Book Reviews

Encyclopedic Reference of Parasitology Vol. 1 Biology, Structure, Function; Vol. 2 Disease, Treatment, Therapy. 2nd Edition. (ed. H. Mehlhorn,) pp. 673 and 678. Springer-Verlag, Berlin, 2001. ISBN 3-540-66239-1. Price £206·50 (US$299·00)
DOI: 1017/S0031182001218988

This is a two volume encyclopedic version of a single volume textbook originally published in 1988. The stated objective for both this edition and its predecessor is to provide a 'comprehensive review of facts and trends … in parasitology'. The second edition is, however, entirely different in format from the first being an encyclopedia with entries arranged rather oddly from A–Z in each volume. Volume 1 has 1592 entries and is devoted to parasite biology, including information on life cycles, structure and function while volume 2 with 565 entries covers diseases and treatments (vector control, drug therapy and vaccines). Both volumes have 17 identical introductory pages that include prefaces to both editions, a list of topics and contributors for both volumes and an historically-based introductory chapter, illustrated with somewhat unusual line drawings.

I really wondered why there were two volumes with separate subject areas rather than, as in most encyclopedias, a straight run from A–Z. Entries range from single words to small chapters, 20 pages for Digenea for instance. Horizontal arrows are used throughout to indicate a cross reference as in ''DNA Synthesis → Deoxynucleotides''. This device is not explained anywhere and surely any reference work should assist the reader in finding the explanation sought. The use of arrows is cumbersome in blocks of text but is, I imagine, cheaper than referring to volume and page number, except that the latter is also used in some sections. The convention here is that cross-references to entries in the other volume are indicated with the volume number in parentheses after the initial entry but not if the entry is in the same volume. Again this is not explained at the outset and the reader must discover it by trial and error.

Extraordinarily, there is no indication on the outside or inside covers, or anywhere for that matter, of the volume number yet many of the entries cross-refer explicitly to volume 1 or 2. Moreover, this confusion is compounded when you examine the initial entry in each volume. This is 'Abscess' in volume 1 and 'Abdominal pain' in volume 2. Surely 'abscess' is a pathological response and should be in the second volume only; abscess is the third entry in volume 2 but curiously the entry for abscess in each volume is different. Some entries are found in both volumes but there seems to be no obvious rationale for this.

Both volumes are amply illustrated with figures, photographs, line drawings, graphs and tables. A remarkable and irritating feature is the figure and table numbering system. Each entry, if accompanied by an illustration, starts with Fig. 1 or Table 1. I believe I can appreciate the reason for this – I presume the publishers will find it less expensive to modify entries in later editions if figures are numbered consecutively only within each entry rather than within the entire volume. However I can see this numbering system as a potential source of confusion there being so many Fig. 1 or Table 1 in each volume, or even on each page (see below). Another curious and unexplained feature of the illustrations relates to acknowledgements of sources. Many of the illustrations come without an acknowledgement in the legend so their precise source is unknown to the reader; others are duly acknowledged in the legend. It is not, however, easy to determine the published source of the majority of figures. There is a blanket acknowledgement in the introductory pages of each volume but this is less than helpful for the reader who wishes to seek further information on a particular topic based on an illustration. Although varied in style and presentation, the figures are generally of decent quality.

In order to determine how user-friendly this encyclopedia is, I tried out a number of relatively straightforward queries. I searched for eye-flukes for instance and found a single entry in volume 1 for 'Eye-parasites' that directed me to volume 2 'Diseases of the eye'. Volume 1 does not have a discrete entry for strigeoid digeneans in any form, so it would be impossible to find out much about the biology of this major and ubiquitous group of digeneans by direct searching. However, within the large entry for 'Digenea' there are several statements on diplostomatids, none of which indicate that the metacercaiae can invade the eyes of fishes. In volume 2 'Diseases of the eye' directed me without further information to 'Eye parasites' in the same volume. This brief entry concerns primarily human ocular infections and cross-refers to page 451 for 'Eye parasites in animals'; all I found there was a table of eye parasites in domestic animals. Thus after much searching between two volumes I discovered virtually nothing on a not insignificant group of parasites that have been well studied, occur widely throughout the globe and can cause severe pathology to farmed fish. It takes time and effort to discover that there is no information since, being an encyclopedia, there is no index. This example reflects the shortcomings of this book – it is neither one thing nor the other, neither textbook nor encyclopedia but a sort of hybrid. I accept that it is probably very difficult to take a textbook and try to

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repackage it as an encyclopedia by simply allowing the index and chapter headings to drive the arrangement. To then subdivide the work into two volumes each running from A–Z is probably a formula for very limited success.

