

Book Reviews

A dictionary of genetics (3rd edition). Robert C. King and William D. Stansfield. Oxford University Press, New York. 1985. Pp. vi + 480. Price £15 PB, £25 HB.

When I first started out as a research student, I treated myself to a copy of the first edition of this dictionary. Its current battered appearance testifies to the use it has had over the ensuing years, so a new edition was more than welcome. The last 15 years have seen a rapid expansion in genetics and this is reflected in the increase of the number of entries from 3800 in the first edition to nearly 6000 in the third edition, due mostly to the burgeoning jargon of molecular genetics.

The general layout is good and the definitions and explanations well-written, although the choice of illustrations is somewhat idiosyncratic, as in any illustrated dictionary. The range of entries covered reflects the long pedigree of the dictionary and many hark back to a gentler era of genetics. For example; one finds entries for fowl (see poultry breeds), pullet, *Gallus domesticus*, chicken, cockerel (this being a North American production, cock does not appear) and an illustration of comb shapes, rubbing metaphorical shoulders with Southern blotting and Pribnow box.

As a reference volume, the turgid Germanic efficiency of the "Glossary of genetics and cytogenetics" probably has the edge over "A dictionary of genetics" because the original references are quoted for most entries. However, the last edition of the "Glossary" was published in 1976 and so pre-dates most of the important developments in molecular genetics. For some entries, clarity has been obtained at the expense of some rigour, but this is not necessarily a disadvantage when all one wants to know is what an unfamiliar term roughly means. But the omission of references to original definitions or usage does prove irritating when more detail or more formal definitions are required.

The last 55 pages are taken up with a series of useful appendices including a chronological list of significant developments and publications in evolutionary biology and genetics. To some extent this must be a personal view of the compilers, but it was noticeable that quantitative genetics received little attention.

Overall, this is a practical and up-to-date volume, but at £15 for the paperback edition, the price probably puts it out of the reach of undergraduates who would benefit from it most. I would certainly recommend it as a "good buy" for a library and those who can afford it.

REFERENCE

RIEGER, R., MICHAELIS, A. AND GREEN, M. M. 1976. *Glossary of genetics and cytogenetics: Classical and molecular*. Springer-Verlag, Berlin.

JOHN BARRETT
Department of Genetics
University of Cambridge

Mechanisms and regulation of carbohydrate transport in bacteria. Milton H. Saier, Jr. Academic Press, Orlando, Florida. 1985. Pp. xviii + 209. Price £39.00.

It has been recognised for well over a quarter of a century that carbohydrates are taken up by micro-organisms via specific proteins in the cell envelope that exhibit many of the kinetic properties of enzymes; this recognition underlies their original designation as "permeases" by the late Jacques Monod and his colleagues. But, although this also enabled numerous models to be constructed that attempted to describe in molecular terms how vectorial translocations might be achieved, and (even more importantly) that attempted to predict how such processes might be regulated in the cell, these models inevitably suffered from a paucity of hard evidence, associated with the difficulty of actually handling the proteins involved. It is only in recent years that techniques, pioneered largely in the U.S.A. by men such as E. P. Kennedy, L. A. Heppel and S. Roseman, have made it feasible to identify, purify and characterise these membrane-associated proteins; even newer techniques (e.g., gene amplification, cloning and DNA-sequencing) have enabled the primary structures of (as yet fewer than a handful) these materials to be elucidated. Clearly, the pace of advance has been accelerating and continues to accelerate; equally clearly, it is becoming increasingly difficult even for those in the field to retain a sense of perspective.

Dr Saier has, for a number of years, been conscious of this need. With C. D. Stiles, he wrote a book in 1975; he published a perceptive and influential review of one type of carbohydrate uptake mechanism—the PEP:sugar phosphotransferase system ("PTS" for short)—in 1977; he followed this up in 1978 and 1979

with similar articles in compendia such as *Bacterial Transport* and in volume 7 of *The Bacteria*; and (with three other of his colleagues) published a definitive article on the whole subject of bacterial carbohydrate transport in 1980. The present volume repeats a good deal of this earlier material but also adds much information obtained in the past 5 years. In that sense, it is a useful update and survey of the "state of the art" in 1985. What, however, makes the book particularly valuable is not the compilation of facts but their interpretation: on virtually every page, the reader realises that this little volume is written by someone endowed with quite unusual imagination, originality, and insight into the biology of the processes he discusses. I doubt whether anyone, however expert, can read this book without being made to pause, think, and reconsider his ideas: I, certainly, am grateful to have had the opportunity of doing so.

