Heredity **85** (2000) 199–201

Book reviews

Quantum Evolution: The New Science of Life. Johnjoe McFadden. HarperCollins, London. 2000. Pp. 338. Price £16.99, hardback. ISBN 0 00 255948 X.

Quantum Evolution: The New Science of Life simply does not work. The author has a central idea regarding how Darwinian natural selection may be complemented by another evolutionary force, which he refers to as quantum evolution. However, this idea is hidden in the shortest chapter, near the end of the book, after more than 200 pages of wide-ranging material covering a miscellany of rather tenuously linked subjects — biospheric extremes, reproduction, the origin of life, muscle action, enzyme action and quantum mechanics. This results in the reader becoming progressively frustrated as the book does not get to the point and when one eventually gets there one is in no mood to take on board speculative and badly explained new mechanisms, which is how I viewed the core ideas when I finally reached them.

So, what is McFadden's 'Quantum Evolution', which he describes in his sub-title as 'The New Science of Life'? Firstly, it bears no relation to G. G. Simpson's 'quantum evolution' that we are all familiar with — indeed, and bizarrely, McFadden seems entirely unaware of this standard usage of his key term. There are no references to Simpson's work anywhere in the book. Instead, McFadden's 'quantum evolution' emerges as an application of quantum mechanics to mechanisms of mutation and it becomes, among other things, a proposed way in which the controversial 'adaptive mutations' described in *E. coli* by Cairns *et al.* (1988) might come about. As I have never believed that environmental conditions systematically cause mutations that are adaptive in those conditions, I was not particularly interested in a possible mechanism for the production of such mutations. Perhaps other readers with different preconceptions may take a more positive view.

Regrettably, the recurrent errors throughout the book lead to the feeling of not being in a safe pair of hands. Some of these are trivial, yet add to the general sense of insecurity — for example, a tendency to get names wrong. So, for example, Margulis becomes Margolis, Eldredge becomes Eldridge and Galilei becomes Galiliei. More importantly, there are other parts of the book that are just plain wrong. For example, McFadden says (p. 133) that the second law of thermodynamics 'states that everything in the universe is accompanied by an increase in entropy'. Even the author himself realises that this is not so, because he states on the following page that the second law 'does not forbid processes that decrease entropy', so the first statement represents careless writing rather than misconception. The lesser of two evils, to be sure, but disconcerting nonetheless.

As will be clear by now, I did not like the central idea or the book as a whole. However, I was left asking myself whether I might have been prepared to consider the central idea more sympathetically if McFadden had written a much shorter book with quantum evolution up front and with greater attention to detail. I suspect the answer is no.

References

CAIRNS, J., OVERBAUGH, J. AND MILLER, S. 1988. The origin of mutants. *Nature*, **335**, 142–145.

ARTHUR WALLACE
Ecology Centre
University of Sunderland
Sunderland SR1 3SD
U.K.

The Human Inheritance: Genes, Language, and Evolution. Bryan Sykes (ed.). Oxford University Press, Oxford. 1999. Pp. 195. Price £19.99, hardback. ISBN 0 19 850274 5.

During the spring of 1997, Wolfson College, Oxford, held a series of eight lectures on human origins, evolution and diversity, which are now published in this compact book. Bryan Sykes, the organiser of these lectures, did not set out with the intention of publishing them but I am glad that he changed his mind. The contributors, Colin Renfrew, Chris Stringer, Don Ringe, Gabriel Dover, Bryan Sykes, Svante Pääbo, Ryk Ward and Walter Bodmer have produced a set of exciting and thought-provoking essays. Although I was already familiar with some of the more genetic material it was the essays, which included linguistics, palaeontology and human migrations — topics that I rarely have the time to read about in any depth — that really grabbed my attention. Also, it is always interesting to find that other disciplines are driven with the same types of strong disagreements and controversies about approaches, methods and, even, the data that afflict one's own field.

Whilst it might be invidious to single out individual essays as they are universally excellent, it was those where my knowledge of the field was minimal that gave me the most enjoyment, for example, Svante Pääbo's 'warts and all' description of the problems and frustrations of working on ancient DNA. If I was not aware before I read these essays that there is probably a limit to how far origins of languages can be traced because of the way languages are transmitted and evolve, I certainly am now. Similarly, despite the considerable hype around studies of ancient DNA in the press and media, Pääbo's statement that '..there probably is a time barrier, which I would put between 100,000 and 1,000,000 years, that we will not be able to break with ancient DNA' was refreshingly frank.