

should not misinform with ideas that we can understand all butterfly biology and identification without research requiring sampling (yes, at times with a net) a small fraction of an overall species pool (very few collectors have used their nets to decimate the remaining populations of declining butterflies). In this regard, the book does not address the importance of conservation with a complete insight into the study of Lepidoptera. We absolutely cannot, and throughout history we could not have, come to the level of understanding (especially the accurate identification) of butterflies by observing them through binoculars or photographs, and much remains to be discovered, even in North America. **This book is for novice (perhaps naïve?) lepidopterists beginning a hobby, but would be of marginal use to the experienced lepidopterist.**

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THE MILLENNIUM ATLAS OF BUTTERFLIES IN BRITAIN AND IRELAND, by J. Asher, M. Warren, R. Fox, P. Harding, G. Jeffcoate and S. Jeffcoate, Oxford University Press, 456 pp.; 270 color illus: publication 2001; Cloth ISBN: 0-19-850565-5; Cloth Price: \$40.00.

The United Kingdom has had virtually no intact habitat for the past 500 years and it sports less than 100 species of butterflies. Nonetheless, there are more books treating the butterflies of the British Isles than anywhere else on earth. So why do we need another book? Despite the area of coverage and topic this is not simply another butterfly book. It is a revelation. The six collaborative authors, whose professions include physics, ecology, biochemistry and medicine have not produced something assembled by committee. Rather, the fruits of their labor resulted in a decidedly readable book that is comprehensive, visually beautiful, scholarly and eminently valuable to a wide audience. The information content and style of the Millennium Atlas is a remarkable benchmark that future butterfly books must attempt to emulate.

The backbone of the Millennium Atlas is the incredibly comprehensive understanding of butterfly distributions. Collated by over 60 people in charge of coordinating local records, hundreds of thousands of observations were verified, entered into a central data-

base, plotted on a detailed geographic grid map whose resolution ranges from 10 km² to 100 m², and then analyzed in the context of records spanning over 100 years. Thousands of volunteers (amateur and professional) contributed to what, in some cases, consist of many thousands of observations per species on each map. This is the template for the Millennium Atlas. The result is a magnificent understanding of the historical variation in distribution, population ecology, reproductive biology, colony dynamics, food plants, habitat use of each species, and a chronology of changes that reveal conservation successes, threats and failures.

The detailed species accounts draw from the comprehensive database and, of course, form the corpus of the book. Each account provides a full-page distribution map, a color photograph of the butterfly taken in the wild, and a complete account of food plants, habitat, lifecycle and colony structure, local distributional trends contrasted with those on the European mainland, a summary of the ecological and conservation outlook for each species, and references to recent literature. Each species account is a pleasure to read, and a work of art into the bargain. Therefore the book will be of use to virtually anyone with an interest in butterflies and their place in nature.

Tucked away at the end are nine appendices ranging in content from vernacular names and addresses where contributing data should be sent, to lucid graphs showing dynamical changes in the abundance and distribution of many species. These are followed by a comprehensive bibliography that provides the reader with a tremendous amount of research possibility. Calling these sections thorough hardly gets into the ballpark, or if you prefer, the cricket pitch. These sections are vital examples of how scholarly information can be presented in admirable and easily accessible form.

This volume resonates a cultural history that emphasizes cognizance of the natural world. For generations, denizens of the British Isles have shown an abiding interest in natural history, a proclivity to make abundant and accurate observations, share them, and interpret those observations for understanding wildlife and its conservation. Such a historical cultural interest in butterflies has fostered, and ultimately led to, the Millennium Atlas. However, the Millennium Atlas is not a finished work that heralds the end of butterfly study in Britain. Rather, the recent collaborative efforts of many European biologists working on butterflies in a fragmented landscape attests to it being a springboard to further refine our dynamic range of understanding butterflies. In producing the Millennium Atlas the cultural heirs of Darwinism elegantly demon-

strate the evolution of butterfly populations in the context of a changing environment. Those of us who work in areas where so little is known about butterflies may be daunted by such an effort. Nevertheless, it is clear we must strive toward its example.

