

TROPICAL LEPIDOPTERA NEWS

September 1996

No. 3

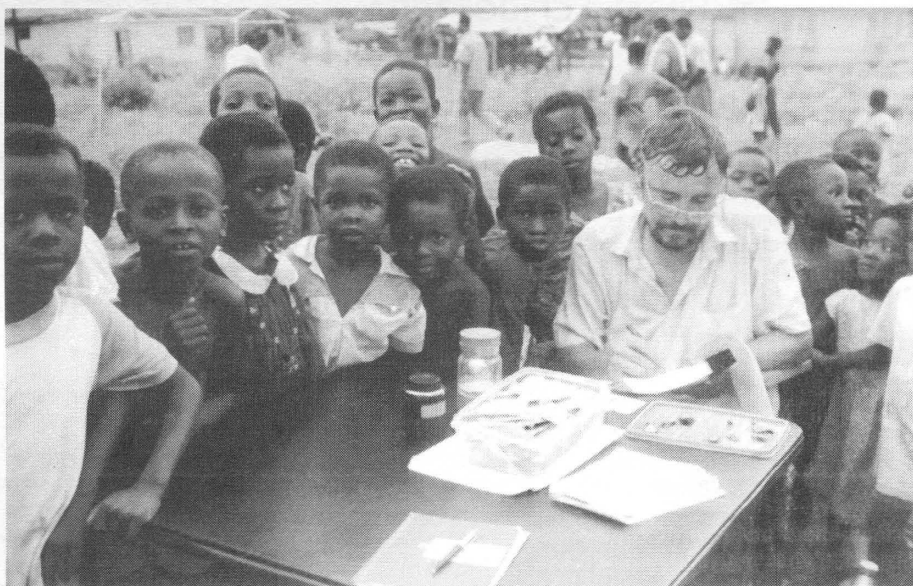
Presidential Address 1996: Dr. Torben B. Larsen BUTTERFLIES AS INDICATOR SPECIES IN AFRICA

Background

During the past nine years I have been able to devote much of my time to study the 3,700 African butterflies, from the driest deserts to the wettest rainforests, from Botswana and Namibia, to Ethiopia and Senegal. I take the opportunity of my presidential address to share some of my experiences and thoughts with members of the Association for Tropical Lepidoptera.

When I first visited Africa in 1967, spending three months in Nigeria, the Seitz (1925) volume on the Ethiopian Region was still the main reference work. It was written single-handedly by Christer Aurivillius, high on my shortlist of people I dearly would have liked to meet. While there were good books on the butterflies of South Africa and Malawi, the rest of the Afrotropical Region did not even have attempts at comprehensive checklists, except for the useful book on Liberia (Fox *et al.* 1965). Many groups, especially of the Lycaenidae and the forest-floor Nymphalidae were in taxonomic chaos.

The last thirty years have seen considerable progress. Carcason (1981) developed a checklist of all Afrotropical butterflies, the manuscript of which was the basis for D'Abbrera's (1980) illustrated catalogue. Berger (1981) published a lavishly illustrated book on the butterflies of Zaïre. Kielland (1990)—tragically killed in a recent car accident—covered Tanzania, with the exception of the extreme northwest. The following year my own book on Kenyan butterflies appeared (Larsen 1991). Bampton *et al.* (1991) developed a checklist for the Congo Republic, though this country



The next generation of African entomologists surrounding your President in Boabeng-Fiema, Ghana.

will have more than the 800 records that they found. Finally, Libert (1992) listed all butterflies from Cameroon not mentioned by D'Abbrera from that country; there are at least 1,500 species in Cameroon.

Evans (1937) did a very impressive review of the HesperIIDae which has stood the test of time well. Henri Stempffer, often in collaboration with Neville Bennett at the British Museum, brought a remarkable degree of order out of the chaos that was then the Lycaenidae. Condamin's (1973) revision of the large Satyrine genus *Bicyclus* is a model of its kind. Pierre, in numerous articles, brought the Acraeinae up to date, and Hecq (1989, 1990, 1994) is battling valiantly with the

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TROPICAL LEPIDOPTERA NEWS

Editor: J. B. Heppner
Assoc. Editor: Thomas C. Emmel

Published by the

Association for Tropical Lepidoptera, Inc.

Publication Office: c/o Florida State Collection of Arthropods

P. O. Box 141210, Gainesville, FL 32614-1210, USA

Tel: (352) 392-5894 FAX: (352) 392-0479 www.troplep.org

Frequency: Quarterly (March, June, September, December)

e-mail: jbhatl@aol.com

ISSN: 1062-6581

The Association for Tropical Lepidoptera, Inc., is a non-profit corporation for the study and conservation of tropical and subtropical Lepidoptera of the world. Contributions are tax-deductible.

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TO OUR READERS

Two articles in this issue, one by our current President and the other by our colleague in the Netherlands, Jan van der Made, provide interesting overviews of research and collecting, and of their inter-relationship, particularly regarding the contribution of amateurs. The collecting controversy has more recently brought many environmentalists to regard collecting as bad (especially among those who know birds and mammals but know little to nothing about insects and their very different biologies); this mainly involves only butterfly collecting, especially by amateurs, and usually does not include other insects such as mosquitoes, bedbugs, roaches, etc. Yet, alongside the campaign to blame the amateur collectors for the reduction in butterflies in some areas, we find little notice given to rampant clear-cutting of habitats for shopping centers, industry, tree farms, etc., especially when no large trees are being cut. Interestingly, our own President is an advanced amateur in whose case irrational collecting guidelines, if adopted, might greatly curtail the collecting needed to conduct his research! It is good, then, to read the article by Jan van der Made about rational collecting guidelines for insects and which includes the valuable contributions of amateurs! The latter article also briefly alludes to the often incredible ignorance sometimes encountered, as when he noted that caterpillars become butterflies (some people will readily kill all caterpillars, not even knowing that some caterpillars turn into butterflies!). More education is certainly needed so rational rules on insect specimens can be made by local and national governments.

J. B. Heppner

Executive Director

NOTES

1. **1997 Annual Meeting:** April 4-5, in Gainesville. Dr. Thomas C. Emmel is in charge of the Annual Meeting this year.

2. **1997 Annual Photo Contest**

Members are welcome to enter up to 5 photographs (8x10 in) in each of three categories: butterflies, moths, and immatures. We now accept photos of temperate or tropical species. Prizes total \$480; winners are published in *Tropical Lepidoptera* or *Holarctic Lepidoptera*. Deadline is March 15, 1997; likewise each year. There is no entry fee.

3. **DUES**

The 1997 dues form shows a restructuring of the cover prices of our journals to \$75 for both journals. However, members paying on time will not see any dues increase: still \$65 for both journals if paid before the end of 1996. Members should send in their 1997 dues payments on time, before December 31, 1996! Your timely dues payment will provide a saving of \$10 over the new regular charges of \$75 for both journals (\$15 off the individual list price of our journals!). Single journal (either *Holarctic Lepidoptera* or *Tropical Lepidoptera*) dues remain at \$40 per year.

Donations are also greatly appreciated (your canceled check can be used to verify donations). Likewise, life membership is now even more a value, since life members get both *Holarctic Lepidoptera* and *Tropical Lepidoptera*, plus all supplements, at no further cost (including airmail for members outside of the USA!).

4. **New telephone numbers:** use the new numbers for ATL business (352) 392-5894 or FAX at (352) 392-0479. Fax can also be made to our cooperating dealer for book orders at (352) 373-3249.

