microanatomy and biology of haemopoiesis, moves to accounts of the receptor technology and molecular biology of the principal colony stimulating factors and concludes with a series of chapters on the clinical applications of CSFs (with associated problems of large scale production of protein pharmaceuticals), CSF signal transduction and control of gene expression. "Colony Stimulating Factors" can therefore be highly recommended as a generally accessible and wide-ranging compendium of information on CSFs which conveys an excellent feel for the successes, problems and future directions of this exciting area of modern biology.

The book, however, is not without its faults. There is an inevitable duplication of information and unevenness of level; the 'splice sites' in certain chapters with multiple authors are painfully obvious and whereas some chapters are readable and informative, others are highly detailed and somewhat indigestible. It is not clear, for example, how many readers will wish to wile away a long flight perusing the complete genomic sequence of GM-CSF. The other problem is that the book is already in certain areas out of date. It seems the book was completed in 1988 and developments in certain areas, particularly the cloning of CSF receptors, whilst anticipated in the editor's excellent summary chapter, are now a reality. For this reason, the most durable aspect of the volume may prove to be those chapters (e.g. Allen et al. on bone marrow biology and Steward et al. on clinical trials) with an analytical and broadly based approach. Finally, both the indexing and proofreading are firmly from the minimalist school of academic publishing, which is rather irritating for a volume costing $162 (in Europe).

John K. Heath

**Molecular Control of Haemopoiesis: CIBA Foundation Symposium 148; Edited by G. Bock and J. Marsh; John Wiley and Sons; Chichester, 1990; xi + 232 pages; £35.95**

Haemopoiesis is one of the principal areas where molecular biology is beginning to make a direct impact on clinical medicine. A discipline that was firmly rooted in cell biology has warmly embraced the new molecular approach and this has increased the pace of progress towards an understanding of the mechanisms controlling both the normal and pathological aspects of this extremely complex process. In May 1989 the CIBA Foundation brought together many of the world's leading research workers in this field, not just from Europe and North America but also from the Southern hemisphere, since Australians have provided a major contribution to dissecting the regulation of haemopoiesis over the last 25 years. This book is the published proceedings of that symposium, and if it has an overall message, it is that however far the field has progressed, it has an awful lot further to go.

Haemopoiesis can be considered as a triangle, the base being all the mature cells of the peripheral blood (plus some cells in other tissues) and the apex the haemopoietic stem cell, a cell with the capability to differentiate down several different pathways and with an extremely high proliferative capacity. Our understanding about how the pluripotent stem cell ends up as a fully differentiated end cell remains limited and the best understood steps are those late in the pathway, towards the base of the triangle. Many of the growth factors needed for these steps have now been cloned (and therefore can be produced in relatively large amounts), as have a few of their receptors. Many of the haemopoietic growth factors are produced by the haemopoietic cells themselves and the factors have pleiotropic effects, including influencing factor release from other haemopoietic cells. Clearly, therefore, haemopoiesis is not a simple hierarchical process but rather a cascade of interactions and thus it is not surprising that our current understanding remains limited.

The molecular control of haemopoiesis may be complex and the basic biology of the system may only be known in outline but that has not prevented the use of some of the haemopoietic growth factors in treating disease. The use of recombinant erythropoietin in the treatment of the anaemia of renal disease is now almost routine in many countries and numerous groups are studying the beneficial effects of granulocyte colony stimulating factors on shortening the period of granulocytopenia following chemotherapy or bone marrow transplantation. These are early, somewhat empirical, trials which provide valuable data on the in vivo effects in man.

Many of these issues are addressed in this book, which is not a series of reviews (and suffers from the lack of an overview of the whole area), but rather, a series of random snapshots of various parts of haemopoiesis, authoritatively written and of a generally high standard, but lacking in cohesiveness. As such it is difficult to identify its intended readership, since the topics covered are somewhat selective. For those in the haemopoiesis field there will be lots to savour and for those in related areas it will provide a good flavour of where this rapidly moving field was in 1989.

