

Book reviews

Evolutionary Medicine. Wenda R. Trevathan, Euclid O. Smith and James J. McKenna (eds). Oxford University Press, New York. 1999. Pp. 480. Price £24.95, paperback. ISBN 0 19 510356 4.

A medical student approached me after a lecture I had given saying that he had only heard the word evolution mentioned twice in his four years of medical studies; and that both occasions were in the previous hour. My lecture had been a general one on dermatology and I had used arguments about our biological history to hopefully illuminate two topics; why we scratch and why skin colour varies in peoples living in different parts of the world. The pleasure of standing on the shoulders of giants is that it often allows one to make up interesting stories for undergraduates rather than fall foul of the ubiquitous ‘name this rash’ or ‘this is psoriasis, this is eczema’, etc. How else can we think about how maladaptive scratching seems in the context of atopic eczema? How else can we wonder why pale skin is allowed to be so susceptible to the effects of that most ubiquitous carcinogen, ultraviolet radiation? Even given my own special interests, it seems that such approaches offer so much in thinking about the ‘hows’ and ‘whys’ of disease.

I therefore looked forward to reading this book. Instead, with one or two chapters that stand out as exceptions, such as the one by Nesse, I ended up frustrated and disappointed. The problems start, as does the book, with the Foreword. Here we discover that one of the themes is to attack orthodox medicine and biomedicine. Much of the book seems to want to berate ‘orthodox’ medicine for the failure to take on Darwin’s great re-engineering of biology in the mid-nineteenth century. I am not at all surprised. Medicine has never been big on theory and lives at the applied end of the scientific spectrum; in general, theory counts for little if medicine can find a quick and dirty solution for one of its pressing problems. Medicine is, and remains, technology-driven, obsessed with short-term practical consequences. The intellectual landscape is often determined by, rather than being just a consequence of, practical considerations. Tuberculosis provides an obvious example. Tuberculosis can be considered a genetic disease or an infectious disease — it all depends on what you want to achieve and what provides the most insight at a particular time. In the nineteenth century insight and therapy followed the idea of an external infectious cause for TB resulting in the development of chemotherapy in the middle of the twentieth century. Conversely, today, interest in genetic susceptibility has recapitulated earlier data on familial influence on TB incidence and may yet provide practical insights.

Rather than chapters on the immunogenetics of malaria or TB, or the evolution of skin colour, the book hosts several poorly disguised and familiar diatribes against the technology that is modern medicine as well as repeated *ex cathedra* statements that prevention is ideologically preferable to

therapy, and worst of all, that doctors need more protocols. Indeed, I wondered whether many of the chapters had been intended for a belated festschrift for Ivan Illich. Many of the contributors seem obsessed with the status of their own disciplines, quick, it seems, to self-reference themselves and other evolutionary medicine theorists, all apparently in an attempt to avoid discussion of empirical data. Much falls within that tired old ‘social science model’ writ big, and, as usual, failing. It may continue to fool the academic judges, but I hope it still counts for little outside the ivory tower. Perhaps with so many academic dollars in medicine one must feel some sympathy for those who, previously excluded, now feel it appropriate to apply for the ever larger ‘welfare for academics schemes’, usually know as research grants or RAE fodder. For me this little inbred strain of theorists urgently needs some hybrid vigour, before it faces the full rigours of whatever the environment can throw at it. On the other hand, perhaps the latter happening sooner rather than later would be kinder.

What saddens most, however, is that there really is so much to say on the subject of evolution and medicine, and good reason to remain excited. Yet, this will only happen if we forget the manifesto statements about membership of the evolutionary medicine club and get to grips with the data and the mechanics of the various physiological systems on offer — confidence limits included. So rather than rely on this volume for inspiration, I would favour looking at Jared Diamond’s wonderful, broad brushstrokes to remind one of the historical context of all human disease and then head straight to the lab or clinic.

JONATHAN REES

*Department of Medical and Radiological Sciences
The Royal Infirmary
University of Edinburgh
Lauriston Place
Edinburgh EH3 9YW
U.K.*

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.

Name an area of biomedical research that does not have mouse models. We can overexpress, mutate or knock out genes; we can mutagenize mice, look for useful phenotypes and discover the genes underlying them. This book, a new title in the *Practical Approach Series* (PAS), tells us how. It brings together diverse protocols spanning all aspects of mouse genetics. An apparent difference between this volume and colleagues in the PAS is the breadth of topics covered. Subsections of several chapters have entire PAS volumes dedicated to them. For a relatively small book it has the monumental task of covering all the protocols used in mouse

genetics, and it does a good job. When detail is scant or something appears to be missing there are cross-references to other relevant PAS titles. This book should appeal to both novices and researchers experienced in the field of mouse genetics. The first chapter 'Simple mouse care and husbandry', for example, is essential reading for those who have not set foot in an animal facility. The protocols can also provide new ideas for more seasoned mouse husbanders as well — tattooing as an alternative to piercing!

