

move the ambiguities. There are, however, pitfalls in single-event detection. These issues are discussed in detail by Wennmalm and Simon. The examples and illustrations provided by the authors should help researchers assess how amenable a biological system is to such studies.

Some articles are based on putative structures of large protein assemblies. Discussions are also provided on the prediction vs reality of membrane protein structure, Elofsson and Heijne point out that *ab initio* high-resolution 3D structure predictions are still not feasible for membrane proteins, and that homology-based structure modelling of membrane proteins holds as good as homology modelling of globular proteins.

The volume presents five articles grouped under the 'mitochondrial theme', and Gottfried Schatz already concisely reviews the chapters under 'The magic garden'. The 'mystic mitochondria' is not only the powerhouse of the cell equipped with its own genetic system, but is also central to the programmed cell death, and possibly other vital processes yet to be determined. Indeed, mitochondria offer plenty of avenues to discovery, and the five articles presented hint at this. Virtually everything about mitochondria appears unique – the structure, genome make-up, mechanisms of DNA replication and transcription, mode and inheritance pattern of DNA, mechanism of mitochondria division, and the way it communicates with other parts of the cell. Recent discoveries in these areas are elegantly presented.

The volume effectively brings forth the recent developments in the core areas of biochemistry. The print offset and figure contrasts have been impressive. Each review article concludes with summary points and future issues. Those interested in biochemistry and biophysics will undoubtedly find themselves enlightened, whether they are research students or scientists.

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Systematics and Biodiversity Conservation. T. C. Narendran and M. Balakrishnan. Agrobios (India), Jodhpur 342 002. 2008. 280 pp. Price: Rs 695, US\$ 46.

In the last two decades, in addition to its traditional meaning of referring to richness and abundance of organisms, the term 'biodiversity' has come to include a commitment for the natural environment and a concern for its conservation. The rate of extinction of biological materials noted at the end of the 20th century¹ has, in fact, pushed us humans to realize that conservation of the natural environment is a normal adjunct to the better understanding of biodiversity. This realization has made us come to terms with the awareness that we are an integral part of the natural world, our future existence would nearly be impossible without biodiversity², and a preferred quality of life depends on the goodness of biological wealth, the value of which, however, cannot be measured in any valuable currency. Based on this realization, many Governments have established departments and authorities to monitor and manage biodiversity in their respective countries^{3,4}, so that any alteration to the natural world would be minimal and manageable, further damage would be mitigated appropriately, and development would progress sustainably.

In such a context of expanding appreciation of and value addition to biodiversity, I was glad to receive this book for review. Because the jacket identifies it as a textbook and the contents are designed for use by university-level biology students, this review will assess the volume as a textbook. Contemporary framework for a university-level textbook is twofold⁵: (i) should clarify the principles that underscore the selected theme and (ii) should serve as the basic resource, enabling the learner to learn relevant information and to interpret that information meaningfully. Further to explaining and discussing the subject matter (i.e. theory with appropriate and contemporary examples)⁶ robustly, a university-level textbook needs to explicitly display a few key textual and physical characteristics: the textual characteristics refer to preferences applied by the author(s) relative to the structure and consistency in style and presentation; the physical characteristics refer to affordability and inclusion of elements that would facilitate

easy comprehension via interactive and self-directed learning.

The first chapter introduces concepts relevant to systematics and biological diversity; the second explains contemporary understanding of biodiversity in a global context; the third refers to systematics and its importance in biodiversity studies; chapters 4–8 deal with the subtler aspects of taxonomy, such as the theory underlying biological nomenclature, collection, storing and identification, principles underpinning biological classification, taxonomic publications and ethical practice. The ninth chapter deals with protected areas for biodiversity conservation, and the tenth refers to principles of conservation biology. The last chapter outlines some of the widely practised methods in basic ecology and biological-diversity studies. The book also includes references, additional reading materials, plus author and subject indices.

An acceptable volume of information relative to taxonomy and biodiversity is available. Starting with explanations of basic terms (e.g. species diversity, species richness and species management), the chapters elaborate on diverse aspects of conservation of organisms, including ecology of extinction and details of taxa that face extinction in the near future. Chapter 10.6 refers to the IUCN categories of threatened species – a worthwhile inclusion, in which Baillie *et al.* (2004), a vital resource, has been cited. Information pertaining to criticality of taxonomy as a science *per se*, diverse micro-dimensions of taxonomy (e.g. rules and definitions that govern biological nomenclature), and taxonomic basis in understanding biodiversity is also included. Chapter 11 (Methods in ecological monitoring – a better title than what exists?) includes useful tips and descriptions of methods in ecological monitoring – appropriate for an undergraduate learner – although most of the examples provided are from Mammalia. I am aware that including examples from other organisms (e.g. insects, birds, reptiles and aquatic organisms) is hard in a handbook sort of book. But weaving examples from other groups, in a purported-to-be-textbook, would contribute substantially to widening of learning of university-level learners.

