

Book Reviews

Ecosystem Change and Public Health. A Global Perspective (ed. Aron, J. L. & Patz, J. A.), pp. xxiii + 480. The Johns Hopkins University Press. Baltimore and London, 2001. ISBN 0 8018 6582 4. US\$ 38 (paperback). DOI: 10.1017/S0031182002212834

How human health is affected by global ecosystem change is a major issue of our age, and increasingly occupies those who formulate health policy as well as a growing group of scientists, economists and public health experts.

This book describes itself as the first textbook devoted to this emerging field. Its funding by the Climate and Policy Assessment Division of the US Environmental Protection Agency, reflects the concern of policy makers and a belief that complex environmental health issues require an integrated and multidisciplinary approach. The result is a volume that draws on the expertise of 'four ecologists, three infectious disease specialists, three epidemiologists, two veterinarians, two international health physicians, two environmental epidemiologists, and one each from the disciplines of occupational and environmental engineering, health policy, climatology, biostatistics and environmental toxicology'. The list emphasises the tendency for disciplines to become fragmented and lends support to the view that these need to be brought together if we are to understand such a complex problem. The book is designed to serve as a textbook for students of this twenty-first century interdisciplinary endeavour. Its avowed purpose is to raise awareness of changes in human health related to global ecosystem change and to expand the scope of traditional curricula in environmental health. In addition to the afore mentioned experts, it draws on the skills of experts in pedagogy, and aims to encourage active learning and make use of information accessible through the World Wide Web. Its main target audience is students at Masters level in public health but it is also seen as serving graduates and undergraduates in disciplines ranging from environmental science and climatology through to social science. There is a fundamental dilemma in interdisciplinary studies in ensuring that the content is both intelligible and appropriate for such a broad audience and there are reasons for thinking that this volume does not quite achieve such an ambitious objective.

The book is divided into three main sections: Approaches, Environmental Changes and Case Studies and appendices largely devoted to internet-based resources. The opening chapter on information resources is strong on metaphor, much talk of road maps for finding information and opening

windows to the total landscape of complex facts, but weak in content. It can be skipped over with little loss. The next chapter on Epidemiological Study Designs has the seemingly impossible task of providing an insight into epidemiological tools appropriate to the influence of ecosystems on health, but through the plentiful use of examples makes for an interesting and informative read. Geographic Information Systems (GIS) and remote sensing are tools increasingly used by parasitologists and the eponymous chapter serves as a very useful introduction to the ideas and remote sensing instruments used in such studies. The sections on spatial data analysis and quality of data are helpful but those who need to understand the complex statistical approaches to spatial analysis will need to consult more specialist sources.

It is little use having information on the impact of ecosystem change on health if it is not used to influence policy, but the chapter on the Science/Policy Interface devotes rather too much space to risk assessment. It is unclear how a formalised discussion of how people make decisions where the information is uncertain, which is an everyday activity for most of us, helps the reader better understand the issues specific to ecosystem change and health.

Section II on Environmental Changes starts with a chapter on Human Populations in the Shared Environment which provides a broad overview of how urbanization, immigration, population growth and ageing are likely to affect human health but this is somewhat strangely married to a discussion of international cooperation and the needs to reach international agreement on issues such as ozone depletion and the emission of greenhouse gases. The following chapter on the Changing Chemistry of Earth's Atmosphere neatly epitomises the dilemma of such a book, for the circa forty chemical reaction formulae, whilst being relatively straightforward for anyone with an interest in chemistry, serve no useful purpose for most readers. How much of this does a Masters student in public health need to know? I can see some staging a walk-out if presented with this level of detail! The following chapter written from an earth sciences perspective does not attempt to link the described processes to human health. A chapter on Water Resources Management again has little on specific health issues but does underscore the central role that access to water plays in the lives and health of populations and there are many useful facts. The subsequent chapter on Ecology and Infectious Disease outlines a few principles such as basic reproductive rates and vectorial capacity but is largely concerned to provide a descriptive overview of diseases and their environmental determinants. Those

with a limited background in health will find this a useful chapter but are unlikely to emerge with a balanced view of the global disease burden of the various agents described.

