Volume 44, Number 4 Winter 2002

NEWS OF THE LEPIDOPTERISTS' SOCIETY

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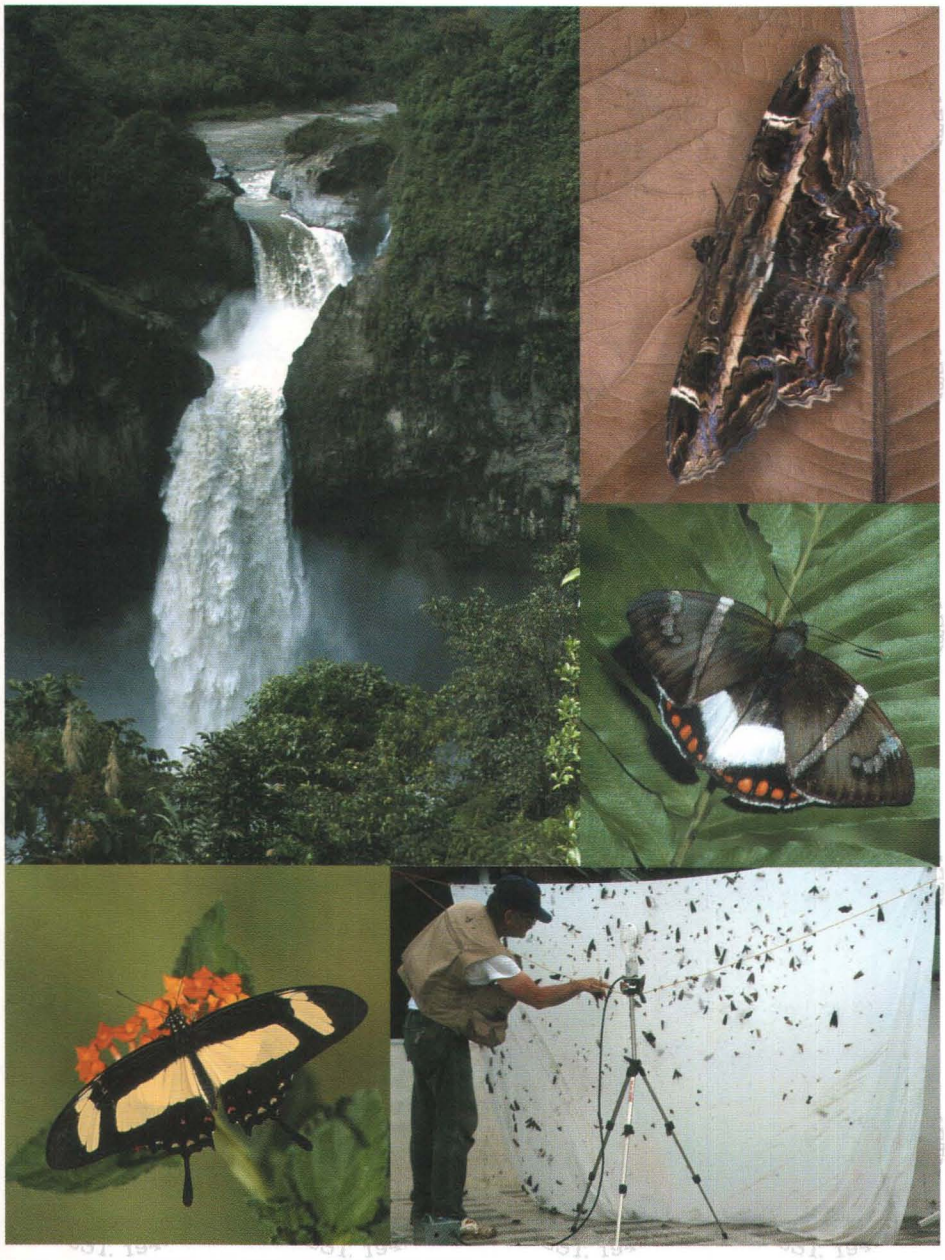

Inside:

NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 44, No. 4 Winter 2002

The **News of the Lepidopterists' Society** (ISSN 0091-1348) is published quarterly by The Lepidopterists' Society, c/o Los Angeles County Museum of Natural History, 900 Exposition Blvd., Los Angeles, CA 90007-4057, USA., and includes one or two supplements each year. The **Season Summary** is published every year as Supplement S1 and is mailed with issue 1 of the News. In even numbered years a complete **Membership Directory** is published as Supplement S2 and is mailed with issue 4 of that volume of the News. Please see the inside back cover for instructions regarding subscriptions, submissions to, and deadline dates for, the News.

Periodicals Postage Pending at address above (Los Angeles, CA) and at additional mailing office (Lawrence, KS).

POSTMASTER: Please send address changes to **News of the Lepidopterists' Society**, c/o Los Angeles County Museum of Natural History, 900 Exposition Blvd., Los Angeles, CA 90007-4057.

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Special Note;

LepSoc 2003 Annual Meeting Information, Registration Forms, and a Call for Papers are found in the center pullout section of this issue of the *News*.

Cover: Ecuador! Clockwise from Upper Left: San Rafael Falls, *Letis herilia* (Ophiderinae); Sugar Cane Borer (*Castnia* sp.; Castniidae); Bill Harding at the Moth Sheet; *Papilio torquatus* (Papilionidae). Photos by Leroy Simon.

Photography and Travel in Ecuador

Leroy Simon
5975 SE 122 Place, Belleview, FL 34420

Many readers might think that foreign travel is too dangerous or so expensive that it is out of reach. This is not necessarily so. During the past 4 years I have traveled to Eastern Ecuador for two weeks each year to photograph insects. Total expenses for one trip, including travel, hotels, food, taxis and airfare to and from Quito, the capitol, was under $800.00 USD from Miami, Florida. One of the biggest savings was using an airline from Panama or Ecuador. Inside the country, travel by bus or taxi.

I spend very little time in the city. Usually arriving late in the day, I check through customs and take a taxi to a hotel near the airport. The next morning another taxi takes me to the main bus station. There, a six-hour bus ride with one rest stop along the way, takes me to Tena. From Tena a taxi takes me to Misahualli, a small village along the Napo River where tourism is the main industry.

I do not go on jungle tours but explore the area by day hikes. One kilometer from town is the smaller village of Puno. There you can cross another river on a suspension bridge and follow a road with very little traffic. It is bordered by forest and you will see many butterflies along this road. All the roads in and around Misahualli are gravel. They are not crushed stone as we in the USA think of as gravel but are more like river rock and dirt.

There are monkeys in the town of Misahualli and near the river where the Napo is joined by the Misahualli River. While there I stayed at the Hotel "Marena," formerly called Hotel Dayuma. At $6.00 USD per night it is a real bargain. Each room has a private bath, lots of storage space, ceiling fan, a comfortable bed and a small refrigerator. I warn you to drink only bottled water or soda, available everywhere in Ecuador.

Travel safety should concern everyone and common sense goes a long way. For instance, I always protect my wallet and passport and keep a copy of my passport photo page in a separate place. Of course, never leave your luggage unattended and its good advise to carry part of your money in a money belt. In any case, before traveling read up on where you are going. Guide books are easily available from book stores or libraries.

Ecuador has recently converted to US currency. Be advised to take small bills as vendors in small towns are usually short of change. Also, they may not accept torn bills or bills that have been marked in any way. Ecuador is a small country on the Equator. Lowlands are hot and humid but higher in the mountains it can be cool or cold especially at night. High elevations, of course, have different species.

At night I use the hotel roof to set up a mercury vapor light near a white sheet to attract moths. I leave my light burning all night and the next morning there are many moths and other insects on the sheet and around the roof that were attracted during the night. Rather than photographing the moths on the white sheet I coax them onto leaves, bark or sticks in order to photograph them against a more natural setting. With some I catch them in a jar and dump them out onto leaves to be photographed. Many times they simply fly away but when they do settle I get the chance to get some interesting photographs.

Different families of moths behave differently. Some fake death when disturbed, some fly away at the first touch but others will crawl onto a stick. Still others open their wings to display eyespots. Too many people think of moths in a negative way. When shown a large colorful moth they say, "What a beautiful butterfly." If told it is a moth they respond, "I bet that eats a lot of clothes!" Of course, some moths are brightly colored and fly in the daytime, as butterflies do, but many more fly at night. Either way, I think moths get a bad rap.

The camera equipment used to take the photos on pp. 104 and 105 included a Nikon 8008, a Nikon F100, 55 mm macro lens, 180 mm Sigma macro, 300 mm Sigma APO close focus lens, extension tubes, Bogen tripod, 81 A filter, reflectors, SB24 Nikon flash, and an old Capro RL80 ringlight. Personally, I think that there are getting to be very few things you can photograph in nature that have not been taken before at one time or another. That being said, I also think most of the moths illustrated are of species most readers have probably never seen pictured before.


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Ecuador!

1. *Haetera piera* (Satyridae); **2.** unidentified stink bug; **3.** *Papilio torquatus* (Papilionidae) larva, NB: adult is illustrated on the cover of this issue; **4.** *Coreura sinsoni* (Arctiidae); **5.** *Cissia hesione* (Satyridae); **6.** *Oressinoma typhia* (Satyridae); **7.** unidentified Ithomiine butterfly; **8.** *Eacles imperialis cacicus* (Saturniidae); **9.** *Glyphodes grandisalis* (Pyralidae); **10.** *Rothschildia erycina* (Saturniidae); **11.** *Synchlora astraeoides* (Geometridae); **12.** *Rosema apollinaire* (Notodontidae); **13.** *Euglyphis zikani* (Lasiocampidae); **14.** *Polygrammodes runicalis* (Pyralidae); **15.** *Amphellarctis priscilla* (Arctiidae); **16.** *Eacles masoni* (Saturniidae); **17.** *Ischnognatha* sp. (Arctiidae); **18.** *Idalis critheis* (Arctiidae); **19.** *Trosia nigropuncta* (Megalopygidae); **20.** *Automeris grammodes* (Saturniidae); **21.** *Euides isabella* (Heliconiidae); **22.** *Iridopsis* sp. (Geometridae); **23.** *Cyclopis caecutines* (?); **24.** *Plectrona buckley* (Pyralidae). Photos by Leroy Simon.

Great Smoky Mountains Lep Blitz

David L. Wagner & Brian Scholtens

Ecol. & Evol. Biol., University of Connecticut, Storrs, CT 06269 & Biol., College of Charleston, Charleston, SC 29424

On 9 June, 2002, 30 lepidopterists, more than 2 dozen volunteers, and two llama teams set out all across the Great Smoky Mountains National Park with the goal of seeing how many species of butterflies and moths could be collected, sorted, and identified in 24 hours. The arsenal included nearly 40 Leroy Koehn blacklight traps, generator-powered MV lights, light sheets, bait traps, and pheromone traps. Volunteers used beating sheets to collect caterpillars; leafminer searches were conducted by flashlight through all hours of the night. Net collecting during the day and at dusk yielded several diurnal and crepuscular micros that are not often seen at light.

Drawn by the lure of donuts and bottomless pots of coffee, the sleep-deprived team assembled at the Sugarlands Visitor Center outside of Gatlinburg early Monday morning to begin pouring through the moths, likely more than 100,000 in number. By 3:00 pm of the first day 783 species of Lepidoptera had been sorted. The second day—where the focus was on data collection and vouchering—added another 85 species to the initial tally (see Table). The total is still creeping upward as dissections are being made and the larval collections yield adults. Likely the one-day total will approach 875 species, a significant proportion of the entire lepidopteran fauna of eastern North America and more than a 1/3 of the known fauna for the entire state of Kentucky! At least 133 species were recorded from the Park for the first time. We estimate 53 species are undescribed, nearly all of which are gelechioids and tineoids.

Not surprisingly, the Noctuoidea richness (262 species), was more than twice that found for any other superfamilial group. Following in species numbers were Geometroidea (125 species) and Pyraloidea (105 species). Given the thoroughness of the sampling, we feel these numbers are fairly representative of the true numbers (proportions) to be expected in deciduous forest ecosystems across much of the East. Although three people worked on the gelechioid families, the number recorded (76 species) is felt to be low—gelechioids are simply too small, too phenotypically similar, and too numerous to be thoroughly inventoried in 48 hours. There were likely closer to 100 species flying in the park during the two-day event.

Taxon	Total Species	New Park Records	Number Undescribed
Primitives through Tineoidea, excluding miners (Davis, Wagner)	32	ca. 4	ca. 7
Leafminers (Wagner, Davis)	66	ca. 5	ca. 2
Gelechioidea (Hodges, Bucheli, Lee)	76	ca. 55	ca. 34
Yponomeutoidea, Zygaenoidea, etc. (Powell)	20	13	ca. 3
Tortricoidea (J. Brown, D. Wright, R. Brown)	87	24	ca. 2
Pyraloidea (Scholtens, Rota)	105	15	ca. 1
Geometroidea (Sullivan, Ferguson, Covell, Canfield)	125	4	1
Noctuoidea (Adams, Nelson and others)	262	11	1
Bombycoidea, etc. (Pogue)	43	1	0
Rhopalocera (Scholtens, Koehn)	47	1	0
Totals	860	133	53

Using the bombycoids, notodontids, and butterflies as yardsticks, we were able to record 47% (44%, 62%, and 48%, respectively) of the known Great Smoky Mountains species in a single day. Using this percentage to extrapolate across all taxa and using 100 species as an estimate for the gelechioids present, one would expect a total of 2000 species for the Park. Other back-of-the-envelope calculations suggest a higher number, around 2,500 species.

This year we placed a decided emphasis on sampling the Park's highest elevations which are under threat from high atmospheric pollution levels and which will probably be severely affected by global warming. Llamas transported traps and batteries to four high elevation balds, volunteers sampled a fifth, and the number of traps set out along Clingman's Dome Road by Leroy Koehn and the Kentucky lepidopterists insured that the whole of the road was visible from space that night!

The participants pinned up a remarkable number of voucher specimens—the conservative estimate is 5,900 over the two-day event. In ad-

Dan Rubinoff, Jerry Powell, and Dave Wagner have a go a light trap sample. More photos on pp. 112.

dition, numerous specimens were preserved in alcohol for subsequent DNA extraction.

This blitz also had a strong educational and outreach component. One undergraduate student, one prospective graduate student, and five Ph.D. students participated. Wagner worked with and gave a presentation for some of the more than 70 school kids from the surrounding areas who had a chance to see aspects of the blitz, work with some of the specimens, search for caterpillars, and interact with the scientists and graduate students. An email from one of the teachers indicated that things went so well that she wouldn't be surprised to learn that 2 or 3 career Lepidopterists hatched that day. Dolly Parton's Dollywood Company helped fund many of the outreach activities. A second grant from Discover Life in America provided honoraria and travel awards for several of the participants.