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7. **Literature Summary - 1996:** the annual literature summary will appear in the June 1997 newsletter issue rather than the December 1996 issue. This change has been prompted by the yearly delay in receiving journals printed in December, which do not arrive until some weeks or months later in the following year. The delay to June of the following year will, thus, allow a more complete yearly account of the most important published books and papers in Lepidoptera.

The next issue will contain the remainder of the 1995 citations.

PRESIDENTIAL ADDRESS

(from page 1)

forest-floor Nymphalidae, among the taxonomically most difficult on the continent (especially the *Euphaedra*).

There are still some large genera in need of thorough revision, but the difference between 1967 and 1996 is enormous.

Butterflies of West Africa

Because West Africa remained the most important 'white area' on Africa's butterfly map, I decided in 1993 to write a book: *Butterflies of West Africa: Origins, Natural History, Diversity, and Conservation*. I have since spent half my time on field-work in West Africa. Though it encompasses 16 countries, there are no comprehensive books and only two checklists.

The first was the Liberian work already referred to which listed 475 known species, though the true total must be almost twice that. In the late 1960s and early 1970s I was myself involved in compiling the first checklist of Nigerian butterflies (Cornes, 1969, 1971; Cornes *et al.*, 1973). We reached a total of about 950 — it is a measure of progress that my working manuscript now has 1,250 species from Nigeria.

Another reason for writing on West Africa was — in the words of Tom Lehrer's ditty about the songs of the World Wars — that 'if we were to have any songs coming out of World War III, we'd better start writing them now'. Between 1960 and the mid-1980s the West African forests were ruthlessly exploited. The forested area shrank to less than 15% of its original extent, and only a third of that is in pristine condition, mostly inside national parks or other protected areas. The spectre of mass extinction loomed.

Indicators of diversity

Africa has a reputation for having a less diverse flora and fauna than other tropical regions. Evidently, the Neotropics are richer than Africa, with some 8,000 species compared to 3,700, but it is richer than the Oriental Region which I estimate holds only 2,700-3,000.

Single localities in Brazil and the Peruvian Amazon may have as many as 1,500 butterfly species (possibly as high as 1,800), but Africa does not do badly. During two one-month visits to the Oban Hills near Calabar in southeastern Nigeria, my team collected about 600 butterfly species and the total number ever recorded is 760 — but systematic search in the Natural History Museum, London, will take this figure well past 800. My present estimate, based on both geographical distributions and a projection of my own collecting curve, is that the Oban Hills have almost exactly 1,000 species, an amazing 27% of the continent's total fauna. I am certain that no locality in the Oriental Region begins to approach this number, which is almost the same as for peninsular Malaysia. At least as far as butterflies are concerned, the Oban Hills and the adjacent Korup National Park in Cameroon are the richest in Africa.

West of the Dahomey Gap — a tongue of savannah in Benin and Togo that separates the Nigerian forests from those of West Africa proper — diversity is considerably lower. Nigeria has 1,250 species, the rest of West Africa only 1,000. Nevertheless, good forests in Ghana, such as Kakum National Park, probably have 600 species.

How well butterfly diversity correlates with biodiversity in general is not known. Rather curiously, they do not seem to correlate at all well with plant diversity. However, when the butterfly fauna is both very diverse **and** contains many regional

endemics, they are clear indicators that the area is worthy of conservation.

Indicators of extinction

Despite the shrinkage of habitat, the West African butterflies do not bear out the doomsday warnings of mass extinction, at least not yet. Vast stretches of what was once forest are now populated exclusively by savannah and adventive species, and a handful of the hardiest forest species — the total number of species run to just a hundred or so. But the butterflies still exist in the remaining forest.

I am trying to establish how many of the 950 forest butterflies ever known from West Africa (west of the Dahomey Gap) have been recorded since the destruction of the forests was largely halted in the 1980s. Relatively few people have collected systematically in West Africa during the 1980s and 1990s, many of whom were not interested in Lycaenidae and Hesperidae, and I still have to check a few major collections. In spite of this, I have positive records since 1980 of 90% of the total, and records of 85% of the total from the 1990s (between 1993 and now, I have personally caught 700 species, or 75% of the total). Removing ten genera, where all field collectors will agree that specimens are almost impossible to come by (I have, for instance, caught four specimens of three species of *Pseudaletis* in my life, a genus with more than twenty species) boosts these percentages by five percentage points.

I think it is safe to conclude that there has been very little extinction so far. I also believe that butterflies — in a rough and ready way — act as a proxy for other terrestrial arthropods, though there may be more narrow endemism in aquatic insects. This is not grounds for complacency, but it shows that the system of protected areas in West Africa probably does conserve the bulk of arthropod biodiversity, which should boost the morale of those responsible.

Even very small forest fragments can house a remarkable number of species. The residents of two villages at the northern edge of Ghana's forest zone, Boabeng and Fiema, have monkeys as their totem animals. As the forest began systematically to be cut, they knew the monkeys would disappear, so they conserved a small tract of forest between the villages, half the size of Central Park in New York. This was successful, because the forest now has the highest density of black-and-white colobus and mona monkeys in Africa. My estimate is that 60-70% of all the 550 butterfly species that were ever there are still present, though the forest is surrounded by such large stretches of derived savannah that gene-flow must be wholly cut for most species. However, 30-40% of the Butterfly fauna in Boabeng-Fiema has been lost, which raises the question of the size of protected areas. We are not entirely certain that the 370 square km of Kakum National Park, Ghana, is sufficient to maintain the gene-pool of its isolated population of forest elephants. But I am almost certain that it is large enough for arthropod conservation. I have so far taken 460 species out of an estimated maximum of 600 (77%), and my collecting curve is still not flat.

I hope eventually to set up a project where butterfly data from national parks all over Africa can be pooled to provide a continental estimate of the proportion of species protected, as a proxy for all arthropods. This would also act as a baseline for long-term monitoring of extinction.

Indicators of ecological coverage

Most butterflies have special geographical distributions, reflecting past conditions, and most have distinct ecological preferences. When butterfly distributions are well known, they can be used as indicators for whether the protected areas cover all major zones of interest.

I was asked to do a review of the Ghanaian butterfly fauna with this purpose. I found that though the proposed conservation coverage was generally sound, one type of savannah and two local areas contained a significant number of species not covered. Further research showed these areas to be interesting enough for their inclusion. A reconnaissance of the proposed savannah area in northern Ghana revealed the only elephant population outside of existing national parks, so I gained a useful reputation as the man who could use butterflies to find elephants!

Protection of two upland wet evergreen forests, which have endemic butterflies, has also been stepped up.

Biogeography indicators

Butterflies in West Africa appear to be excellent biogeographical indicators. Narrowly endemic species are relatively few, but they are all correlated with exceptional features, especially mountains which may be presumed from time to time to have been forested islands in a sea of savannah.

A distinct pattern of regional endemism indicates that the West African forests have been split in two main blocks for considerable periods of time, though others are found in all forests west of the Dahomey Gap.

The Volta Region of Ghana illustrates the complex function of the Dahomey Gap as a filter between the fauna of Nigeria-Cameroon and West Africa, but I have not yet started analysis of the data.

Conclusion

Butterflies are possibly the only large group of arthropods that can effectively be used as indicator species. They are relatively well known (I have so far only come across a score or so of species in Africa new to science). Most can readily be identified, and certain 'difficult' genera can be left out of comparative studies. They can be caught and curated with simple equipment.