W.G. Wood

**Cell Growth and Division: A Practical Approach;** Edited by R. Baserga; Oxford University Press; Oxford, 1989; xiv + 158 pages; £27.50

This volume in the successful "Practical Approach" series comprises 10 chapters presenting practical methodology used in studies on the growth and division of animal cells in culture. Most of the information provided relates to specific cell lines: chapters are devoted to culture of mouse embryo cells, mouse fibroblast lines (C3H 10T1/2 and NIH 3T3),
human leukaemia cells, human epidermal keratinocytes and mesothelial cells, human T lymphocytes, muscle cells, human diploid fibroblasts and mouse BALB/c-3T3 cells. Two more general chapters present methods for measuring parameters of growth and for cell synchronization.

It is difficult to define precisely the audience at which the book is aimed. Many volumes in the 'Practical Approach' series are particularly well suited to beginners in the field, including new post graduates. It is hard to see this being the case here – the treatment of basic techniques is too patchy. Thus, the beginner looking for information about ways to count cells would find a clear account of the use of the haemocytometer in the chapter by Baserga, but no mention of other cell counting techniques such as the use of the Coulter Counter. Methods available for cell synchronization receive a brief but useful treatment, but ways of determining cell viability receive little mention. On the other hand, some basic techniques, such as the use of trypsin to detach cells, are described repeatedly in relation to specific cell lines, with little information about general applicability.

The book will be useful for those wanting information about the specific cell lines listed above. The Appendix does provide a list of other commonly used cell lines, but the information provided is minimal and without references or information about suppliers it is of limited use. Researchers wishing to study cell lines not discussed in detail here, or requiring information about methods for studying cell growth and division in general, will probably find other sources, including books devoted to general techniques for cell culture, more useful.

Mike Wallis

Light Microscopy in Biology: A Practical Approach; Edited by A.J. Lacey; Oxford University Press; Oxford, 1989; xviii + 449 pages; £19.00

In recent years, light microscopy has regained much of the ground that it had lost earlier to electron microscopy. Few would now contest that it has recovered its long-held central position as the most ubiquitous technique in Biology, if this were ever lost. Now is the time for a book that captures the current excitement in the field and relates the story of the many ingenious inventions that have transformed the light microscope from a powerful magnifying glass for examining fixed and stained material to a versatile laboratory for the study of living processes.

I found this book somewhat disappointing with respect to conveying the current excitement. One of the more important recent microscopical techniques – of which the prominent microscopist Shinya Inoué has said “Seldom has the introduction of a new instrument generated as instant an excitement among biologists as the laser-scanning confocal microscope” – has received no more than cursory attention. The confocal scanning light microscope, with its ability to obtain clear images from deep within living tissue, is set to revolutionise embryology and other aspects of biology and it deserves more than a passing mention even though its full potential is yet far from realised.

Nevertheless, several of the new techniques are given a comparatively much fuller treatment in the book and chapters 6 and 8 on fluorescence and video microscopy, written by foremost experts in these fields, are particularly useful introductions to these topics. Chapters 1, 2, 3 and 7, on the principles of microscopy, contrasting techniques, photomicrography and micrometry, respectively, together form a very good technical primer in light microscopy techniques for the beginner. But the remaining three chapters, on immunohistochemistry, histochemistry and chromosome banding, while informative and well written, seem out of place to me in an introductory text and would be better placed in a book on cytological techniques (or perhaps the title could have been better chosen to indicate their presence).

Overall, I found this book to be a curiously mixed bag of basic and specialised topics; of advice to raw beginners and operational details of the latest and most expensive equipment; and of technical optics and histochemistry. The intended readership is not at all clear. Even so, given the dearth of books written in English on the optical principles of microscopy, I will be happy to find it a place on my bookshelf.

G.A. Dunn

Microstructure and Function of Cells; By Andreas Bubel, Illustrated by Cecilia Fitzsimons; Ellis Horwood Wiley; Chichester, 1989; 271 pages, £39.95

This collection of electron micrographs from a wide range of organisms is intended, according to the preface, to emphasize the wide range of structural variations in invertebrates and plants in addition to those of mammals. There are as we might expect some very interesting structures illustrated and an opportunity for any cell biologist to increase his knowledge by even a rapid survey of the micrographs.

There is one most serious drawback which should not accompany a new publication of this sort. The reproduction of the electron micrographs is poor. They are simply not clear
The many different kinds of blood cells found in the human body are derived from multi-potential stem cells, which are induced to differentiate into one or another cell type by the action of regulatory proteins or growth factors. This volume looks at the way that binding of these proteins to specific receptors causes changes in gene expression in the nucleus and the activ...