

Financial constraints must also explain the rather poor and very condensed quality of the print which detracts from an otherwise excellent publication.

In 1927 Augustine Henry reviewed *Naturbilder aus Südwest-China* in *Nature* (119, 667–668; 1927) in glowing terms, commenting that the book has “a strong appeal to horticulturists; and we hope that a translation into English will soon be published”. It may have taken 70 years to appear but at last we have it, and undoubtedly it will become a main reference work for botanists working on Handel-Mazzetti’s collections, as well as those interested in Chinese plants. □

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A revolution in evolution

Patterns in Evolution: The New Molecular View

by Roger Lewin

W. H. Freeman: 1997. Pp. 245. £19.95, \$32.95

Svante Pääbo

It is often said that biology is becoming increasingly specialized. What this book shows is that, at least in evolutionary biology, the opposite trend is at work. Many of the questions in evolutionary biology were formulated by generations of scholars specializing in the study of particular groups of organisms. Yet molecular evolutionists apply the same techniques and interpretative tools regardless of whether they study bacteria, fungi, birds or humans. Therefore those who use molecular techniques can both talk to, and learn from, each other. As molecular data accu-

mulate, this trend will continue. Evolutionary biologists can rejoice in living in a time of synthesis, rather than fragmentation, of their field.

Over the past ten years, molecular genetic approaches have revolutionized evolutionary biology. Roger Lewin’s overview of this development begins by describing some major issues in the field, starting with the ‘molecules versus morphology’ controversy, the question of whether morphological characters or gene sequences provide a better guide to evolutionary relationships. A balanced consensus seems to be in sight: where morphological studies have yielded unequivocal answers, molecular data tend to confirm them; but where morphology has not provided a clear view, molecular studies are invaluable because they yield large numbers of clearly delineated characters with modes of change that can be modelled mathematically. Many ‘trichotomies’ or ‘explosive radiations’ may yet be resolved by molecular studies, particularly given recent technical advances that allow huge amounts of DNA sequences to be determined quickly and inexpensively.

Lewin then discusses molecular phylogenies, the ‘selection versus neutrality’ debate, and ‘molecular clocks’. Some oversimplifications here may annoy the insider, but the main message is clear: the neutral model should serve as the null hypothesis against which molecular data are tested, as it makes defined, and therefore falsifiable, predictions. Lewin goes on to describe the molecular contributions to ecology and anthropology, and the retrieval of ancient DNA.

This is an excellent and beautifully illustrated book, and the text is written in a lucid and captivating fashion. I can recommend it to anyone who wants an accessible introduction to the field of molecular evolution. □

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Mind over matter

The Large, the Small and the Human Mind

by Roger Penrose

Cambridge University Press: 1997. Pp. 185. £14.95, \$19.95

Philip W. Anderson

Roger Penrose is devoted to persuading us that the three problems in science that seem to him to be the deepest and most intractable are, somehow, to be solved by the same somewhat vague inspiration. These problems are the quantum theory of gravity, measurement and decoherence in the quantum theory, and the nature of consciousness. How he manages to link these three, and in the last of them to implicate microtubules (which are objects of known structure and function that control the internal working of all of our cells, including neurons), is not at all clear.

In this respect, and many others, *The Large, the Small and the Human Mind* is similar to his previous book, *Shadows of the Mind*, of which it seems to be a digest. It embodies all of the same arguments and a selection of the same words and illustrations. *Shadows of the Mind*, in turn, elaborated at some length on some ideas contained in his previous very popular book, *The Emperor’s New Mind*.

New to *The Large, the Small and the Human Mind* are discussions from one mathematical physicist, Penrose’s former student Stephen Hawking, and two philosophers, Nancy Cartwright and Abner Shimony. Hawking explains Penrose’s ideas with admirable clarity, and equally clearly lays out the criticisms of these ideas that an empirically minded physicist is likely to have. Cartwright asks, very properly, “why not a biologist?”, by which I presume she means that biology has its own somewhat independent intellectual content that Penrose’s strong reductionist point of view ignores, and therefore it may be inadequate to deal with problems such as consciousness. I read her as suggesting that a biologist’s commentary would have been useful, and personally I agree with both points. Shimony, on the other hand, introduces a concept he calls “Whiteheadism”, which to me suggests primitive ideas such as the *élan vital* or even animism, which are foreign to the point of view of modern neuroscience.

It is clear that I am saying, with some regret, that I cannot recommend the present book to those who have read either of the previous ones, and that, whatever one may make of Penrose’s thesis, the earlier books are superior in exposition and content.

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Easter eggs

Before Easter slips away, here are some eggs — from the dinosaur *Spheroolithus irenensis*. For more eggs, shell out on *Fossil and Recent*

Eggshell in Amniotic Vertebrates: Fine Structure, Comparative Morphology and Classification (Special Papers in Palaeontology no. 56) by K. E. Mikhailov (The Palaeontological Association, £35).