Once the vastly improved version of D'Abbrera's *Afrotropical Butterflies*, currently under development, and my own on West Africa, are available, we may hope to see an explosion in good and interesting studies on African butterflies. For it is the absence of ready access to identification that has stood in the way of more research in many cases.

If West Africa can avoid the type of breakdown in law and order that of late has characterized Sierra Leone, Nigeria and Liberia, most insects will survive. But the possibility of gene-flow between increasingly isolated forests will probably be lost. A hundred years from now, we may have the opportunity of seeing speciation and subspeciation in action.

References

Bampton, I., S. C. Collins, and R. J. Dowsett

1991. Butterflies (Lepidoptera) of the Mayombe and lower Kouilu (with a checklist for Congo). *Tauraco Research Report*, 4:57-108.

Carcasson, R. H.

1981. *Collins Field Guide to the Butterflies of Africa*. London: Collins. 188 pp.

Condamin, M.

1973. Monographie du genre *Bicyclus* (Lep.; Satyridae). *Mém. Inst. Fond.*

Afr. Noire (Dakar), 88:1-324.

Cornes, M. A.

1969. A checklist of the Nigerian Lycaenoidea. *Occas. Pub. Nigerian Ent. Soc. (Lagos)*, 3:1-23.

1971. A checklist of the Nigerian Hesperioidea. *Occas. Pub. Nigerian Ent. Soc. (Lagos)*, 7:1-10.

Cornes, M. A., J. Riley, and R. G. T. St. Leger

1973. A checklist of the Nigerian Papilionoidea. *Occas. Pub. Nigerian Ent. Soc. (Lagos)*, 11:1-18.

D'Abbrera, B.

1980. *Butterflies of the Afrotropical Region*. Melbourne: Lansdowne Pr. 593 pp.

Evans, W. H.

1937. *A Catalogue of the African Hesperidae in the British Museum*. London: Br. Mus. (Nat. Hist.). 212pp.

Fox, R. M., A. W. Lindsey, H. Clench, and L. D. Miller

1965. The butterflies of Liberia. *Mem. Amer. Ent. Soc. (Philadelphia)*, 19:1-438.

Hecq, J.

1989. 'Les *Euphaedra*.' [Reprint: a collection of papers from *Lambillionea* (Tervuren), vol. 76-87]

1990. Les *Bebearia*. *Lambill.* (Tervuren), 90:1-46.

1994. Remarques sur quelques espèces de Nymphalidae africains des genres *Euphaedra*, *Bebearia* et *Euriphene*. *Lambill.* (Tervuren), 94:437-439.

Larsen, T. B.

1991. *The Butterflies of Kenya and their Natural History*. Oxford: Oxford Univ. Pr. 490pp.

Libert, M.

1992. Notes faunistiques sur les Lépidoptères Rhopalocères du Cameroun. *Lambill.* (Tervuren), 92:21-34.

Seitz, A. (ed.)

1925. *Gross-Schmetterlinge der Erde. Band 13. Die Afrikanischen Tagfalter*. Stuttgart: A. Kernen. 613pp, 80 pl.

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TO COLLECT OR NOT?

by Jan van der Made et al., Vlinderstichting, Wageningen, Netherlands

The following article has been translated from a Dutch article in *Vlinders* magazine (August 1996, 11(3):18-20) and is reprinted here as an interesting summary of viewpoints on this controversial subject from a European perspective. Views expressed here are those of the Vlinderstichting and a committee of their authors, not of the Association for Tropical Lepidoptera.

The Vlinderstichting (or Dutch Butterfly Conservation) is a Dutch organization for the protection of butterflies and moths in the Netherlands. Mr. van der Made is Director. The society has been publishing their quarterly *Vlinders* (or "Butterflies") magazine for 11 years now, each issue with many interesting conservation and ecological articles on Dutch butterflies and moths, usually with color photographs as well. Articles are in Dutch (sometimes with English summaries).

* * *

The Dutch Butterfly Conservation foundation regularly receives questions about its stand on the issue of collecting butterflies. Collectors think that we are very much against it; others believe that our policies are not sufficiently outspoken regarding the catching and preservation of butterflies. It seems like a good idea to bring together all the various viewpoints in order to accurately illuminate our stand.

The Legal Argument

Legally, the question is fairly simple. In the Netherlands, 19 species of butterflies are protected, and in Flemish Belgium, there are six. These species may not be caught, transported, or killed, which means they may not be collected. Whoever still wishes to do so must seek a permit. To catch butterflies (also those that are not protected) in nature areas, one always needs a permit from the property owner, or Nature Conservation organizations, or the governmental Forest Management and Natural Monument Agencies. In Flemish Belgium, a permit is needed from the Provincial Landscape and Nature Reserve Agencies.

Apart from that there are no legal restrictions. Whoever wishes to catch Red Admirals in their backyard may do so as much as they wish, in accordance with Dutch and Belgian laws. That is not the case everywhere, though. In Germany, all butterflies are protected, with the exception of three common whites. Many moths also fall under these strict protective regulations.

The Argument of Conservation (Nature Protection)

For many people it seems quite clear: there are now less butterflies because butterflies are being caught. Of course, there is an element of truth in this. After all, every set butterfly is one butterfly less flying freely in nature. That this is the reason for the general decline of butterflies in the [Dutch] Lowlands is, however, very doubtful.

The most important reason for the disappearance of butterflies is the change in land use. In former days there were whole butterfly biotypes throughout the entire country. The heathland moors were lightly grazed and not fouled by polluted air, and the grasslands formed large complexes which had not dried out or been fragmented, and so forth. The entire agricultural area offered plenty of opportunities for butterflies to reproduce. We can still find examples of this type of land in other countries where numerous quantities of butterflies still abound. But there too lie threats: cities and villages need space to build, roads need to be widened or detoured, and fertilizers and poisons are increasingly used.

Only when the butterfly population has been decimated by all these factors can the added threat of collecting lead to extinction (as was the case with the Large Copper in England). But collecting in itself is then not the real cause. There are no known instances of normal, healthy butterfly populations becoming extinct due solely to collecting.

The Ecological Argument

Butterflies are creatures that can produce many offspring. One fertilized female can easily lay tens to hundreds of eggs. How many of these actually become an adult butterfly depends on many factors, such as the weather, number of parasites (such as parasitic wasps), predators (such as great tits), and the quantity and quality of the available food supply. To keep the population at a stable level, only two out of a hundred eggs need to emerge as adults for the following generation.

Most females are fertilized in the first few hours after they emerge from the cocoon. Usually a female mates only once. Because a male can fertilize a large number of females, collecting males is not usually detrimental to the population. The same can be said for females that have already laid all their eggs. However, these animals are not interesting to collectors because most want fresh and beautiful specimens in their collection.

Among very small and isolated butterfly populations there can be an effect on genetic variation. Every single butterfly has traits that can be important to its survival. By collecting individuals from a very tiny population, the genetic variation can be greatly and adversely affected. This genetic impoverishment can endanger the existence of a population.

The Scientific Argument

Scientific research on butterflies is commonly done using the method of mark-release-recapture in order to gain an understanding of the number of butterflies of one species, development of the population size, mobility, etc. Researchers try to capture and mark the butterflies which they site daily. They are then freed again. One of the goals of this work is population estimates. One can tell fairly well how many butterflies have flown in the area being surveyed. And, of course, you know how many butterflies have caught and marked. Many such studies have been carried out in the last twenty years. It appears that, in all those studies, no more than 30 to 40% of the butterflies could ever be caught. This also includes butterflies which are discolored and unattractive and, thus, less interesting to collectors. In a normal, healthy butterfly population (i.e., when you a few tens of butterflies are observed without having to seek them out), it is practically impossible to catch too many. A problem can only arise if, year after year, day after day, each and every butterfly that a collector sees is caught. But even the most avid collector has never done this.