A meeting of the All Species Foundation and the National Park's Foundation was timed so that visiting luminaries could see a blitz in action. Dan Janzen ambled through as did National Park administrators from Washington and representatives from several National Parks around the country that are looking at the Great Smoky Mountains' "All Taxa Biological Inventory" as a model for the country's National Park System. We are told that the visitors were very favorably impressed with what the "swat" team was able to accomplish.

The event made the cover of the Knoxville Sentinel (again James Adams was our cover boy) and was the subject of a follow-up article and editorial, there was an AP release, and Scholtens made National Geographic News. Wayne Gibbs, a writer from Scientific American, covered the whole of the two-day event—his article on the Great Smoky Mountains All Taxa Biological Inventory and Bioblitz appears in the November 2002 issue.

The blitz was a headlong, full-tilt taxonomic workshop where one could see adults and immatures of much of the East's lepidopteran biodiversity in a single day—a frenetic 100-meter dash into the world of moths and butterflies. Not surprisingly, there was no shortage of chaos, but when all was said and done the event proved to be a unique and wonderful mix of science, education, outreach, and fun for those that attended.

Noctua...*continued from pp. 120*

microlep, *Agonopterix alstroemeriana* (Clerck) (Gelechioidea: Depressariinae), despite the marked differences in size and larval biology. *Agonopterix alstroemeriana* is a small moth (FW ca. 6-7 mm) not believed to be a long distance flier, and the larvae are specialist feeders on the introduced weed, Poison Hemlock (*Conium*). This species was not known in North America prior to 1973 (Hodges 1974), and the earliest record was at Ithaca, NY in 1973, an unlikely point of initial colonization; it spread only slowly and was not detected in Ohio and Illinois before 1990. Yet it suddenly expanded over the northwestern U.S. during 1983-1987, appearing in CO, UT, WA, OR, and CA (Powell & Passoa 1991).

I thank L. Crabo, D. Lafontaine, R. Leuschner, L. Richers, and R. Robertson, who responded to my inquiry for western records, for their unpublished data, and S. Passoa for comments on the ms and literature references.

Literature cited:

Albu, V. 2000. *Noctua prunuba:* expansion continues... News Lepid. Soc. 42: 11.

Brou, V. 1997. A Gulf Coast record of the European cutworm, *Noctua pronuba* (L.). News of So. Lepid. Soc. 19: 3.

Gilligan, M. and R. Rings 1997. *Noctua pronuba*, a European species, discovered in Ohio. Ohio Lepid. 19: 30.

Howard, R.A. 1999. Possible migration of *Noctua pronuba* (L.) (Lepidoptera: Noctuidae) at Lizard Point, Cornwall. Entomol. Gaz. 50: 33-38.

Hodges, R.W. 1974. Gelechioidea, Oecophoridae. Moths of Amer. N of Mex., Fasc. 6.2; i42 pp. E.W. Classey Ltd. & RBD Publ, London.

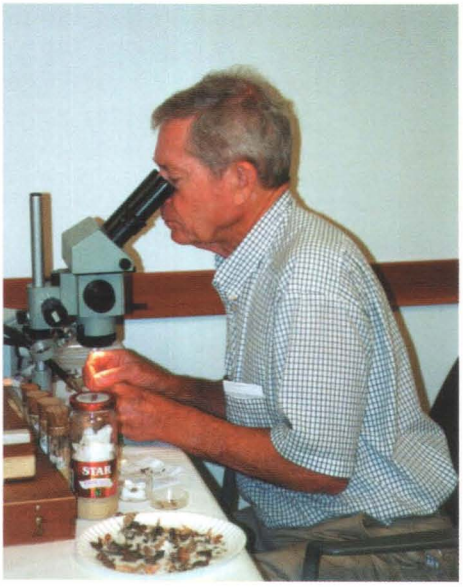
Lafontaine, J.D. 1998. Noctuoidea, Noctuidae (Part). Moths of Amer. N of Mex., Fasc. 27.3; 348 pp. Wedge Entomol. Found., Washington, D.C.

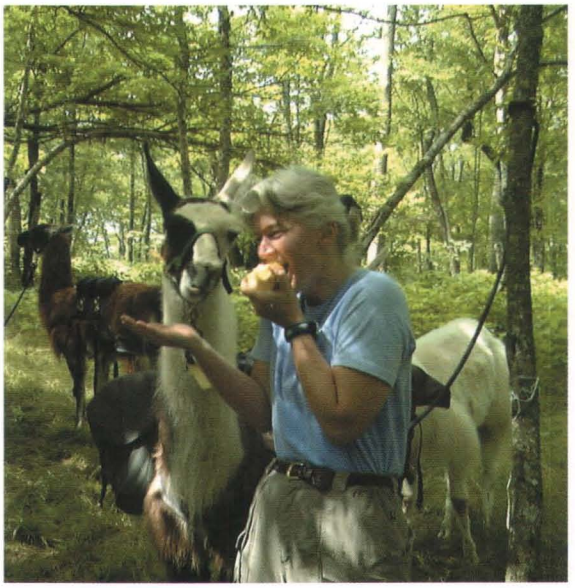
Neil, K.A. 1981. The occurrence of *Noctua pronuba* (Noctuidae) in Nova Scotia: a new North American record. J. Lepid. Soc. 35: 248.

Passoa, S. and C.S. Hollingsworth 1996. Distribution, identification and rate of spread of *Noctua pronuba* (Lepidoptera: Noctuidae) in the northeastern United States. Entomol. News 107: 151-160.

Powell, J.A. and S. Passoa 1991. Rapid colonization of the western United States by the Palearctic moth, *Agonopterix alstroemeriana* (Oecophoridae). J. Lepid. Soc. 45: 234-236.

Warren, A. 2000. *Noctua pronuba* in Colorado! News Lepid. Soc. 42: 85.





Lepidoptera BioBlitz...

Top Left: Michael Pogue and John Brown with summer intern sorting a light trap catch. **Top Right:** "The Gelechioid Twig." Ron Hodges works with graduate students Sibil Bucheli and Sangmi Lee. **Far Left:** Jerry Powell, hard at work. **Left:** One of two llama teams preparing to deploy traps at one of the high elevation balds sampled during the blitz. See the article on pp. 110-111.

A Hybrid *Limenitis* from Louisiana.

Left: Dorsal view; **Right:** Ventral view. Photos by Gary Noel Ross. See the article opposite.

Another Interspecific Hybrid between two *Limenitis* sp. in Louisiana

Gary Noel Ross and Craig W. Marks

6095 Stratford Ave., Baton Rouge, LA 70808 and 106 Duncan Circle, Lafayette, LA 70503

Hybridization between various species of admiral butterflies (*Limenitis*: Nymphalidae) is not uncommon in the United States (see Platt and Maudsley, 1994 for review; Elder, 2002; Kemp, 1991; Schiefer, 1999, 2000). Of the 86 specimens recorded, more than 60 percent involve crosses between the viceroy (*Limenitis archippus* (Cramer)) and the red-spotted purple (*L. arthemis astyanax* (Fabricius)). While hybrids between these two congeneric species are formally designated as *L. archippus* × *L. arthemis astyanax*, specimens are often recognized taxonomically as hybrid form "rubidus" Strecker.

Geographically, these crosses have been noted from the Southwest, Midwest, New England and the Southeast—particularly Georgia and Florida. In fact, two such locations—Athens, Georgia, and O'leno State Park in northern Florida—have been named interspecific "hot spots" (Platt and Maudsley, 1994). All of the wild-caught specimens are males; however females have been produced in laboratory experiments (see Platt & Maudlsey, 1994). Since biological anomalies are of interest not only to the casual observer but to taxonomists, geneticists, ecologists, and evolutionists as well, we are reporting here the recent capture of a hybrid "rubidus" from south-central Louisiana, the second such morph to be recorded from the state (see Kemp, 1991).

On July 29, 2001, we conducted the first official NABA (North American Butterfly Association) "Fourth of July Butterfly Count" in Indian Bayou Area, located at 30° 23' N latitude, 91° 36' W longitude, consisting of 28,500 acres (11,538 hectares), and owned and administered by the U.S. Army Corps of Engineers. The site lies between the towns of Butte La Rose and Krotz Springs in St. Landry Parish and St. Martin Parish (parish=county) and is easily accessed from Interstate 10 from the Butte La Rose Exit approximately halfway between the metropolises of Baton Rouge and Lafayette.

The eastern boundary of Indian Bayou Area is the Atchafalaya River—a controlled distributary of the Mississippi River, and which flows from its junction with the Mississippi 140 miles (235 km) south to the Gulf of Mexico. Directly across the Atchafalaya in St. Martin Parish, Pointe Coupee Parish and Iberville Parish lies Sherburne Wildlife Management Area (43,618 acres or 17,659 hectares, owned jointly by Louisiana Department of Wildlife and Fisheries, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers), and the federally managed Atchafalaya National Wildlife Refuge (15,220 acres or 6,162 hectares) located in St. Martin and Iberville parishes.

All three units represent significant preserves within the Atchafalaya River Basin, the nation's largest complex of forested wetlands and one of the most productive wildlife (including a remnant population of black bear) areas in North America. Vegetationally, this natural floodplain of the Atchafalaya River is classified as "Bottomland Hardwoods and Cypress" (Brown, 1965). Because of low topography (barely above sea level), a difference in only a few inches in elevation often signals changes in plant composition. Important trees include: bald cypress (*Taxodium distichum* Rich.) (Pinaceae), tupelogum (*Nyssa aquatica* L.) (Cornaceae), Drummond red maple (*Acer drummondii* Hooker & Arnold.) (Aceraceae), boxelder (*Acer negundo* L.), water ash (*Fraxinus caroliniana* Mill.) (Oleaceae), pumpkin ash (*Fraxinus tomentosa* Michx. f.), cottonwood (*Populus deltoids* Bartr.) (Salicaceae), black willow (*Salix nigra* Marsh.) (Salicaceae), overcup oak (*Quercus lyrata* Walt.) (Fagaceae), water oak (*Quercus nigra* L.), green hawthorn (*Crataegus viridis* L.) Rosaceae), American sycamore (*Platanus occidentalis* L.) (Platanaceae), hackberry (*Celtis laevigata* Willd.) (Ulmaceae), sweetgum (*Liquidambar styraciflua* L.) (Hamamelidaceae), honey locust (*Gleditsia triacanthos* L.) (Fabaceae), and water locust (*Gleditsia aquatica* Marsh.). Palmetto (*Sabal minor* (Jacq.) Pers.) (Aracaceae) and wax-myrtle (*Myrica cerifera* L.) (Myricaceae) are common understory components.

Although much of Indian Bayou is shaded, there are substantial open, sunny venues: numerous roads and trails topped with limestone aggregate, mowed pipe line right-of-ways, man-made levees, and agricultural fields designated for seasonal produce for wildlife. Typically, summer temperatures reach 90-95°F (32-35°C). If winter temperatures dip below freezing, they do so for only a few hours. Annual rainfall averages 60 plus inches (153 cm). Relative humidity throughout the growing season rarely falls below 70 percent. Because of prodigious wildlife, the area is popular with sportsmen who take (in season with hunting permit) the following: white-tailed deer, squirrels, rabbits, waterfowl, snipe, rail, gallinule, raccoon, crawfish, mourning dove, woodcock, quail and a

wide variety of fish. Non-consumptive forms of recreation require no permits but are best undertaken in non-hunting seasons (for safety).

In 1992 CWM began conducting annual (except for 1998) informal butterfly surveys (excluding skippers) in Indian Bayou Area, averaging 3-4 surveys between early spring and early fall. Then in 2001, CWM and GNR designated the facility an official NABA count site (see above). During that survey we noticed a butterfly dart from a black willow growing along a roadside slough. The butterfly flew about 30 feet (9 meters) before disappearing within high vegetation bordering a roadside ditch. Our first appraisal was "red-spotted purple," a common species. However, there was a disconcerting flash of orange. CWM pursued the insect and quickly netted it. Upon examination, we were surprised with what appeared to be a badly tattered male hybrid between a red-spotted purple and viceroy (viceroys are usually less common that red-spotted purples). CWM pinched the specimen, placed it an envelope, and later, spread and mounted it for further reference. The hybrid was noted in the NABA 2001 Annual Report (Ross, 2002). (Incidentally, the cumulative butterfly data as of fall 2002 for Indian Bayou Area totals 51 species.). The specimen is in the collection of CWM.

The aforementioned hybrid is relatively dark, reminiscent of a red-spotted purple (see photo on pp. 108). However, the bluish coloration on the hindwings of a typical red-spotted purple is replaced by an orangey suffusion and band—more typical of a viceroy. By comparing our specimen with those taken from Florida (Platt & Maudsley, 1994), Mississippi (Schiefer, 1999; 2001), Missouri (Elder, 2002) and Louisiana (Kemp, 1991), ours matches more closely that taken by Kemp in September 1991at Amite, Louisiana—a locale approximately 70 miles (115 km) east of Indian Bayou Area. Additionally, the microhabitat of our specimen is excellent for viceroys and consistent with that reported by Platt & Maudsley (1994) as typical for all hybrid "rubidus"—"rather open moist field or ecotonal areas having willows and water nearby."

Since the parental types are both involved with mimicry complexes (for example, the viceroy mimics various species of distasteful milkweed (danaine) butterflies while the red-spotted purple mimics the distasteful pipe-vine swallowtail (*Battus philenor* (L.)), Platt & Maudsley (1994) hypothesize that "the morphologically intermediate F1 hybrids represent a complete breakdown of both mimetic patterns, and they quite likely are at a selective disadvantage from predation (by birds), when compared to either of the parental types." Furthermore, the authors suggest that since the wild hybrids are all males, "they most certainly are at a mating disadvantage" and probably unable to "persist in nature." Klots (1959) and Ritland (1990) suggest that the majority of interspecific pairings encountered in nature involve female *L. arthemis astyanax* and male *L. archippus*. However, Covell (1994) has demonstrated that reciprocal crosses (female *L. archippus* and male. *L. arthemis astyanax*) also occur in nature.

For further contact: Indian Bayou Area, U.S. Army Corps of Engineers, 112 Speck Lane, Port Barre, LA 70577, (337) 585-0854 or 585-0853. Louisiana Department of Wildlife and Fisheries, 2000 Quail Drive, P.O. Box 98000, Baton Rouge, LA 70898, (225) 765-2918, (for immediate license privileges call toll free 1-888-765-2602), ***www.wlf.state.la.us***.

