

Fifty Years of Invasion Ecology – The Legacy of Charles Elton. D.M. Richardson (ed.). Wiley-Blackwell, Oxford (2011). 432 pp., £45 (paperback), £95 (hardcover), ISBN: 978-1-4443-3586-6 (paperback), 978-1-4443-3585-9 (hardcover)

This book is intended for all scientists and students interested in biological invasions. It is based on a conference held in South Africa in 2008 to celebrate the 50th anniversary of the famous volume by Charles S. Elton on 'The Ecology of Invasions by Animals and Plants'. When a scientific discipline starts exploring its history, defines terms and reviews achievements, this can be a sign of maturity, yet invasion ecology continues to develop in a positive and dynamic way. The research dynamics in this field are enormous, building on a wide diversity of concepts and methods, and contributing to solve pressing environmental problems. The dynamics are driven by a good number of highly innovative and productive researchers, some of which contributed to this book. The well-known South-African ecologist David M. Richardson has done an excellent job in selecting and editing a number of complementary contributions.

After an introduction that summarises the main parts of the book, the volume starts with four chapters offering an historical perspective on invasion ecology. Roger L. Kitching gives a personal account on his experience within Charles Elton's research group at Oxford University in the late 1960s. This chapter is followed by an evaluation of Daniel Simberloff, describing Elton as a 'prophet' rather than a 'founder' of invasion ecology. Chapter 3 deals with the history of invasion research in the world's oceans, while chapter 4 carefully discusses the concept of biotic nativeness. The second main part explores current dimensions of invasion ecology under the headings 'Patterns and rate of growth of studies in invasion ecology' (chapter 5) and 'Invasion ecology and restoration ecology: parallel evolution in two fields of endeavour' (chapter 6). This is supplemented by part 3 on recent developments in invasion ecology in Europe and invasion of tree pests and pathogens. Part 4 comes under the heading 'The nuts and bolts of invasion ecology' and features as diverse topics as plant dispersal, biotic resistance, plant-microbe interactions, mutualisms, exotic birds, evolutionary aspects, reproductive ecology, freshwater ecosystems, and the concept of propagule pressure. Part 5 includes two case histories on exotic ants and the infamous *Bromus tectorum*. Part 6 points out new research directions, technologies, and challenges, including a valuable contribution by Mark A. Davis, chapters on remote sensing technology, DNA barcoding, the emerging field of biosecurity, economic aspects, modelling approaches, climate change, conceptual pathways, and management programs. The final part consists of two chapters devoted to future research avenues and a helpful compendium of concepts and terminology in invasion ecology. There is a taxonomic and general index at the end of the book, while references are provided after individual chapters.

The 30 chapters are well written, and David Richardson did an excellent job in editing the diverse contributions of 51 authors, most of them from North America, South Africa, and Australia. Asia and South America are not represented by any contribution, and European researchers are underrepresented. Most chapters are relatively short, with an easily accessible essay style. This comes at the expense of presentation of original data, mirrored by rather few tables and figures. On the other hand, we applaud the possibility to download illustrations from a companion website. The book is technically well done; virtually no typos could be spotted, and the overlap among individual chapters is minimal. The terminology, for example on 'alien' and 'non-indigenous' species (chapters 1 and 4), is not fully consistent, but this should not be taken too seriously.

In conclusion, we found this to be an inspiring volume on invasion ecology, which should be consulted by everybody interested in the history and recent developments of this discipline. There are already many useful books on biological invasions, but this one singles out by being a series of stimulating reviews and essays. It is original in combining complementary aspects and pointing out new research directions. – Will it be remembered 50 years from now? Most likely not, but this is less due to a lack of quality and originality of the individual contributions than to emerging new scientific methods and the resulting breakthroughs to be expected. Most readers will be impressed how this discipline still expands, several decades after the publication of Elton's famous volume.

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Biological Diversity – Frontiers in Measurement and Assessment, A.E. Magurran, B.J. McGill (Eds.). Oxford University Press, Oxford (2010). 368 pp., £39.95 (paperback), £75.00 (hardback), ISBN: 978-0-19-958067-5 (paperback), 978-0-19-958066-8 (hardback)

Measuring biological diversity has been the scope and indeed title of a previous book by Anne Magurran. Instead of updating her previous volume, she and colleague Brian McGill opted for something emphasising the cutting-edge, in addition to covering the traditional methodologies. The author's list reads like the who-is-who of quantitative ecology, featuring, among others, Colwell, Gotelli, Chao, Jost, Gaston, He, Vellend, Ugland, Rosenzweig, as well as the editors themselves.