I suspect, in many cases, the interrogator of this encyclopedia would need to have some prior knowledge to expedite a successful search. Take antiparasite drugs as an example of this premise. I tried to find out about cyclosporins since I know there to be extensive literature covering a wide variety of parasites. There is no individual entry for this topic itself so the reader is then required to embark on a long voyage through a series of related entries to determine if cyclosporin is hidden amongst them. This clearly requires previous knowledge about the action of cyclosporin on individual parasites. To commence the search I investigated 'Drugs' and 'Chemotherapy' from whence I had to look under a collection of entries such as 'Malaricidal drugs', Cestodicidal drugs' and Trematodicidal drugs' – all to no avail. I was unable to find, in a reasonable amount of time, any information on cyclosporin. I still cannot be sure this drug is not referred to somewhere but since the book is arranged in a very cumbersome manner there is no easy way to confirm this. An encyclopedic reference should make life easy for the investigator, not leave him 'travel weary' and perplexed.

This is a rather idiosyncratic work overall; it includes, for example, a significant section of 7 pages on arboviruses but very little on Rickettsii, Lyme disease or *Wolbachia*. I checked out the definition of 'Parasite' in volume 1 and discovered the statement that ''Some authors also consider viruses, bacteria and fungi as parasites''. However, I could find no reference to *Candida*, cholera or tuberculosis leaving me unsure of the position adopted on inclusions and exclusions in this book. On pages 319–324 (volume 2) there are 10 tables all labelled Table 1 relating to 'Mange' placed in the middle of the section on 'Malaricidal drugs' – this seems bizarre. Furthermore, it leads to an extraordinary scenario whereby on page 322 all we find is three tables each called Table 1 and on page 323 there are four of them. There are countless spelling errors and inconsistencies throughout both volumes; there are pages that lack numbers such as in volume 1 after page 667 there are 6 unnumbered pages and in volume 2 there are 8 pages without numbers between pages 659 and 668. There is an entry for 'Historical Landmarks' containing a list of such events commencing in 1500BC and ending in 1993 with Pattaroyo's ''successful malaria vaccine trials''. The explanation for stopping eight years ago is that ''… more recent findings … have to be confirmed and/or enlarged …''. Given the rate at which new developments in parasitology are appearing this seems a little remiss to me. AIDS and HIV attract brief entries in volume 1 only (surely the wrong volume!) both leading to a short paragraph on 'Opportunistic infections'. This seems rather dismissive of such an important parasitological topic.

The bibliography is a further reading section located at the back of volume 2. It is subdivided into 23 sections that seem to bear little relationship to the layout of the book including the following: Arboviruses and transmission, Control measurements (sic), Diseases (Animals), Insectizides (sic), *Pneumocystis carinii*, Strategy and Test systems. The choice and purpose of these headings eludes me in the context of an all-embracing encyclopedia. The referencing system itself seems a little arbitrary since in some sections all authors and full article titles are listed whereas in others only the senior author is listed and the title omitted. Such inconsistencies reflect a poor editorial policy. I noticed on page 675, for example, two references to the same book in adjacent sections in which the editor's initials were different, the titles were different, the publication dates were different and one of the entries was incomplete. This really is not helpful to the reader.

On a more positive note the book is well packaged. It comes in a solid cardboard holder like many multivolume reference works. It is quite handsomely bound with gold type on green board; the weight and quality of the paper are quite high although there is some show-through of text or illustrations from backing pages. The quality of the illustrations themselves is generally good and the pages are laid out cleanly and moderately clearly. However, these attributes do not make for a useful and usable reference work. I doubt that many parasitologists will find this encyclopedia particularly informative or easy to use. The lack of an index, the division into two volumes based on topic, the errors and inconsistencies, and the abundance of oddities and idiosyncrasies combine to relegate it to the interesting but not recommended pile. I would not use this book as first choice to find out facts that I needed to know in a hurry. And that is surely the point – an encyclopedic reference needs to provide rapid access to facts rather than require the searcher to move around two volumes having to read small chapters from which to retrieve information. There is a CD-ROM which replicates the book but which is more difficult to use since reproduction of each page produces typescript that is too small to read comfortably.

This is an expensive reference work that has clearly involved the editor and co-authors in considerable effort. It seems a great pity therefore that the final product is let down in so many ways.

