have a longer lifespan? With the development of biochemical and genetic techniques this approach can now be pursued down to cells (their rate of division etc.) likely to determine the 'rate of living' which has long been thought of as a longevity correlate. A full chapter is devoted to summarizing correlations, mostly from mammals. It is suggested that transgenic organisms (mice) may be used to alter these correlates meaningfully, but you still need to know what you are looking for and the extant data do not provide that clue. So the next chapter explores genetic influences, particularly age-related diseases. In most instance, polymorphisms make interpretation difficult, and except for the *age I* gene of *Caenorhabditis* no genetic locus has been found which significantly increases lifespan.

A second 'shot-gun' approach has been to look at the biochemical changes and, particularly, the stability of the genome during aging. The most striking general conclusion is the remarkable quantitative and qualitative differences in the biochemistry of the various aged cell types of the organism (e.g. in the accumulation of lipofuscins); and the post-translational 'degeneration' of enzymes through racemization and the like. But since some of these changes may be environmentally induced there is little to be gained here, and the same is true of chromosomal changes (aneuploidy, breakage etc.) associated with age. We knew long ago that aging must be linked to changes in macromolecular synthesis. But which? Again, environmental manipulation of the life span provides no clues. All these areas of study are carefully documented, and anyone looking for this kind of information will find it here.

The penultimate chapter is particularly interesting and brings together such data as we have on the influence of phylogeny and evolution on senescence and lifespan. This survey exposes so many gaps in our knowledge that researchers into life histories will find that dozens of approachable projects suggest themselves. As earlier chapters imply, senescence is polyphyletic in origin. Sometimes, as in the case of mammals, similar changes of senescence patterns occur over a wide range of lifespans (thirty-fold in this case) so one must assume either a persistent early genetic pattern, or convergent evolution. In other cases stability is not the arrangement, and for the American shad semelparity is environmentally determined, with northern populations having a high proportion of iteroparous members. This, and other like cases, taken with the ease with which *Drosophila* aging can be selected for, suggest that aging is a very plastic phenotype and its expression limited and determined by the organisms bauplan. If this is correct, since gerontology is concerned primarily with humans, the comparative approach (except for mammals) is unlikely to be profitable. Over 40 years ago Medawar classed aging as an unsolved problem of biology. It still is despite all the documentation in this book, and that probably implies that it is being looked at in the wrong way. Medawar also emphasized that the power of natural selection weakens with age, allowing late-acting deleterious genes to survive in populations. Finch questions this thesis at many points, but we shall take it as axiomatic. It does not follow that in heterogeneous populations the same inherited defect is always the cause of a metabolic taint which leads to decline and death. The wealth of data about humans shows that there are many and varied proximal causes of aging, and this should direct research towards their genetic causes. Unfortunately Finch does not pursue these points but, instead, suggests that 'organismic aging and senescence be considered as aspects of a nascent subject, *the biology of extended time*'. This harks back to an idea, popular in Carrel's laboratory in the 1930s, that there was some special life parameter called 'biological time'; a senile idea by now.

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Embryos – A Color Atlas of Development. By JONATHAN BARD. Woolfe Publishing Ltd. 1994. 224 pages. Price £49.95. ISBN 0 7234 1740 7.

As more and more genes important in key developmental decisions are discovered, they are found often to be conserved across a range of organisms. As the molecular technology continues to become more sophisticated, finding new developmental genes and their homologues in other species becomes easier. However, finding the precise function of these new genes in developmental processes is often difficult. Analysis of expression patterns of genes during development is necessary, yet many of the recently trained molecular biologists lack the essential background in developmental biology and embryology needed to interpret these expression patterns. It takes an even greater understanding of developmental biology to see when something has gone wrong in a mutant or an organism designed to mis-express a gene. Furthermore, because of the conservation of these molecules between organisms it is becoming important to be able to follow the development of a number of species of embryos, not just one's chosen research organism.

Jonathan Bard has recognized this and filled a gap in the literature to cope with it. The book describes the embryology of the most studied developmental systems in use at the moment. The organisms covered are the mouse, human, chick, sea urchin, *Xenopus*, *Drosophila*, zebrafish, molluscs, the nematode, arabidopsis, the leech and the 'honorary embryo' *Dictyostelium discoideum*. I cannot think of any organisms that should have been included as well, and I am very glad to see such a broad selection.