Literature Cited

Brown, C.A. 1965. Louisiana Trees and Shrubs. Louisiana Forestry Commission, Bulletin No. 1 (1945). Reprinted by Claitor's Book Store, Baton Rouge, LA. 262 pp.

Covell, C.V., Jr. 1994. Field observations of matings between female *Limenitis archippus* and male *L. arthemis* subspecies (Nymphalidae). J. Lepid. Soc. 48: 199-204.

Elder, W.H. 2002. A *Limenitis* sp. Hybrid from Missouri. News Lepid. Soc. 44(2): 64-65.

Kemp, J.M. 1991. My rudibus (sic). News Lepid. Soc. 1991(6): 82.

Klots, A.B. 1959. A mixed mating of two species of *Limenitis* Fabricius (Lepidoptera, Nymphalidae). J. New York Entomol. Soc. 67: 20.

Platt, A.P. & J.R. Maudsley. 1994. Continued interspecific hybridization between *Limenitis (Basilarchia) arthemis astyanax* and *L. archippus* in the southeastern U.S. (Nymphalidae). J. Lepid. Soc. 48(3): 190-198.

Ross, G.N. (ed.). 2002. Region 10: Southeast [pp. 33-38]. *In*: Swengel, A.B. (eds.), NABA Fourth of July Butterfly Counts 2001 Report. North American Butterfly Association, Inc. XXII +100 pp.

Schiefer, T.L. 1999. First records of interspecific hybrids between two *Limenitis* sp. in Mississippi. News Lepid. Soc. 41(4): 99.

Schiefer, T.L. 2000. A second interspecific hybrid of two *Limenitis* sp. In Mississippi. News Lepid. Soc. 42(1): 29.

Tails...*continued from pp. 121*

sing the most superficial knowledge of entomology, we did what seems today to have been a cruel and wanton act. We attempted to mount it by pinning it—alive—to a block of wood with its wings weighted down. When it expired, I kept the body for sometime in plastic container until it crumpled and faded. But in its death throes, this winged dream deposited a number of eggs which my father destroyed with the end of a lighted cigarette—one of the many cigarettes that would, in turn, destroy him. At the age of eight, having no entomologists in the family, and only just beginning to make a collection, I was not a strong enough authority on insects to inform my elders about proper killing and mounting techniques, let alone to be aware that not all moth eggs yield clothes-eating worms.

Such fleeting entomological encounters are trivial and profound and melancholic and uplifting because they are the perfect metaphor for our lives—childhood memories, odd melodies, long-absent acquaintances, deceased loved ones, dreams, family gatherings, passing moods, nostalgic musings, former neighbors—and because they are reflections, too, of all things that renew themselves.

2002 Pacific Slope Meeting Held

Kelly Richers

9417 Carvalho Court. Bakersfield, CA 93311

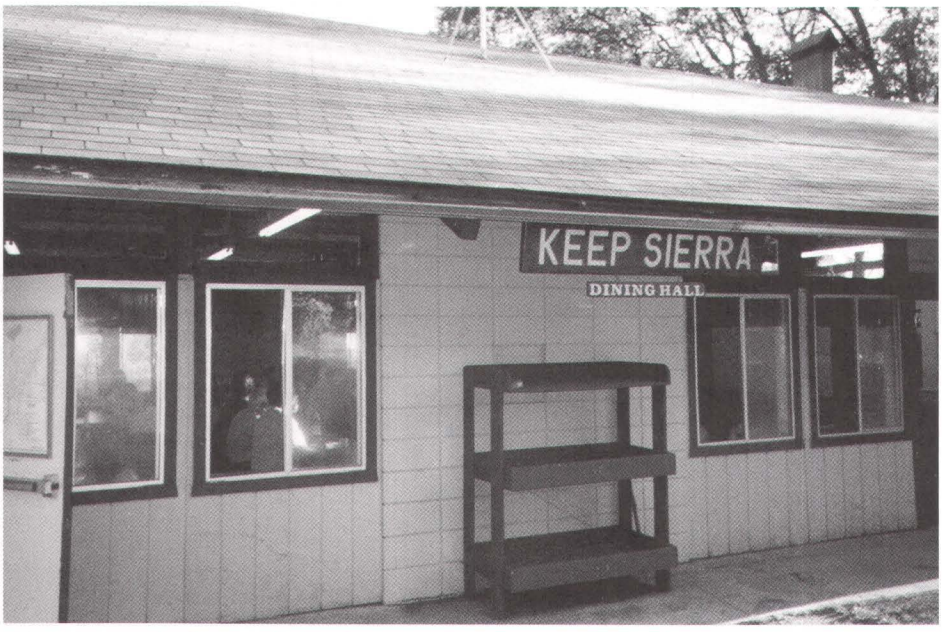
The 2002 Pacific Slope meeting, 49th in a series, was held as planned at Camp KEEP Sierra, Poso Park, Tulare County, California, over the weekend of July 5-7. More than forty lepidopterists gathered to share a weekend in the pines and honor Ray Stanford, the recipient of the Comstock Award.

Before the meeting several lepidopterists gathered at Kernville and split into two parties, with one going up toward Sherman Pass with me, and one going several other spots with Ken Davenport. Butterflies were flying and the sun was shining, creating great conditions for good catches of *Speyeria* and *Hemileuca* for the quick of feet and net.

Friday night was given over to a presentation of "Butterflies of the Greenhorn Mountains and Southern Sierra, Kern and Tulare Counties, California" by Ken Davenport, at which he handed out annotated lists of the species available in the area. Ken is the premier investigator of butterflies in the area, and everyone was prepared for their pursuits of the next few days after his presentation.

The facilities were beautiful, with cabins holding 8 bunks and a large dining and meeting facility available. Parking was also adequate for those wanting to stay in campers, and the staff was able to easily accommodate all, including those with special dietary needs. The only problem encountered was that the meeting room was so open and airy that we had to wait until dark to show slides, as there was no way to block the light under the arched ceiling.

On Saturday, presentations were made of "*Euchloe hyantis*: Is it a Pandora's Box?" by Paul Opler. He has discovered that what was once thought a single species is in fact a complex of several. "Is it Time for Another Commemorative Volume?" by Kelly Richers was a discussion with those present of the possibility of another 25 year commemorative volume, and what to put in and leave out if it is proposed to the national membership.



The main facility for the Pacific Slope meeting. Photo by Kelly Richers.

Ron Leuschner reported on the national meeting in South Carolina, and gve an update on the fascicles in progress of the Moths of America North of Mexico series. He also reported on other, unrelated, unfinished studies that may or may not be completed by those involved.

Kelly Richers then presented the update of the county lists of the moths of California, which has reached 23,600 individual entries, and the state list, which has reached 4092 entries. Research continues.

As darkness fell, Paul Opler could finally show his *Euchloe hyantis* complex slides, and we followed with an update on the Western USA Atlas by Ray Stanford and Paul Opler. William Patterson completed the presentations with a beautiful set of slides on *Xanthathrix ranunculus* form *albipuncta* in California.

The dinner concluded with a presentation by the Comstock Award recipient, Ray Stanford, introduced by Paul Opler, with slides of Ray at a younger age. Ray has been contributing to western lepidoptera knowledge for many yeas, and all were pleased to see him receive this well deserved award.

Collecting at sheets and traps was excellent Friday and Saturday nights, and butterflies were flying at the camp itself. Short drives Saturday yielded many other species, and identifications were done in all available spare time.

Sunday, after a short meeting to discuss future meetings, attendees left for various destinations. Interestingly, two weeks after the meeting, the entire area east of the meeting suffered a forest fire that is still burning and is expected to do so through October. As of this writing, it has burned 127,000 acres, including all the area one group collected on Friday, up to and across Sherman Pass.

Collecting Moths in Nicaragua in 2001

Matthew J. C. Barnes

Upper Cow Leys Farm, Piddington, Bicester, OXON OX25 1QE, England, **mbarnes@dircon.co.uk**

Having received some modest feedback on my previous articles on moth collecting in French Guyana and Belize I thought it possible that some members might be interested to hear about my latest adventures in Nicaragua.

I have been going to Belize to collect moths every winter for the past six years (the fruits of my labors can be seen at ***www.tropicalmoths.org***, where nearly 1,000 identified species are currently illustrated in color, with many more to come). Sadly, this annual research effort was cut short by the effects of Hurricane Iris, which devastated southern Belize in October 2001 and resulted in severe damage to my main base there.

A contact from Nicaragua, Jean-Michel Maes, has been asking me to go to there to collect moths for some time now, so I took my courage in my hands and took the plunge. Sadly, Nicaragua suffers from unfortunate press—when I mentioned that I was going there to friends and relatives they paled visibly; muttered things about 'drugs' and 'guns' and invariably wished me a heartfelt "be careful".

Like the rumors of Mark Twain's death I am happy to report that such rumors are grossly exaggerated. In addition to Nicaraguans being an exceptionally friendly and helpful people who are determined to put their violent past behind them, Nicaragua is also an extraordinarily cheap place to visit and offers almost unparalleled opportunities to do original entomological work. If you can go there to collect bugs (or even just do some tourism) I would strongly recommend you do so before—like Costa Rica—everyone discovers it.

Jean-Michel very kindly organized the whole trip for us, since I was frankly dubious about driving around Nicaragua on my own—something about which I would have no hesitation now. Given a choice by Jean-Michel of racing around the country collecting in various locations for three weeks, or of settling down to do some serious work in just a few places, I elected to collect in just two localities—Bartola, in the exceptionally wet rain-forest region of the Caribbean east coast known as the Rio San Juan; and Domitila, a Jungle Lodge in dry forest on Lake Nicaragua on the Pacific west coast—with some tourism and general reconnaissance thrown in between times.

Bartola is not easy to get to, to put it mildly. It's a three-day trip from Managua (the capital) by boat, or a two-day trip by air and boat, but once you are there the rain forest is good and the collecting superb.

Photo by Matthew Barnes.

On Day One of the trip to Bartola we set off from Managua by road for the old colonial city of Granada, on lake Nicaragua. Granada is well worth seeing anyway as it is the oldest city on the American mainland and stuffed full of beautiful old colonial houses, churches and cathedrals. The faded splendor of this once-beautiful city, damaged over the years by both natural and man-made disaster, is happily being restored gradually with the aid of grants from the Spanish and other governments. Ravaged by decades of dictatorship, civil war, earthquakes and volcanoes it is difficult to comprehend that this country—now one of the poorest on earth—was once a bustling entry port that catered for much of the overland trade between Atlantic and Pacific until the Panama Canal was built.

After an overnight stay in a wonderfully cheap old colonial hotel in Granada we caught the early ferry across Lake Nicaragua (the second largest body of fresh water on earth, with its own endemic species of freshwater shark and many other unique creatures) to the town of San Carlos, at the mouth of the Rio San Juan.

The boat journey is 13 hours long but quite comfortable as the 'Solentiname' is a magnificent modern 100 ton former Baltic cruiser, with onboard videos (in English, with Spanish subtitles), cushioned seats, air-conditioning and uniformed stewards. For a little less than the US$30 we paid to travel first class we could have dispensed with the videos and air-conditioning and sprawled out on the wooden benches of 'Second Class' below.

We found out later that we could have flown across Lake Nicaragua to San Carlos in just under an hour, but it is worth doing the boat journey just once to appreciate the magnificent scenery surrounding this majestic lake—so big that its shores are barely visible. We sailed past volcano after magnificent volcano, majestically capped in windswept white cloud, before finally stopping for an hour of tourism at Ometepe, the largest fresh-water island in the world. From there we powered on into the gathering tropical dusk to the Solentiname islands, home to many famous Nicaraguan artists and artisans.

There is always something magical about arriving in a strange place in the

tropics, like Solentiname, by boat—an assault on all the senses with the loud tropical night sounds being punctuated by the revving and slowing of the engines as the ship maneuvers into the quayside; the vibration of the deck beneath your feet; the excited chattering of sailors and residents happy to be home; and above all, the exotic smells of warm tropical night air drifting lazily from the new-found shore.

After a brief stop at Solentiname we finally groped our way into San Carlos at about 9 pm, the skipper cruising back and forth outside the port for about an hour before finally locating—with searchlights—the home-made buoys that mark the channel to the port, a somewhat surreal experience.

San Carlos is another kind of assault on the senses. The character played by Clint Eastwood in 'Spaghetti Westerns' would not have felt out of place in this exceptionally grubby little central American town, with mud and trash everywhere—and houses in such an advanced state of dilapidation it was difficult to believe they were still standing. I shamefacedly admitted later to my newfound Nicaraguan friends that I did not permit food or unbottled drink to touch my lips for the entire 12 hours we were in San Carlos only to be reassured by them that they would not dream of doing so either! Curiously we did not find a single cockroach or bedbug in the little hotel which Jean-Michel had booked for us in San Carlos, but all became clear when we were woken up by the sound of a motorised insecticide sprayer being walked around town first thing in the morning, a sight we saw repeated in many subsequent places in Nicaragua. Nicaraguans are keen on fumigation, which probably explains why, unlike Belize, Nicaraguan hotel rooms seem to be mercifully free of Scorpions and Tarantulas as well as bugs.

The boat for El Castillo, some sixty miles up the Rio San Juan from San Carlos, left at about six the next morning and, unlike the 'Solentiname', was the original 'pigs and chickens' boat: a long, thin river boat with a powerful outboard motor seating about thirty on cramped little bench seats.

Mercifully there were no pigs or chickens on this particular trip, but plenty of cardboard boxes full of various bits of produce tied together with string. To this I added my six-gallon can of gasoline that had been supplied by Jean Michel in Managua to feed the generator I was going to be using at Bartola. Together with a cheerful gang of Nicaraguan souls (this is not real tourist country—yet) we set off for the three hours down river to El Castillo.

The scenery on this part of the Rio San Juan is frankly disappointing, with much evidence of deforestation and only small patches of broken forest. I am told, however, that further up-river, by the Costa Rican border in the Refugio Bartola the forest becomes pristine but we didn't get to see it on this trip.

El Castillo itself was the last in a series of successively more remote river villages. Curiously enough it possesses an imposing 17th century fort, which I was impressed to find was the site of the battle in which Admiral Lord Nelson lost his eye. I was even more impressed to find that the launch that Bartola Research Station had promised to send for us was already tied to the jetty there and waiting for us.

A further hour downriver, the somewhat eerie shape of Bartola Lodge and Research Station loomed out of the river mist. How on earth they haul in the materials to build these remote dwellings is beyond me, but Bartola is quite substantial with a large central palapa used as a dining area; a wooden hotel area and several large concrete buildings including a purpose-built laboratory. The clearing on which it is built relatively small, right on the riverbank and the lodge itself is surrounded by pretty good rainforest. All rooms have en-suite bathrooms, an astonishing luxury in the middle of the jungle!