Part III is a section of case studies of global ecosystems and cholera, malaria, air pollution and water. Students may well find these chapters and their associated study projects the most useful part of the book. The appendices touch somewhat superficially on the learning process but mainly focus on the role of web-based resources, including an annotated list of some potentially useful sites. Mature students who have yet to catch-up on the internet revolution or those studying from home may find this useful but most universities will have their own guides to on-line directories and library resources.

In summary, this may be a useful source of ideas for anyone developing a course module on ecosystem change and public health, an aid for students on such a course, but hardly a must for parasitology students and their teachers.

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Keys to the Trematoda. Vol. 1 (ed. Gibson, D. I., Jones, A. & Bray, R. A.), pp. 521. CABI Publishing and The Natural History Museum, UK, 2001. ISBN 0 85199 547 0. £95.00
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For those with the narrow focus engendered by training in veterinary medicine or medicine, trematodes might seem a small and restricted taxon of organisms. But illumination is at hand. The first of three volumes that will reveal the true diversity of the group has now been published. If strange life-forms intrigue you, look at the illustrations of aspidogastreaans – a group that will never come to the attention of the medical professions – in Chapter 2. A future volume will include the didymozoids, anatomical drawings of which seem to the uninitiated like alien circuit-diagrams or deranged but disciplined doodles.

For over 30 years, the main reference in English for identification of trematodes has been the volumes published by Yamaguti in 1971, now seriously out of date. The Yamaguti compilation also had the unfortunate property of arranging keys according to the vertebrate host taxon in the first instance. This has not been done in the new offering, which arranges trematode taxa by superfamily and family regardless of host.

The editorial team for this series includes two members involved with the successful “Keys to the Cestode Parasites of Vertebrates” (1994) also

published by CABI. Obviously forgetting the huge amount of labour involved in preparing that single volume, they have launched into a much larger enterprise here. Although they have limited the treatment to identification of adults at the level of genus and have not included a list of species within each genus, or any known details of life history, the work will cover three volumes. The format is similar to that of the cestode book. The layout is clear and readable. Figures are clustered throughout chapters and – a criticism here – occasionally have been reproduced at too small a size to show all the detail intended by their authors.

The small subclass Aspidogastrea and part of the Digenea are covered in the first volume. The best-known superfamily of digeneans treated here is the Schistosomatoidea, the blood flukes of vertebrates. But also found in this volume are a further 10 superfamilies including the bizarre transversotrematoids parasitising the surfaces of fish and the curious and diverse, often bipartite, diplostomoids found in many groups of tetrapods. Keys to all these and their constituent families are spread among 53 chapters, each dealing with a family (or superfamily) and beginning with an historical review of the taxon including a discussion of synonyms and special points that illuminate the keys to follow. Diagnoses of the family and of subordinate genera are included in a hierarchical manner so that features common to all taxa at one level are described once at the next level above. Keys take the reader as far as genus. A diagnosis of each is inserted among key couplets and each genus is featured in at least one figure. The first volume contains well over 500 figures – I counted them! The remaining two volumes will be similar in their layout. However, the final volume will also contain a glossary of terms, a cumulative index, and a key to all superfamilies.

Those seeking authoritative statements about phylogenetic relationships among trematodes will be disappointed. The editors have been explicit that identification of adult specimens to the level of genus, and not phylogeny, is the focus. The only cladograms in the book show possible relationships among the Bucephaloidea.

The editors have allowed the contributors some latitude in terminology, in styles of figures and in the amount of material to be covered in introductory sections. Some chapters start with only a brief introduction whereas others are prefaced by a substantial treatise. The introduction (by Overstreet and Curran) to the Bucephaloidea – odd little worms that have their mouths where their ventral suckers ought to be and their suckers where their mouths ought to be – is particularly long at about 30 pages.

Sixteen people, including the editors, contributed to the volume. The same names appear again and again on chapter headings – perhaps indicative of the small pool of expertise available for a work like this. Dare

one say, this might also be a decreasing pool but this volume and its companions will hopefully encourage youngsters into a career in parasite systematics. Certainly, I will use the book in teaching at both undergraduate and postgraduate levels. As happened to me many years ago, our students frequently become fascinated by the beauty and variety of form of well-mounted slide specimens of trematodes.

“Keys to the Trematoda” will become the standard reference on the group for many years. Given the infrequency of appearance of such large works, this is likely to remain the definitive work for the first half of this century and to find a place on bookshelves all over the planet.