Unfortunately, there are also criticisms that must be voiced. The coverage of material is, to put it mildly, idiosyncratic. For a book that purports to be about carbohydrate transport in bacteria, surprisingly little attention is paid to organisms other than *Enterobacteriaceae*. There is scant treatment of the newer findings that bear on the mechanisms of proton symport and on binding-protein mediated processes: discussion concentrates on the lactose and maltose uptake systems of *E. coli*, and this material has already been reviewed recently by W. Boos elsewhere. Wider problems such as those of oligotrophic transport are not even mentioned. There is also rather little consideration of the techniques—expression vectors, protein and operon fusions, DNA sequencing, etc.—that are making these advances possible. And there is no discussion of the use of antibodies in probing the configuration of membrane proteins.

As would be expected from the author's own record of distinguished research on the PTS, this system is well reviewed, and there are stimulating and thought-provoking new ideas on its nature and evolution and on its interaction with adenylate cyclase. But here again the approach is less than even-handed. Literature citations concentrate to a great extent on the work of the author and his colleagues (which is acceptable, since one should be able to burrow into the literature from there) but often refer to papers "in preparation", or to "unpublished experiments" (which is infuriating, if one really wishes to examine the evidence). And the weight of Dr Saier's statement in his preface, that he needed to publish a book because "... a review article of normal length could not possibly provide an in-depth analysis of all the new information..." is considerably weakened by the publication, in a recent issue of *Microbiological Reviews*, of an excellent article by P. W. Postma and J. W. Lengeler which does precisely that, and does it in 37 pages.... In these hard times, it is inevitable that one must consider whether the expenditure of more than 18p per page for this book is justified. The answer to such a question must rest with each individual. In my opinion, anyone interested in membrane transport would be seriously disadvantaged by not having the

opportunity to read Dr Saier's book: I would therefore strongly advise any Librarian to buy a copy.

HANS KORNBERG
Department of Biochemistry
University of Cambridge

Cloning of frogs, mice, and other animals. Robert Gilmore McKinnell. University of Minnesota Press, Minneapolis. 1985. Pp. ix + 127. Price \$12.95 US. (Revised edition of *Cloning: A biologist reports*).

The laid-back style of this short book will certainly make it easy to read by non-scientists, and it should fulfil its stated purpose of dispelling the apprehension, said to surround "cloning". The book is a complete rewrite of the earlier volume by the same author. The coverage of this edition has been broadened to include more discussion of propagation in non-amphibian animals and plants; in particular, substantial space is devoted to various manipulations that can now be carried out with mammalian eggs.

While the book has much to recommend it, I have two substantial criticisms. First, it is hard to conceive how, in a 120-page book on cloning, no reference at all should be made, in the text or references, to the first case in which a clone of any normal adult vertebrate was described, some 25 years ago. Perhaps the explanation is that the author has chosen to exemplify any conclusion, whenever possible, from his own work, with which he is, understandably, most familiar. My other more general criticism is that the term "clone" has been confusingly expanded to include any living organism, however abnormal, which has been generated from any cell, however embryonic. The ordinary person, to whom the book is addressed, must surely understand by "clone" a group of genetically identical *adult* individuals. Thus, *one* mouse produced from an early embryo cell nucleus is certainly not a clone, and it would be confusing to describe it as having been produced by cloning. A group of abnormal embryos even though ultimately derived from a single nucleus is not a source of concern to those said to "fear" cloning. Though a careful reader can disentangle what really is a clone from what is not, it would have been helpful if this distinction had been made more clearly.

My overall impression of this book is that what is really a molehill of public concern (vegetative propagation and nuclear transplantation) has been portrayed as a mountain (fear and dread of human cloning), thereby implying the need to write this book, which tells the reader to sit back and relax: the mountain is after all a molehill.

DR J. B. GURDON
CRC Molecular Embryology Unit
Department of Zoology
University of Cambridge