

Book Reviews

Evolution

EVOLUTION: CONCEPTS AND CONSEQUENCES

by Lawrence S. Dillon. 2nd ed., 1978. The C.V. Mosby Company (11830 Westline Industrial Drive, St. Louis, Missouri 63141). 504 p. \$14.95

The first edition of Dillon's textbook was published in 1973. It was a neat and tidy book in hardcover, of 319 pages, in 8- by 10-inch format. The subject matter was fairly well balanced with population genetics, speciation, origin of life, phylogeny, and human evolution all receiving their due.

The second edition provides a considerable expansion over the first and is rather awkward to handle. With the 8- by 10-inch format, 504 pages, softcover, and considerable weight, I fear for its appearance and usefulness after being dropped, spread over knees, and otherwise mishandled. More seriously, the subject matter balance has, in my opinion, been upset by chemical and mathematical overkill in chapters two through seven. The author indicates that "this book is designed to be comprehensible even to students with no more than an elementary knowledge of biology." Methinks he missed his target. In my experience, students with "...no more than an elementary knowledge of biology" have even less knowledge of chemistry and mathematics. For those with college level knowledge of these subjects, chapters two through seven (pp. 17-150) will still be formidable and challenge the students will to continue. I recognize the necessity of revealing the chemical basis of life and its inheritance and delight in the mathematical manipulations that have been invented to help describe its continually changing variability. In an undergraduate textbook, however, these subjects should be adjusted to the knowledge, ability, and perseverance level of the student. It isn't a matter of including or not including such material. It is a matter of balance. In the second edition, I believe that the balance has been upset.

The new chapter on the evolution of plants is disappointing. The life cycles of *Chlorococcum*, *Nitella*, Moss, *Marchantia*, *Psilotum*, Club moss, horsetail rush, fern, cycad, ginkgo, conifer, *Ephedra*, and flowering plant are standard grist for sophomore Plant Kingdom courses.

They are well done in Dillon's book, but somewhat out of place. Except for one photograph and a comment here and there, the rich fossil record of plant life is by and large ignored. It is also unfortunate that continental drift is dismissed (p. 245) as "...an unresolved problem beyond the scope of the present text."

The invertebrates receive short shrift in this book. Even though a large trilobite (*Greenops boothi*) is presented in purple, white, and orange on the cover and in black and white on p. 323, the reader isn't told much about trilobites except (p. 323) that "...in the past they have been suggested as possible progenitors of the vertebrates." There is, however, an interesting brief discussion of the evolutionary history of nautiloid cephalopods. Even among the vertebrates, the treatment of the fossil record is spotty.

The chapter on human evolution is very well done. The illustrations and text work together to provide an excellent overview treatment of a usually difficult and confusing subject. The nature of this chapter, along with the genetics and population biology chapters (2 through 7) lead me to suggest that this book will be useful for graduate students, teachers, and college faculty members wishing a comprehensive but condensed treatment of these subjects.

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EVOLUTION

by Colin Patterson. 1978. British Museum (Natural History) and Cornell University Press (124 Roberts Place, Ithaca, New York 14850). 197 p. \$10.95 hardback; \$4.95 softback.

This little book is an amazingly concise and compact treatment of modern evolutionary theory. Its major premise is that the neo-Darwinian view of organic evolution represents the basic conceptual foundation of contemporary biology and that many scientific fields converge upon and draw meaning from this central unifying scheme. The presentation of topics is well organized and provides the readers with a nice introduction to modern concepts and major processes. The approach to controversial issues and unresolved problems is well balanced and

exemplifies the open-ended and self-correcting nature of scientific inquiry. Careful reading is required because a great deal of information is packed into each page, and because the illustration captions often contain information that is not repeated in the text (e.g., figure 30, p. 98 and figure 38, pp. 114-115).

The chapters are well integrated, but each can probably be read as an independent selection. Chapter Eight ("Selection In Action"), for example, focuses on five cases—sickle-cell anemia, industrial melanism, resistance to antibiotics, shell pattern in snails, and kin selection and haplo-diploidy in social insects—to produce a very informative summary of the evidence for natural selection as a major force in evolutionary history. Chapter Twelve ("Proof and Disproof") is particularly noteworthy in that it deals with the philosophy of science and confronts the question, "Is evolution science?"

The well-chosen illustrations are an important part of the total text; however a small number of them (e.g., figure 25 on page 78) might be clearer if contrasting colors were used rather than different shades of the same color. One minor error may be found on page 77, in a discussion of the amino acid substitution at position six in the beta chain of the hemoglobin molecule that leads to sickle-cell anemia. The text states that HbS is the result of a point mutation in DNA—"substitution of "T" for "A" in the middle of the triplet," but this appears to be incorrect as it is the substitution of an "A" for "T" that produces valine instead of the "normal" glutamic acid.

Overall, this book is an excellent introduction to evolutionary biology. Although it is intended for readers with little or no technical knowledge of biology, such readers might find some sections rather difficult. It can, however, be easily recommended to biology teachers looking for a brief but comprehensive summary of contemporary thought.

Finally, it might be just the right book for biology teachers to recommend to those who do not "believe" in evolutionary thought but have not yet taken the opportunity to consider the scientific bases for the modern view.

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