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The Behavioural Ecology of Parasites. By E. E. Lewis, J. F. Campbell & M. V. K. Sukhdeo, pp. 384. CABI Publishing UK, 2002. ISBN 0 85199 615 9. £65.00
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Parasite behavioural ecology has been described in many excellent reviews, and formed sections of several edited books. However, most examples are either of vertebrate or invertebrate hosts, and few address parasites of plants in the same volume as those of animal hosts. In compiling chapters on these, as well as discussions on parasitoids, seed parasitic insects and social parasitism in ants, the editors have expanded the subject breadth beyond that of most parasitological texts. They justify the inclusion of some of the more unusual examples given in the book (e.g. seed pests/parasites, social parasitism) by defining a parasite as being the receiver of some benefit to the cost of a donor host (after Cheng, 1991). The host, therefore, could be a single organism as in the traditional sense, or a group of organisms. All parasites require behavioural traits that will enable them to find the correct host and correct location within the host. This book demonstrates the similar means by which these events occur and, thus, the close-relatedness of seemingly diverse disciplines in parasitology.

Whilst primarily aimed at researchers and postgraduates with an interest in ecological, co-evolutionary and behavioural aspects of host-parasite interactions, this book would also be of potential value as a resource for advanced undergraduates, since only a basic knowledge of the systems described is required. The editors have chosen leading scientists in appropriate subjects to convey the

complexities and intriguing nature of parasite behaviour. The text is organised into five parts, taking the reader through the sequence of events leading to successful parasitism. Each chapter begins with a clearly written background, and most of the reviews contain good explanations of current hypotheses and specialist terms.

Part I is devoted to foraging for hosts, the first chapter provides a well-written, informative review of trematode transmission strategies and, given the plethora of hosts utilised by cercariae and miracidia, the diagrams in the chapter are useful illustrations of some of the more complex life-cycles. Also in this section, an engaging and enthusiastically written chapter on the multi-sensory cues exploited by parasitoids in host finding and host acceptance decisions.

Part II, entitled “Host Acceptance and Infection”, includes an excellent review of the part played by the host immune system and temperature in influencing whether larval female nematodes develop into free-living or parasitic stages. The other two chapters concentrate on parasite-plant relationships, often omitted from parasitological books. First, parasites of seeds, such as bruchid beetles, grain borers, weevils and chalcid wasps are considered. This discussion revisits the idea that parasitic insects often avoid parasitised hosts for oviposition (see also previous chapter on parasitoids); secondly, a review of plant-parasitic nematode movements, directed through the soil and thence towards potential hosts.

Part III comprises four chapters on interactions among parasites within the host. The first chapter consists mostly of a review of the morphological and biochemical adaptations of the parasitoid to ensure parasitism, including a concise appraisal of the complex mechanisms of host immune suppression by the parasitoid. However, only a small part of this chapter examines parasitoid-parasitoid interactions, and, hence, one wonders if it would have been more appropriate in another section of the book.

Part IV assigns five chapters to host-parasite interactions. One of the most carefully constructed chapters covers parasite virulence, using the fascinating case study of lizard malarial to illustrate the suitability and relevance of current theories, and fully emphasising the time-consuming nature of work that is unlikely to increase “academic fitness”! The last review of this section concerns social parasitism, in various forms, in ant species. This chapter, as in others, echoes the common theme of the book – that success in a parasitic lifestyle depends upon host habitat finding, host finding, host acceptance and host suitability, is multifactorial, and is dynamic and evolving.

The final section is a summary written by the editors. Here there are a few errors, for example, on p. 341, the editors state that the cysticercoid of *Hymenolepis diminuta* is embedded in the muscle of the beetle host, whereas it actually resides in the

haemocoel; on p. 344 it is said that nematodes of the genus *Strongyloides* develop in the stomach, but an earlier chapter devoted to this subject explains that larval worms undergo two moults in the mucosa of the small intestine.

To conclude, the quality of production, content and diagrams is high. What is particularly impressive is that the editors have brought together parasitologists with wide ranging interests. Thus, they endeavour to promote cross-pollination of ideas from fields that may not otherwise have obvious overlap, and the idea works well. Familiar trends

appear across the taxa, a finding which will hopefully serve to stimulate research and lead to a more comprehensive view of the less understood aspects host-parasite interactions.

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