In a population that has become very small (for instance, due to a change in agricultural use, regional drought, road construction or building development), the situation is, of course, very different. As already noted, catching all possible butterflies can then greatly reduce the survival of the population. This is also the case in the first few years after a new butterfly species has been reintroduced.

The Identification Argument

The situation used to be quite simple. Birdwatching meant the same thing as shooting birds. And observing butterfly meant catching butterflies and placing them in a collection. The fact that we know so much about butterflies prior to 1980 is almost entirely due to collectors. We must not forget that for a very long time there were few really accurate identifications. There were books, but they were huge and not something you could take into the field as a guide. In order to make an identification, it was usually necessary to collect specimens and compare with those in other collections. In the days when there were no useful field guides, trading specimens provided a reasonable overview. Nowadays, this can no longer be said for butterflies in our region. Field guides are available in all colors, qualities, and sizes. However, for someone to accurately identify whether they have a Silver-studded Blue or an Idas Blue, they still must catch the specimens. Killing and collecting is, however, no longer necessary.

The further south we go in Europe, the more difficult it becomes to identify in the field. For some butterfly families such as skippers, a number of blues, the fritillaries, and browns (think of the *Erebia*'s in the Alps), it is inevitable to catch a few specimens in order to make an accurate identification. Field identification of moths and especially micro-moths, is more difficult. Some owl moths and geometers are not easy to name, especially when specimens are past their prime. Difficult to determine groups are *Eupithecia*'s, small geometers with a large variation within the species. Catching and killing these Lepidoptera is necessary for a correct identification. By using genital preparations from the collected specimens at home and in the museum, the moths can then be identified.

The Proof Argument

It is the general idea among some collectors that a set butterfly is the only proof of existence of a particular species in a certain area. That argument can no longer hold for the butterflies of the Benelux (Belgium, the Netherlands, and Luxembourg) countries. Photo and video cameras, film and videotapes, are now of sufficient quality and low enough in cost to establish proof of existence. At Dutch Butterfly Conservation, we have the experience that we are still able to identify a butterfly from a photo taken with a pocket camera at a distance of two meters. As proof of the existence of a particular butterfly species, this is more than adequate. Most collectors already own much better equipment anyway. Just as with the identification argument, an exception must be made for a few families of moths. Only a set specimen can justifiably aid in their precise identification. Moreover, the nomenclature of some species is still undergoing regular change. This means, for instance, that a species can be divided into two new species. Only on the basis of collections can the accurate identification of the new species be decided. This happened in 1991 with *Noctua janthina*: this species was divided into *N. janthe* and *N. janthina*.

The Ethical Argument

The last and perhaps most important argument is on ethical grounds. Or, to say it in layman's terms: have we the right to kill other animals just because we want to know their name or because we wish to place them in a drawer?

No one can tell another person how he should believe regarding this matter. There are very few people who are consistent in their actions to avoid the killing of all animals. For most, it is a sliding scale, whereby each sets his limits at another point:

- Should you kill mosquitoes and not butterflies? The mosquito may have been very rare and you won't likely die from a little bump.
 - Should you kill harmful butterflies (for instance, the Processionary Caterpillar) and not the Holly Blue? The Processionary Caterpillar was nearly extinct in Holland until several years ago and is much more rare than the Holly Blue.
 - Should you kill Cabbage White caterpillars, but not the butterfly? That caterpillar will eventually become a butterfly.
- Many people base their ethical argument on 'cuddlyness'. They find that a butterfly has more worth than a moth, mosquito or a tick.

What Does Dutch Butterfly Conservation Believe?

The main goal of Dutch Butterfly Conservation is the protection of butterflies and their habitats. From that viewpoint, we find the collecting of butterflies unnecessary.

In order to have good protective regulations, it is necessary to have enough information about the species and their ecology. One can only begin to protect a species when you know enough about it and its behaviour, and for this identification is a good start. It is possible to achieve this for butterflies in the Benelux countries without having to collect them. Unfortunately this is not the case with certain groups of moths and micros which are more difficult to identify. The same goes for certain hard to identify groups of butterflies outside the Benelux countries. It is most essential that the information thus obtained can actually be used for the protection of butterflies. *We do not promote collecting for the sake of collecting.* Only when observations are reported to official organizations, can collecting be viewed as positive. How badly this is needed is seen in contacts with our foreign colleagues, especially in Mediterranean or East European countries. In some countries, there are only a handful of people actively working in research and the protection of butterflies. They often do not have an adequate picture of the distribution of species in their countries. If everyone who sees or collects butterflies would report their observations, that would mean an enormous broadening of knowledge. At the moment, most sightings do not go much further than the memory of the butterfly observer, the notebook, or the photo or butterfly collection.

In the Netherlands, observations (such as sighting and collection observations) on all butterflies, moths, and micros in all European countries are passed on to the Dutch Butterfly Conservation foundation. We ensure that these observations get distributed to the pertinent organizations. In Flemish Belgium, the Flemish Butterfly Working Group is the primary organization.

DAS INSEKTENBUCH, by Maria Sibylla Merian (1705) – Facsimile Reprint



MARIA SIBYLLA MERIAN
DAS INSEKTENBUCH

The rare book by Maria Sibylla Merian, *Metamorphosis Insectorum Surinamensium*, whose reprint cover and original title page are shown above, was first published in 1705 in Amsterdam. Many members may be unaware of the recent reproduction of this work on insects of Surinam as a facsimile reprint by Insel Verlag of Germany, titled *Maria Sibylla Merian, Das Insektenbuch* (1991). The reprint of the 60 color plates of Merian's book is in 7 x 12 inch (18 x 30 cm) format, reduced from the original elephant-folio size of 53 cm (21 inches) in height. The original introduction and the text for each plate are translated from their original Dutch into German. This reprint edition follows the color plates with a modern biography of Merian and her work. The book is well done and a bargain at \$35.

The Insel reprint edition is available in the USA for \$35 (plus \$3 shipping/handling), from Flora & Fauna Books, P. O. Box 15718, Gainesville, FL 32608 (FAX: (352) 373-3249).
e-mail: ffbks@aol.com Home Page: <http://www.ffbooks.com>

METAMORPHOSIS
INSECTORUM SURINAMENSIIUM.
OFTE
VERANDERING
DER
SURINAAMSCH E
INSECTEN.

Waar in de Surinaamsche Rupsen en Wormen met alle des zelfs Veranderingen na het leven afgebeeld en beschreeven worden, zynde elk geplaat op die Gewassen, Bloemen en Vruchten, daar sy op gevonden zyn; waar in ook de generatie der Kikvorschen, wonderbaare Padden, Hagedissen, Slangen, Spinnen en Mieren werden vertoond en beschreeven, alles in America na het leven en levens-groote geschildert en beschreeven.

DOOR
MARIA SIBYLLA MERIAN.



Tot AMSTERDAM,

Voor den Auteur, woonende in de Kerk-straat, tusschen de Leydse en Spiegel-straat, over de Vergulde Arent, alwaar de reetse ook gedrukt en afgezet te bekoomen zyn; Als ook by GERARD VALCKE, op den Dam in de waekende Hond.