I enthusiastically read the chapter 'Systematics and its importance in biodiversity studies', because I hoped this would link 'systematics' and 'biodiver-

sity' – the key words in this book, and it did. However, I wished the sentence 'Systematics or taxonomy...' (p. 44; line 13) was better constructed because in its present form it can mislead the reader, as it did to me. In the remainder of this chapter, the authors have laboured to offer a convincing text arguing that taxonomic determinations are the key for unravelling the finer dimensions of biodiversity. I also wished that a discussion on phenotypic plasticity and its value in taxonomy and in understanding biodiversity and conservation, was available at this point. In 'Impact of introduced species' (p. 180), a sentence 'For example, the introduction of *Acacia* sp. in Kerala has affected... their original habitats' exists. Reference of *Acacia* as 'sp.' without specifying it as *A. auriculiformis* irked me, because *Acacia* includes about 1000 species, growing naturally in parts of Africa, India and Australia⁷. *A. auriculiformis*, an Australian native, is allelopathic⁸. Specification of *A. auriculiformis* and explanation of its allelopathic behaviour were necessary here, given that the key purpose of the book was to stress the relevance and applicability of taxonomy in biodiversity and conservation. A majority of cited examples are from either southwestern India or northeastern Africa, probably because of the authors' links with these regions. Although this is not a weakness, what was unclear to me was to which readership this textbook was meant – undergraduates or postgraduates, or both, to be marketed in the Indian subcontinent or northeastern Africa or the world over? Examples from other biogeographical regions exist (e.g. in p. 49), but in passing. Moreover, in contexts referring to names of Indian states and towns (e.g. Kerala), inclusion of pertinent geographical grid references would help non-Indian readers, as I imagine that the targetted readership includes them as well. A few personal anecdotes sparkle (e.g. p. 46), which, I am confident, would inspire undergraduate learners. The authors Narendran and Balakrishnan, an insect taxonomist and a wildlife ecologist, respectively, have embedded plant examples in the text, although infrequently.

Reading through the book, I got a feeling that the chapters dealing with taxonomic principles and practice were written by Narendran and those dealing with

biodiversity and conservation were by Balakrishnan. Whereas such a division of labour is normal in book-writing projects, what would have been good is achieving homogeneity. The publisher should have verified homogeneity in text before processing the manuscript. Moreover, use of gender-neutral language is the trend of the day (e.g. 'man-motivated' in the preface). The text is generically easy to read, yet the publisher should have scrutinized the manuscript to make the prose contemporary in style (e.g. minimizing passive-voice use, use of right type of quotation marks, avoiding contractions and meaningless terms such as 'etc.', using cautious capitalization [e.g. aphelinids, not Aphelinids; ecosystem, not Ecosystem] and correct spellings [e.g. p. 44, 'importance' for importance; p. 46, 'Nathen Rotschild' for Nathaniel C. Rothschild; p. 248 'Henning' and 'Hennings' for Hennig]). The reference list (pp. 245–258) is comprehensive and about 60% of it is between 1985 and 2005. However, I struggled with the French and German references: the Hennig (1950) reference should have been 'Hennig, W. 1950. *Grundzüge einer Theorie der phylogenetischen Systematik*, Deutscher Zentralverlag, Berlin'; the Davis and Zangherl reference (1966, cited wrongly as 1960) refers to Hennig as Hennings; the A(ugustin) P(yramus) de Candolle book title should have been *Théorie élémentaire de la botanique, ou exposition des principes de la classification naturelle et de l'art de décrire et d'étudier les végétaux*, Déterville, Paris.

Lack of relevant exercises and worksheets, enabling one to learn effectively under minimal supervision is striking. With extraordinary facilities available in today's publishing world, modern textbook designs emphasize interactive learning. In a two-dimensional context, activity items such as worksheets, dialogue boxes, and exploratory case studies are critical features of a modern university textbook. For example, using data from either Thomas and Balakrishnan⁹, or Krishnamurthy¹⁰ case-study-based challenges could have been included, encouraging independent learner activities and self-assessments, thus provoking learners to think and respond not only conventionally, but also laterally¹¹. The price of the book at Rs 695 (India) and US\$ 46 (overseas) is affordable for un-

dergraduate learners either in India or other developing nations?

In terms of subject matter, content and textual characteristics, the book meets almost all desirable criteria of a textbook, whereas in terms of physical characteristics, it struggles to make the cut. Nonetheless, to those undergraduate biology learners enabled with 'good' lecturers, this book would be worthwhile. The book would also be useful to amateur biologists keen on learning the principles and practice of taxonomy and its relevance in biodiversity and conservation biology.

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