

Book Reviews

Nematology: Advances and Perspectives, Vol. 1, *Nematode Morphology, Physiology and Ecology*. By Z. X. Chen, S. Y. Chen and D. W. Dickson, pp. 656. International CABI Publishing, UK, 2004. ISBN 0 85199 645. £85.00 (US\$150.00). doi:10.1017/S0031182005218589

As a zoologist, I have never really understood why those of us who study nematodes continue to partition ourselves into at least two distinct camps, one of which works on the plant-parasitic and free-living species, and the other primarily on animal-parasitic species. And I suspect that nematodes themselves are equally puzzled by this segregation of their ardent scholars. Historically, of course, plant nematologists aggregated in crop research and botany departments, whereas the animal nematologists were stationed in livestock, veterinary, medical and zoological departments of research institutes and universities. I found much of interest in *Nematology* Vol. 1, but I was left with the impression that, whilst the ‘iron curtain’ was beginning to tumble, it still had a long way to fall. We have not yet reached a stage where nematodes as distinct organisms, whatever their niche, take priority in our thinking. But I race ahead. Let us retrace and begin with the details of this volume.

This is the first part of a two volume edition, and is subtitled ‘*Nematode Morphology, Physiology and Ecology*’. The book comprises 12 chapters (636 pages), some multi-authored, and includes possibly the last written work of the eminent Alan Bird who died in 1999, and in whose memory this volume is dedicated. The subjects of these chapters comprise a history of nematology in the 20th Century (K. R. Barker, pp. 51), speculation on what the next century holds in store (J. M. Webster, pp. 19 and very much biased towards plant parasitic species), developmental biology as exemplified by *Caenorhabditis elegans* (M.-A. Felix, the longest chapter at 104 pages, but thorough and informative), morphology and sensory structures (J. G. Baldwin and R. N. Perry, the second longest chapter at 83 pages, but well-written with wide coverage and particularly clear explanations of topics), oesophageal glands and plant parasitism (R. S. Hussey and E. L. Davis, pp. 37), adhesion to the nematode surface (A. F. Bird, pp. 35), behaviour and migration (A. Forest Robinson pp. 76), ecology (G. W. Yates and B. Boag, pp. 32), marine biodiversity (P. J. D. Lambstead, pp. 31), population dynamics (R. McSoreloy and L. W. Duncan, pp. 24), biodiversity and co-speciation in marine nematodes (R. M. Giblin-Davis, K. A. Davies, G. S. Taylor and W. K. Thomas, pp. 48), and cultivation (P. de Ley and M. Mundo-Ocampo, pp. 80). The Editors (Z. Chen, S. Chen and D. W. Dickson) express their

satisfaction with the many renowned nematologists who collaborated to produce this ‘quality book’.

I have to say that I was pleasantly surprised at how well the various contributions combined together. Multi-contributor volumes are notoriously difficult to edit, especially in terms of refining the contributions to a similar format, since strong-willed academics are often reluctant to conform. Editors have aged prematurely and/or sworn never to undertake a similar task again. But these editors can be congratulated. I did not find any incongruity in style and structure that grated with me. Each chapter is well structured, with at least a four-tier level of subdivision that is emphasized by different font sizes. The prose is good, generally clear, easy to follow and informative. The sections are well referenced and point the way to major reviews of related topics. This is not a text book. Some basic information is provided, but the emphasis is very much on current research in the context of earlier studies. And I was pleased to find that history had not been forgotten. In this day and age, it is so easy just to download the most recent publications from computer databases. Often the pioneering studies that laid the foundations for a discipline in earlier years, even relatively recent major contributions in the 1950–70s, are forgotten or neglected because effort is required to trace them physically in volumes published before the electronic age. Pleasingly, technical terms are explained, so the volume will have a role in undergraduate teaching.

And now to some reservations. In an age when we are being encouraged to be interdisciplinary in our research by bridging research initiatives from funding councils, it is surely time that barriers within disciplines were also demolished once and for all. I felt that several of the chapters in this volume could have adopted a wider remit, and included animal parasitic nematodes. I understand that brevity and volume space were considerations, but even so why emphasize the division? In the chapter on oesophageal glands of nematodes, to devote just 14 lines to secretions of animal-parasitic nematodes, out of a total length of 36 pages is a significant omission. So much has been done on the secretions of animal parasitic nematodes. We know that they contain interesting enzymes, immunomodulatory factors and a range of interesting molecules that are being researched as potential medicines for the future and also as vaccine candidates.