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Diseases of Carp and other Cyprinid Fishes by D. Hoole, D. Bucke, P. Burgess & I. Wellby, pp. 264. Fishing News Books, Blackwell Science UK, 2001. ISBN 0 85238 252 9. £49·50.
DOI: 1017/S0031182001228984

Cyprinidae is an important family of fishes, not only because many species are commercially important, but also because there are more than 200 genera including something over 1700 species in the freshwaters of the world. This book aims to provide an understanding of cyprinid health and diseases fundamental to the successful management and exploitation of these fishes. The book is described as a practical guide to disease diagnosis, prevention and control. How far does it achieve its objectives?

There are 12 chapters: 1 Introduction, 2 Cyprinid Biology, 3 Disease Symptoms, 4 Infectious Diseases – Viruses, Bacteria and Fungi, 5 Infectious Diseases – Parasites, 6 Noninfectious diseases, 7 Environmentally Induced Diseases, 8 Nutritionally Induced Diseases, 9 Diseases of Eggs and Fry, 10 Management of Fish Health, 11 Future Developments, 12 Laboratory Procedures in Disease Diagnosis and Control. There is a list of fish names cited in text, a comprehensive, 27 page, glossary of terms and an index. For someone reading a book of this type for the first time, overall, this represents good cover of the subject area. For a specialist familiar with the field, however, there is a sense of *déjà vu* in that the style of presentation and content follows a well established pattern to be found in a number of similar accounts dealing with parasites and diseases of other groups of fishes. It is doubtful anyone already involved in fisheries or parasitology would gain any seminal knowledge, although, of course, they could learn concerning particular problems relating to cyprinids.

Unfortunately the book fails to stress that in natural populations of plants and animals parasites are always present and that these parasites are normally in a complex dynamic equilibrium with the free-living communities of plants and animals. Fishes, including the Cyprinidae, tend to be towards the apex of the predator-prey pyramid within freshwaters, and therefore are infected by a considerable range of parasites, which may occur in large numbers. This is the normal condition found in any natural environment. Furthermore, the authors omit discriminating between the presence of a parasite and the occurrence of disease with its attendant symptoms. Many species of parasites live in relative harmony with the infected host individual, and although by definition the parasite is ''An organism that lives, at the expense of, in or on another organism (the host) … '' (page 245) disease defined as ''A deviation from the state of complete physical or social well-being of an organism involving a well-defined set of signs and aetiology and leading to an impairment of its normal function.'' (page 232) is not necessarily a consequence. Indeed, in natural populations of cyprinids, and animals in general, there are few obvious symptoms of disease.

Putting this aside, the Introduction sets the tone of the content of the book explicitly. The second chapter, Cyprinid Biology, outlines the anatomy somewhat superficially. Curiously, there is no mention of the spawning tubercles in this chapter although they are noted later (page 27) under Disease Symptoms and illustrated in Plate 3.3. Furthermore, the succession from oesophagus to intestine is not noted, contrasting markedly, for example, with the well-defined stomach of the salmonid fishes. I would disagree with the claim that (page 13) ''All the organs associated with digestion are particularly prone to disease.'' – surely the authors mean infection by parasites not disease?

The chapter on Disease Symptoms suffers from not initially clearly differentiating parasite, pathogen and disease. Identification of the symptoms of disease are described under behavioural, external and internal visual signs in sufficient depth for a non-specialist.

Chapters 4 (Infectious Diseases – Viruses, Bacteria and Fungi) and 5 (Infectious Diseases – Parasites) review the major infectious species, and although there is good indication within the description for most species of its potential for pathogenicity, there is no attempt to contrast overall between the highly pathogenic agents, for example, spring viraemia of carp, which is a notifiable disease in the UK, and the non-pathogenic protozoan and cestode genera, for example, *Trichodina* and *Archigetes*. Although *Trichodina* are often present on the skin of fishes in enormous numbers, these ciliophorans normally feed on particulate food from the water and are non-pathogenic. Indeed, in some instances, as for example the cestode *Archigetes* spp., there is actually no information given concerning potential or actual pathogenicity.

A number of spelling or taxonomic errors were noted in various parts of the book: page 29 *Neasus* should be *Neascus*; page 65 *Ichthyobodo necatrix* is usually a synonyn of *I. necator*; page 72 *Glosatella* should be *Glossatella*; page 75 *Hoferrelus* should be *Hoferellus*; page 100–101 the cestode *Caryophyllaeides fennica* is designated as a species of *Caryophyllaeus*, whereas, in fact, the two genera are in different families, Lytocestidae and Caryophyllidae respectively.