The most outstanding aspect of the book is the high

quality of the figures. This is true of every chapter, without exception. Embryos are beautiful to look at and this book has captured that superbly.

As is needed, the chapters concentrate on the embryology and developmental mutants with sections to follow that give a flavour of the current trends in research in that particular species and any special experimental manipulations that are important to understand.

This book is essential for those teaching Developmental Biology to undergraduates and should be available in the lab while practical classes are in progress. It will also be invaluable to those new to development (perhaps forced there by having discovered their 'new gene'), to people interested in being able to make comparisons between species and those wishing to follow the literature in a species with which they are not familiar. I can also recommend it to those who just like to look at embryonic development!

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Clinical Genetics Handbook, 2nd edn. By ARTHUR ROBINSON and MARY G. LINDON. Blackwell Scientific Publications. 1993. 614 pages. Paperback. Price £32.50. ISBN 08 654 219 43.

The stated aim of this book is to provide the primary-care physician with access to information on genetics as the need arises in the clinic. The book is divided into two sections: the first deals with basic genetic concepts and diagnostic techniques and the second with clinical disorders with a genetic aetiology. The first selection is relatively short, presumably to encourage the non-specialist reader to complete this as an introduction to the terms used in the rest of the text. The chapters on genetic counselling and prenatal diagnosis, in particular, provide a useful summary for general physicians and obstetricians and should allow them to use such services more efficiently. The remainder of this book deals with specific genetic diseases and is divided into systems-based chapters. Generally these chapters are of a high quality with the section on pharmacogenetics being particularly strong. It is, however, very sobering to realize how quickly new genetic data change our clinical practices, such as the discovery of the molecular basis of Huntington disease and several hereditary cancer syndromes. The fact that these are not included in the text is simply a reflection on the rapid development of this field and a general limitation of printed reference materials as opposed to on-line systems such as OMIM. Another slightly disconcerting thing about this book from a clinical genetic standpoint is lack of references given for specific risk figures or clinical facts. This probably reflects our obsessions with raw data rather than a genuine deficiency in the book. UK readers will also find that the addresses of only US family support groups are given.

In summary this compact reference book has achieved that most difficult task in producing readable text in an intuitive, sensible layout with a good index. The genetic information provided is accurate and gives a reasonably comprehensive coverage of topics. I have no hesitation in recommending it to non-specialist colleagues who deal with genetic diseases providing they remember that things may have changed since the book was published.

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How to Write About Biology. By JAN PECHENIK and BERNARD LAMB. Harper-Collins, London. 1994. 262 pages. Paperback. Price £6.99. ISBN 0 00 499000 5.

It is a lamentable reflection on our schools that most undergraduates cannot write. It may therefore be reasonable for Dr Lamb to adopt a headmasterly approach to his anglicization of the American Pechenik's *A Short Guide to Writing about Biology*. But his style would turn me off; as in, for example, 'Acknowledge the struggle for understanding and work to emerge victorious; read with a critical questioning eye' – some sentence! So the best advice I can give the student is: keep this book on your shelf and consult it only as necessary. There is information here which will help you, even if it is often lost in rather pompous phrases.

Before reading the text, I checked the References, and was surprised by the absence of Fowler's *English Usage* and of Gower's *Plain Words*, which even civil servants are expected to understand. So I was prepared to trawl half-way through the book before I came to the chapter on punctuation, word choice (no mention of Roget's *Thesaurus*, which is an education in itself) spelling and grammar. This is a collection of writing tools which the student should already be familiar with, but if he does need to know when to use a colon or a slash there are paragraphs here to guide him, and there are even lists of commonly misspelled words. In my experience, most undergraduates learn to write by reading. As Sartre put it: 'People read because they want to write'. Students should have been encouraged to read Huxley, T. H. and J. S., Haldane, Medawar, Gould, Maynard Smith; and if they can find the classics of 100 years ago like Darwin, Weismann, Darcy W. Thompson and others, they will get a feel for style and language which reading about the mechanics of writing cannot provide. And it is more fun!

The bulk of the book is concerned with note taking, preparing essays and reports, recording experimental results and, finally, the writing of a publishable paper.