Some contributors did make a valiant effort to bring in the animal parasitic nematodes (e.g. Chapters 4 and 7) and some chapters concerned topics that were only relevant for plant parasitic/free-living species. However, I did feel that, for example, a chapter entitled ‘Cultivation of

Nematodes' could have included something on animal-parasitic species. With respect to the latter, this is one of the great neglected aspects of the subject. I am unaware of any animal-parasitic nematode that can be maintained in long-term culture, and you would have thought that with Home Office Inspectors and ethics committees (and the continual pressure to reduce, refine and replace use of animals in research) breathing down our necks, a renewed effort in this direction would have been higher on the agenda. Or to compile a subsection (2.7) on 'Human Health', in a chapter predicting major advances in the current century, without mention of vaccines for human and livestock nematodes, novel anthelmintics, immunological and PCR based diagnoses, genetics of resistance including development of resistant breeds of livestock, new medicines based on nematode molecules, only emphasized the one-sided nature of some of the contributions in this volume.

I understand that in any historical account of a subject and any attempt to identify the milestones, many events are likely to be omitted. But Table 1.1 surely could have listed the fact that *Trichinella spiralis* was the first ever pathogen to be unequivocally identified as a disease-causing entity. Jenner's work came earlier but he did not actually know what he was dealing with. Viruses were described much later in the 20th Century. Pasteur worked later in the 19th Century, but Leuckart, Virchow and Zenker (1850–60s) both saw the organism and showed that it caused disease. Manson's conclusion that mosquitoes were intermediate hosts of *Wuchereria bancrofti* was the first ever demonstration that insects could transmit disease to humans, and this discovery paved the way for subsequent studies revealing the role of mosquitoes in the transmission of malaria and tsetse flies in trypanosomiasis.

Finally, I have to say that, despite the niggles (and I can add to the above, miniscule font size on some illustrations, and at least one factual error that I spotted), this volume was well worth the effort. I will certainly refer to it more the once in the years ahead. I am sure that you also will find much of interest and relevance.

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Medical Entomology for Students 3rd Edn. By M. W. Service, pp. 285. Cambridge University Press UK, 2004. ISBN 0 521 54775 X. £27.00. (US \$48.00)
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Four years on from the 2nd Edition of this useful introductory text this book remains good value at a

modest price rise of only £5.00. In twenty chapters Professor Service follows his well-worked and consistent pattern in each chapter by describing the morphology of each group of vectors, followed by life-cycle, medical importance and control. The further reading information provided at the end of each chapter has been updated wherever relevant. In addition, as an aide-mémoire to revising, certain key words now appear in bold. In many groups, new information is provided on the numbers of species now described. In the case of mosquitoes this is now 3300, an increase of 100 and there are now 4 further genera including *Ochlerotatus*, a previous subgenus of *Aedes*. Outstanding developments in control include the innovative development of manufactured bed nets that are impregnated with synthetic pyrethroids, which are designed to release the active molecule over periods as long as four years. Mike Service is, however, cautious, and warns that despite our great hopes for this new development, the incidence of resistance to pyrethroids is a realistic potential threat to its success. In similar vein it is noted that mosquitoes in the laboratory have been observed to develop resistance to the bacterial insecticides *Bacillus thuringiensis* and *B. sphaericus*. This has not as yet proved to be a problem in the field with mosquitoes, but experience with agricultural pests, such as the diamondback moth, indicates the need for vigilance.

In the chapter on Triatomine bugs, further information on the progress being made in the control of Chagas disease is reported in the southern cone countries of Uruguay, Chile, Brazil, Bolivia and Peru. New advice on the treatment of scabies with Permethrin cream is advised in Chapter 18 and, in some cases, resistance of the mites to Permethrin, HCH, Malathion and oral doses of Ivermectin is also reported.

