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book review

Fifty years of Elton

Fifty Years of Invasion Ecology: The Legacy of Charles Elton, by David M. Richardson (ed.)
2011, Wiley-Blackwell, 432 pp. ISBN: 978-1-4443-3586-6
Price: £95.00 (Hardback) / £45.00 (Paperback); <http://www.wiley.com/>

The year 1958 marked the publishing of *The Ecology of Invasions by Animals and Plants* (henceforth *EIAP*) by Charles Elton. In this book, Elton examined the introduction and subsequent success of numerous non-native species and put forth a set of hypotheses about why certain species become invasive (invasiveness) and why certain communities may be more susceptible to invasion (invasibility). Fifty years after *EIAP* was published, David Richardson organized a symposium in Stellenbosch, South Africa, that brought together 137 people from over 14 different countries to discuss how the study of biological invasions has progressed since the publication of *EIAP*. *Fifty Years of Invasion Ecology* (henceforth *Fifty Years*), edited by Richardson, grew out of that symposium and provides a comprehensive examination of what knowledge has been gleaned in the past 50 years by studying the subset of organisms that have become prolific when moved, by accident or purpose, out of their native range.

Some might find it strange for an entire book to be devoted to updates on the ideas proposed in one monograph, particularly when that monograph was written for a lay audience. Yet anyone who has read *EIAP* knows how captivating the book is, how many ideas about community invasibility were set out in it, and how the book set the groundwork for a field of biological inquiry that now generates thousands of publications per year. Whether or not Elton founded the field of invasion biology (and this is covered by a chapter by Daniel Simberloff), it is clear that *EIAP* was an “important milestone in the history of invasion ecology” (Richardson page xiii), and following up on the ideas Elton set forth and species he case-studied was a worthwhile endeavour.

The book is split into seven parts, some of which are stronger than others. The first part is one of the strongest – it provides a historical per-

spective on Elton, the field of invasion biology, and the idea of “nativeness.” The chapters in the next two parts, “Evolution and Current Dimensions of Invasion Ecology” and “New Takes on Invasion Patterns” don’t hang together as well, but I’m not sure where I would have put these chapters either. The meat of the book is called “The Nuts and Bolts of Invasion Biology,” and it is these nine chapters that people interested in determining the state of knowledge on ecological and evolutionary explanations of invasion success will be most keen to read. Almost all of the chapters cite very recent literature, including papers and books published in 2010.

The fifth part contains two chapters on “poster-child invaders”, while the penultimate part marks new directions and technologies being used to detect and evaluate the spread and impact of invasive species. This part has one of the more polemical chapters in the book, by Mark Davis. He critiques invasion ecology for relying on niche-based paradigms of community assembly and for overstating conclusions. Although this chapter is a rearrangement of one in his 2009 book *Biological Invasions*, I liked the inclusion of a chapter in *Fifty Years* that cautions against falling into the same “mess” that permeates community ecology.

The link to Elton and *EIAP* are tenuous for some chapters, but that doesn’t matter because almost every chapter provides a comprehensive, synthetic review of a topic of interest to ecologists. Interested in the state of the diversity-invasibility debate? Read chapter 10 by Jason Fridley. Interested in new techniques to detect invasive species at the point of entry? Read chapter 22 on the possibility of hand-held devices to perform DNA barcoding on the spot. In addition, several chapters discuss whether propagule pressure, the number of times and number of individuals of a species that are introduced, can ex-

plain most patterns of invasiveness equally as well as invasibility. Propagule pressure was not explicitly considered by Elton but clearly needs to be considered before invoking a niche-based paradigm of community assembly.

What would Elton say? Even with 30 chapters, each examining a different aspect of biological invasions, I felt like *Fifty Years* was missing a chapter reviewing evidence for or against the enemy-release hypothesis as well as biological control of invasive species. Elton wrote extensively about “counterpests” and the circumstances under which they may control invasive species, but this theme is not examined in *Fifty Years*. The only chapter highlighting the role of resistance by biota focuses on soil microbes, with a few examples about the effects of aboveground “natural enemies.” In addition, I would have liked to have seen more follow-up on the invasive species that Elton talked about in his book. Only two chapters incorporated this approach. James Carlton’s chapter on marine invasions updated the names of 31 of the 33 species that Elton mentioned, while the chapter by Petr Pyšek and Philip Hulme examined the current distribution of some of the animals and plants mentioned by Elton as invasive in Europe. Although many tools in population ecology have been used to try to understand the dynamics of invasive species populations, a chapter investigating individual-based and population-projection

models was also notably absent. Perhaps this was intentional, or perhaps the book, which contains 30 chapters and 432 pages in the paperback edition, was already long enough.

Some of the downsides of this edited volume are the lack of a common bibliography, variation in the strength of the chapters, and sections that contain chapters that don’t really fit together but wouldn’t fit elsewhere. Many edited volumes have these issues, and they should not be seen as unique to *Fifty Years*. With those caveats aside, the volume is a must-read for invasion biologists and would serve well in a graduate seminar on invasion biology if paired with *EIAP*. Indeed, the two books now sit side-by-side on my bookshelf.

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Edited by Markus Eichhorn

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