

The central premise of Nevo is that the adaptation of mammals to a subterranean life-style can be viewed as a global experiment in evolution, beginning with climatic changes in the Eocene and early Oligocene, with 'regression', 'progression' and 'global convergence' in structure and function, and he presents a wealth of information to support this thesis. From the title it is evident that the aim of this book is an ambitious one, but with 50 years of experience in this field, Nevo is suitably qualified for such a task, and a lifetime of enthusiasm for his subject shines through in the writing. The great strength of the book is its multidisciplinary approach, covering topics as diverse as palaeobiology, ecology, anatomy, physiology, behaviour, population genetics and speciation, all set within the context of evolutionary theory. As Nevo points out, this 'global experiment' is a wonderful opportunity to apply the comparative method in evolutionary biology, which is so much in vogue at present. After experiencing many peaks and, I have to say, some troughs during the course of reading the book I think that on balance Nevo largely succeeds in his objectives. The text is prone to become rather unwieldy in places, but in other parts the fascination of the author for the animals sparkles through to liven it. Although much is made of the comparative method, I found disappointingly little evidence of integration of the mass of data presented with the wealth of phylogenetic information that is now out there in the literature. The inclusion of some recent mammalian phylogenies in Chapter 16 seems superfluous, as they are almost totally ignored in the text. It seems a shame that the section of the book (mainly Part VI) containing the cross-taxa analysis was based on a questionnaire put out in 1987, and not updated, as there has been a mass of new papers on subterranean mammals since that time. Furthermore, although some 1999 references are included, disappointingly, these appeared to be somewhat selective, as discussion in some sections of the book were out of date. I also found the sections on the evolution of social structure and eusociality weakly argued and confusing, with several *non sequiturs*. For example, it is hard to understand how the statement 'the hystricomorph ovary is highly secretory' (p. 275) has any bearing on eusociality. I think that these criticisms arise mainly as a consequence of the all-encompassing nature of the book. With such a broad remit covering diverse topics, it is difficult for a single author to please everyone.

The book covers a lot of ground and does contain a mass of information, with many useful pictures and diagrams. The price tag of £95 will almost invariably restrict the book to libraries or dedicated researchers in the field, but it is certainly a valuable first port of call for those interested in subterranean mammals, and should have a broad interest to biologists of many disciplines. I certainly enjoyed just picking it up, dipping in at random and invariably finding an interesting snippet of information provoking further thought.

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**Prokaryotic Gene Expression (Frontiers in Molecular Biology Series, 21).** Simon Baumberg (ed.). Oxford University Press, Oxford. 1999. Pp 325. Price £32.95, paperback. ISBN 0 19 963603 6.

The chapter titles in this monograph whet the appetite for a volume that covers the subject from conception to current analyses of pathogenic bacteria. An instructive, historical perspective from the editor prefaces three foundation chapters concerned with the recognition of specific DNA- and RNA-binding sites by relevant proteins. Appropriately, Peter Stockley starts with a basic introduction to the sequence-dependence of nucleic acid conformations and the recognition potential of Watson-Crick base pairs, before documenting these principles with examples of defined structures. The chapter by John Heldman reviews RNA polymerases and their interactions with promoter sequences and that by Stephen Busby the interactions of repressors and activators with DNA, with each other, and with RNA polymerase. Zhiping Gu and Paul Lovett follow with a survey of modes of post-transcriptional regulation, principally those affecting translation. Karl Drlica and colleagues discuss the subtle effects of DNA topology on gene expression before Regine Hengge-Aronis integrates the control devices into a global regulatory network as currently understood for *Escherichia coli*. This leads logically to the two-component signal transduction systems reviewed by Mariette Atkinson and Alexander Ninfa. There is no specific review of the role of proteolysis.

Three chapters extend the topic of gene expression in bacteria to important problems of increased complexity. Jon Saunders covers those systems in which genes are switched on and off by one of a variety of novel mechanisms, including the rearrangement of DNA sequences, and Charles Dorman considers control devices relevant to bacterial pathogenicity. Michael Yudkin and Keith Chater combine to provide a lucid account of some of the complex interactions that control the developmental pathways of sporulation and antibiotic production in *Bacillus subtilis* and streptomycetes. The editor concludes with a brief reflection on evolutionary aspects in which he poses some questions that remain unanswered.

Inevitably, phage systems are mentioned by many authors, nevertheless, I feel that the book rather neglects their significance in the elucidation of basic principles. I was, for example, prompted to return to the enjoyable chapter in Jacob's autobiography in which, among other things, he documents the significance of his early experiments with phage  $\lambda$  in providing clues to an understanding of the induction of the *lac* genes. Jacob recognized a parallel between the mutants of  $\lambda$  that conferred a clear-plaque morphology, and repressor-negative mutants of the *lac* system. He was struck with the realization that zygotic induction of a  $\lambda$  prophage led to the immediate expression of a series of phage genes, suggesting their control as a unit. In his autobiography, *The Statue Within*, Jacob recalls his appreciation of the  $\lambda$  and *lac* systems: 'Where can the repressor act to stop everything all at once? The only simple answer, is on the DNA itself! In one way or another, the repressor must act on the DNA of the prophage to neutralize it, to prevent the activity of all its genes. And by

way of symmetry, the repressor of the lactose system must act on the DNA containing the genes of the galactosidase and of the permease'. Jacob persuaded Monod to consider these ideas and the classical model of the operon developed. The anticipation that the mutations in *λvir* prevent repressor from binding to its target sequences gave confidence in the search for operator-constitutive mutants that would leave the switch for the *lac* genes set in the 'on' position.

I suspect that failure to obtain one transcript on time has delayed publication of the others; the lag between the literature surveyed and publication is commonly 2 years, but occasionally as much as 4 years. The problem of unmet deadlines frustrates the task of publishing a collection of reviews, which together contribute more than a series of independent articles.

Perhaps, in the absence of a guaranteed high 'impact factor', editors have no 'carrot' with which to persuade laggards. Despite this problem the editor has produced a useful monograph.

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## Books received

**Mouse Genetics and Transgenics: A Practical Approach.** I. J. Jackson and C. M. Abbott (eds). Oxford University Press, Oxford. 2000. Pp. 299. Price £29.95, paperback. ISBN 0 19 963708 3.

**Ecology and Evolution of Darwin's Finches.** Peter R. Grant. Princeton University Press, Princeton, NJ. 2000. Pp. 492. Price £14.50, paperback. ISBN 0 691 04866 5.

**The Meaning of the Gene.** Celeste Michelle Condit. University of Wisconsin Press, Madison, WI. 1999. Pp. 325. Price \$19.95, paperback. ISBN 0 299 16364 4.

**An Introduction to Human Molecular Genetics: Mechanisms of Inherited Diseases.** Jack J. Pasternak. Fitzgerald Scientific Press, Bethesda, MD. 1999. Pp. 498. Price £29.50, hardback. ISBN 1 891786 03 2.