The shortest is by Roman who gives a succinct historical review of yeast genetics pointing out that it precedes the genetics of *E. coli* by more than ten years. Mortimer and Schild describe the methods of genetic mapping and provide a valuable and up-to-date map of 312 genes on the 17 chromosomes (and fragments) of *S. cerevisiae*. Fogel, Mortimer and Lusnak review the problem of meiotic gene conversion with the delightful sub-title of "Wanderings on a Foreign Stand". Their contribution is for the experts but includes a nice section on the possibility of using chromosomes modified by recombinant DNA techniques to ask direct questions about polarity and conversion. Herskowitz and Oshima give a clear and concise account of the mating type system; this is an outstanding review of the genetics and molecular biology of a fascinating aspect of yeast biology. Esposito and Klapholz deal with meiosis and ascospore development in a good article which includes a number of peripheral topics. Haynes and Kunz review the question of DNA repair and mutagenesis — a complex area which will become increasingly important in the future.

At the slightly higher level of cell physiology and cytology, Byers gives an authoritative account of the ultrastructure of the yeast life cycle where there is a real mystery in the existence of a mitotic spindle without condensed chromosomes. Perhaps this is because of the absence of H1 histone, as Fangman and Zakian suggest in their interesting review of genome structure and replication. Thorner describes the intriguing pheromones of budding yeast; these regulatory proteins "phase" cells of the opposite mating type. There is an article of high quality on the cell cycle by Pringle and Hartwell, who analyse the results from *cdc* mutants and come to a conclusion about cell cycle controls which is more complex than earlier ones. The "circuitry" of the cell cycle has proliferated into a series of parallel pathways and some of the elegant simplicity of the earlier models has been lost — but this is a criticism of life rather than of the authors.

Although the title firmly restricts the book to *Saccharomyces*, it is a little sad that there are not more comparisons both with other yeasts and with other eukaryotic cells. This, however, is a minor point. The major one is that this important book should be available to all who work with yeast and related cells. □

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## Monocot characters

Peter D. Moore

*The Monocotyledons: A Comparative Study.* By Rolf M.T. Dahlgren and H. Trevor Clifford. Pp.378. ISBN 0-12-200680-1. (Academic: 1982.) £48, \$98.50.

A COMPREHENSIVE survey of the taxonomic and phylogenetic classification of the Monocotyledones has long been needed. Perhaps it is the sheer size of the task which has deterred prospective authors, together with the wide range of techniques and evidence which is now available to those who wish to investigate evolutionary relationships.

Happily, this task has now been undertaken and it has been tackled in an ambitious and refreshingly novel manner. The bulk of this well-illustrated book is taken up with a "survey of the distribution of selected characters and their states" within the monocotyledons. Here the authors begin with vegetative morphological characters (such as bulbs, petioles, leaf-venation), progress through reproductive features (floral structures, pollen morphology, fruit types) and then consider biogeographical and physiological characteristics (salt tolerance, cyanogenesis, secondary compounds and so on). Within each of these sections the occurrence and variation of that feature within the monocots is considered and often its distribution in the group is illustrated using ordination-type diagrams of floral orders.

Finally, the classification of the monocots is considered in the light of these character analyses. The proposal of the authors is that 26 orders should be recognized, of which 11 contain just one family and a further 7 two or three families only. This may be regarded as the outcome of undue splitting, but three alternative systems are presented which permit higher levels of fusions, at the extreme recognizing only 16 orders. Also, relationships with allied dicot groups are kept firmly in mind.

This is a novel work which has broken with traditional taxonomic treatments by approaching the study of the monocots via characters rather than by dealing with proposed orders in a systematic fashion. This will prove particularly valuable to those who may have interests in specific morphological or physiological traits, from ovule types to saponins, or even in such topics as fungal or insect host-specificity. Not only does this arrangement make it possible to extract information simply and rapidly, but it also provides a rational and objective approach to the final synthesis, giving equal weight, as it does, to all of the varied lines of evidence which are now available to assist in the classification of the monocotyledons. □

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