Sturdily bound, filled with illustrations and information, and inexpensive, this book is uniquely outstanding in many ways. However, I especially appreciated one aspect of it; the subtle yet pervasive conservation underpinning based on the study of butterflies. If I read the message correctly it might be paraphrased in a more general way: appreciate and learn from nature before it vanishes into the increasingly greedy maw of the human dominated landscape. That is to say, the game is not just about collecting and writing epitaphs of colorful insects. It is about preventing the ecological holocausts that surround us, and surviving. As the song title suggests, now is the time.

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BUTTERFLIES THROUGH BINOCULARS: THE EAST. A FIELD GUIDE TO THE BUTTERFLIES OF EASTERN NORTH AMERICA, by J. Glassberg. 1999. Oxford University Press. \$18.95. ISBN 0-19-510668-7

HOW MUCH SCIENCE IS TOO LITTLE?

The practice of butterfly watching has rocketed in recent years, fueled primarily by increasingly accessible field guides equipped with easy shortcuts to identification, technological advances in photography, and numerous organizations, local and national, devoted to furthering public awareness of butterflies and their diversity. Butterfly watching, a healthy medium for natural history education, has realized considerable popularity not just among weekend naturalists and recovering bird-watchers, but also among educators and even professional lepidopterists that participate in local butterfly counts. Dr. Glassberg's *Butterflies through Binoculars: The East* (hereafter BTB) is likely to surpass previous guides' popularity among butterfly watching enthusiasts, and to that end it serves as a photographic guide for most eastern butterflies. Unfortunately, the general utility of this book is reduced sharply by several shortcomings, all of them related to the furtherance of lepidopteran science and science-based conservation.

It is difficult to decide in what spirit to review this book. It is clearly a volume intended for hobbyists

(which is fine), but at the same time the purview of its influence is intended to include matters of scientific import, and it includes promotional material linked to the North American Butterfly Association (NABA). The historical and organizational context from which the butterfly-watching movement has sprung is plain within the pages of BTB, and I therefore view it as impossible to review this book and some of the information presented therein independently of similar messages published by NABA. It is my hope that a contextual review of this kind will add more light than heat. Regardless, after tending to the book's technical aspects, I will proceed to its message.

First to the nitty gritty. The meat of BTB is of course its 283 species accounts and accompanying photographs. Again, through these, BTB is a fine introduction to observing butterflies of eastern North America. Species accounts include identification cues, geographic range maps (which accompany the plates), some life history information, including primary host plants and extensive flight season data in the form of "phenograms" which consist of rough relative abundance by month in four geographically separated states (WI, NY, NC, and LA) generated in consultation with various local experts (no use of collection data is referenced). The lack of detailed descriptions should not be viewed as a shortcoming, assuming the guide's primary target audience comprises hobbyists and prospective inventorists. The identification cues are by and large well crafted, with the exception of their reliance on comparative observation: Size measurements for species are not generally given, but evaluated with reference to other butterflies. Field diagnoses, when present, are emboldened, and brief descriptions accompanying plates make quick identification easy and reduce the need for page flipping. The photographic quality is generally quite good (with a few exceptions), and should help butterfly watchers get a feel for what various species look like in vivo, although field marks are not consistently delineated. The photographs are also carefully scaled against others on the plate. In any event, BTB should serve as a step towards identifying butterflies reliably in the field, and therefore meets its purpose.

The text comprising the book's introduction includes sections on butterfly photography, butterfly gardening, tips on finding butterflies, and butterfly biology. There is no discussion of proper vouchering, collecting, or rearing techniques or protocols, nor any broad discussion of butterfly taxonomy or systematics except for some remarks buried in the species accounts. With those exceptions, this material serves as an adequate introduction for the casual butterflyer.