The author, Maria Sibylla Merian (1647-1717), from a portrait made during her later years.

Neotropical Lepidopterists in Documentary Film

In early May, Association member Dr. Kurt Johnson (American Museum of Natural History) and Robert Dirig (Cornell University Hortorium) were filmed collecting butterflies, and also providing taxonomic commentary, for a French national television (Cineteve) documentary concerning novelist and lepidopterist Vladimir Nabokov. The film will be released for television in France, Belgium and Switzerland in the fall of 1996. It may later be syndicated in English. Collecting footage is to be used as background to the narrator's reading of Nabokov's own words concerning his interests in butterflies (all butterflies caught during the filming were later released). Commentary will comprise part of a number of interviews in the film concerning Nabokov as a literary and scientific figure. Mr. Dirig has kept a close account of Nabokov's activities while a professor at Cornell; Dr. Johnson (often with lepidopterists Zsolt Bálint, Hungary, and Dubi Benyamini, Israel) has published numerous taxonomic papers on the Neotropical "blues," originally pioneered by Nabokov for the Nearctic fauna and, most recently, co-authored a detailed analysis of Nabokov's entomological career in the 1996 *Nabokov Studies* (Univ. California). The film originated in 1995 by French Cineteve and Dr. Brian Boyd (principal biographer of Nabokov) while Boyd was a guest professor at the literary institute of Nice, France. Boyd and lepidopterist Robert Michael Pyle are also collaborating on a forthcoming book concerning Nabokov's fascination with Lepidoptera.

Chengdu Museum of Butterflies

In Sichuan, China, a new butterfly museum opened earlier this year. The modern museum is housed in a new building on the grounds of the Sichuan Panda Breeding Institute, just outside of Chengdu, the capital of Sichuan Province, in west-central China. Chengdu is now a large metropolis of about 8 million people. Mr. Li Zhao (or Chao) is the young director of the museum, recently having finished a 2-volume introduction to Sichuan butterflies together with co-author H. Y. Wang of the Taiwan Museum, Taiwan (sold by Flora & Fauna Books in the USA).

The museum houses about 10,000 specimens, mostly of Chinese butterflies, but also with examples of moths and a few showy insects such as dragonflies and larger beetles and bugs. The exhibits are modern and very well done, neat and well lighted. The facility is exceptional and well worth a visit if travelling in China. To see the museum when in China, visitors should make an appointment from their hotel, since it is out of town and still so new that an appointment may be needed for staff to help the visitor see everything.

Diagnosis of Colombian Lycaenidae

The combined efforts of three natural history museums in Colombia (Pedagogical University, Bogota; La Salle University, Bogota; University of Caldas, Manizales) will produce a set of volumes concerning Lycaenidae of Colombia beginning in 1996. The first volume, already near completion, will mostly treat generic level assemblages, along with a number of unusual endemic taxa. Subsequent volumes will aim at diagnoses of many species level taxa, particularly undescribed or poorly understood entities. All work follows from a background morphological analysis of the type material of "Thecla." This is a great opportunity for any Association member with unusual unidentified Lycaenidae from Colombian localities to have this material examined. Examination can proceed from either (i) actual specimens or (ii) color photographs or slides, followed by provision of abdomens for dissection, if requested. Anyone submitting material can expect, in a reasonable time period, a diagnosis of the material based on comparison to the historical type material. All material will be returned to the originator; in the case of new species, the originator will also have sole discretion regarding the location of deposition for any new type material. For convenience, workers outside of Latin America should contact Dr. Kurt Johnson (Dept. of Entomology, American Museum of Natural History, Central Park W. at 79th St., New York, New York, 10024), or in South America, Dr. Jesus Velez and Julian Salazar (Museo de Historia de Historia Natural, Universidad de Caldas, Apartado Aereo 275, Manizales, Colombia). This project has already gotten some notice in the recently appearing *Insectos de Llano* (publisher: Cristina Uribe Editores, Bogota) by Salazar, Velez and Uribe, a beautiful color book on the unusual Colombian insects of many Orders. If interested in the latter volume, contact Dr. Jesus Velez and Julian Salazar. The project also received a four-page color write up in *La Patria*, a magazine published in Manizales.

Belize Butterfly Research

The Belizean non-profit research organization, Belize Tropical Forest Studies, has opened a new research facility in the foothills of the Maya Mountains of Belize. The facility consists of low-cost lodging facilities and a rearing facility with a 1000 sq. ft. flight cage for manipulative experiments.

In the past, Belize Tropical Forest Studies projects have concentrated on collecting biodiversity data on various groups of organisms but mostly on Lepidoptera and Odonata. Results have been published in specialized journals and in an internal report series. Several more papers are in preparation. Among these is a catalog of the Butterflies of Belize which is intended for eventual publication in *Tropical Lepidoptera*.

Belize Tropical Forest Studies welcomes any student who wants to conduct long-term field studies on Lepidoptera. Subjects can be identified by the student or be suggested by the scientific board. Research can be at any level but publication of the results should be a main objective.

For more information, write to: Belize Tropical Forest Studies, P.O. Box 208, Belmopan, Belize (or e-mail: tfs@bcsf.com.bz).

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6. Giant Silkmths & Carpenter Moths (1994) 16.95

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9. Bomb., Thyat., Lima., Lasio., Sping. (1995) 26.95

10. Brahm., Eupt., Cyclid., Drep., Notodont. (1995) 26.95

12. Zygaenid Moths (1995) 18.95

13. Noctuidae & Allied Species [1] (1995) 21.95

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15. Noctuidae & Allied Species [3] (1996) 22.95

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LEPIDOPTERA OF CHINA: SICHUAN (Chao/Wang) 2v. (1996)45.00L

LIVES OF BUTTERFLIES (Douglas) (1986) 45.00c

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MOTHS OF TAIWAN (Chang)

1. Sping., Drep., Thyat., Bomb., Lasio., Agarist. (1989) 35.00

2. Arctiidae, Limacodidae, Notodontidae (1989) 35.00

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4. Geometridae, 2 (1990) 42.00c/38.00

5. Noctuidae, 1 (1991) 42.00c/38.00

P. APOLLO: SEINE UNTERARTEN (Glassl) (1993) 100.00L

SEDGE MOTHS OF NORTH AMERICA (Heppner) (1985) 24.95

SWALLOWTAIL BUTTERFLIES: THEIR ECOLOGY & EVOLUTIONARY

BIOLOGY (Scriber/Tsubaki/Lederhouse, eds.) (1995) 65.00Lc

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Wilson) (1994) 49.50c (24.50 for student edition)L

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ADDITIONS and CORRECTIONS

The following are a few additions and corrections to articles of mine that appeared in the last two *Tropical Lepidoptera News*: "Wokomung - A Remote Guyana Tepui," June 1996, and "Tambopata - Variety and Numbers," March 1996.

In my article on Wokomung, I stated that Mt. Wokomung (ca. 5500 ft) is the highest summit of a large tepui massif. According to my partner on the expedition, Terry Henkel, Mt. Wokomung and another summit, Mt. Morakabang, are nearly equal in height and surpassed in height by a few hundred feet by the broad plateau summit of Mt. Kopinang. On Mt. Kopinang is by far the largest area of shrubby tepui vegetation.

In D'Abrera's Lycaenidae volume (page 1244) the range of *Strymon tegaea* is given as Brazil and Guianas. So perhaps the couple of specimens I took along the upper Ireng River do not represent a known range extension, the species having been taken in Guyana in the past, which I stated might be a possibility.

