

girth of trees, via Aristotle, Plato and Protozoa, and leaves the reader with no particular idea of either self-organization or natural selection. Unfortunately, this chapter sets the trend for the rest of the book to follow.

The most interesting chapter in the book is one on gene accumulation and gene silencing. Here Bonner treats phenomena wherein a process that is not originally under genetic control may evolve (even without selection) to become genetically determined. The opposite may also happen: a process genetically determined originally can evolve into a more flexible system that is responsive only to external signals. These ideas are developed further through examples from the study of animal behaviour and development. These are certainly interesting ideas even if the paucity of corroborative evidence renders them somewhat speculative.

The chapters on competition and the division of labour in biological systems contain little that is new to organismal biologists. At the same time, I am doubtful if these would be of much interest to non-biologists because the treatment is often choppy and the author has an annoying tendency to jump from one topic to another rather abruptly. From a scientist of Bonner's stature, I think one is entitled to expect more than a rambling series of musings on rather unconnected topics. Development and Evolution are today rapidly growing areas of biology. In recent years we have learnt a lot about how the development of organisms is controlled and managed by their genes, and about how simple biochemical processes occurring within organisms can give rise to complex patterns. On all of this, the book does not offer the reader anything. On the other side of the coin, evolutionary biologists in the past decade or so have greatly refined their understanding of how development can constrain evolution, and how much of evolution may, in fact, consist in escaping from the shackles of a prescribed ontogeny (e.g. by gene duplication). These aspects of evolution are barely touched upon by Bonner. Indeed, the book really does not do justice to either developmental biology or to evolutionary biology.

All in all, I found the book disappointing. The content is insipid and the penmanship uninspiring. I actually read the book twice, with a four week gap

between readings, in the hope of getting some intellectual stimulation from it. Unfortunately, two readings later, I was left with not much more than a greater appreciation of what Mirza Ghalib must have felt when he penned the line '*bahut be-aabru hokar tere kuche se ham niklay*' (dejected did I depart from your neighbourhood).

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**Cell and Molecular Biology.** S. C. Rastogi. New Age International (P) Ltd. 4835/24, Ansari Road, Daryaganj, New Delhi 110 001. 1996. Rs 550. 502 pp.

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Thanks to the emergence of newer techniques of ever-increasing precision at cellular and molecular levels, recent years are witnessing unprecedented rapid developments in the fields of cell and molecular biology. Obviously, the students need to have good resource materials which may provide them a comprehensive view of the current information about the cell and its functioning. As expected, during the past few years many excellent textbooks on cell and molecular biology have become available and several of them have undergone new editions in a rather quick succession. The book under review is an attempt in this direction: as stated in the preface, the author has intended this book to serve as a textbook for undergraduate students.

This book has an impressive get-up, is neatly printed with a large number of illustrations (nearly all in the form of line-drawings) and is relatively (though not absolutely) free of typographical errors. It covers almost the entire spectrum of cell and molecular biology (although defining the limits of this field is nearly impossible today). Each chapter is followed by references and recommended readings and by a number of questions/problems. Thus, on first impression, the book appears useful.

However, when examined in greater depth, many serious weaknesses become apparent. The most glaring is the list of references and suggested readings: nearly

all the books and papers, referred to in the book, date earlier than the 1980s with only a very small number of books being as recent as 1985 or so. There is hardly any reference to the very large number of excellent books or reviews that have been published in the past decade. This gives a very wrong signal to young readers as well as to teachers in remote areas who may not have access to current literature. With an ostrich-like view of current literature, it is obvious that the subject matter dealt within the pages of this book is in many cases (though not all) relatively outdated and fails to convey the current excitement in a given area to the students.

Since the book is primarily addressed to under-graduates, it is obvious that none of the topics is dealt in any detail. However, the brief coverage of a topic due to the limited scope, cannot be an excuse for providing outdated and/or misinformed concepts. To substantiate this rather strong statement, I would cite some examples. In reference to ultrastructure of a lampbrush chromosome, it is stated on p. 241 'It consists of alternating regions of high-density granules and low density lateral loops. The high density regions are chromosomes'. The high-density regions within a chromosome cannot be chromosomes! Likewise, the description of polytene chromosomes on p. 242 includes, 'Until recently it was believed that each band represents a single gene with high DNA content. However, analysis has shown that each band on an average consists of about 30,000 base pairs, hence the band may be polygenic and a particular gene may be repeated several times'. There is neither any evidence for a gene being repeated in a band nor are they to be confused with 'polygenes' which is a distinct term in genetics. The exciting area of the immune response is surprisingly included in the chapter on 'Plasma membrane: structure and function'; like all other aspects, this topic is also covered very briefly but what is more worrisome is the fact that the discussion on antibodies does not have any mention of the remarkable processes of gene rearrangements that generate the antibody diversity. The reason given (in the chapter on Recombinant DNA Techniques) for calling the restriction endonucleases as 'restriction endonucleases' is also wrong. Almost all chapters have such confusing, and sometimes erroneous, state-

ments. Obviously, the teacher as well as the student would be utterly confused by such misinformed statements.

As stated in the beginning, the current excitement in biology is essentially due to the emergence of powerful techniques and the seamless amalgamation of cell biological and molecular techniques (facilitated of course by the video and computer applications, etc). While the recombinant DNA techniques are considered in a separate chapter, the microscopic and other cell biological techniques do not find any mention in the

book. As a consequence, the cell biological components are rather weak. In fact, the chapters dealing with structures and functions of the various cell components seem to have remained frozen at pre 1980-era!

Writing a textbook is a far more difficult task than writing a reference book. The former calls for a remarkably good comprehension of all the relevant aspects and an equally good control on expression and elucidation of the subject matter. Not all textbooks actually succeed in accomplishing these daunting

tasks. The book under review is no exception. Although the author has made an attempt to include the vast area of cell and molecular biology in a compact volume, the many weak points of the book make me hesitant to recommend this book to serious students of the under-graduate classes.

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