world. Annotations for most species consist of "Common Names," "Host Records," "Geographical Records," and "RAE References." RAE references are to volume number only, thus fostering compactness in the book without greatly hindering retrieval of abstracts and original publications.

Index of Specific and Infraspecific Epithets serves as the book's general index. It is arranged alphabetically by species names, each followed by the preferred generic name in bold italics and any nonpreferred ones in plain italics.

Manufactured at the University Press, Cambridge, the book's print format is comfortably readable, its paper of high quality, and its binding sturdy.

Shortcomings are self-acknowledged. One is that choice of species for inclusion follows from prior inclusion in ANI and RAE. Actually, many included species are of scant economic importance. Some seem present only because important congeners are, or because of a commodity host plant. A few entries lack host records; very few host records mention the plant part affected. It is also stated that expediency prompted assembly of annotations almost entirely from RAE and CAB ABSTRACTS, and therefore the host lists and geographic ranges are not comprehensive. There may be overmodesty in this caveat because RAE covers more than 6200 serials, not to mention annual reports of research and other organizations (Smith, S. [ed.], 1988, *CAB International serial checklist*, 1988 ed., 511 pp.). The annotations for an arbitrary list of species I am familiar with seemed quite adequate. A few synonymies had not caught up with ANI in time to be included in the book. Refreshingly, the book invites readers to suggest improvements to CABI for future editions.

In addition to a source of snapshot information on economic Lepidoptera worldwide, this book improves accessibility to RAE. RAE, an admirable legacy of empire, is the oldest entomological abstract journal, indeed, the only one for more than half a century (Gilbert, P. & C. J. Hamilton, 1990, *Entomology: a guide to information sources*, 2nd edition, Mansell, New York, 259 pp.). It is useful anywhere—in developed countries because it abstracts many obscure publications from the less developed often in languages other than English, and in developing counries because it abstracts expensive publications from the more developed countries. Beginning in 1913 as the Review of Applied Entomology in two series, agricultural (A), and medical (B), RAE was more formally divided in 1990 when the letters began to stand for Review of Agricultural Entomology. Countless professional and student literature reviews have been and still are generated from RAE. ANI and RAE are not only being continued but expanded, references by the thousand being added annually.

The book also aptly identifies its audience, namely people involved in international, national, and local plant quarantine and crop pest management. Journal readers might browse in it for a different or broader spin on their favorite taxa. Anyone who opens it will find it easy to use and informative.

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A MONOGRAPH TO THE NEW WORLD HELIOTHENTINAE (LEPIDOPTERA: NOCTUIDAE), by David F. Hardwick. 1996. Published (apparently) by the author through the Centre for Land and Biological Resources Research, Agriculture Canada, Ottawa, Canada. 281 pages, 24 color plates. 17 × 25 cm, ISBN: None. Soft cover, $50 US; hardcover, $70 US, available from the author.

This attractive and potentially useful book is a compilation of Hardwick's extensive work on this widespread, popular subfamily of the Noctuidae. The subfamily Heliothinae (see below) includes some well-known genera (such as *Heliothis* and *Schinia*) that are brightly colored and can be observed both at lights and on the flowers of the larval foodplants. The

147 species discussed in this book include all apparent known species from Canada, the United States, and Mexico. Hardwick attempts to describe 8 new species and raises a few more to species status. He also attempts to resolve confusing species groups, and in the process synonymizes several species names. This book represents the first major revision of the subfamily, picturing mounted adults of all species as well as the larvae of many, and so is a vital resource for anyone interested in the Heliothinae.

The book is user-friendly in many respects. In the Introduction, Hardwick presents an overview of oviposition behavior and foodplant choice, number of broods and flight periods (in synchrony with the flowering of foodplants), adult behavior and lifespans, and larval feeding habits. He also provides an excellent section on specific rearing techniques for numerous species, as well as general descriptions of all life stages. In the individual species accounts, he presents characteristics of each larval instar and of the pupal stage for those species that have been reared. He includes a larval food plant table for quick reference for those interested in rearing. The color plates depicting the larvae are excellent, providing images that should allow the reader, along with the appropriate sections of text, to make reasonably accurate identifications. The plates of the mounted adults, however, do leave something to be desired. Plates H, J, and L are excessively dark, though are not obscured to the extent where they are virtually useless (Brou, Vernon A., 1997, *A brief critique of "A monograph of the North American Heliothentinae" by David F. Hardwick*, News So. Lepid. Soc. 19:5). Even though the images of many adults are dark (for example those of *Schinia indiana* and *Schinia "conizae"* on plate H are indistinguishable) the images are reasonably accurate and average wingspans are given for each species. Presumably, the individuals who will be using the book will be somewhat familiar with the Heliothinae, and should be able to identify most species through comparisons with the plates.

