

dissection), demonstrations of specimens to illustrate the range of form within each group, and some simple experiments. All these aspects are well served by the second edition of *Practical Invertebrate Zoology*, edited by Dales. He and the six other authors are all experienced university teachers and each is an expert on one of the major invertebrate phyla. The book is well written and the material sensibly arranged. There is too much writing and not enough illustration for a laboratory manual, to my mind, but the book contains a great deal of valuable information. The section on general methods, and the numerous suggestions for simple experiments, make the work a useful sourcebook for the teacher as well as the student. □

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## Insects entomologed

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*The Science of Entomology*, 2nd Edn. By William S. Romoser. Pp.575. ISBN 0-02-403410-X. (Collier Macmillan/Macmillan, New York: 1981.) £13.95, \$21.95. *Fundamentals of Entomology*, 2nd Edn. By Richard J. Elzinga. Pp.422. ISBN 0-13-338194-3. (Prentice-Hall: 1981.) \$22.95, £17.20. *Insect Physiology*. By W. Mordue *et al.* Pp.108. Pbk ISBN 0-632-00385-5. (Blackwell Scientific/Halsted: 1981.) £5.75, \$16.95.

ENTOMOLOGY is one of the few component parts of zoology to be taught as a science in its own right. Physiology, parasitology and cytology, for example, are major topics covering the whole of the animal kingdom; the Insecta and Chordata are the only individual groups to merit major topic treatment, and this is reflected by the large number of books concerned with their study. One might wonder whether more entomology texts are really necessary — perhaps merely to include recent advances? — but since the fundamentals of insect biology do not change, a sensible solution is to rewrite the better books. Two of the three texts reviewed here are second editions of books already established in North America. All three are good examples of the recent generation of entomological texts which pack a large amount of information into a single, readable and well-illustrated volume. Modern textbooks are not necessarily better than some of their predecessors, but they are often more lucid and are usually more attractive visually; studying is still hard work, but now it may be less painful.

Romoser and Elzinga have each written comprehensive accounts which emphasize the general biology of insects rather than

their classification or economic importance. *The Science of Entomology* is the larger book and is clearly intended for intermediate or advanced courses (second or third years in Britain; for North America, the author suggests a one-semester course). It has a rather academic approach of the sort found in a good standard text such as Richards and Davies's *Imms' General Textbook of Entomology* (10th Edn, Wiley/Chapman & Hall; 1977). Romoser ranges from morphology and physiology to ecology and evolution, allotting a chapter each to applied entomology and systematics. For completeness, an entomology course would need a more extended treatment of systematics based on a text such as Richards and Davies or Borror, DeLong and Triplehorn's *An Introduction to the Study of Insects* (5th Edn, Holt, Rinehart & Winston; 1981). In fact, such back-up is emphasized throughout the book, as demonstrated by the introductory section on entomological literature and by the impressive number of references cited.

*Fundamentals of Entomology* is an introductory-course book which aims to cover the whole of entomology at a more elementary level. Again, it is based on general biology, but there is also a lengthy classificatory section with keys to both orders and major families. It is profusely illustrated with line drawings and photographs; however, as in many zoological texts, the macrophotographs sometimes lack the clarity of the scanning electron micrographs and the precision of the line drawings. Most of the topics have been treated by Elzinga in a compact and readable manner, although it might have been wiser to omit some sections rather than over-reduce them; for instance, it is difficult to explain population dynamics in eight pages.

*Insect Physiology* is a multi-author paperback which deals with only part of a large subject. It is a clear exposition of homeostatic problems — from cell metabolism to nerves and muscles — although only about one-fifth of the book deals with behavioural physiology. In spite of four authors, the chapters link together well and the diagrams are excellent. A few key references are quoted at the end of each chapter to guide the student to the more important literature; I would have preferred a few more in order to reach the most interesting topics more rapidly. Although an introductory text, the book has the merit of conveying some of the fascination of recent research in this field.

All three books are welcome additions to the field of insect biology. Elzinga can be recommended for a short, introductory course, Romoser for a major part of a longer, more advanced course, and Mordue for the up-to-date physiology section of a general entomology course.

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## Saline solutions

D.J. Crisp

*Elements of Marine Ecology: An Introductory Course*, 3rd Edn. By R.V. Tait. Pp.356. ISBN 0-408-71054-3. (Butterworths: 1981.) £8.95, \$22.50. *The Estuarine Ecosystem*. By Donald McLusky. Pp.150. Hbk ISBN 0-216-91115-X; pbk ISBN 0-216-91116-8. (Blackie/Wiley: 1981.) Hbk £12.75, \$29.95; pbk £6.25. *The Ecology of Marine Sediments: An Introduction to the Structure and Function of Benthic Communities*. By John S. Gray. Pp.185. Hbk ISBN 0-521-23553-7; pbk ISBN 0-521-28027-3. (Cambridge University Press: 1981.) Hbk £15, \$34.50; pbk £6.95, \$16.50.

AN ELEMENTARY text should not only provide a clear and comprehensive account of its subject, but it should also stress those areas where there is a consensus of view and give less prominence to more controversial subjects where current research has yet to resolve the pattern. In doing so it will provide the reader with an historical perspective, identify the founders of classical works and provide up-to-date reviews.

The third edition of Tate's *Elements of Marine Ecology* achieves most of these objectives. It differs little in content from earlier editions and fully meets the needs of elementary students of marine biology who seek only the minimum of understanding of chemical and physical oceanography. The reference lists have been considerably enlarged and the division into books for general reading and specific references to textual matters has been eliminated. Neither of these changes seems particularly beneficial, other than to a reference collector. The majority of classical marine biology works are included but so also are a frightening number of minor papers. The author therefore has done less than he might in guiding the student towards serious and essential reading. Nonetheless, it remains a sound, well-ordered and very useful student text. There are no obvious errors, except for the blatant misuse of the word "parameter" in the title of Chapter 4 — alas, a fault now almost sanctioned by usage.

*The Estuarine Ecosystem* is aimed at a more specialized readership. The first chapter includes some elementary consideration of the hydrography, sedimentary processes, species composition and food webs of estuaries. It is a rather superficial account suffering from false simplification, perhaps on the wrong assumption that students of marine biology should not have to bite on hard science. To take a simple example, sinking rates are discussed in relation to the impact law for large particles and Stokes' law for small ones, but the underlying reason behind the different approaches is not explained. Neither the bounds over which the equations hold true nor their