Things took a slight turn for the worse when I lugged my six gallons of gasoline onto the jetty and the manager asked (in Spanish—virtually no English is spoken in Nicaragua outside of big hotels and airports) "What's that for?" I replied "it's for the generator" to which he replied blankly "what generator?" I was less than impressed to find that, despite this trip having been organised by Jean-Michel some months previously, the small gasoline generator I had been promised was lying in a rusty heap behind an outhouse. Such things happen in the tropics, I reminded myself, trying to suppress my gringo-ish craving for order and efficiency.

Fortunately the station had a large Diesel generator—normally turned off at 9 pm—which I was allowed to run all night when there were no other guests at the lodge. My gasoline, laboriously lugged 80 miles downriver, languished in its little drum behind our room while I had to pay for yet more diesel to be lugged up from El Castillo. Such is life. The promised five nights of collecting rapidly collapsed to one complete night and three partial nights, but I could hardly complain—Bartola is one of those amazing places where you switch on a mercury-vapour light after nightfall and it is soon covered in bugs. I took about 1,500 moth specimens and for what was essentially a reconnaissance mission I did not feel that was too bad. Next time, however, I will bring my own generator!

Collecting, as always, was best in the rain. Fortunately it rained pretty much non-stop at Bartola. Indeed, the Rio San Juan may not be to everyone's taste as it rains pretty much non-stop all the time—up to seven metres of rain are recorded per year in these parts, which is among the wettest places on earth. This incredible rain promotes an incredible biodiversity, however, so to say that I am looking forward to mounting a collecting expedition into the depths of the undisturbed Refugio Bartola one day soon would be an understatement.

Our efforts to get back *out* of Bartola would occupy an entire book. Suffice it to say that we had planned to take two

boats, as before, to San Carlos and then catch the 'La Costena' aircraft to Managua the next morning from San Carlos. This did not happen, and the reason it didn't happen was because much of Nicaragua has not yet worked out that, if it wants mass tourism, folk are going to have to get used to the boring idea of setting a timetable and sticking to it. In the meantime, don't expect things to run smoothly on the transport front in Nicaragua! We were rescued by an unlikely 'Fairy Godmother' in the form of the ex-Governor of the province—a former Sandinista-guerrilla-turned-frog-breeder—who took us in his personal boat to San Carlos and then (when 'La Costena' refused to acknowledge that I existed when the aircraft turned up five hours late) arranged for me to be on the next flight the following day. In the meantime, I spent another unscheduled night of near-starvation in San Carlos and another collecting night was lost. Nicaragua is wonderful and fascinating but I was reminded of my youthful collecting expeditions in Africa, somewhat of a shock after the relative efficiency of Belize.

Next stop was Domitila Jungle Lodge close to Grenada on the Pacific shore of Lake Nicaragua and in the shadow of the brooding Mombacho volcano. After getting myself and all of my belongings saturated in the non-stop rain of the Rio San Juan it was nice to get dried out and see some sun for a change but the downside was that there were, of course, far fewer moths here.

Our hosts at Domitila, Maria-Jose and Silvio Mejia are the products of two distinguished old Granada families. Courteous, energetic and educated (and fluent in Spanish, English and French) Maria and Silvio are passionate about their 550 acres of private reserve, which is home to more than 150 species of bird and numerous mammals as well as a largely-uncatalogued host of invertebrates including the brilliant six-inch metallic blue Morpho butterfly, *Morpho peleides*. Although the estate has been in Silvio's family since 1881 and has been divided into smaller reserves under the various brothers, Silvio and Maria have only recently constructed the Domitila Jungle Lodge, run along eco-friendly lines with the aim of attracting eco-tourist and researcher alike. Already it has attracted several prizes for conservation and innovation from the Nicaraguan government. At present the facilities include a roomy and comfortable student bunkhouse—used extensively by Nicaraguan Universities for training in conservation management—plus two double rooms with thatched roofs and en-suite bathrooms. There are plans to expand accommodation for eco-tourists and scientists at Domitila as demand grows.

Although common elsewhere throughout Central America, Jungle Lodges are a new departure for Nicaragua, which is anxious to build up its tourism industry after the recent end of decades of civil war. To date only Bartola and Domitila, and another, highly luxurious Jungle Lodge called Montecristo a little higher on the Rio San Juan from Bartola, are capitalizing on this growth industry. The extensive use of private reserves such as Domitila is pivotal to the proposed 'Meso-American Biological Corridor,' and such ventures need to be funded by paying researchers and eco-tourists. Anyone wishing to see what is happening at Domitila, or lend a helping hand with faunal inventory, can contact Maria at ***domitilareserve@yahoo.com***.

Special 'researchers' rates' are available at both Domitila and Bartola for those undertaking serious scientific projects, and the food and general ambience at Domitila are excellent and certainly to be recommended. Although I found moths scarce at this dry time (collecting is better in June, during the wet season) the butterfly diversity at Domitila was still astonishing.

Several other collecting sites, in a variety of habitats, were also offered to us by Jean-Michel. These included Mombacho itself, where basic reseach-station type accommodation is available in the cloud forest, and Guatuzos, in the dry Pacific plains, where a similar bunkhouse arrangement is available. Nicaragua is the second largest Central American country and possesses an astonishing range of vegetational types, ranging from dry forest and coastal plain through moist cloud forest to ultra-wet lowland rain forest. The insect biodiversity could be expected to be commensurately high, although much is still unknown about this aspect of Nicaraguan nature study. Jean-Michel has catalogued nearly 120 sp. of Sphingidae from the country so far—about 15% of the world total—and similar astonishingly high figures for other groups can be expected.

From Domitila we moved to Leon, Nicaraguas second old colonial city, where Jean-Michel maintains the privately run 'Museo Entomologico de Leon.' The latter is a remarkable enterprise in which Jean-Michel, almost single-handedly, has made major in-roads into cataloguing the biodiversity of this fascinating country. Virtually no work had been done on Nicarguan insects before his arrival and now, as well as extensive collections, a variety of publications

Mombacho. Photo by Matthew Barnes.

have been produced on various Nicaraguan insect groups. All of this has been squeezed around a non-entomological 'daytime job' in the best traditions of amateur science that also characterizes so many Lepidopterists' Society's members.

As well as organizing our itinerary Jean-Michel also dealt with all of the necessary collecting and export permits for my specimens, as well as their shipment back to Europe. This made logistics considerably easier. Although himself a coleopterist Jean-Michel is still looking for specialists in certain groups who can help with the task of cataloguing the Nicaraguan insect fauna and he would be willing to extend the same support to them as he has done to myself and others. The butterflies are pretty well 'done' now, although specialists in some of the more rarefied groups such as the Theclinae and Riodinidae would still be made welcome. Several people other than myself have now visited Nicaragua under Jean-Michel's auspices to collect moths, but there is still much work to do especially in groups other than Sphingidae and Saturniidae. However, commercial collectors and those collecting common, well-studied groups would probably have to make their own arrangements for permits as there is little they could do to add to knowledge of the Nicaraguan insect fauna. Jean-Michel Maes may be contacted (in English, French or Spanish) at ***jmmaes@ibw.com.ni***

If you avoid one or two well-known troublespots (mostly in the north of the country) you are no more likely to be mugged or shot in Nicaragua than you are in most European or North American countries—and a lot less likely than in many of the neighbouring countries. On the other hand you *are* almost certain to have a good time (unlike much of Belize, the food is generally excellent!); to bring back a lot of new and unusual material and—in certain groups—make a real contribution to the knowledge of the insect fauna of an extremely interesting country. I recommend you go there if you can.

Membership Update...

Julian Donahue

This update includes all changes received by 16 October 2002.

New and Reinstated Members:

members who have joined/renewed/or rescinded their request to be omitted since publication of the 2000 Membership Directory (not included in the 2000 Membership Directory; all in U.S.A. unless noted otherwise)

***New members are listed here by name only; their addresses will appear in the 2002 Biennial Membership Directory that is being mailed with this issue of the* News.**

Avey, Jenny (Mrs.)
Avni-Pedersen, Naomi
Avni-Pedersen, Ran
Brunet, Donna A.
Caruthers, Bonnie
Graser, Steve
Hayden, Jim
Krivda, Walter Vladamir
Malloy, Michael
Moore, Paulus B. (Dr.)
Phillips, Derek
Salvato, Mark H.
Sears, Terry A.
Steele, Robert, III
Stichter, Sharon (Ph.D.)
Tupa, Amy L.
Zaleski, Philip

Address Changes

(all U.S.A. unless noted otherwise)

***The new addresses will be found in the Membership Directory being mailed with this issue of the* News.**

Classey, Eric W.
Oliver, Jeff
Prudic, Katy
Rindge, Frederick H. (Dr.)
Schmidt, Chris
Solis, Maria Alma (Dr.)
Summerville, Keith (Dr.)

Announcement...

Basic Techniques for Observing and Studying Moths & Butterflies

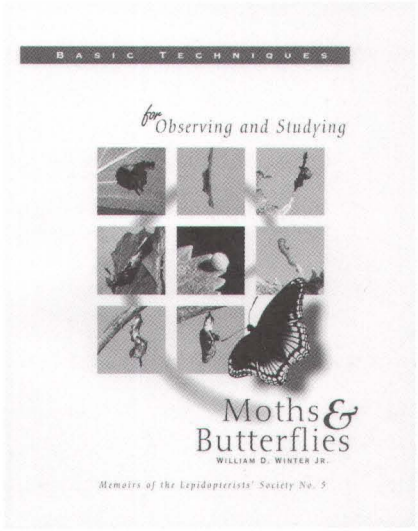
by William D. Winter.

Lep. Soc. Memoir #5 is a 350-page book (with 82 pages of Appendices) packed with information for study of Lepidoptera. Both beginners and experienced students of Lepidoptera will find this book to be a valuable reference.

To get a copy, send check or Money Order for $29 (Members), $44 (Non-members), postpaid (Canada add $6; other countries add $10), made payable to

"The Lepidopterists' Society," to:

Ken Bliss, Publications Mgr.
P. O. Box 1366, Edison, NJ 08817



Noctua pronuba Reaches the Pacific Coast

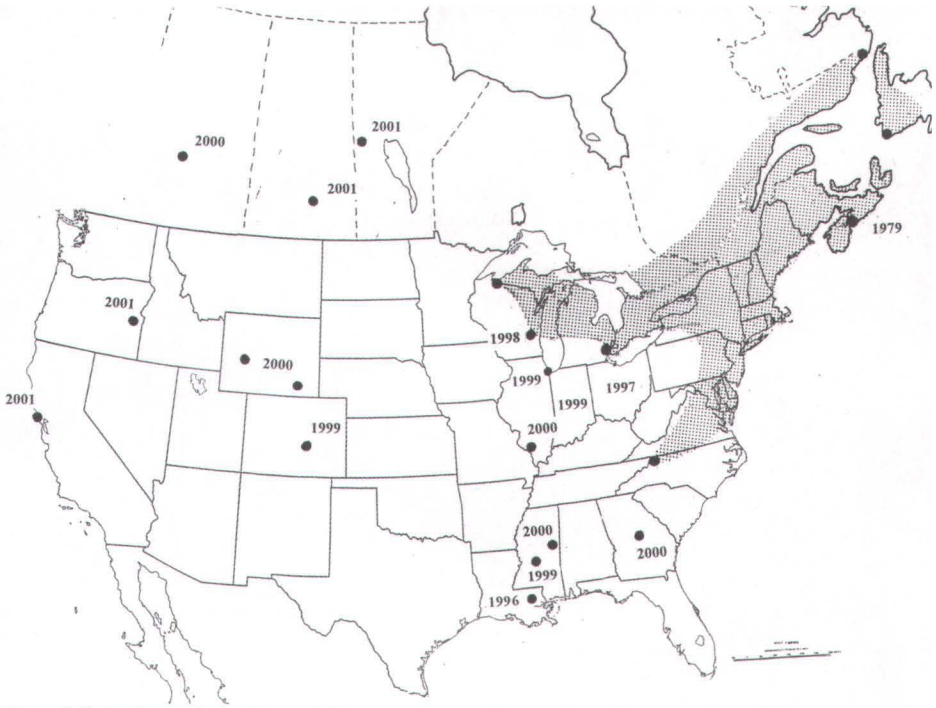
Jerry A. Powell

Essig Museum of Entomology, University of California, Berkeley, CA 94720

Noctua pronuba (L.), the type species of the genus, and hence the Noctuidae, is a large noctuine with yellow-orange hindwings that is widespread in the Palaearctic, from Europe and North Africa to India (Lafontaine 1978). It was first discovered in North America at Halifax, Nova Scotia, in 1979 (Neil 1981).

There is a single annual generation, but the adults are long-lived and capable of extended migration in great numbers (Howard 1999). The larvae are general feeders, particularly on low herbaceous plants, so are adapted to numerous habitats, facilitating colonization. The species gradually moved southward, becoming abundant and widespread in southern Canada and the New England states during the succeeding 15 years. Passoa & Hollingsworth (1996) calculated the rate of spread in the eastern U.S. averaged approximately 80 miles per year during 1985-1994. Since that time *N. pronuba* has increased its westward expansion exponentially. It was discovered in Louisiana in 1996 (Brou 1997), which suggests the possibility of an independent or secondary introduction in the Gulf states.

The North American distribution, mapped as of 1997 by Lafontaine (1998), extended northward to Newfoundland and northeastern Quebec, westward to Michigan, and southward to North Carolina (see map). Timely reports in the Lepidopterists' Society Season Summary recorded *N. pronuba* in several states west to The Mississippi River by 1999-2000, and Warren (2000) collected the immigrant in Colorado in 1999. The next year it appeared in Wyoming, including several dozen specimens in traps near treeline in the Wind River Range, and at Edmonton, Alberta; then in Manitoba and Saskatchewan in 2001 (Lafontaine *in litt.*). A single specimen was collected near Vale, Malheur Co. in eastern Oregon in September 2001 (Crabo *in litt.*).



Map of Canada and the United States showing the westward expansion of Noctua pronuba *following its discovery at Halifax, Nova Scotia, in 1979. Shaded area depicts known range in 1997 as mapped by Lafontaine (1998). First records mapped by state (Brou 1997, Gilligan & Rings 1997, Albu 2000, Lepid. News Season Summary 1998-2000, Warren 2000, Crabo* in litt.*) and province (Lafontaine* in litt.*)*

Noctua pronuba completed its journey to the Pacific Ocean by the end of the 2001 season, when I caught two adults in a blacklight trap at Inverness, Marin County, CA, on 26 October and 1 November 2001. The trap, which was set in a *Quercus-Umbellularia* woods and a weedy garden-apple orchard on the two dates, was run all night at this locality on 28 consecutive nights, 10 Oct.-6 Nov., along with two blacklight sheets. About 185 species of moths were recorded, including 44 Noctuidae, many of them on multiple nights, but just the two *Noctua* were taken. Hence, if established, it had not become abundant yet. The site is at the western edge of the village of Inverness, just above Tomales Bay, about 5 airline miles from the Pacific Ocean at Pt. Reyes National Seashore.