Although "useful" is a word I used above to describe the monograph, "unsettling" is unfortunately also appropriate as the book experiences a number of shortcomings. The references cited in the book offer an excellent resource of information to anyone interested in heliothine moths, but some extremely important references on noctuid moths are omitted, such as the work on cutworm moths by Rockburne and Lafontaine (1976, *The Cutworm Moths of Ontario and Quebec*, Canada Dept. Agric. Res. Branch Publ. 1593, 164 pp., 613 figs.) and the major work on the owlet moths of Ohio (Rings, Roy W., Eric H. Metzler, Fred J. Arnold, & David H. Harris, 1992, *The Owlet Moths of Ohio (Order: Lepidoptera; Family: Noctuidae)*, Ohio Biol. Surv. Bull. New Series Vol. 9 No. 2., 219 pp., 16 plates). These omitted references provide important information on both flight periods and ranges for several species that would have extended Hardwick's ranges for some species. For example, Hardwick states that *Schinia parmeliana* occurs in the Gulf States, but it has been recorded from Ohio (Rings, et al., ibid.), as has what Hardwick calls *Schinia grandimedia* (=*Schinia oleagina* in Ohio in Rings, et al., ibid.) that he lists as occurring from Kansas westward. Additionally, although several important institutional and private collections were apparently examined, Hardwick clearly did not examine a number of other collections that would also have filled in or extended the ranges for many species. For instance, Hardwick indicates that he examined specimens of *Schinia bimatris* "only from the type locality in Texas and from. . . Brandon, Manitoba." Does this mean the species occurs in two very isolated populations, or does the range extend all the way from Manitoba to Texas? The examination of just a few collections from the Great Plains and Rocky Mountain states would have allowed Hardwick to give the range as "sparsely distributed" in much of the Great Plains (as far east as Lawrence, Kansas). Several other ranges are underrepresented: *Schinia ultima* extends north and east of the indicated range into northeastern Kansas and northwestern Missouri; *S. regia* extends north into northwestern Kansas and eastern Colorado; *S. chrysella* is abundant in Missouri and recorded as far east as Kentucky; *S. sexplagiata* extends eastward into west Texas; *Derrima stellata* has been taken many times as far west as Missouri; *Heliocheilus lupatus* extends northward into southern Tennessee; and *H. julia* occurs in the Davis Mountains of west Texas (a locality that is frequented by collectors), not just in Arizona and New Mexico in the United States as listed by Hardwick. I am well aware that the stated ranges/range maps in any book on any group of organisms can never be completely accurate, but the underrepresentations in this book seem a little excessive.

By far the most disturbing aspect of the book are the nomenclatorial problems that have been created in the monograph. Hardwick uses "Heliothentinae" to represent this subfamily, even though the currently approved name (by the International Commision on Zoological Nomenclature [ICZN]) is "Heliothinae." He gives a reasonable argument as to why the name should (probably correctly) be "Heliothentinae," but unfortunately the name currently has no standing. Though the subfamilial name may seem to some to be a minor point, Hardwick's "descriptions" of new species present a major problem to anyone working with heliothines. Hardwick states in his introduction that ". . . genitalic characters [are not] employed in the treatment of species in the present work." Unfortunately, this practice includes treatment of his "new" species. As indicated by Heppner (1996, *Book review: A monograph to the North American Heliothentinae (Lepidoptera: Noctuidae)*, Holarctic Lepid. 3:42), the new species descriptions lack appropriate descriptive information, with no information on or illustrations of genitalia, and very little discussion of important characteristics distinguishing these species from other similar species. It is doubtful that most of the new species are even validly described, as there is not enough diagnostic information presented in the text (according to the appropriate ICZN rules). For instance, Hardwick's "new" species *Schinia blanca*, *S. pulchra*, *S. arizonensis*, and *Heliolonche joaquinensis* are all described solely by the statement "The new species is as illustrated in Figure. . ." (see Brou, 1997, ibid.). *Schinia grandimedia*, *S. macneilli*, and *S. subspinosae* are described in a little more detail, but only in comparison to "macular differences" with the close relatives *S. trifascia/oleagina*, *S. persimilis*, and *S. spinosae* respectively. Of all of Hardwick's new species, only the ultimate instar larva of *H. joaquinensis* is described (and illustrated), and the description of the larva is more extensive than that of the adult. *Pyrrhia adela* is also described as new, but the authors of this species (Lafontaine and Mikkola) have used genitalic characters to indicate distinctness from the Old World *Pyrrhia umbra*, the name previously applied to the North American species. Some other "species" have been raised to specific status, including *Schinia conizae* and *S. intermontana*. These two were originally described by Hardwick (1958, *Taxonomy, life history, and habits of the elliptoid-eyed species of Schinia (Lepidoptera: Noctuidae), with notes on the Heliothidinae*, Can. Entomol. Suppl. 6:1–116) as subspecies of *S. villosa*, but he now separates them (unfortunately again) on the basis of coloration and macular differences. At least the larval and pupal descriptions of *S. villosa* and *S. intermontana* are detailed and do include some distinct differences. In spite of the problems with the "new" species descriptions, Hardwick has done a respectable job of putting information about heliothine species in one work, though the reader should be aware that there are at least a few species of *Schinia* known to me that are neither pictured nor described in the text (perhaps we should be thankful about this?). As such, not quite the entire fauna is covered in the text, and the reader may, as is always the case, encounter additional undescribed species.