What I tentatively identified as a worn orange *Calospila*? (*Calospila maeonides*?), Dr. Lee Miller of the Allyn Museum, Sarasota, Florida, identified as *Thysanota galena*. What I tentatively identified as *Pyrrhopyge sergius* (?), Steve Steinhauser of the Allyn Museum tentatively identified as *Pyrrhopyge amythaon orino*.

Steve Steinhauser kindly provided me with a list of the skippers taken on the expedition that he examined. As stated in the article there probably are interesting records here. But who besides Steve and a few others are very familiar with the vast Neotropical fauna? Of interest to me were *Wallengrenia otho* subsp. and *Polites vibex* subsp., species found in eastern North America (although *P. vibex* also has an extensive range south to Argentina). I took a number of small branded skippers on those rich savannahs, skippers very reminiscent of branded skippers I have caught in the United States. Under the glaring tropical sun, with the grasses of varied greens exploding with vibrancy, a little irony appears, a touch of the familiar with the exotic.

Just one short note on my Tambopata article: I took someone's word at the reserve that we were 5000 km from the Atlantic. With atlas and ruler I measured it at approximately 3500 km. Where the Rio Marañon enters the Andean foothills, it is nearly 5000 km from the Atlantic. The Amazon basin is vast! !

STEVE FRATELLO

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JOURNAL ABBREVIATIONS: Current Journals

The journals listed here include those covered in our annual literature listing. Abbreviations used are in the left column, with full names to the right.

* journals on Lepidoptera or primarily Lepidoptera

<i>Acta Agric. Boreal.-Occident. Sinica</i>	<i>Acta Agricultura Borealis-Occidentalis Sinica</i> , Yangling, Shaanxi, China
<i>Acta Ent. Chil.</i>	<i>Acta Entomologica Chilena</i> , Santiago, Chile
<i>Acta Zool. Cracov.</i>	<i>Acta Zoologica Cracoviensis</i> , Kraków, Poland
<i>Acta Zool. Lillo.</i>	<i>Acta Zoologica Lilloana</i> , Tucuman, Argentina
<i>Actias</i>	* <i>Actias, Russian Journal of Scientific Lepidopterology</i> , Moscow, Russia
<i>Alexanor</i>	* <i>Alexanor, Revue Française de Lépidoptérologie</i> , Paris, France
<i>Amer. Mus. Novit.</i>	<i>American Museum Novitates</i> , New York, New York, USA
<i>An. Soc. Ent. Bras.</i>	<i>Anais da Sociedade Entomológica Brasil</i> , Itabuna, Brazil
<i>Ann. Carnegie Mus.</i>	<i>Annals of the Carnegie Museum</i> , Pittsburgh, Pennsylvania, USA
<i>Ann. Ent. Soc. Amer.</i>	<i>Annals of the Entomological Society of America</i> , Lanham, Maryland, USA
<i>Ann. Hist.-Nat. Mus. Natl. Hung.</i>	<i>Annales Historico-Naturales Musei Nationalis Hungarici</i> , Budapest, Hungary
<i>Ann. Naturhist. Mus. Wien</i>	<i>Annalen des Naturhistorischen Museum Wien</i> , Vienna, Austria
<i>Ann. Rev. Ent.</i>	<i>Annual Review of Entomology</i> , Palo Alto, California, USA
<i>Ann. Soc. Ent. Fr.</i>	<i>Annals de la Société Entomologique de France</i> , Paris, France
<i>Atalanta</i>	* <i>Atalanta</i> , Munich, Germany
<i>Beitr. Ent.</i>	<i>Beiträge zur Entomologie</i> , Berlin, Germany
<i>Biol. J. Linn. Soc.</i>	<i>Biological Journal of the Linnean Society</i> , London, England, UK
<i>Bishop Mus. Occas. Pap.</i>	<i>Bishop Museum Occasional Papers</i> , Honolulu, Hawaii, USA
<i>Bol. Ent. Venez.</i>	<i>Boletín de Entomología Venezolana</i> , Caracas, Venezuela
<i>Bol. Mus. Ent. Univ. Valle</i>	<i>Boletín de Museo Entomología de Universidad del Valle</i> , Cali, Colombia
<i>Boll. Lab. Ent. Agrar.</i>	<i>Bollettino del Laboratorio di Entomologia Agraria</i> , Portici, Italy
<i>Boll. Soc. Ent. Ital.</i>	<i>Bollettino della Società Entomologica Italiana</i> , Genoa, Italy
<i>Brit. J. Ent. Nat. Hist.</i>	<i>British Journal of Entomology and Natural History</i> Reading, England, UK
<i>Bull. Allyn Mus.</i>	* <i>Bulletin of the Allyn Museum</i> , Sarasota, Florida, USA
<i>Bull. Amer. Mus. Nat. Hist.</i>	<i>Bulletin of the American Museum of Natural History</i> , New York, New York, USA
<i>Bull. Ann. Soc. Roy. Ent. Belg.</i>	<i>Bulletin et Annales de la Société Royale Entomologique de Belgique</i> , Brussels, Belgium
<i>Bull. Br. Mus. (Nat. Hist.), Ent.</i>	<i>Bulletin of the British Museum (Natural History), Entomology Series</i> , London, England, UK
<i>Bull. Ent. Soc. Egypt</i>	<i>Bulletin of the Entomological Society of Egypt</i> , Cairo, Egypt
<i>Bull. Mus. Comp. Zool.</i>	<i>Bulletin of the Museum of Comparative Zoology</i> , Harvard University, Cambridge, Massachusetts, USA
<i>Bull. Mus. Natl. Hist. Nat.</i>	<i>Bulletin du Museum National d'Histoire Naturelle</i> , Paris, France
<i>Bull. Otsuna Wom. Univ., Home Econ.</i>	<i>Bulletin of the Otsuna Women's University, Home Economics</i> , Tokyo, Japan
<i>Bull. Soc. Ent. Fr.</i>	<i>Bulletin de la Société Entomologique de France</i> , Paris, France
<i>Caldasia</i>	<i>Caldasia</i> , Museo de Historia Natural, Universidad Nacional de Colombia, Bogotá, Colombia
<i>Can. Ent.</i>	<i>Canadian Entomologist</i> , Ottawa, Canada
<i>Ecol. Ent.</i>	<i>Ecological Entomology</i> , London, England
<i>Ent.</i>	<i>Entomologist</i> , London, England, UK
<i>Ent.</i>	<i>l'Entomologiste</i> , Paris, France
<i>Ent. Exp. Appl.</i>	<i>Entomologia Experimentalis et Applicata</i> , Amsterdam, Netherlands
<i>Ent. Fenn.</i>	<i>Entomologica Fennica</i> , Helsinki, Finland
<i>Ent. Gaz.</i>	* <i>Entomologists' Gazette</i> , Wallingford, England, UK
<i>Ent. General.</i>	<i>Entomologia Generalis</i> , Stuttgart, Germany
<i>Ent. Meddel.</i>	<i>Entomologiske Meddelelser</i> , Copenhagen, Denmark
<i>Ent. Nachr. Ber.</i>	<i>Entomologische Nachrichten und Berichte</i> , Dresden, Germany
<i>Ent. NachrBl.</i>	<i>Entomologische Nachrichtenblatt</i> , Vienna, Austria
<i>Ent. News</i>	<i>Entomological News</i> , Philadelphia, Pennsylvania, USA
<i>Ent. Rec. J. Var.</i>	* <i>Entomological Record and Journal of Variation</i> , Surrey, England, UK
<i>Ent. Rev.</i>	<i>Entomological Review</i> , New York, New York, USA [English translation of <i>Ent. Obozr.</i>]
<i>Ent. Obozr.</i>	<i>Entomologicheskoe Obozrenie</i> , Moscow, Russia
<i>Ent. Scand.</i>	<i>Entomologica Scandinavica</i> , Copenhagen, Denmark
<i>Ent. Tidskr.</i>	<i>Entomologisk Tidskrift</i> , Stockholm, Sweden
<i>Ent. Tijds.</i>	<i>Entomologische Tijdschrift</i> , Amsterdam, Netherlands
<i>Ent. Zeit.</i>	<i>Entomologische Zeitschrift</i> , Frankfurt, Germany
<i>Entomofaun.</i>	<i>Entomofauna</i> , Munich, Germany
<i>Entomotaxon.</i>	<i>Entomotaxonomia</i> , Yangling, Shaanxi, China
<i>Envir. Ent.</i>	<i>Environmental Entomology</i> , Lanham, Maryland, USA
<i>EOS Revta. Esp. Ent.</i>	<i>EOS Revista Española de Entomología</i> , Madrid, Spain
<i>Eur. J. Ent.</i>	<i>European Journal of Entomology</i> , České Budějovice, Czech Republic
<i>Facetta</i>	* <i>Facetta</i> , Ingolstadt, Germany
<i>Faun. Norv.</i>	<i>Fauna Norvegica</i> , Trondheim, Norway
<i>Florida Dept. Agric. Consumer Serv., Div. Plant Indus., Ent. Circ.</i>	<i>Florida Dept. of Agriculture and Consumer Services, Division of Plant Industry, Entomology Circular</i> , Gainesville, Florida, USA
<i>Florida Ent.</i>	<i>Florida Entomologist</i> , Gainesville, Florida, USA
<i>Fol. Ent. Mex.</i>	<i>Folia Entomologica Mexicana</i> , Xalapa, Veracruz, Mexico
<i>Frag. Ent.</i>	<i>Fragmenta Entomologica</i> , Rome, Italy
<i>Frust. Ent.</i>	<i>Frustula Entomologica</i> , Pisa, Italy
<i>Galathea</i>	* <i>Galathea</i> , Nuremberg, Germany
<i>Gt. Basin Nat.</i>	<i>Great Basin Naturalist</i> , Provo, Utah, USA
<i>Gt. Lakes Ent.</i>	<i>Great Lakes Entomologist</i> , East Lansing, Michigan, USA