A technical fault occurs on page 77 where the polar tubule of the microsporean is termed a polar filament. In actuality, the sporoplasm of the microsporean is extruded through the polar tubule, whilst the polar filament of the myxosporean when everted most likely serves to attach the hatching spore to the intestinal surface of the potential host.

There are also a number of life cycle descriptions

where the details are difficult to follow from the text. One example is cited: the definitive hosts of the nematode *Camallanus lacustris* (page 105) are usually Percidae; it is incorrect to claim the ''The final hosts to *Camallanus lacustris* are piscivorous fish, notably the pike as well as the freshwater burbot … ''. These latter hosts are postcyclic hosts in the sense of Moravec (1994) (Parasitic Nematodes of Freshwater Fishes of Europe. Academia, Prague. pp 473.). No doubt this is what the authors intended to say, but as printed the statement is confusing for an inexperienced reader.

It should be noted (page 107) that the anglers' vernacular name for the acanthocephalan *Pomphorhynchus laevis* is the orange peril not the ''yellow'' peril.

Chapters 6 through to 8 describe a range of non-infectious conditions leading to disease in adult cyprinids, whilst Chapter 9 does the same for eggs and fry. Management of fish health is covered in Chapter 10, whilst Chapter 11 briefly suggests some probable future developments. Finally, Chapter 12 outlines laboratory procedures that facilitate diagnosis of disease conditions.

In summary: the book does achieve its stated aims and is reasonably priced, with good colour illustrations, although each plate is rather small. The thrust of the book is directed to the non-specialist, for whom much of the content within each section represents a short, mostly explicit summary, although, as noted above, there are occasional errors of fact and in some parts details are expressed in less than totally accurate terms. Nevertheless, for the non-specialist, the book will be a useful first-source of information. For a more experienced parasitologist, scientist or fishery manager it is unlikely there will be much new. If detail is required concerning any particular topic, then obviously, this must be sought elsewhere; the lists of Further Reading at the end of each chapter greatly facilitate starting such searches.

Throughout the book it is difficult to know when the authors are reporting their own observations, and when they are quoting from published sources. For all readers, it would be helpful to know who said what and when. Publishers should be condemned for not insisting that authors cite sources of all information given in the text. To give author and date of publication does not impair the readability of a book as is sometimes claimed, unequivocally, to quote such enhances the value and appreciation of context for the reader.

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Molecular Epidemiologicy of Infectious Disease (ed. Thompson, R. C. A.) pp. 326. Arnold, 2000. ISBN 0 340 75909 7. £70
DOI: 1017/S0031182001238980

In the race to study the genomes of mice and men, important pathogens have not been overlooked. In July 2001, Beowulf Genomics, at the UK Sanger Centre, announced that three more major pathogen genomes had been completed, those of the organisms causing whooping cough and diphtheria and a recent isolate of epidemic Methicillin-resistant *Staphylococcus aureus*. In addition, the projects devoted to protozoan parasites, such as *Plasmodium falciparum*, *Leishmania major* and *Trypanosoma brucei* are proceeding apace, although that of *P. falciparum* is acknowledged as one of the toughest goals facing the sequencing community. Parasitic nematodes are not neglected, and hookworms, roundworms, *Trichuris*, and filariae are all receiving attention, as are a few pathogenic fungi. The results of these various initiatives will greatly extend our ability to understand and control important pathogens of humans and domestic animals.

Molecular epidemiology, although a relatively new discipline, will be revolutionised by the application of this new knowledge and the new technologies of DNA microarrays and proteomics. In that sense the authors of a book in this discipline have the unenviable task of summarising a body of knowledge that inevitably is superseded at a rate that would have seemed impossible only 20 years ago. Nevertheless, the wider community of scientists and public health workers concerned to understand the epidemiology of infectious disease have a need for such a book, for all this elegant science will be of little avail if it is not utilised in reducing the burden of disease.