The next two chapters highlight the difficult task of covering such a wide subject, and may be better suited to the end of the book, when you have made your interesting mice and want to analyse or store them. 'Spatial analysis of gene expression' cannot be comprehensive. There are entire titles in the PAS dedicated to this subject, from *in situ* hybridization to DNA microarrays. The chapter does an admirable job of providing example protocols for *in situ* hybridization, and then provides a greater focus on analysing different transgenic reporter constructs and wholemount skeletal analysis. In contrast, 'The cryopreservation and rederivation of embryos' provides much technical information and covers the topic comprehensively.

The next five chapters deserve a book of their own. 'Mapping phenotypic trait loci' and 'Mapping genomes' are great chapters. They cover the topics as thoroughly as they can within the limitations of space. The genomes chapter is indicative of the speed at which technology is developing, combining lab protocols and internet-based resources. The internet is, in fact, given a chapter of its own — 'Electronic tools for accessing the mouse genome'. It provides information and web addresses of databases containing genomic, gene expression and mutant mouse information. 'Mouse cytogenetics and FISH' provides information and protocols sufficient for a novice to begin using these techniques. The last of these chapters, 'Mutagenesis of the mouse germline', is again limited by space. It details one type of chemical mutagenesis and provides protocols for the mutagenesis itself and subsequent analysis. The last two chapters of the book, 'Generation of transgenic mice from plasmids, BACs and YACs' and 'Directed mutagenesis in embryonic stem cells' provide good reviews and protocols for the different transgenic and knock-out technologies in use and in development at present.

The best thing about this book is that it is written by experts from around the world and is indicative of the networks established by mouse geneticists internationally. It recognizes the use of the internet as a research tool and resource for the dissemination of data derived from mouse genetics. The worst, and probably only bad, thing is that this book has stretched itself too thinly, and many of the chapters could have been expanded. When the second edition comes out it should be at least two volumes. We give a thumbs up to a book already well thumbed and in use in the lab.

SARAH L. KING AND MARINA R. PICCIOTTO
Department of Psychiatry
Yale University School of Medicine
 34 Park Street
 New Haven CN 06508
 U.S.A.

Transgenic Mammals. John Bishop. Longman, Harlow. 1999. Pp. 294. Price £19.99, paperback. ISBN 0 582 35730 6.

Over the last 15 to 20 years, our ability to manipulate the mammalian genome through transgenesis has revolutionized modern biology. Transgenesis is providing us with insights into gene regulation and function, as well as the mechanisms underlying developmental and pathologic events. Moreover, it is enabling us to develop animal models that can serve as predictors of human disorders, or as systems with which to start thinking about gene-based therapies. These techniques are also being used to improve our domestic crops and animals, as well as in the production of rare substances in either blood or milk. Last, with the possibilities of cloning and spermatogonial transplantation, the potential involving transgenesis is becoming limitless. Thus, this timely book, written by an expert in the field, represents an essential addition for any researcher desiring to gain a comprehensive overview of transgenic technology.

Transgenic Mammals represents in a single text a compilation of the necessary background information, as well as a discussion of strategies available for the generation of a transgenic mammal. The unique features of this text include an outstanding comprehensive overview of the field, including a discussion of what defines a transgenic animal, what strategies are available to generate transgenics, what some uses of transgenesis might be, as well as ethical issues. This introduction is not only suitable for scientists at any professional level, but may also be understood by a lay person involved in any capacity with transgenic technology. Several background chapters summarizing murine reproduction and development, genetics and husbandry, sex determination, and uniparental expression follow this section. Because all transgenic strategies involve an intervention at early developmental stages, followed by transgene propagation through generations, this information is fundamental for our understanding of transgenesis. The remaining chapters discuss: (1) strategies involved in the generation of transgenic mammals, including a discussion of pronuclear microinjections, retroviral vectors, 'knock-outs', 'knock-ins', conditional knock-outs, as well as nuclear transplantations; (2) DNA integration by either random or homologous recombination methods, including insertional mutagenesis and gene trapping approaches; (3) transgene expression, including a discussion of chromosomal position effects and RNA and protein processing and expression; and lastly (4) the generation of transgenic livestock.

The text is written in an easy-to-follow style intended for upper level undergraduates, graduate students, and beginners in the field, and is illustrated by two-colour diagrams. Rather than being a 'how to' methods/strategy book, this text concentrates on concepts; in addition, it incorporates essential background into every chapter and provides an excellent reference list for additional reading, if desired. Although the author should be complimented on the thoroughness of the presented topics, at times the detail is superfluous and not essential for the reader to understand the basic concepts of transgenesis. Moreover, although it may not have been the author's intention to emphasize the advantages, disadvantages and limitations of one strategy over another, nor to focus on