- Herbipol.*
Holarctic Lepid.
Ins. Koreana
Ins. Mundi
Invert. Taxon.
Japan Heteroc. J.
Japan. J. Appl. Ent. Zool.
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J. Ent. Sci.
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J. Lepid. Soc.
J. New York Ent. Soc.
J. Nat. Hist.
J. NW. For. Coll.
J. Res. Lepid.
J. Taiwan Mus.
J. Trop. Ecol.
J. Ukrain. Ent. Soc.
Korean J. Appl. Ent.
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Melanargia
Mem. Ent. Soc. Can.
Mem. Natl. Sci. Mus.
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Mitt. Thür. Ent.
Nachr. Ent. Ver. Apollo
NachrBl. Bayer. Ent.
Neue Ent. Nachr.
New Zealand Ent.
N. Carolina Agric. Res. Serv., Tech. Bull.
Nota Lepid.
Nouv. Rev. Ent.
Occas. Pap. Ent.
Occas. Pap. Florida St. Colln. Arth.
Occas. Pap. Syst. Ent.
Oedippus
Opusc. Ent.
Opusc. Zool. Flumin.
Oriental Ins.
Pan-Pac. Ent.
Papilio
Physiol. Ent.
Proc. Denver Mus. Nat. Hist.
Proc. Ent. Soc. Washington
Proc. Zool. Inst. Russ. Acad. Sci.
Psyche
Redia
Rep. Mus. Nat. Hist. Univ. Wisc.
Revta. Bras. Ent.
Revta. Chil. Ent.
Rev. Fr. Ent.
SHILAP Revta. Lepid.
Smithson. Contr. Zool.
SW. Ent.
Spixiana
Syst. Ent.
Tinea
Trans. Amer. Ent. Soc.
Trans. Lepid. Soc. Japan
Trav. Mus. Hist. Nat. G. Antipa
Trop. Lepid.
Univ. Calif. Publ. Ent.
Yadoriga
Zborn. Sloven. Narod. Muz.
Zeit. Arbeitsgem. Österr. Ent.
Zool. Meded.
Zool. Verh.
Zool. Zhurn.
- * *Herbipoliana*, Marktleuthen, Germany
 * *Holarctic Lepidoptera*, Gainesville, Florida, USA
Insecta Koreana, Chuncheon, South Korea
Insecta Mundi, Gainesville, Florida, USA
Invertebrate Taxonomy, Canberra, ACT, Australia
 * *Japan Heterocerists' Journal*, Tokyo, Japan
Japanese Journal of Applied Entomology and Zoology, Tokyo, Japan
Japanese Journal of Entomology, Tokyo, Japan
Journal of the Australian Entomological Society, Canberra, Australia
Journal of Biogeography, Hull, Ontario, Canada
Journal of the Bombay Natural History Society, Bombay, India
Journal of Entomological Science, Griffin, Georgia, USA
Journal of the Kansas Entomological Society, Lawrence, Kansas, USA
 * *Journal of the Lepidopterists' Society*, Los Angeles, California, USA
Journal of the New York Entomological Society, New York, New York, USA
Journal of Natural History, London, England, UK
Journal of the Northwest Forestry College, Yangling, Shaanxi, China
 * *Journal of Research on the Lepidoptera*, Beverly Hills, California, USA
Journal of the Taiwan Museum, Taipei, Taiwan
Journal of Tropical Ecology, Cambridge, England, UK
Journal of the Ukrainian Entomological Society, Kiev, Ukraine
Korean Journal of Applied Entomology, Seoul, South Korea
 * *Lambillonea*, Tervuren, Belgium
 * *Lepidoptera*, Copenhagen, Denmark
 * *Linneana Belgica*, Vilvoorde, Belgium
The Maryland Entomologist, Baltimore, Maryland, USA
 * *Melanargia*, Düsseldorf, Germany
Memoirs of the Entomological Society of Canada, Ottawa, Canada
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Memorie della Società Entomologica Italiana, Genoa, Italy
Mitteilungen des Thüringer Entomologenverbandes, Kranichfeld, Germany
 * *Nachrichten des Entomologischen Verein Apollo*, Frankfurt, Germany
Nachrichtenblatt Bayerische Entomologen, Munich, Germany
 * *Neue Entomologische Nachrichten*, Marktleuthen, Germany
New Zealand Entomologist, Auckland, New Zealand
North Carolina Agricultural Research Service, Technical Bulletin, Raleigh, North Carolina, USA
 * *Nota Lepidopterologica*, Basel, Switzerland
Nouvelle Revue d'Entomologie, Paris, France
Occasional Papers in Entomology, California Dept. of Food & Agric., Sacramento, California, USA
Occasional Papers of the Florida State Collection of Arthropods, Gainesville, Florida, USA
Occasional Papers on Systematic Entomology, Natural History Museum, London, England, UK
 * *Oedippus*, Bad Neustadt, Germany
Opuscula Entomologica, Lund, Sweden
Opuscula Zoologica Fluminensium, Flumserberg, Switzerland
Oriental Insects, Gainesville, Florida, USA
Pan-Pacific Entomologist, San Francisco, California, USA
 * *Papilio* (new series), Lakewood, Colorado, USA
Physiological Entomology, London, England, UK
Proceedings of the Denver Museum of Natural History, Denver, Colorado, USA
Proceedings of the Entomological Society of Washington, Washington, DC, USA
Proceedings of the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
Psyche, Cambridge, Massachusetts, USA
Redia, Florence, Italy
Reports of the Museum of Natural History, University of Wisconsin, Stevens Point, Wisconsin, USA
Revista Brasileira de Entomologia, São Paulo, Brazil
Revista Chilena de Entomologia, Santiago, Chile
Revue Française d'Entomologie, Paris, France
 * *Sociedad Hispano-Luso-Americana de Lepidopterologia, Revista de Lepidopterologia*, Madrid, Spain
Smithsonian Contributions to Zoology, Washington, DC, USA
Southwestern Entomologist, Dallas, Texas, USA
Spixiana, Zeitschrift für Zoologie, Zoologische Staatssammlung München, Munich, Germany
Systematic Entomology, London, England, UK
 * *Tinea, Japan Heterocerists' Society*, Tokyo, Japan
Transactions of the American Entomological Society, Philadelphia, Pennsylvania, USA
 * *Transactions of the Lepidopterists' Society of Japan*, Osaka, Japan [formerly *Tyô to Ga*]
Travaux du Muséum d'Histoire Naturelle "Grigore Antipa", Bucharest, Romania
 * *Tropical Lepidoptera*, Gainesville, Florida, USA
University of California Publications in Entomology, Berkeley, California, USA
 * *Yadoriga*, Osaka, Japan
Zborník Slovenského Národného Múzea, Bratislava, Slovakia
Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen, Vienna, Austria
Zoologische Mededelingen, Nationaal Natuurhistorisch Museum, Leiden, Netherlands
Zoologische Verhandlungen, Nationaal Natuurhistorisch Museum, Leiden, Netherlands
Zoologicheskyy Zhurnal, Moscow, Russia