The race across western North America spanned ca. 1800 miles during 1998-2001, an average distance of 450 miles per year. Northward advance to mid Manitoba and the southern occurrence in LA and MS represent equivalent distances to the westward spread, defining a range (right angle width X length) of about 3,000,000 mi² that was occupied during six seasons.

The pattern of spread in North America is similar to that of the Palaearctic

continued on pp. 111

LEPSOC 2003

54th Annual Meeting of the Lepidopterists' Society
Olds College, Olds, Alberta, Canada
July 23-27, 2003

The 54th Annual Meeting of the Lepidopterists' Society will be held July 23-27, 2003 (Wednesday through Sunday) on the campus of Olds College in Olds, Alberta, approximately 50 miles north of Calgary. Local hosts of the meeting are Ernest Mengersen (Olds College) and the Alberta Lepidopterists' Guild. Accompanying this announcement is a Registration Form and a Call for Contributed Papers, as well as directions to the site and information on local accommodations. The Advance Registration fee covers the Open Reception on Thursday night, the daily paper/ symposium presentations, registration materials, and US $15.00 for society awards. Costs of the Friday night barbecue, the Saturday Annual Banquet, and Field Trips (including bag lunch and beverage) are extra, and must be paid for at the time of advance Registration. Walk-in registrations at the time of the Meeting will be limited to registration for the sessions only, and tickets for the Banquet and other events will be not be available at that time.

The Meeting schedule (subject to change–check LepSoc website (www.lepsoc.org) for updates/changes) is as follows:

Wednesday July 23.

Butterfly collecting or photography field trips.
Evening moth collecting field trip.

Thursday July 24.

Executive Council meeting
Local butterfly collecting or photography field trips.
Open reception in evening. Local moth collecting.

Friday July 25

Symposium 1 – The Future of Lepidopterology
Group Photograph
Contributed Papers.
Friday Night Barbecue

Saturday July 26

Symposium 2 – Lepidoptera Biology
Contributed Papers
Social Hour & Annual Banquet

Sunday July 27

Contributed papers (if required)
Annual Business Meeting (following any contributed papers)

Please direct program questions to: Dr. Felix Sperling, Department of Biological Sciences, M-354 Biological Sciences Center, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9, (780) 492-3991, felix.sperling@ualberta.ca.

Registration Form

54th Annual Meeting of the Lepidopterists' Society
July 23-27, 2003. Olds College, Olds, Alberta, Canada

Last Name: _____, First & Initial _____
Street Address or P.O. Box _____
City/Town: _____
Province/State: _____ Postal/Zip Code: _____
Country: _____ E-mail: _____

Registration fee includes reception, breaks, program, postage, registration materials and US $15.00 for society awards.
NOTE: **All meeting costs including registration are quoted in US dollars.**

Regular Registration Rate
Number of persons x US $85.00 (by June 1), US $100.00 After June 1. $_____

Student Registration Rate
Number of students x US $65.00 (by June 1), US $80 after June 1. $_____

Companion/Family Registration Rate
(includes reception, but no breaks or meeting sessions) $_____
No. of persons x US $45.00 (by June 1), US $55.00 after June 1.

Barbecue, Friday evening US $14.00/person $_____
Indicate menu: Meat ____ Vegetarian _____

Annual banquet, Saturday evening US $24.00/person (cash bar) $_____
Indicate menu: Meat ____ Chicken/Fish _____ Vegetarian _____

Field trips, US $6.00 per participant/trip (includes lunch and beverage)
Please remember to include signed release form (opposite) if participating in field trip

Wednesday: Butterfly collecting _____ Photographing _____ Moths _____ $_____

Thursday: Butterfly collecting _____ Photographing _____ Moths _____ $_____

Official LepSoc 2003 T-shirt featuring "stealth bomber butterfly" US $14.00 ea.
Number and size: small _____ medium _____ large _____ extra large_____ $_____

Vendor Table for sale of books, equipment or other materials, US $10.00/day/table $_____

Olds College Townhouse Housing

Persons for: Tues. _____ Wed. _____ Thurs. _____ Fri. _____ Sat. _____ Sun. _____
Cost of single room (4 single rooms per unit) (US $23.50 per night - includes linens) $_____

Name of Individual(s): _____

Total Enclosed: **$ _____**

Field trip, barbeque and banquet tickets must be reserved and paid in advance. Walk in registrations during the meeting will be for sessions only. **Note:** Remember that if you are crossing the border into Canada you will require a passport or other acceptable identification and proof of citizenship (i.e. Birth Certificates) for yourself and for any minors accompanying you, to both enter Canada and to return to the USA.

Method of Payment and Cancellation Policies

Make checks out to "Alberta Lepidopterists' Guild," payable in US Dollars or equivalent amount in Canadian Dollars as calculated by current exchange rates to be equivalent to the US dollar amount. Mail completed registration and payment to:

Alberta Lepidopterists' Guild, c/o Dr. Felix Sperling, Department of Biological Sciences
M-354 Biological Sciences Center , University of Alberta, Edmonton, Alberta, Canada, T6G 2E9.

Cancellations: A processing fee of $15.00 US will be retained for all cancellations through June 15, 2003. There will be **no refunds** for cancellations after June 15, 2003

Call for Contributed Papers

54th Annual Meeting of the Lepidopterists' Society
July 23-27, 2003, Olds College, Olds, Alberta, Canada

Name: _____

Address: _____

_____

Phone (including Area Code):_____

Fax: _____ E-mail _____

_____ Check if student paper _____ Check if poster

Title:_____

_____

Author(s): _____

_____

Abstract: (Type 125 words or less):

Audiovisual equipment required (slides ____ video ____ Powerpoint ____other ___)

Submission guidelines (please read carefully !)

1) Only one contributed paper per person may be submitted.
2) Each paper limited to 15 minutes presentation; allow 12 minutes for the talk and 3 minutes for questions.
3) Deadline for contributed papers is June 1, 2003. This form (completed), including title and abstract must be received by June 1st to guarantee inclusion in the printed meeting program.
4) Please consider submitting this form in Microsoft Word or ASCII to Felix Sperling (felix.sperling@ualberta.ca) to expedite production of the printed program.

Contributed papers are scheduled for Friday and Saturday (25-26 July). After June 15, 2000 we will begin confirming actual time slots for papers. Please also contact us by June 1 if you plan to ship a poster.

Return this completed form to: **Dr. Felix Sperling, Department of Biological Sciences, M-354 Biological Sciences Center , University of Alberta, Edmonton, Alberta, Canada, T6G 2E9. Telephone: (780) 492-3991**

Field Trip Liability Release Form

I release the Lepidopterists' Society and the Alberta Lepidopterists' Guild, the officers of both organizations and the field trip leaders from any liability which may result from my voluntary participation in field trips associated with the 2003 annual meeting of the Lepidopterists' Society in Olds, Alberta, Canada. I understand that I may be transported in a private vehicle and that there are potential hazards on any field trip. I assume all responsibility, personal and financial, for any accidents or other injury or loss on any field trip in which I choose to partake.

Name: _____.

Signature: _____ Date: _____.

54th Annual Meeting of the Lepidopterists' Society

July 23-27, 2003. Olds College, Olds, Alberta, Canada

Local Arrangements

Olds has a population of 6000, and is located one hour north of Calgary. It is a busy town with a large commercial sector, fueled by agriculture, the oil and gas industry, as well as the Olds Agricultural College. For more information about Olds, accommodations, or the surrounding area, visit their website at www.town.olds.ab.ca

Directions:

From the Calgary Airport: Take Highway #2 north for approximately 45 minutes to the Olds overpass (Highway #27 exit). Go west into town on Hwy #27 for about 3 minutes and turn left at the first set of lights (this puts you going south on Hwy 2A). Turn left at the third entrance into Olds College (at the Aquatic Center) and follow the signs to register for the Lep Soc Meeting/accommodations.

Accommodations:

OLDS COLLEGE

Olds College **Townhouses** have 4 single bedrooms with common kitchen, living room and 2 bathrooms. There are no dishes (bring some if you like) but the college cafeteria is available for meals at a reasonable rate. Ask to share with appropriate sex when registering and the registration office will do the arranging. The college also has an on campus fitness facility. If you require late check-in and other information, please inquire at the time of making your reservations. You will be within walking distance of the meeting rooms and cafeteria. Cost is US $23.50 per night. Reserve through the Alberta Lepidopterists' Guild when sending in your Conference Registration.

Olds College also has a limited number of **RV Camping** sites, all with electrical hookups. Cost is approximately US $8.00 per night. Available on a "first come, first served" basis.

OTHER LOCAL ACCOMODATIONS

Note: prices for local Commercial Accommodations only are quoted in Canadian dollars. Exchange rates may vary depending on when you register. Please register directly with hotel/motel.

BEST WESTERN INN
4520-46 St. Olds, Alta., T4H 1P, Phone: 1-403-556-5900 Fax: 1-403-556-5999
Rate including taxes is about $95.20 Canadian per person or $106.40 Canadian for double. Continental breakfast included . They have a pool, hot tub and fitness room. (You'll drive past it on the way into town just before the first set of lights).

CIRCLE 5 MOTEL
4513-52 Ave, Olds, Alta., T4H 1M8, Phone: 1-403-556-7755 Fax: 1-403-556-1299
Rate including taxes is about $50.40 Canadian per single or $60.48 Canadian per double. Fridge and coffee in ll rooms. They are located at the second set of lights as you come into town from the east on Highway 27. Smitty's Restaurant is in the front of the motel.

SPORTSMAN INN MOTEL
5610-46 St. Olds, Alta., T4H 1B8, Phone: 1-403-556-3315 Fax: 1-403-556-3703
Rate including taxes is about $51.52 Canadian per single and $58.24 Canadian per double. A few blocks further west on Highway #27, just past Tim Horton's.

SIESTA MOTEL
5218 – 46 st. Olds, Alta. T4H 1B8, (Highway 27 West, on north side about half way through town), Phone 1-403-556-3376, Fax 1-403-556-3583.
Approximate rates are as follows: Single – $45.00 Canadian, 2 persons $55.00 Canadian, $5.00 Canadian for each additional person. (mention the LepSoc Meeting when making reservations).

Camping Facilities

O. R. Hedges Park Campground. Full shower facilities and RV hook-ups. Located in town about a 15-minute walk to the college. Rates are about $16 Canadian per night - first come, first served – self-registration. Follow above directions to the college, and go just past the last entrance to Olds College. Turn right (west) at the Auction Mart and continue west across the railroad tracks. One block after tracks, turn left into second entrance of the campground.

The Lives of Butterflies: Tails & Tales

Paul Manton

Encounters

A long walk through farm, grassland, and meadow-hill.

Shaded under trees, above a rocky beach, is my favorite picnic spot; checkered blanket with my guy.

Salt sprays, bologna sandwiches and Snapples.

Orange-and-black butterfly flutters through beach plum thickets, alighting on a twig.

"How did you catch it without a net?" asks my guy on the checkered blanket.

Once released, it flew off towards the boulder-strewn beach; Connecticut across the turquoise Sound.

Back to the checkered blanket, bologna sandwiches, and Snapples.

"How did you catch that orange-and-black butterfly?" my guy on the checkered blanket asks again. "How did you catch it without a net?"

Cathy A. Manton

This poem, recently crafted by my wife, reminds me that the mind of every lepidopterist is a vast collection of memories that are pinned and labeled with differential degrees of accuracy and states of preservation; never approaching "museum quality" because life itself is characterized by taxonomic chaos and consist of specimens battered and faded by time and the elements. But here, from my own collection, are a few specimens exhibited in Nabokovian style.

This article continues a series of light-hearted columns about the lives of butterflies (and butterfliers). Contact the author of this installment, Paul Manton at 10 Flower Street, Hicksville, N.Y. 11801, or at **paulmanton1@aol.com**. *Contact series editor, Bob Robbins, at the Department of Entomology, NHB 127, NMNH, Smithsonian Institution, Washington, DC 20560-0127, (202) 357-2353,* **robbins.robert@nmnh.si.edu**

Flemmington, N.J. (2000).

Behind a railroad siding, a meadow of Queen Anne's Lace rippled and murmured like a live field of snow. There, aft a vintage 1930's era train upon which I had ridden, I saw more Black Swallowtails in any one locale and at the same time than I have ever before witnessed.

Traversing the belly-high grass along the verge of this two-acre mantle of rich cream and flashes of hymenopterian black and red and yellow, I swept-up those fluttering blurs of elegant black and cheveroned necklaces until the bag of my net held two and another flapped under my straw hat. Setting them free was as pleasing as the capture.

Fire Island (1973).

In a desert-like swale, where October goldenrods grew hidden from the world by sandy crests, a lone pine tree bore hundreds of saffron fruit. As the setting sun cast its burnt orange glow over the land in long, finger-like beams, the silhouette of the Monarch butterflies seared itself into my memory.

Muttontown, N.Y. (1984).

It's a lonely little patch of woods I oftentimes revisit; a place where the air is always heavy with primordial foreboding and the surreal feeling wherein one is inspired to conjure odd and haunting fancies from contorted shadows. A young hemlock tree in this place, innocuous in a sunny glade in the morining, becomes a shaggy wood giant lurking in the gloom of an overcast afternoon. But on this afternoon, a sprite seemed to dance in and out of sight; the Mourning Cloak butterfly alighting again and again on the last patch of snow.

Manhattan, N.Y. (1999).

Horns and shrill whistles and sirens from sources seen and unseen echoed through the bustling canyons of glass, masonry, and billboard. High above, unnoticed like the butter

fly in Van Gogh's "The Prison Yard", a Cabbage White tumbled along. It was oblivious to human sights and sounds as though somewhere in its own little meadow.

How strange is this place and this creature in this place, I thought, and then recalled the odd scene of unworldliness and eerie-colored sky visited, thirty-five million years hence, by the narrator in H.G. Wells' **The Time Machine.**

> "Far away up the desolate slope I heard a harsh scream and saw a thing like a huge white butterfly go slanting and fluttering into the sky and, circling; disappear over some hillocks beyond."

Levittown, N.Y. (1969).

