

## BOOK REVIEWS

GENE FUNCTION: *E. COLI* AND ITS HERITABLE ELEMENTS. Robert E. Glass. Croom Helm, London. Pp. 487. Price: Paperback £9.95.

The author's aim is that his book should be an "up-to-date picture of the molecular biology of *Escherichia coli*" which, by and large, he has achieved. His comprehensive and well chosen reference lists include 1981 publications and he has achieved a wide coverage of his subject area in an introductory section (48 pages) and sections on gene expression (104 pages), transfer (214 pages) and regulation (89 pages). He presents a well documented and balanced digest of reviews and key papers profusely illustrated with figures, the majority of which are original and which relate well to each other. A good quantitative continuity is maintained by means of frequent references to physical dimensions, numbers of molecules and rates of processes. There is an almost total lack of error and inconsistency at the scientific and presentation levels for which credit must be shared with publisher and printer. So far so good, but the problem for a reviewer is deciding for whom the book is intended and appraising it accordingly. To aid this, criticisms must be made.

Taken overall the presentation of the material in the book is uneven. Its descriptive passages range from the near superficial to a prose style which is almost impenetrable because of excess detail. An example of the former is the treatment of the physical analysis of gene structure at the end of the chapter on gene structure and function and of the latter, the subsection on the regulation of phage  $\lambda$  development at the end of the book. At a different level some figures and tables are bold and easily scanned, whereas the lettering and detail on others are so fine and small as to be difficult to read. Also the consignment of vital information to sometimes lengthy figure legends and the frequent use of footnotes in small print interferes with continuity in the communication of some of the more intricate and detailed passages. The inclusion of regular summaries of main points covered would have been a great asset. There is the inevitable necessity for making references to later chapters than those being read, but this is only occasionally obtrusive. Because of the amount of material covered by the author one can lose sight of the practicalities of the science being described. More importantly the book lacks historical perspective and some indication of the development of ideas over the last two decades. An example is the presentation of molecular models for recombination without consideration of relevant genetic data and their interpretation; another is the omission from the text of the names of many who have made significant contributions.

For whom then is this book likely to be of most use? It is not a basic text to be read generally by undergraduates, although some parts would be appropriate at second year level and others (notably the reviews of multivalent control of transcriptional-translational operons and the regulations of F plasmid transactions) for third year students. Certainly it has

much to offer postgraduate readers, since they are less likely to be deterred by the form and style of the book. This particularly applies to those involved in teaching who wish to bring themselves up-to-date and use it as a source of ideas for visual presentation. The *E. coli* molecular geneticists are another group for whom Dr. Glass's book should be of interest, but should they not have the majority of information it contains at their fingertips anyway? It would be interesting to know their reactions (and of course, those of undergraduates). In spite of these uncertainties and criticisms made earlier in this review, this book is an important one for contemporary microbial geneticists and deserves to be widely consulted if not necessarily read from cover to cover. Ironically in twenty years time it may well be an important historical document in contrast to the many and much wider-ranging text books that are currently available.

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THE NUCLEOLUS. Edited by E. G. Jordan and C. A. Cullis. Cambridge University Press 1982. Pp. ix + 218. Price: £25.00 (paperback £9.95).

This is volume 15 of the S.E.B. Seminar Series, but probably the first to hold much interest for geneticists. Its contents vary from the discursive review to the exhibitionist research report, according to the taste of the contributors. It has two minor defects (three if you expect to find an author index). The arrangement of the contributions and lack of an editorial introduction deprive the volume of any obvious pattern or coherence. The photographs are reproduced on normal matt paper like this page and thus fail to validate or even illustrate statements about ultrastructure.

The swinging sixties were halcyon days for the nucleolus: its identification as the cell's ribosome factory surrounding a defined locus of tandemly repeated genes, which occasionally showed the surprising property of independent replication—amplification, magnification and compensation—and which could be isolated for detailed analysis. The initial advantage of ribosomal RNA genes or rDNA persisted until single copy genes could be identified and cloned to yield equivalent amounts, and that partly explains the popularity of *Xenopus* for so long after it was discarded as a means of pregnancy testing. As a nucleolar acolyte in that period, I knew most of the high priests and wondered what the rascals were up to nowadays. This book provides a fair indication, by samples rather than a complete survey and by taking the above summary as well known in order to concentrate on the last decade.

It is no secret that the main progress has been in sequence analysis of the rDNA unit of *X laevis*, nearing completion in the laboratories of Birnstiel and Maden. They and their associates provide two excellent chapters which together illuminate the functional interpretation of the spacer and transcribed elements, sketching the necessary background before guiding the reader up to 1981, the prospect of further enlightenment and some insight into the myopic world of RNA polymerase I.

Two chapters are concerned with alterations in the number of ribosomal RNA genes. Cullis points out analogies between the induced changes of rDNA he has observed in flax and the short-term compensation or inherited magnification of rDNA which can be produced by manipulating