In conclusion, undergraduate and postgraduate masters students can continue to rely on this affordable and reliable basic introduction to the discipline of Medical Entomology.

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The Trypanosomiasis (ed. Maudlin, I., Holmes, P. H. & Miles, M. A.), pp. 624. International CABI Publishing, UK, 2004. ISBN 0 85199 475 X. £99.50 (US\$185.00).
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Back in the early 1960s, when the curtain was falling on British colonial administration in Africa, the newly-created Ministry of Overseas Development decided to gather together for posterity the expertise

and experience of authorities on tsetse and trypanosomiasis control. Weighing in at three and a half pounds, the resulting publication, '*The African Trypanosomiases*' edited by Colonel Hugh Mulligan and published in 1969, has since been a baseline not only for investigators in the field but also for pure scientists working on related problems at the laboratory bench. The editors of the present volume were inspired by the enormous progress made in trypanosomiasis research over the last thirty years to produce 'an update of Mulligan' – so, how do the two books compare? Well, amazingly, their weights are exactly the same – but content and coverage are, as might be expected, very different.

The new editors have chosen to broaden the subject to include South American trypanosomiasis (*Trypanosoma cruzi* and Chagas' disease) and the non-tsetse transmitted animal trypanosomiases of African origin. And whereas Mulligan originally toyed with a subtitle of 'The British Contribution' for his book, the dazzling array of contributors to the new version is drawn from a truly international cast. Coverage of traditional topics (epidemiology, diagnosis, pathogenesis, chemotherapy, vector control) is now supplemented with consideration of the impact of the trypanosomiases on medicine and economics. There is little repetition between the two volumes. The introductory section on the biology of trypanosomes deals with topics unheard of in Mulligan's day – genome organization, genetics and communication in trypanosomatids, and treatment of systematics based on gene sequence phylogeny rather than morphology alone.

The overall emphasis, however, is unashamedly on disease, rather than on the causative parasites – indeed the only portrayal of a trypanosome in the book is the colourful scanning electron micrograph on the front cover. The editors tauntingly point out that over the last thirty years we have learned a great deal about the trypanosome's workings at the molecular level but, so far, little of practical benefit has come of it: new drugs for treatment of the trypanosomiases remain elusive and despite an explosion of interest in the mechanism of antigenic variation in African trypanosomes, vaccination remains a pipe-dream. In contrast, they say, vector studies have brought real practical benefit. Geographical information systems combined with satellite imagery can project the likely distribution of the tsetse fly and before long will predict outbreaks of disease;

the highly successful Southern Cone Initiative, a cooperative venture on the part of the governments of the seven South American countries instituted in 1991 to eliminate *Triatoma infestans* the most important vector of *T. cruzi*, has brought about a sharp decline in the infection rates of children born since the programme began and some states are now certified free of transmission. With all due respect to the editors' remarks, however, the reader cannot fail to be impressed by the major contributions of molecular studies to diagnosis and our understanding of epidemiology made plain in this book.

The editors describe their publication as a textbook, but is this description apt? The didactic urge to make a good story, demanded by a textbook, and so evident in its forebear, is less noticeable here. Such treatment is perhaps unsuited to the age of the data base which is now upon us; information is all! *The Trypanosomiases* is, however, a very fine reference book which presents an invaluable cross section of its subject at the beginning of the 21st Century. It successfully integrates different aspects of the African trypanosomiasis problem so that the research worker primarily interested in, say, the trypanosome as parasite, is led on to read other chapters on, say, epidemiology and then vector control. This heuristic element is promoted by the succinct conclusions or summary sections with which most authors finish their chapter. It has to be admitted, however, that the excellent chapters on the American disease stand somewhat apart from those on African trypanosomiasis, and it is not strikingly obvious why they were included in the same book in the first place: the two diseases, their vectors and the causative trypanosomes are very different. The lessons to be learned from integration of the two are left for readers to work out for themselves.

The editors are to be warmly congratulated on persuading some 33 contributors to produce manuscripts, and the publishers for arranging such rapid publication of this important work (some references dated 2003 appear in bibliographies). One cannot help wondering if, in 30 years time, any editors will care to undertake another update!

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