In twenty chapters by thirty-six authors, this book manages to capture the feel of the discipline at the turn of the century. Two introductory chapters describe the applications of molecular epidemiology and the nature of the sequences used in such studies. There follows an overview of methods of analysis and interpretation of data by Tibayrenc and Ayala, although anyone new to this area will require a more detailed primer on the statistical analysis and the assumptions on which such tests are based. As these authors rightly emphasise, coalescent theory is a powerful method for dealing with nucleic acid sequence data, but some of the analytical methods available through this approach are currently not widely accessible, being computationally intensive. Three subsequent chapters include a short review of molecular diagnosis, an introduction to population genetics and a useful examination of infectious diseases in hosts from an ecologist's viewpoint. The last of the seven introductory chapters deals with mathematical modelling. In this, Sunetra Gupta

emphasises how immune selection can cause populations of infectious pathogens to self-organize into a stable group of strains, but this apparent stability disappears where protective immunity is reduced, often leading to cyclical or chaotic fluctuation in strain prevalence. The important lesson from this is that longitudinal epidemiological studies that use data sets where strains are molecularly (or immunologically) defined need to be interpreted with considerable caution. Gupta goes on to discuss the influence of population structure on choice of vaccines. This is one chapter that should be compulsory reading for anyone with a developing interest in molecular epidemiology.

The remaining thirteen chapters deal with individual or groups of pathogens, save for one devoted to insect disease vectors and a chapter on the epidemiology of nosocomial infections. Malaria, TB, HIV/AIDS, measles, hepatitis viruses, enteric protozoa, *Pneumocystis*, fungi, rabies, trypanosomes and arboviruses all receive treatment, but nowhere is the molecular epidemiology of helminths specifically considered. Inevitably there is overlap in discussion of concepts or methods between chapters but the virtue of the book is an opportunity to gain insights into the epidemiology of a diverse set of organisms. Thus, in a particularly interesting chapter by Holmes and Zanotto, the parasitologist, for example, can learn about the evolution of hepatitis viruses and the role of human behaviour in their evolution. Lineage through time plots suggest that HCV has changed from being an endemic to an epidemic infection within the past 50–80 years. This is associated with virus entering new susceptible populations, aided by infected blood products or the sharing of contaminated needles. Although not mentioned in this chapter, the high prevalence of HCV in Egypt is known to be associated with sharing of needles and syringes in previous attempts to control schistosomiasis. It is sobering to recognise that a virus unknown to science until 1989, has circulated in human populations perhaps for hundreds of years but has only become prevalent as a result of our own recent actions.

At £70, this is not a book that will find its way onto everyone's bookshelf but I know many with an interest in molecular epidemiology who will want to see it in their library. Research students in particular are sure to find this a most useful overview of a rapidly developing discipline.

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A Century of Protozoology in Britain by K. Vickerman and M. A. Sleigh with a contribution by B. S. C. Leadbeater and S. McCready, pp. 198. The British Section of the Society of Protozoologists (BSSP) UK 2000. £20.
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The concept of *A Century of Protozoology in Britain* began as a history of the British Section of the Society of Protozoologists (BSSP), founded in 1962, but inevitably expanded to include an introductory account of the whole field of protozoology beginning with the contributions of Robert Hooke in the seventeenth century and the broad developments in the subject up to the beginning of the twentieth century not only in Britain but elsewhere. British protozoology has a lot to be proud of, particularly in the field of parasitology. The years around the turn of the twentieth century were marked by Ronald Ross's discovery of the life cycle of the malaria parasite, David Bruce's discovery of the life cycles of the African trypanosomes in the tsetse fly and William Leishman and Charles Donovan's discovery of the leishmania parasites. Everett Dutton identified *Trypanosoma brucei gambiense* and Muriel Robertson later described its life cycle in the tsetse fly, and, in more recent times, Keith Vickerman and George Cross discovered the mechanism of antigenic variation in African trypanosomes, a phenomenon that had puzzled Ronald Ross over half a century earlier. The malaria tradition also flourished in Britain and what was probably the most important discovery since Ross's time was the elucidation of the liver stages by Cyril Garnham and Henry Shortt. Another important discovery was the life cycle of *Toxoplasma gondii* by Bill Hutchison, a finding that had major implications for the understanding of *Sarcocystis* and other cyst forming coccidians.

It has only been possible to touch on some of the more important parasitological aspects of this splendid, well illustrated, book which includes over 90 portraits of protozoologists and covers much more than the bare bones of the subject, for example there are sections on the London and Liverpool Schools of Tropical Medicine, the Wellcome Bureau, the Molteno Institute and the National Institute for Medical Research. This is a book to be read for information and pleasure and would make an ideal present for anyone interested in protozoology. *A Century of Protozoology in Britain* is a limited edition and can only be obtained from Dr Barry Leadbeater, School of Biosciences, University of Birmingham, Birmingham B15 2TT UK by cheque for £20 made out to BSSP (+£2 for overseas postage).

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