It was one of those cool mornings that, in our youth, seem like the dawning of a new world rather than the start of another day. On this sunny morning, around ten o'clock, our neighbor, Mrs. Eichhorn, spied a Cecropia moth sitting on the privet hedge that used to separate her property from the sidewalk. This was the same hedgerow I would have a painful encounter with a squadron of nesting yellow jackets the following summer. It was quickly captured and brought over to my house; this strange and astonishing "wild butterfly", the likes of which nobody had ever seen before. It became obvious, in time, that it was a moth and, posses-

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The Marketplace

IMPORTANT NOTICE TO ADVERTISERS: **If the number following your advertisement is "442" then *you must renew your advertisement* before the next issue! Remember that all revisions are required in writing.**

Books/Videos

For sale: Books on Lepidoptera and other orders. Have a number of D'Abrera's books, plus pins, vials, nets, etc. Send SASE to Dr. Eugene J Gerberg, 5819 NW 57th Way, Gainesville, FL 32653, ***genejg@aol.com*** 443

Butterflies of the Australian Region (Vol. 1) by B. D'Abrera. 1971. This edition is out of print. Excellent condition, with marginal discoloration only. $180 postpaid. Glenn A. Gorelick, Dept. of Biological Sciences, Citrus College, 1000 W. Foothill Blvd., Glendora, CA 91741, e-mail: ***ggorelick@citrus.cc.ca.us*** 442

For sale: Journal of the Lepidopterists' Society, vols. 24 (1970) through 55 (2001), all in excellent condition. Also available: News from 1970 through 2001 complete except #2, 3 of 1996, #5 of 1980 and #3 of 1971. Best offer for all. Baldhard Falk, P.O Box 315, Belvedere, CA 94920-0315, ***falktibrn@aol.com*** 442

Livestock

Cocoons of *Hyalophora cecropia*. Large numbers available for research purposes, US only. Joseph W. Markowicz, 343 Summer St., East Bridgewater, MA 02333, marko217@attbi.com, 508-587-8658 443

For Sale (US only): Cocooms of *Antheraea polyphemus* and *Callosamia promethea*. Send SASE to Karl W. Ploran, 110 Route 20, Chester, MA 01011-9642, 413-354-7852 (7-9 pm EST). 443

Coccoons of *C. angulifera*, $5.00, and *Samia cynthia*, $3.00 each, + $7.50 S & H. Thomas Frey, 364 Oaklyn Rd., Lebanon, PA 17042-5858, ***snakes364@lmf.net*** 442

Eggs and cocoons of many northeastern North American Saturniidae available for sale fall 2002: *Actias luna*, *Antheraea polyphemus*, *Automeris io*, *Callosamia promethea*, *Hyalophora cecropia*, *Hyalophora columbia*, *Samia cynthia*. Bill Oehlke, Box 476, Peardon Road, Montague, Prince Edward Island, Canada C0A 1R0, 902-838-3455, ***www3.islandtelecom.com/~oehlkew***, ***oehlkew@islandtelecom .com*** 442

For sale or trade: Diapause cocoons of *Callosamia angulifera*, *Callosamia promethea* and *Samia cynthia*. Please call before 10 pm EST. Thomas Frey, 364 Oaklyn Rd., Lebanon, PA 17042, (717) 272-6597. 441

For Sale: Live pupae of Nymphalidae, Pieridae, Papilionida, *T. maggelanus*, *T. rhadamantus* and other species of Philippine butterflies. Send order to: Leodegario Layron, P.O. Box 4, Boac, Marinduque, Philippines. Tel. 042-332-1558; Fax 0063-423-321-558. 441

The aim of the Marketplace in the **News of the Lepidopterists' Society** is to be consistent with the goals of the Society: "to promote the science of lepidopterology...to facilitate the exchange of specimens and ideas by both the professional worker and the amateur in the field,..." Therefore, the Editor will print notices which are deemed to meet the above criteria, *without quoting prices,* except for those of publications or lists.

No mention may be made in any advertisement in the **News** of any species on any federal threatened or endangered species list. For species listed under CITES, advertisers must provide a copy of the export permit from the country of origin to buyers. **Buyers must beware and be aware.** Advertisements for credit, debit, charge cards or similar financial instruments or accounts, insurance policies and those for travel or travel arrangements cannot be accepted because they jeopardize our nonprofit status.

Only members in good standing may place ads. All advertisements are accepted, in writing, for two (2) issues unless a single issue is specifically requested and must be renewed before the deadline of the following issue to remain in place. All ads contain a code in the lower right corner (eg. 386, 391) which denote the volume and number of the **News** in which the ad. first appeared.

Advertisements must be under 100 words in length, or **they will be returned for editing**. Ads for Lepidoptera or plants must include full latin binomials for all taxa listed in your advertisement.

Send all advertisements to the Editor of the News.

The Lepidopterists' Society and the Editor take no responsibility whatsoever for the integrity and legality of any advertiser or advertisement. Disputes arising from such notices must be resolved by the parties involved, outside of the structure of The Lepidopterists' Society. Aggrieved members may request information from the Secretary regarding steps which they may take in the event of alleged unsatisfactory business transactions. A member may be expelled from The Lepidopterists' Society, given adequate indication of dishonest activity.

Buyers, sellers, and traders are advised to contact your state department of agriculture and/or PPQAPHIS, Hyattsville, Maryland, regarding US Department of Agriculture or other permits required for transport of live insects or plants. Buyers are responsible for being aware that many countries have laws restricting the possession, collection, import, and export of some insect and plant species. Plant Traders: Check with USDA and local agencies for permits to transport plants. Shipping of agricultural weeds across borders is often restricted.

Wanted to Buy: Eggs or pupae of *Rothschildia forbesi*, *Eacles imperialis* and *Citheronia regalis*. Page Don Olhausen at (713) 501-6353 or call (281) 446-8588. 19415 Haude Rd. Spring, TX 77388. 441

Specimens

For Exchange: Oriental Lycaenidae (Thailand, Vietnam, Philippines, Malaysia, Indonesia) in exchange for other lycaenid species worldwide (except South America). Single specimens as well as longer series or lots (with full collecting data) are very welcome. I will also buy. Stefan Schroeder, Auf dem Rosenhuegel 15, D-50997 Koeln, Germany, ***ste.schroeder@gmx.net*** 443

Butterflies,Saturniides and Sphingiides from Latin and South America and the Caribbean Islands, as well as from the palearctic region. Very large selection of rare, hard to obtain species and common butterflies. We also always have a small list of interesting undetermined Beetles from these areas. Please contact us for our list. Robert Westphal, Calle Llimoner 6 (Urb. Pino Alto), E-43892 Miami Playa(Tarragona), SPAIN, Tel/Fax:++34+977+810787, ***Westphal.Ramos@terra.es*** 442

Rich variety of *Charaxes* and Papilionidae from Africa available. List available on request. Wanted: *Charaxes* and Papilionidae from Eastern/Southern Africa. Giancaarl Veronese, Viale Venezia 138-33100 Udine (Italia), Fax: 0432/232654, ***gc.veronese@ iol.it*** 442

For sale or exchange: Iranian butterflies. Ahmad Karbalaye, P.O. Box 11495-175, Tehran, Iran, Tel/Fax: 0098.21.7531604, ***karbalaye@yahoo.com*** 442

For exchange: Eastern North American *Catocala* in exchange for other *Catocala* species worldwide, in particular, those from the Central and Western United States. All inquiries will be answered. Dr. Ken Neil, P. O. Box 410, Canning, Nova Scotia, Canada. B0P 1H0, ***irene.neil@ns.sympatico.ca*** 441

For Exchange: Many species of A1 mounted Noctuidae (Cuculliinae, Hadeninae, Amphipyrinae, Plusiinae, *Catocala*, etc) and Arctiidae of Japan. Also, large numbers of A1 papered butterflies (Papilionidae, Pieridae, Nymphalidae, Satyridae and Lycaenidae) of Japan. I am interested in A1 mounted Noctuidae (as above with *Perigrapha*) and Arctiidae (*Pararctica*, *Arctia* and various *Grammia*) of North America. Shin-ichi Ohshima, Shimohideya 707-99, Okegawa, Saitama (363-0025) Japan. Fax (81) 48-787-0290, ***o_shima@nifty.com*** 441

Equipment

For Sale: Traps for collecting Lepidoptera. **Light Traps:** 12VDC or 110VAC with 15W or 20W black lights. Traps are portable and easy to use, rain drains and sorting screens protect specimens from damage, straight tube design provides 360° light visibility, stainless steel or plexiglass vanes. **Bait Traps:** 3 types available: tropical, inverted funnel and flat bottom, 25"W x 36"H, nylon coated fiberglass screen with heavy cloth top, plastic zipper in side for access, plywood platform. Optional shroud/hood provides dark area for moths to hide. For a free color brochure and price list, please contact: Leroy C. Koehn, 202 Redding Rd., Georgetown, KY 40324-2622, 502-570-9123, ***leptraps@aol.com*** 443

For Sale: Used Light Traps. Several used traps offered, all self-fabricated and in good to excellent condition. For prices and photos, please contact: Leroy C. Koehn, 202 Redding Rd., Georgetown, KY 40324-2622, 502-570-9123, ***leptraps@aol.com*** 443

Miscellaneous

Help! South America in 1986? Does anyone remember participating in a collecting trip to South America during the periods May 3-8 and/or September 25-30, 1986? I have a lot of neotropical papered material with no data except dates, all of which fall into those two periods. There's a decent chance the specimens were collected on a group trip, and if you took part in such an expedition, please tell me where you went. Any help or clues appreciated! Contact John Hyatt, 423-343-0067 (h) or ***jhyatt@eastman.com*** 443

The "Sphingidae of the Americas" site is an online membership club featuring over one thousand images of Sphingidae from North, South and Central America. Images (adults, larvae, pupae, eggs) are attractively displayed with text giving taxonomies, range, flight times, larval hosts, etc. Visit ***www.silkmoths.bizland.com/samplessphinx.htm*** to see sample files and access registration information and members' comments. Contact Bill Oehlke, Box 476, Peardon Road, Montague, Prince Edward Island, Canada C0A 1R0, 902-838-3455, ***www3.islandtelecom.com/~oehlkew***, ***oehlkew@islandtelecom.com***, for more information. 442

Research Requests

Cyclargus thomasi bethunebakeri was once an abundant species in south Florida and the Florida Keys. Since 1992, it has all but disappeared. The only know remaining population is at Bahia Honda State Park on Bahia Honda Key. There is currently a recovery effort consisting of Lepidopterists, Watchers, Breeders and Naturalists, to recover *C. t. bethunebakeri*. However, before any females are removed from the Bahia Honda Key population, a thorough search is underway to look in every corner of south Florida and the Florida Keys. To assist this search, we need locations where *C. t. bethunebakeri* has been collected. We just need the location and dates. We need your help. *Cyclargus t. bethunebakeri* needs your help. Send records to: Leroy C. Koehn, 202 Redding Road, Georgetown, Kentucky, 40324-2622, ***Leptraps@aol.com*** or David Fine, 2924 Dunlin Rd., Delray Beach, FL 33444, ***vladnuts@aol.com*** 442

I am writing a field guide to the butterflies of Nova Scotia. I require any relevant data regarding dates, location, collector, sexes, and numbers of any

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Species Concepts and Conservation Law: Why We Have a Problem

Arthur M. Shapiro

Center for Population Biology, University of California, Davis, CA 95616

Preface

This is a version of a talk given several times since 1998, one venue being the 52nd Annual Meeting of the Lepidopterists' Society (Sierra Vista, AZ, August 1999) where it formed part of a symposium on Lepidopteran species and speciation. It was hoped that the symposium might be published, but that has not happened and in the meantime the problem I address has only gotten worse. Substantially the same problem was raised for birds in the article "Are You a Lumper or a Splitter?" by Malcolm G. Scully, published in the August 16, 2002 ***Chronicle of Higher Education****. I think it is too pressing to wait any longer.*

Discussion, anyone?

> There can be little doubt that the concept of the biological species is what most modern biologists have in mind when they talk about species.
>
> *Ernst Mayr, 1986*

"Ideas have consequences." That's a favorite maxim on both the Left and the Right. Intellectuals love to flatter themselves that what they think and say matters to the wider world. Sometimes it does. All the great political movements of the modern era, for good or ill, have claimed intellectual foundations. For many of them, a highly motivated vanguard wedded to some core idea or set of ideas was an essential prerequisite to mass action. Such matters may seem very remote from matters of taxonomy—such arcana as species concepts. But species concepts are highly ideological constructs and they do entail real-world consequences. The proverbial man in the street cares little if at all what species concept a museum taxonomist uses when she puts a name on a little blue butterfly. For the man in the street species are species, self-evident bits of nature, with no conceptual baggage attached: taxonomists merely describe and name what is objectively *out there*. He would care a lot about species if he thought his job depended on how they were defined. Increasingly, *it might*. This paper addresses the interface of species concepts and real world consequences in a series of seemingly disconnected discussions. They will come together at the end to convince you—I hope—that we have a problem.

This is a particularly lively time in the intellectual history of species, with major books on species and species concepts appearing at a dizzying rate. Why now? Because the broad consensus about species that formed an integral part of the neo-Darwinian synthesis is collapsing. Part of this is due to methodological breakthroughs, and part to intergenerational conflict, careerism, and other processes familiar to sociologists of science. Rapid advances in molecular genetics—advances in both concept and technique—have given us a whole new set of ways to quantify genetic differentiation among populations. Thus far we have been limited to fairly arbitrary chunks of the genome, but whole-genome characterization is just around the corner. Butterflies have hardly led the way in these advances, but butterfly biologists are at least less slow on the uptake than they used to be. At the same time but in a different department of human knowledge, cladistics has emerged victorious in the ideologically-driven systematics wars. Cladistics has yet to make a major impact on butterfly systematics at the species level, but it will: while butterfly taxonomists have been relatively slow to embrace cladistic reasoning and are still practicing primitive 19th-century name-generation with abandon, the 21st century is inexorably closing in.

We have come a long way since Ernst Mayr published **Animal Species and Evolution** in 1963. Since then, Michael Ghiselin and David Hull have taught us that species are individuals, not classes. Graduate students have been forced to study such arcana as bootstrapping, maximum likelihood, Bayesian methods, long-branch attraction, site change rate variation, micro satellites, RAPIDs, and other stuff seemingly derived from the armamentum of an alchemist like Theophrastus Bombastus Paracelsus of Hohenheim. When we examine a Ph.D. candidate in evolution or systematics, much of the time is spent covering subjects unheard of when we took our own orals. But if the candidate's focus is on species or speciation, we still ask a question that was asked of us: "*What species concept are you using, and why?*" And while there are numerous new named rivals to choose from, few of our students invoke them voluntarily except if pressed to do so. The big question—now as 40 years ago—is whether one's concept is grounded in reproductive isolation or not. The "biological species concept" was a triumph of rhetoric, claiming as it did exclusive grounding in the discipline. It was first challenged seriously in the 60s by the pheneticists, who advocated a nominalist view of species: species are like all other taxa, arbitrary and defined for our convenience. They claimed the BSC had outlived its usefulness, but 40 years later it still dominates our discourse, directly or indirectly—even *legally*—but its grip is, as we shall see, getting more tenuous.

