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Defending Biodiversity: Environmental Science and Ethics
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The authors of *Defending Biodiversity* – an ecologist and two philosophers – want to get one thing clear from the start: '…some may view this book as an attack on environmentalists and on the view that biodiversity ought to be conserved. It is not'. Instead, '…our hope is that reading this book will help environmentalists *improve* the arguments they make for conserving biodiversity' (p. ix). Well, hopefully it will, but in their telling it is far from easy to build a solid defence.

For those with little background in environmental ethics, this book makes a useful introduction. It could be valuable as a course textbook, with its highly structured and didactic approach. It updates and extends Norton's well cited and readable *Why Preserve Natural Variety?* (1987), while Maier's *What's So Good About Biodiversity? A Call for Better Reasoning About Nature's Value* (2012) has similar aims but a more polemic tone.

Defending Biodiversity begins with an attempt to define 'biodiversity' and a basic critique of the concept. It then tries to define what the authors mean by 'environmentalism', while recognising that there is no single environmentalist position. Nonetheless, the book's focus occasionally broadens into a defence of environmentalism (e.g. chapter headings such as 'How far do intrinsic value defences get environmentalists?') rather than biodiversity *per se*.

The main body of the book is divided into two parts. Part I deals with arguments for defending biodiversity that focus on its instrumental value, and Part II deals with intrinsic value. For the authors, neither approach offers a bullet-proof, catch-all rationale for conserving biodiversity.

The instrumentalist point of view is that biodiversity exists to serve humans and is only valuable to the extent that it does something for us. This line of argument takes a hard beating. Chapter 2 looks for evidence that biodiversity underpins ecosystem function and stability, and finds little support from empirical studies. The authors argue that much of the diversity in real-world ecosystems is redundant: if one species goes extinct, another will fill its ecological niche. Chapter 3 examines the 'Precautionary Principle' – the idea that we should avoid reducing biodiversity in case of unforeseen negative consequences – and shows that some degree of risk is inevitable in environmental management; we need to balance the potential but imperfectly known risks of (say) neonicotinoid pesticides against their potential benefits, *and* the similarly unknowable costs of foregoing them. Chapter 4 considers whether biodiversity should be preserved just in case some species turn out to be useful for food or pharmaceuticals, and concludes that it is usually more economically rational to set up a gene bank in a warehouse than to preserve organisms in the wild. Chapter 5 shows that nature-based tourism is rarely economically competitive with other land uses such as agriculture.

So by the time that Chapter 6 summarises Part I, the reader should be in no doubt that these instrumentalist arguments will not yield a solid defence of biodiversity. However, I found myself unconvinced. Much of the discussion is based on lengthy summaries of a handful of papers. For example, pages 68–76 summarise a single meta-analysis of the role of producer diversity in ecosystem function. Newman et al.'s reading of this paper dwells on the many uncertainties in the science, and on the fact that diversity and the many aspects of ecosystem function are not always correlated. The reader would not guess that the original authors, in this and other papers, instead emphasised the 'unequivocal' empirical support for the view that high biodiversity often (if not always) promotes ecosystem services such as carbon storage. Later, 13 pages are devoted to a list of species used in 'Modern Medicine' (pp. 145–157), adapted from one published elsewhere in 2004, in

order (paradoxically) to emphasise how small that list is; I would have preferred to see the space used to review a wider, more recent literature.

Part II focuses on the arguments that biodiversity has *intrinsic* value, that is, that biodiversity is valuable for itself and not just because it is useful. For the benefit of readers with little philosophical training, Chapter 7 explains how academic philosophers construct an argument, and provides a very short primer on the history of Western moral philosophy. Chapter 8 looks at 'Extensionism in Environmental Ethics': the view that fundamental human rights, such as the right to life, should be extended to at least some other categories of organisms (e.g. sentient animals). This is held to be problematic for 'environmentalists' (all of them?) because it would conflict with some common practices in environmental management – e.g. culling deer to protect forest ecosystems. Chapter 9 considers and essentially dismisses the 'ecoholist' view that whole ecosystems should be treated as though they have rights. Chapter 10 is a detailed exploration, and dismissal, of one particular flavour of ecoholism, Aldo Leopold's 'land ethic'. This was a highlight of the book for me: its sustained critical analysis of a single topic made a welcome counterpoint to the wide-ranging discussions elsewhere.

Chapter 10 finishes off the discussion of intrinsic values with an exploration of what the authors hold to be a promising line of research, the analogy between biodiversity and works of art. Much like art, biodiversity adds to the richness of our lives. Even without an education in art appreciation, most people can derive enjoyment from the pretty things in our environment, the flowers and the butterflies; and as those of us who work with Nature's less charismatic products know (tropical swamps, anyone?), familiarity and education can lead to an aesthetic appreciation of any organism or ecosystem. But a problem with this line of reasoning is that artworks are widely thought of as a luxury, not a necessity. For the millions of people across the planet who struggle to meet their basic needs, arguments for biological conservation that are grounded in aesthetics are unlikely to seem compelling.

Defending Biodiversity closes with a chapter in which the three co-authors write separately about the development of their personal viewpoints through time. Strikingly, all three admit that they have yet to find a satisfying justification for their firmly-held belief in 'environmentalist' values. It seems that logic and science can help environmentalists to rationalise their beliefs, but only up to a point. There *are* times when it makes sound economic sense to protect ecosystem services, and there certainly *is* a case for treating sentient animals with respect. But no-one has yet discovered a universal argument that will always make a compelling case for conserving biodiversity.

Perhaps that would be an unrealistic expectation: 'biodiversity' is probably too broad a concept to be rigorously defended by a single line of argument. And how many 'environmentalists' believe in protecting *all* biodiversity? I'm not sorry that smallpox and Spanish flu have been driven to extinction, and I'd like many other irreplaceable, intricate, highly-evolved pathogenic microbes and parasites to go the same way. But the sound advice from this thought-provoking book is that those who would defend biodiversity should question their assumptions and frame their arguments with care.

References

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