

Comprehensive survey of the pulmonates

Pulmonates. Volumes 2A and 2B. Edited by V. Fretter and J. Peake. Pp. 540 and 150. (Academic: London, and New York, 1979.) £24.50, \$50.75 and £12, \$25.20.

ANIMALS with high potential for colonising the land came into existence with the first appearance of the Gastropoda, of which the pulmonates form a subclass. The compact body was protected by an impervious shell with a restricted opening into which the broad foot was withdrawn; and the enclosed mantle cavity easily converted into a respiratory sac. Emancipation of the reproductive from the renal system made internal fertilisation possible and removed the last barrier to landward passage.

The subclass Pulmonata is classified into two orders. The modern Stylommatophora possess unique ingenuity in resisting the prime danger of desiccation; and it is a rare terrain that is devoid of these animals capable of remaining dormant for the greater part of the year, even for years on end. In contrast the Basommatophora have returned to aquatic life — largely in freshwater, but in certain seas they are amongst the commonest intertidal limpets.

Dependence by the majority of snails and slugs on plant life has made them major competitors with man for food; and their association with other animals, notably in damp places, has made them admirable intermediate hosts for parasites. They are thus animals of high economic significance and for that reason also worthy of careful study.

These volumes represent the completion of a comprehensive survey begun in 1975 with the publication of a volume dealing with functional anatomy and physiology. In volume 2A treatment covers *systematics, evolution and ecology* presented in 10 chapters by highly competent authors.

With unique wealth of experience, B. Hubendick reviews systematics and comparative morphology in the Basommatophora revealing the range of structural variety from high spired snails to flattened limpets. This is followed by consideration from the equally authoritative pen of A. Solem of the data on which classification of the 20,500 odd species of land molluscs, almost entirely Stylommatophora, is based. In both chapters, unfortunately, references are largely restricted to those before 1972.

G.M. Davis, concerned with precise demarcation of species where transmission of human parasites is involved, reveals the importance of the new methods of chromatography, electrophoresis and immunology. This leads on to an account

by C.M. Patterson and J.B. Burch of the results of work on the chromosomes of pulmonate molluscs. Chromosomes vary from 5 to over 70 pairs although variation is usually conservative within the various taxa. B. Clarke and co-workers from Nottingham deal with genetic variation, showing how pulmonates are particularly favourable material for demonstrating the action of natural selection on genetically determined visible characters.

Convergence is widespread throughout the Mollusca, the diversely originating slugs being notable examples. Liable to become major pests, control, as P.J. Hunter stresses, often depends on knowledge of their ecology. This leads on to the chapter by D.S. Brown on pulmonates as intermediate hosts for digenetic trematodes. No-one is better qualified than W.D. Russell-Hunter to discuss the ecology of freshwater pulmonates, and so we proceed by way of an account of the evolution of gastropods in ancient lakes by K.J. Boss to the final chapter on the distribution and ecology of

the Stylommatophora by J. Peake, co-edited with Vera Fretter of these volumes.

Volume 2B entitled *Economic Malacology*, by A.R. Mead represents a continuation of its author's wonderful Giant African Snail (*Achatina fulica*) published in 1961. This supreme malacological saga tells of the spread by a surprising variety of agencies across Asia and then over the Pacific islands of this relatively immense high spired snail. Its supreme attempts to enter the United States, first by way of California and more recently by way of Florida, were only with difficulty repelled. This volume brings the story up to date and adds to the debt all malacologists owe to its author.

Enough one hopes has been written to reveal the range and high competence of these volumes and their importance to zoologists working on both pure and applied aspects of their subject.

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Peptide synthesis

The Peptides. Edited by Erhard Gross and J. Meienhofer. Pp.435. (Academic: New York and London, 1979.) \$39.50.

THE publication of *The Peptides* by Schröder and Lübke in 1965 was a landmark in the literature of peptide synthesis. The intervening period has seen the continued rapid growth of the subject, both in the development of new methodologies (including solid-phase synthesis) and in biological importance, yet no major survey in the English language has appeared. This entirely new *The Peptides* edited by Gross and Meienhofer is thus particularly welcome. The overall scope of the multi-volume and multi-authored work has been widened as indicated by its subtitle, *Analysis, Synthesis, Biology*; this first volume deals with major methods of peptide bond formation.

The opening chapter (by Gross and Meienhofer) presents a broad survey of the properties of the peptide bond. The coverage is wide, embracing structure, cleavage and synthesis, and is necessarily superficial in some instances. A case in point is the section on conformational analysis in solution where the single example quoted (oxytocin) is atypical and gives a misleading impression of the field as a whole. It would now be generally agreed that in the absence of special constraints, short linear peptides have rather random conformations in free aqueous solution. Conformational analysis under these circumstances is less useful.

The following chapter (by J.H. Jones) surveys all the main methods for peptide bond formation. Much of the information is covered in greater detail in subsequent chapters. The author has perhaps wisely avoided overmuch comment on the relative merits and applicability of the various methods, though his personal experiences have been distilled most valuably into a section on the choice of individual activated esters. This is a useful introductory chapter, especially for the newcomer to peptide synthesis.

The following four chapters provide detailed coverage of the major methods of synthesis. An authoritative account by Bodanszky surveys a wide range of activated ester derivatives concluding with a most useful series of fully referenced tables. The azide and mixed carbonic anhydride methods are surveyed by Meienhofer. Inclusion of significant experimental detail in these chapters gives an excellent 'feel' for the various techniques. The carbodiimide method is reviewed by Rich and Singh. The volume is completed by a comprehensive account of the racemisation problem by D.S. Kemp.

It is inevitable that *The Peptides* will be essential reading for all engaged in or contemplating peptide synthesis. It will supplement (but not replace) the monumental reference work edited by Wünsch in Volume 15 of *Houben-Weyl's Methoden der Organischen Chemie* (1974). Further volumes of Gross and Meienhofer's compilation are awaited with great interest.

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