Almost as disturbing as the lack of descriptive information for his "new" species are the numerous synonymies made with an apparent lack of appropriate morphological evidence i.e., he does not discuss what features support the synonymy. Actually, the first major synonomy of *Heliothodes fasciata* and *H. joaquin* with *H. diminutiva* is extensively discussed and well supported. However, virtually every other synonomy lacks credible discussion. Hardwick does indicate where the types are deposited for the synonomized species and whether genitalic preparations have been made. In two cases, types were lacking abdomens, so comparisons of the genitalia of the types was impossible. Hardwick states *Schinia alencis* is a synonym of *S. chrysella*, explaining that *S. alencis* is a form of *S. chrysella*, but that the type of *S. alencis* is missing the abdomen. He does not give any indication in the text that other specimens of *S. alencis* have been examined for any unifying characteristics. Hardwick also synonomizes *Schinia ernesta*, *S. baueri*, and *S. sara* with *S. oleagina*, but indicates that the "evident monotype of *S. oleagina*. . . is without abdomen." Some very familiar species, such as *Schinia bifascia* and *S. gloriosa*, have also been synonomized with *S. gracilenta* and *S. sanguinea* respectively, again with no discussion. Even worse, *Schinia ar*, *S. approximata*, and *S. labe* are all synonomized with *S. sordida*, not only without discussion, but with a statement that "the species [*sordida*] is highly variable in maculation and colouration." An unfortunate side effect of the apparent unsupported synonomies is that the reader will be left unsure as to what species the larval descriptions

and plates may actually represent; thankfully, Hardwick does indicate the source area for all larvae reared. In Hardwick's defense, some of the synonomies are valid. For instance, *Schinia inclara* has been synonomized with *S. siren*; specimens of "*inclara*" I examined are superficially indistinguishable from those of *S. siren*, and the genitalia of the two "species" are virtually identical.

The book, despite all of its shortcomings and uneven as it may be, contains a tremendous amount of useful information. It is the only available compendium of the North American heliothine fauna, and reasonably affordable. Interested workers will find it useful as a visual identification tool, and an excellent resource for adult behavior and larval rearing information for some species. But in many cases the reader is left to wonder what names are actually valid, and some groups are potentially more confusing now (such as the *S. gracilenta/bifascia/oleagina/ernesta/baueri/sara/"grandimedia* [sp. nov.]" group) than before the publication of the book. But as is the case with any revisionary work, there is always some debate over nomenclature. There is little doubt that anyone interested in the heliothines will want this book.

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SUOMEN KIITÄJÄT JA KEHRÄÄJÄT, by Olli Marttila, Kimmo Saarinen, Tari Haahtela and Mika Pajari. 1996. Published by Kirjayhytmä Oy, Helsinki, Finland. 384 pages, 153 color photographs, 3 black and white photographs, 29 color plates, 137 maps. Hardcover, dustjacket, glossy paper, 21.5 × 28.5 cm, ISBN 951-26-4145-3. Available from South Karelia Allergy and Environment Institute (Lääkäritie 15, SF-55330, Tiuruniemi, Finland, e-mail: all.env@inst.inet.fi) for about US $77.00 (postpaid, airmail).

This team of Finnish authors has again given the lepidopterological community an outstanding book documenting their fauna. As a follow-up to their 1990 book, *Suomen Päiväperhoset*, on the butterflies of Finland (reviewed in 1997 by Warren in the *News of the Lepidopterists' Society*, 39:16–17), the title of this new book roughly translates to mean "Finnish Bombyces and Sphinges," a traditional concept that includes Sphingidae, Lasiocampidae, Saturniidae, Notodontidae, Lymantriidae, Arctiidae, Endromidae, and Lemoniidae. These are the families treated in this volume, and are now all classified in Bombycoidea and Noctuoidea by most taxonomists.

Although the very detailed text is in Finnish, there is an English summary under each species giving basic data on habitat, distribution (with a map of Finland), phenology, and hostplants. A total of 14 excellent illustrations of male and female genitalia are included in the text for similar species that are difficult to distinguish without genitalic examination. A detailed bibliography on the Scandinavian literature published on these moth groups is of particular value.

The common names of every species covered in the area are given in Finnish, Swedish and English. Swedish is the primary language of about 6% of the Finnish people, but is used regularly by a much larger percentage. While some of us can wade through many foreign language texts using our knowledge of related languages and relying on cognates, this expectation cannot be realized in the case of Finnish, which is neither a Slavic nor Germanic language. We would have liked to see an English version of the table of contents, so that we would not have to guess the topics of the chapters by illustrations alone. These chapters include rearing in captivity, collecting in the field, preparation of specimens for collections, morphology, ecology, and complete species treatments for all 109 species treated, as well as 26 additional species which have not yet been recorded from Finland, but are considered likely to be found in the future. Regarding collecting, imagine collecting moths during the northern summer when the sun never sets!

This book will appeal to book collectors, especially those like us who value books having many color photographs of living caterpillars and adult lepidopterans in their natural habitats. The abundance of stunning and clear photographs with well thought-out compositions (often showing habitat in backgrounds) more than compensates for a text which one may not be able to read. Most of