Even before molecular genetics took off, there was not infrequently a problem of conflicting data sets around the species

level: it was perceived that morphology was not always a good marker of reproductive isolation. The pheneticists argued that actual data on reproductive isolation were very rare compared to the number of taxonomic decisions that actually needed to be made at the species level, and that we were hypocrites to claim to be using the BSC when we were really using morphology—albeit as a supposed surrogate for reproductive isolation. They had a point there, but they failed to convince most systematists that any of their methods for quantifying overall similarity or difference was truly robust and satisfying. Molecular markers, capable of identifying interruptions in gene flow without behavioral or similar data, introduced a new level of complexity: surprises became routine, and our faith in morphology as a species-level indicator was rudely shaken. An example is the North American butterflies of the genus *Lycaeides*. Here we thought we knew very well what the species were. Their wing patterns differed, their genitalia differed, their life history differed, their habitats and host plants differed, and all these differences mapped onto one another geographically. But after 4 years of trying with a wide variety of genetic systems we have yet to find a molecular marker—nuclear or mitochondrial—that gives us two neat species (Nice and Shapiro. 1999). Of course, the prescription is to keep trying. It's a classic inductive exercise.

The primatologist Clifford Jolly has written a truly outstanding essay on these problems, using baboons as an exemplar. He says important things better than I can, so let me commend his work to you (Jolly, 1993). One sentence stands out for cutting right to the essence of the matter: when it comes to defining species, "the more numerous the diagnostic criteria, the more frequently ambiguous cases will be discovered." That is, the more we know, the less we are sure of.

All animal taxonomists, but few other biologists, know that the International Code of Zoological Nomenclature maintains strict neutrality *vis-à-vis* both ideology *and* biology. Its provisions apply only to the publication of names, insofar as procedural validity is essential for the stability and universality of nomenclature. (That's the *goal*; you may titter.) The Code and its "Supreme Court," the Commission, will not touch issues of phenetics or cladistics—or whether or not taxon A is conspecific with taxon B, a "biological" decision unless they have the same type specimen. The validity of taxa is grounded not in the criteria or concept used in recognizing them as worthy of taxonomic designation, but rather in whether the description was properly prepared and published. The criteria are basically founded in utility, assuring that future workers can properly recognize the biological entity on which the name is based. "Biology" is left by the Code to the judgment of each individual biologist or taxonomist. You are free to agree or disagree with the describer of a taxon or the usage of a name, so long as you afford it its legal due. Endangered-species law is exactly the same.

Professor Holly Doremus of the U.C. Davis Law School has written the definitive analysis of these matters. If you are interested in the take-home of this talk, you should read her paper in full. She has a background in biology, and her understanding of the biological issues, including the philosophical problems of systematics, is better than that of most of my non-systematist colleagues. She says:

> The ESA's definition of "species" is singularly uninformative. It is merely a list masquerading as a definition: 'The term "species" includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.' The legislature (i.e. Congress)'s failure to further define "species," "subspecies," and "distinct population segment" could indicate either that it assumed the terms were unambiguous or that it could not devise acceptable definitions. The absence of any discussion of those terms in the early legislative history supports the former explanation... At the same time, the deliberate expansion of the statutory term to include lower taxonomic categories suggests an intent to reject narrow technical interpretations of the groups within the law's scope.

And:

> The ESA rests on a mix of evolutionary and essentialist assumptions, and demonstrates a concern for both morphological and reproductive distinctions. The legislative history, however, offers few clues to the puzzle of identifying groups worthy of protection. (Doremus, 1997)

Congress assumed species (and subspecies) were real entities, more or less unambiguously understood, though Senator Howard Baker, for one, later observed that "The science of taxonomy offers opponents of Federal public works projects a virtually limitless arsenal of weapons with which to do battle." The odd thing is that it hasn't—*yet*.

Observe carefully: the Federal statute (and for that matter, the State statutes I've seen) does not specify criteria for something to qualify as a "species" or a "subspecies." Things just *are*. The law follows the Code in grouping subspecies in coordinate status with species, at least in certain taxonomic groups. The Code makes them coordinate because its framers recognized the potential subjectivity and fluidity of decisions "around the species level." The ESA has been interpreted as not conferring protection on hybrids, an issue that has caused problems for the Florida Panther and Red Wolf. Genetic integrity thus seems somehow a part of the vague mix of inexplicit criteria. The law, however, is much more explicit in prescribing how endangerment or threat is to be defined. Most of the ESA litigation to date has dealt not with

taxonomy but with claims of endangerment or non-endangerment and of malfeasance or misfeasance on the part of the Secretary of the Interior in adjudging these. In all of this the courts have been prudent, and we have been lucky.

North American butterfly taxonomy has gone through several stages, which are not atypical of taxonomy in general. In the "old days" (before the neo-Darwinian synthesis), most novelties were named and catalogued as "species." Thus Holland's **Butterfly Book** lists 47 US species of larger fritillaries, genus *Argynnis*, in the first (1898) edition. By 1940 the list had grown to 56 species. Most of these have long since been demoted to subspecies status, or vanished into junior synonyms. The biggest factor in this was the neo-Darwinian synthesis beginning in the 40s, with its emphasis on speciation as a *process*—an emphasis closely tied to the BSC. By the time of the 1981 Miller and Brown checklist of North American butterflies, the number of species of *Speyeria*, the successor genus to *Argynnis*, was down to 13. (This is nothing. One lumper reduced the number of species in the blue-green algal family Oscillatoriaceae from 2000 to about 20.) The number of *Speyeria* recognized by various authorities has hovered below 20 since: 17 by Howe (1975) and 14 by Scott (1986), for example. By the way, the species *Speyeria callippe* has 16 recognized subspecies in Miller and Brown, of which a couple are Federally listed. One worker—a lumper—revised them and reduced the number of subspecies drastically. His action was widely ignored, an event we cannot count on happening again.

A by-product of the synthesis was the perception that subspecies were species *in statu nascendi*. Invested with such pregnant possibilities, they assumed new importance. No acceptable biological concept of the subspecies emerged, however, and their use remained controversial, unresolved by a famous series of published polemics in the 50s and 60s that mainly centered on butterflies. The most useful rule of thumb for subspecies recognition, the "75% Rule" used by many mammalogists, was never assimilated by Lepidopterists and had no intellectual justification anyway. The original Peterson field guide to the eastern birds laid out the issues in a public display of indecision on whether to list subspecies at all. All of this finds its consequences in the implicit reification of subspecies in the ESA. If they aren't real, how can they be endangered?

Molecular data sets again made for *more* ambiguity. Conspicuous phenotypic markers used to delimit subspecies commonly did not agree with molecular genomic markers as to where interruptions of gene flow occurred. Ball and Avise (1992) opined:

> Recognition of deep historical separations may not be the only rationale for subspecies descriptions... Any mutations serving as genetic markers of breeding populations (including those underlying particular morphological or behavioral traits) can be of great utility...even if the mutations are of recent origin and do not reflect long-term population separations or genome-wide patterns of differentiation...We have argued that short-term population separation should not be sufficient to justify formal taxonomic recognition of subspecies (in part, because sensitive and refined genetic assays will likely reveal significant structure even at deme and family levels in most species)...Subspecies names should be reserved for the major subdivisions of gene-pool diversity within species...concordant subdivisions at multiple independent loci...therefore, some other means of cataloging geographic distributions of individual markers should be implemented. Overall, an enlightened perspective on intraspecific differentiation would recognize the great variety of evolutionary breadths and patterns likely to be represented among populations, and the various taxonomic and population applications to which these levels of genetic separation might be applied.

In the 1970's a wave of generic splitting that began in Europe spread to North American butterfly systematics. Generic names like *Occidryas* infested the literature; *Pieris rapae* took a holiday in *Artogeia*. But species-level nomenclature remained largely unperturbed. In the late 70s and 80s long-overdue global revisions of several Holarctic complexes resulted in familiar American "species" being demoted to subspecies status, since the Old World names were usually the oldest. Most of these decisions were subjective and morphology-based. The first to be examined phylogeographically were in *Coenonympha* and *Lycaeides*, in my lab. This work goes on.

A long-anticipated book (Emmel 1998) will have more widespread repercussions, with the naming of an incredible number of new butterfly taxa in western North America. No new conceptual issues are raised. All this taxonomizing is done using the traditional methods and concepts—that is, vague and inexplicit. Quite a few of these new taxa are prime candidates to be proposed for ESA protection.

The history of "expert testimony" in federal jurisprudence is complex and controversial. The legal system has struggled for decades with the question of how to use and evaluate testimony when cases involve issues beyond the training or understanding of non-specialists.

Historically, the issue first arose *vis-à-vis* the definition of pornography:

> ...the legal question turned on whether the novel was literature, since if it *was* literature, then—according to the Jenkins Act—it didn't matter whether it was obscene. It was necessary therefore to define literature in order to determine whether **Lady Chatterley** fit the specifications...

Once again it was the responsibility

> of the literary establishment, predominantly academic by now, to answer the question...But after all allowances were made, the explanations of literary matters offered to the Court by the expert witnesses from the literary departments of the university are embarrassingly confused and contradictory. (Kernan, 1990)

But the typical case is one of medical or other professional malpractice, or of product liability, and in such cases expert witnesses for the two sides routinely contradict one another, all in the name of objective science. How can this be? One possibility is that some of the "science" being served up on the stand is better understood as snake oil. But how is one to tell?

> The common law of evidence has historically deferred greatly to the fact finder's abilities. Lay witnesses testified to that which they had seen and heard, leaving all inferences or opinions from such testimony to the fact finder. The expert witness entered the scene only when references to experiences not possessed by jurors were necessary to enhance a juror's understanding. The lay or expert witness merely assisted the fact finder by providing only that information necessary to evaluate the evidence presented...
>
> Because the gulf between the fact finder's experience and the knowledge required to understand and evaluate issues is perhaps widest in the field of scientific testimony, a special test developed out of the common law to govern the use of scientific testimony. The test, popularly known as the "Frye test" after the court decision from which it arose, was designed to limit the admission of testimony regarding a particular scientific principle to that testimony "generally accepted" in the field... (Browne and Keeley, 1999)

The book **Galileo's Revenge** (Huber, 1991) is a popular history of expert testimony and the Frye Rule.

> Not surprisingly, determining what methods in a particular field were 'generally accepted' was more difficult than the test suggested on its surface. From what community should the judge 'count heads' to assess general acceptance...? In addition...blocking valid and relevant theories from the courtroom was arguably antidemocratic. After many years of such criticism, the pendulum swung back toward juror independence with the advent of the Federal Rules of Evidence's more liberal rules of admissibility. These rules placed greater faith in the juror to evaluate the testimony and restricted the community of experts' gatekeeping role. The shift...went perhaps too far... The 1993 U.S. Supreme Court decision of *Daubert v. Merrell Dow Pharmaceuticals* ...forged a position somewhere between the Frye standard and the liberal standard propounded by the Federal Rules of Evidence. (It) rejects the Frye test's deference to external groups and substantially returns the onus of evaluation to the judge...The judge may make several considerations in determining what is relevant and reliable. Among (them) are whether the theory or technique had been subjected to peer review and publication, whether the expert used the scientific method, whether a particular scientific technique had a significant rate of error, and whether the methodology was generally accepted in the relevant scientific community.
>
> The Daubert approach, in contrast to the Frye test, admits any evidence with 'good grounds' and then places enormous faith in the ability of cross-examination, contrary evidence, carefully-crafted jury instructions, directed verdicts, summary judgment, and the court-appointed experts to safeguard from the alleged deleterious consequences of this more permissive standard. (Browne and Keeley, 1999)

The increasing extent to which these issues impinge on our lives and careers led to an excellent article in **American Scientist** (Petrosky, 1999) and to a policy decision by the American Association for the Advancement of Science: On May 25, 1999 AAAS, with support from the Open Society Institute, began to refer scientists for judges to choose as court-appointed experts in cases where traditional adversarial means are unlikely to reach a resolution without such inputs. U.S. Supreme Court Associate Justice Stephen Breyer endorsed this initiative at the AAAS annual meeting in 1998, saying "I believe we must build legal foundations that are sound in science, as well as in law...The result, in my view, will further not only the interests of truth, but also those of justice."

Now, these issues have not been properly litigated with respect to the taxonomy of endangered species. Can you see where I am going with this?

Now consider the following statement:

> The goal of a phylogenetic species concept is to reveal the smallest units that are analyzable by cladistic methods and interpretable as the result of phylogenetic history. We define species as the smallest aggregations of populations (sexual) or lineages (asexual) diagnosable by a unique combination of character states in comparable individuals (semaphoronts). A character state is an inherited attribute distributed among all comparable individuals (semaphoronts) of the same historical population, clade, or terminal lineage. (Nixon and Wheeler, 1990)

Willi Hennig was no radical when it came to species concepts. He accepted a Mayrian view, not recognizing that ability to interbreed was a symplesiomorphy—an ancestral character—which by definition is uninformative in cladistic reasoning. His disciples were not slow to discover this. The BSC was thus not a valid basis for recognizing species in cladistics, and cladists have been looking since the early 1970s for a satisfactory cladistic (or phylogenetic) species concept. There have been seve-

continued on pp. 130

A Post-Eclosion Danausean Rite?

Bruce Wiley

4 Maplewood Dr., Kennebunkport, ME 04046

As part of my on-going interest in the life cycle of the Monarch butterfly (*Danaus plexippus*), I have had the opportunity to observe and make video-microscopic records of the larvae during the period following eclosion. A striking larval behavior that I have observed and videotaped is the subject of this communication.

As is well known, the newly eclosed larva moves briefly away from its egg shell remnant and then returns to eat much of it. After consuming half or more of that remnant, it will typically lie still for some minutes. Then something intriguing happens.

The larva gives one or more quite energetic twitches, and lifts its anterior and posterior ends high above its supporting prolegs, forming a letter "U" configuration for several seconds (Fig. 1, opposite). During this time, the head and rear portions wave back and forth and from side to side. Eventually the anterior and posterior ends actually touch, with the ends of the "U" meeting well above the supporting prolegs. This results in the anal region touching the head capsule-cervix junction region one or more times.

