

Preface

This book is a collection of anecdotes and observations and philosophies by a subset of the scientific community: lepidopterists. Many of the authors in this book do not refer to themselves as lepidopterists, rather they might be ecologists or molecular biologists or systematists, but they all share one thing in common. They all made the decision to spend their lives thinking about caterpillars, and moths and butterflies, which is an odd thing if you pause to reflect. Among people who make their living as scientists, many or maybe most would like to directly improve the fate of humanity by curing disease or inventing an unlimited energy supply.

Lepidopterists are a different folk, because butterflies and moths are not going to save the world. They are beautiful and strange, and the benefit they offer to humanity is more subtle than an everlasting cell phone battery. So why do we do it? An easy answer is because they are really handy study organisms for all kinds of basic questions about how the natural world works, at least in part because they are easily observed. This is particularly true of the butterflies, which have a unique combination of features in that they are conspicuous (day-flying) and gentle (butterflies have no weapons, as Jim Scott observed¹), which means that anyone can observe them and keep notes. Because so many people have observed butterflies for so many decades, we know how entire faunas (groups of animals living in the same place or region) have shifted and evolved over time. Butterflies have provided key insights into the ways that organisms respond to changing climatic conditions and human-modified landscapes.

However, if the question is “why do we do it?” then the value of butterflies and moths as objects of scientific study feels like far too easy an answer. This is because most of us who spend our time with butterflies and moths only discover their scientific utility at some later point in life, perhaps when we think about careers and long after we become addicted to the creatures. Instead, the answer might be as easy as this: We study butterflies and moths because we are charmed by them. Many of the authors in this book recall an early experience with a caterpillar in the grass or a large moth at the window that captivated them, apparently for life.

¹ Scott JA (2010) New terminology for describing mate-locating behavior of butterflies (and moths), with examples in Colorado. *News of the Lepidopterists' Society* 52:58–62.

But, you might object, surely butterflies and moths are essential parts of essential ecosystems and we have to understand them in order to keep the world functioning. Perhaps. If all caterpillars as well as adult butterflies and moths were to disappear from the planet tomorrow, there would indeed be consequences. Birds would suffer the loss of caterpillars to feed to their families, and millions of species of specialized flies and wasps that also depend on caterpillars as food for their young would go rapidly extinct. Plants, however, might be happier, because they would be spared the outrageous number of little bites they suffer every day. In any event, none of these things explain the addiction that attaches lepidopterists to their subjects.

Even though the answer might be as simple as I have suggested (we study moths and butterflies because we are charmed by them), many of us at public institutions use tax dollars, so we should be responsible for a more articulate answer. Here's my shot at an answer: Butterflies and moths are worthwhile subjects because the study of lovely and alien creatures satisfies our human need for riddles. Because Lepidoptera are both insanely diverse (possibly as many as a quarter million species) and also reasonably well understood (at least in terms of basic biology and ecology), they hit a certain sweet spot for the scientific imagination: plenty of riddles to go around, but the challenges feel just tractable enough to not be terrifying. By way of riddles, we can ask, among other questions: Why are most Lepidoptera so specialized in their feeding habits? Or why are some lineages of moths so much more diverse than others? Or how does the diversity of caterpillars affect the diversity of phytochemicals in plants and forests?

In addition to addressing those questions, I hope that I contribute to society by exposing others to these creatures that go about their lives without any concern or interest in human beings. When I have given presentations on insect diversity for elementary schools, occasionally I have been asked, often by a parent: "That's very interesting, but what do butterflies *do*?" Having fielded that question a couple of times, I have come to be pretty sure that what they are really asking is: "What do butterflies *do for me*?" The answer of course is that butterflies just *are*, and they do not care about you at all. For the kids at least, I think that perspective makes a few of them look around and consider the world in a slightly different way. Too many of them have somehow gotten the message that studying biology leads only to a career in medicine, but there are plenty of viable careers in science that start with a butterfly net.

Please do not assume that any of the other authors in this book would provide the same explanation for why they study butterflies and moths. Happily, the community of lepidopterists is just about (but not quite!) as weird and diverse as the butterflies and moths we study. If you are not a lepidopterist yourself, I think you will enjoy meeting the authors of these chapters. I hope that some of the joy they get out of butterflies and moths inspires you to take a second look at some strange creature in your backyard that does not care one whit for you (one of my favorites is shown in Fig. 1). If you are a lepidopterist, then we apologize for not inviting you to write a chapter! The community is large and we have left a great many people out; there was just no other way to go about it. Even to attempt a list of the people we wish we could have included would inevitably leave some people out. However, I suspect you (if you are a lepidopterist) will find someone you know in these chapters, and



Fig. 1 A small package full of surprises: the western pygmy blue butterfly (*Brephidium exile*), is one of the smallest butterflies in North America. With a wingspan of typically less than 2 cm, adults can be mistaken for swarms of flies as they fly low to the ground. The caterpillars are tended by ants that protect them in exchange for sugary rewards, and consume a number of plants that include the exotic (nonnative) tumbleweeds, *Salsola* species, famous from cowboy movies. Despite their small size, the adults are quite far ranging, which in combination with rapid generation times, allows the species to seasonally spread across enormous distances, even into areas that are too cold for it to maintain permanent populations. (Illustration by MLF)

hopefully that someone has written down a story that will preserve a bit of the legacy of late twentieth-century and early twenty-first century lepidopterology.

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