BOOK NEWS

WINGS OF PARADISE. *The Great Saturniid Moths*

by John Cody. 163pp. 1996.

This artistic book of 80 paintings by John Cody depicts various spectacular saturniid moths from around the world. Preface by Dr. Richard S. Peigler. Price: \$60 (cloth). Univ. of North Carolina Press.

LEPIDOPTERA OF CHINA

1. *Butterflies in Sichuan Province: Papilionidae, Parnassiidae, Pieridae, Danaidae, Amathusiidae, Satyridae, Hesperidae*

2. *Butterflies in Sichuan Province: Nymphalidae, Lybytheidae, Riodinidae, Lycaenidae*

by Li Chao and Hsiao-Yue Wang. 349 + 287 pp. 1996.

This full-color treatment of central Chinese butterflies illustrates several hundred species from Sichuan. The book is a remarkable color atlas of Sichuan species. All the species pages have color photographs of spread specimens, at least two figures per species, showing the dorsal and ventral wing maculation for each, plus occasional photos from nature. Price: \$45 (2 vol.), paper. Taiwan Museum, Taipei. In the USA from: Flora & Fauna Books, P. O. Box 15718, Gainesville, FL 32604.

THE BUTTERFLIES OF MOROCCO, ALGERIA AND TUNISIA

by John Tennent. 217pp (32 color pl.). 1996.

The author treats 175 species known for the countries covered. The author has studied the fauna for many years. The book has 32 excellent color plates of spread specimens at the end, plus another 6 color plates of butterflies in nature near the middle of the text. Introductory 12 color plates near the front of the book show the many varied habitats of the region. Price: £62.00 (cloth). Gem Publishing, England.

MONOGRAPH TO THE NORTH AMERICAN HELIOTHENTINAE

by David F. Hardwick. 281pp (25 color pl.). 1996.

This new revision of the Noctuidae subfamily Heliorthinae (called Heliorthentinae by the author) has all adults and many of the larvae illustrated in color. Besides much new synonymy, there are 8 new species descriptions (including 1 new species by other authors: Lafontaine and Mikkola). Included is a host index.

Price: \$70.00 (cloth). D. F. Hardwick, Ottawa, Canada.

MEETINGS

1997 Association for Tropical Lepidoptera: April 4-5, Gainesville, Florida, USA

Lepidopterists' Society: July 9-13, New Haven, Connecticut, USA — 50th Anniversary Meeting!

NOTICES

LOST MEMBERS! F. Bourlière, Paris, France. Matthew Kettle, Berlin, Germany. Lauri Luukkonen, Vantaa, Finland. Debra Murray, Tena, Ecuador. Mel Tintpulver, Toronto, Canada. Thierry Varenne, Draguignan, France. Lawrence R. Wills, New Plymouth, New Zealand. H. Ziegler, Chur, Switzerland.

REMEMBER! If you do not send us your address changes, your copies of the journals may get lost (in the USA, our journals are sent 3rd class mail, which is thrown away by the postal service if the address is wrong!).

RUSSIAN BUTTERFLIES: Selling butterflies from Russia at minimal prices. Large stocks, excellent quality, super rarities (*Parnassius*, *Colias*, *Oeneis*, *Erebia*, etc.) [NOTE: USA citizens require permits for protected species]. 7-day delivery time. Prices on request: Sergei Gundorov, Plant Protection Dept., Agricultural Inst., Teatralnaia Square, ROS-410710 Saratov, Russia. FAX: (845-2) 264-963.

FORTHCOMING BOOKS – 1996/97

ATLAS OF NEOTROPICAL LEPIDOPTERA November 1996

Checklist. Part 4B: Drepanoidea – Bombycoidea – Sphingoidea, by V. O. Becker, R. H. Carcasson, J. B. Heppner, and C. Lemaire

Part 4B of the Neotropical catalog classifies 2,488 species, including those in such popular families as Saturniidae and Sphingidae. An extensive bibliography cites virtually all papers dealing with the included families for the Neotropics. The catalog is expected in November 1996 (currently at the printer). Parts 1 and 2, treating all Microlepidoptera, already are available. Member price for Part 4B is \$14.95 (non-member price: \$29.95).

LEPIDOPTERA OF TAIWAN

1997

Vol. 1 – Part 1: Introduction, by J. B. Heppner and H. Y. Wang

The introductory part for this series follows the catalog already published in 1992. This part covers the history of Lepidoptera work in Taiwan from early days up to the current Lepidoptera survey, begun in 1981. A key to families is provided in English and Chinese. The main part of this volume comprises 60 plates of color photographs of selected species from Taiwan, about a third of the fauna being illustrated. Future parts will cover all species in detail.

Member price is \$81.50 (non-member price: \$125.50).

CLASSIFICATION OF LEPIDOPTERA

1997

by J. B. Heppner

This work is being readied as a separate book. The planned supplement (Supple. 3 of *Tropical Lepidoptera* Vol. 4, 1993) will be only the key to families (\$10.00 for ATL members).

Members who ordered the supplement have three options: 1) they can accept the current version (keys to families) to be mailed in November, 2) they can receive a refund, or 3) they can have their payment transferred as part of the cost of the classification book in 1997 (\$14.50, plus \$2 shipping, would be needed in addition to their past payment).

Member price is \$24.50 (non-member price: \$42.50). Please write us your decision: if no response is made, the supplement will be sent automatically.

November 1, 1996