The five parts (plus a concluding sixth) built on 21 chapters, following this idea in a recursive way. They move from the general to the specific, which each one of them progressing from the traditional to the “frontier”. Part I, Basic Measurement Issues, sets the scene very generally. Already here a gem can be found in the form of a chapter on the relevance of detectability (by Buckland and co-authors), which belongs to the best and most persuasive introductory text to sampling designs I have come across. Part II, Diversity, comprises what the reader expects to find: species richness estimation from samples, diversity indices and diversity turnover in time and space. Here a first downside of edited books became noticeable. The chapter introducing, tabling and reviewing diversity indices does not include the rather fundamental critique of Lou Jost. Rather, he and colleagues are given “their own chapter”. This separation feels unnatural, as if the editors wanted to avoid conflicting view to make bad reading. When read together, however, the picture is comprehensive and balanced. Part III, Distribution, covers both frequency distributions of species and spatial distribution of diversity. Noteworthy, in my opinion, are the occurrence-occupancy review (positive) and the spatial structure of biodiversity (negative), the latter written by McGill and more reflecting the methods he routinely employs (geo-statistics) than what is available. Part IV covers Alternative Measures of Diversity, bringing into focus the current fad of functional/trait-based, phylogenetic and molecular diversity indices. Trait and phylogenetic diversity are handled very competently in the form of excellent reviews, which can be highly recommended for teaching at any university level, while the genetic chapter delves more into molecular, rather than statistical, topics. Part V, Applications, reports four case studies employing the methods outlined so far. These examples estimate richness (and sampling effort) of microbes, effects of disturbance on diversity, landscape-scale diversity and extinctions in the fossil record. Because of their focus on a specific data set, rather than a specific measure of diversity, they are more enjoyable to read, albeit less informative. The last chapter in this part is on species density, i.e. how to correctly quantify richness per area, and would be much better placed for part I. A comprehensive and up-to-date reference section followed by an extensive index concludes the book.

The quality and usefulness of edited books depend exceedingly on the skill of the editors. Their talent in outlining each chapter and recruiting a set of author who are competent yet willing to comply with the editors' scope is crucial to turn a book from well-intended to a well-done. This book has the hallmarks of an excellent edited book – excellent scientists as contributing chapter authors, a clear layout of the content, a clear intended readership – but, alas, it lacks the final touch to turn it into a must-read. Several chapters are highly recommendable as introductory texts also for scientists moving “sideways”, e.g. from molecular ecology into biodiversity research or from vegetation science into conservation.

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Handbook of Alien Species in Europe, DAISIE. Springer, Dordrecht/Heidelberg, London, New York (2009). 398 pp., €133.70, ISBN: 978-1-4020-8279-5

“Biological invasions” is one of the most important ecological issues with a rapidly increasing number of publications over the last 50 years, from the book by Elton (1958) up until “50 years after Elton” (Richardson 2010). On the one hand, there is the ecological analysis of the process of invasion—from pattern to process and theory, a field that is flourishing and continuously expanding. On the other hand, there is the quantitative aspect of cataloguing the many species arriving in a new land. It is here that our knowledge is deficient.

For Europe, a quantum leap forward was DAISIE (“Delivering Alien Invasive Species Inventories for Europe”). Launched within the Sixth Framework Programme of the European Union, it developed a pan-European inventory of the more than 10,000 invasive alien species with the participation of 182 contributors. The information is publicly available at <http://www.europe-aliens.org> (as “The European Alien Species Database”) and it is summarized in this handbook.

The book consists of 14 chapters. Following an introduction about the rationale, implementation and implications for managing biological invasions, 8 chapters cover the animal and plant groups in detail: alien fungi, bryophytes and lichens, vascular plants, terrestrial invertebrates, invertebrates and fish in inland waters, marine biota, birds, amphibians and reptiles, and, finally, mammals. Each of these chapters focuses on several aspects: taxonomy, temporal trends of invasion, main pathways to Europe, biogeographical patterns, most invaded habitats, ecological and economic impacts and expected future trends, management options and their feasibility. These condensed, informative overviews constitute the first part of the book.

An extensive list of alien taxa follows, comprising 10,771 species. The list contains three categories: alien taxa from outside Europe, European species which became alien within Europe outside their native range, and “cryptogenic” species (of unknown origin – either European or non-European). Unfortunately, the list, even at a glance, contained some minor errors. For instance, the gammarid *Niphargus* is listed as member of the Astacidae; *Beroe ovata* is correctly given under Beroidae, *Beroe cucumis*, however, is linked to the fish family Cottidae.

The third section of the book covers one hundred of the most invasive alien species in Europe threatening biological diversity. One page is devoted to each species including information on biology, ecology, distribution (including a