Further, just before one of the times when the larval anal region touches the dorsum of the head capsule-cervix region, a drop of clear fluid appears at the anus (Fig. 2, opposite), and is applied to the dorsal craniocervical junction region through approximation of the two larval ends (Fig. 3, opposite).

The above-described "U-behavior" is apparently performed consistently by newly-eclosed monarch larvae. Since first observing this phenomenon in July, 2001, I have accumulated video-microscopic imaging of 27 examples of "U-behavior" in newly-eclosed caterpillars of monarchs, and 17 examples of the associated anointing. In addition, I have observed microscopically, without video taping, 3 additional examples that each included both "U-behavior" and anointing. Of the larvae I observed following eclosion (30), 100% have demonstrated this "U-behavior," and anointing occurred 67% (20/30) of the time. Average time between eclosion and "U-behavior" has been 38 minutes, with a range of 24 to 74 minutes.

What purpose does this "U-behavior" serve? Is the appearance of fluid at the larval anal region—and its application to the dorsal craniocervical region—of some physiological significance, or is its exudation simply the result of strenuous muscle contraction of the "U-behavior" itself, with incidental compression of the larval gut?

Reoccurrence of *Kricogonia lyside* in Florida and a New Host Record for *Automeris io*

Mark and Holly Salvato

3307 39th Pl W, Bradenton, FL 34205

On 29 June 2002, while conducting a butterfly survey of the middle Florida Keys, we encountered three adults of *Kricogonia lyside* (Godart) on Tavernier. This appears to be the first reported sighting of *K. lyside* in the Florida Keys in at least 11 years (John Calhoun, pers. comm.). We conducted several return trips to the area in the months that followed to search for the butterfly. More importantly, we searched endangered lignumvitae (*Guajacum sanctum* L.), the known host for *K. lyside* in the West Indies, for any sign of early stages. Although the butterfly was again observed on Tavernier (and also reported by others) in July and August, no signs of oviposition were ever found. However, every observation of *K. lyside* was found to be in close association with *G. sanctum*. We have continued to visit Tavernier on a monthly basis to monitor for *K. lyside*.

While searching lignumvitae trees on 20 July 2002 we came across a single 1st instar larva of the Io moth, *Automeris io* (Fabricius). Although larvae of this moth species have been recorded to feed on over 100 types of plants, *Guajacum sanctum* appears to be a new host record. To confirm the viability of this plant as a host for *A. io*, the larva and a small lignumvitae bush were brought back to our greenhouse in Bradenton, Florida. We placed the plant within a screen mesh enclosure and monitored the larva until pupation on 5 September 2002 (see photos on pp. 132). The adult *A. io* moth emerged on 6 October 2002.

Acknowledgement

We thank John V. Calhoun for his assistance in searching host records for Automeris io.

Danausean Rite?

Above Left: *"U-behavior by freshly eclosed larva of D. plexippus. Note reflection from 8-source fibreoptic ring light on the head that is lacking from the perianal region.* ***Above:*** *Fluid droplet at anus, shown by ring light reflections.* ***Left:*** *Fluid droplet distorted when contact with head capsule is made. Photos by Bruce Wiley.*

Below: *Group Photo from the* 2002 Pacific Slope Section Meeting. *See the report on pp. 115. Ray Stanford (holding net) was the recipient of the Comstock Award. Photo by Evi Buckner.*

Species...*continued from pp. 127*

ral premature declarations of victory. Hill and Crane, for example, proposed the CRU—the "cladistically resolved unit:"

> A species is recognized and distinguished from others by autapomorphy, and its apparent relationship to others is established by synapomorphy.

But:

> Genetics provides independent tests of CUs for living organisms; i.e. it can contrast CUs with real (genetic) species. (Since genetic species are essentially time-dimensional 'chronospecies,' ...uniformitarian extrapolation of genetic results backwards in time is necessary for interpretation of real species.) *The minute proportion of extant taxa that have been studied genetically reveal, as is well known...that there is no necessary congruence between such a CU and real species.*" (Emphasis added) (Hill and Crane, 1982)

Time will not permit a recapitulation of the gropings toward a cladistic species concept. What is important for us is that they all revert to typology. Nixon and Wheeler argue that their Phylogenetic Species Concept "provides a unit concept of species, as the smallest entity determined by characters (not traits)." A character, as used here, is an invariant (one might hiss the word "essential") property of the taxon, while a trait is potentially variable. Any such approach decouples species-level decisions from any biological data. When the cladistic species becomes the taxonomic atom, the smallest entity recognizable by an autapomorphy, there is no further need for subspecies (or perhaps they can be recognized by mere traits!). The one desirable byproduct of cladism's search for consistency is to lay the subspecies problem to rest: everything becomes a species now. (For a caustic critique of all of this, see Avise, 2000 (please).)

If we use a cladistic concept of species in *Speyeria*, the number goes up to around 50 again. Collectors do not collect reproductively-isolated populations; they collect nominal taxa. Stamp collectors and butterfly collectors hate incomplete or "short" sets. A complete set is defined as what the catalogue says it is. If there are 50 species of *Speyeria*—species are the equivalent of "major varieties" for the philatelist—there is a strong imperative to get a male and female of every damned one of them. The imperative is less strong for subspecies ("minor varieties" in philately, traditionally the domain of the advanced specialist). If species concepts are decoupled from biology, collecting pressure on recognized populations will go up. We have the infamous history of the European Apollo butterfly as an example: here the ante was raised by expanding to an (unofficial) *quadrinomial* taxonomy, and every local population got named.

The "solution" to such a problem from a conservation standpoint is to put more taxa under the umbrella of legal protection. We know what that means: more scofflaws; more disrespect for authority; more enforcement; more public ridicule; more Lepidopterists needlessly driven into the arms of the anti-regulation "Wise Use" movement; and more litigation.

Was Congress informed by the BSC consensus when it passed the ESA in 1973? It certainly shows no sign of having been influenced by phenetics, and cladistics was still in its gastrula stage. On the other hand, it declined when it had the chance in 1978 to restrict protection to reproductively isolated entities. Congress did this because it specifically wanted to protect US populations of species widespread outside the US, and which might not be taxonomically distinguished here: "distinct population segments," it called them—a term unknown in biology, to my knowledge.

There *have* been cases in which ESA protection of a taxon was challenged on taxonomic grounds. One 1995 Alabama case[1] is particularly illuminating. Defendant Guthrie was convicted of poaching Alabama Red-Bellied Turtles, *Pseudemys alabamensis*. He appealed partly on grounds that the taxonomic community was divided over the status of this turtle, hence the Secretary of the Interior's action in listing it under the ESA was "arbitrary and capricious." In point of fact some turtle taxonomists did consider *P. alabamensis* conspecific with the Florida Red-Bellied Turtle, *P. floridana*. The Court reviewed the pertinent literature and concluded that the Secretary's action was certainly not "arbitrary and capricious" because he had read all the relevant stuff prior to making his decision. Guthrie lost. This illustrates a critical point about ESA litigation to date: like the ICZN, the courts have been unwilling to get into evaluating biological decisions. They have side-stepped the biology by focusing narrowly on whether the agency met its statutory obligations in its decision-making process.

Perhaps such temporizing can continue for a while, even with the proliferation of conflicting biological data sets. But cladistic species concepts create a whole new ball game.

Phylogenetic or cladistic species concepts, by decoupling the species category from *any* biological evidence, seem to contravene the intent of Congress when it passed the ESA. Despite the lack of any reference to the BSC, Congress was clearly interested in protecting genetic units, not autapomorphies. As cladistic species concepts become more widely applied, numbers of nominal species will proliferate wildly, and increasing numbers of them will come into the orbit of regulation. At that point the species concept will become a legal issue.

If I were a radical enviromentalist I would be very happy with cladistic species concepts. They seem to offer boundless opportunities to get more and more nominal taxa protected by law and more and more restrictions on what people can do and where they can go. If I were a savvy lawyer working for a developer in an ESA case, I would go for the conceptual basis of species

recognition as an issue to be litigated. Rather than let the Court focus narrowly on procedure, I would try to force the issue — has the will of Congress been subverted? When one of these cases does go to trial, there will be expert witnesses. Let's see how such a case might go.

Xus albus is listed as endangered under the ESA. Fritz Diablo, plaintiff, is a developer whose interests are injured by this decision. He sues the Secretary of the Interior on the grounds that *Xus albus* is not a biological species but only a cladistic formalism, and should not qualify for protection under the Act. Plaintiff can in fact render a significant amount of indirect evidence showing that the intent of congress was to protect "real" biological entities and that the agency's own previous attitude supports this interpretation (for example, in its negativity toward hybrids). The judge finds that the case is substantial enough to be allowed to go to trial. Under the current post-Daubert evidentiary regime, the judge is the gatekeeper for expert testimony. He must be very careful, because his judgment in allowing or excluding testimony, and the way he reached that decision, will be reviewed and could be reversed on appeal. All the witnesses in this case are first-rate, and the Judge's AAAS-appointed adviser tells him so. The case rolls on.

Plaintiff Diablo calls as expert witnesses three of the nation's foremost evolutionary population geneticists, all of whom ringingly endorse the BSC as the only biologically meaningful species concept, and explain why. They deplore the straying of taxonomic species into the abyss of empty formalism.

The Secretary of the Interior calls three very important cladistic systematists, all of whom have contributed to the refinement of a cladistic species concept. Their credentials are equally impeccable in their respective discipline. They explain that cladistics provides the only criterion for species-level recognition that can be applied objectively across all taxa. They assure the Court that virtually all working systematists agree with them. As backup, the Secretary notes carefully that since the Act does not explicitly define species, the Court would be interpreting it very narrowly, and probably reversibly, if it found for Plaintiff. The AAAS expert tells the judge that everyone is "right" in his or her own context.

Some non-governmental conservation organizations file *amicus curiae* briefs for the defense. They are enjoying the proliferation of protectable taxa and do not want to see it end. Other NGOs file briefs for the Plaintiff. They fear that such proliferation is already eroding public support and respect for the Act. They see a backlash against the protection of "thousands of indistinguishable bugs and weeds" that will endanger protection of real, and important, species.

Whatever happens there will be a lengthy appeals process, and almost certainly Congress will have to revisit the issue. What it might do in its infinite biological wisdom is your guess and mine.

The function of species concepts is not the facilitation of conservation law, any more than the function of noses is to hold up eyeglasses. Species concepts have plagued us from antiquity and will continue to do so. But ideas do have consequences, as we have seen. Here's my final word:

I'll see you in court.

[1]*Known as the Guthrie case: US v. Guthrie, C.A. 11 (Ala.) 1995, 50F, 3rd, 936 (if this citation is meaningless, ask a lawyer or law librarian).*

Literature Cited

Avise, J. 2000. Cladists in wonderland. Evolution 54: 1828-1832.

Ball, R.M. Jr. and J.C. Avise. 1992. Mitochondrial DNA phylogeographic differentiation among avian populations and the evolutionary significance of subspecies. The Auk 109: 626-636.

Browne, M.N. and T.J. Keeley. 1999. When is expert testimony useful to courts? The Scientist, July 5. p. 13.

Doremus, H. 1997. Listing decisions under the Endangered species Act: why better science isn't always better policy. Washington University Law Quarterly 75(3): 1029-1153.

Emmel, T.C., ed. 1998. Systematics of Western North American Butterflies. Mariposa Press, Gainesville, FL.

Hill, C. and P. Crane. 1982. Evolutionary cladistics and the origin of angiosperms. Ch. 10 in Joysey, K.A.and A.E. Friday, eds., Problems of Phylogenetic Reconstruction. Academic Press, New York.

Holland, W.J. 1898. The Butterfly Book. Doubleday and McClure, New York.

Howe, W.H. 1975. The Butterflies of North America. Doubleday, Garden City, New York.

Huber, P. 1991. Galileo's Revenge. Basic Books, New York.

Jolly, C.J. 1993. Species, subspecies and baboon systematics. Ch. 4 in Kimbel, W.H. and L.B. Martin, eds., Species, Species Concepts, and Primate Evolution. Plenum, New York.

Kernan, A. 1990. The Death of Literature. Yale University Press, New Haven.

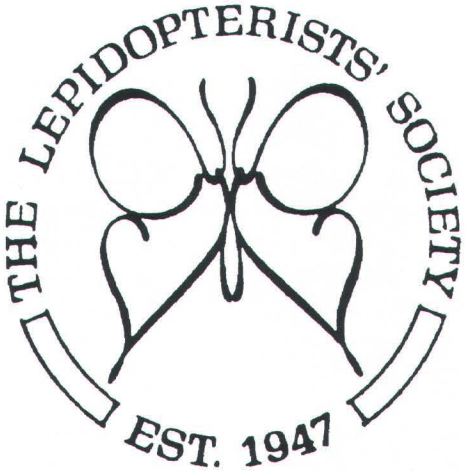
Mayr, E. 1986. The species as category, taxon and population. Ch. 15 in Fischer, J.L. and J. Roger, eds., Histoire du Concept d'Espece dans les Sciences de la Vie. Fondation Singer-Polignac, Paris.

Nice, C.C. and A.M. Shapiro. 1999. Molecular and morphological divergence in the butterfly genus Lycaeides (Lepidoptera: Lycaenidae). Journal of Evolutionary Biology 12: 936-959.

Nixon, K.C. and Q.D. Wheeler. 1990. An amplification of the cladistic species concept. Cladistics 6: 211-223.

Petroski, H. 1999. Daubert and Kumho. American Scientist 87: 402-406.

Scott, J.A. 1986. The Butterflies of North America. Stanford University Press, Stanford, CA.



Market...*continued from pp. 123*

butterflies collected in this province. Full acknowledgements given to all contributors. All responses would be greatly appreciated. Submit data to Dr. Ken Neil, P.O. Box 410, Canning, Nova Scotia, Canada B0P 1H0. ***irene.neil@ns.sympatico.ca*** 441

Gray Hairstreak by Teddie Ciavola Carboni.

See **www.geocities.com/tciavolacarb/art.html** *for more of her artwork. Contact her at* **tciavolacarb@yahoo.com**.

Monarch from a photo/card by Liam O'Brien, Benicia, CA.

Contact Liam at 1358 West L. St., Benicia, CA 94510. See previous issues, and the outside back cover, for more of his artwork.

Florida Records...

Upper row, left to right: *Kricogonia lyside* on Tavernier in the Florida Keys, June 2002; 2nd instar larva of *Automeris io*; 5th instar of *A. io*. **Far left:** 5th instar of *A. io* and frass showing it was feeding on the host. **Left:** Adult *A. io* eclosed on 6 Oct. 2002. Plants in all photos are *Guajacum sanctum* (lignumvitae). All photos by Holly Salvato.

Photo Salon...

More photos by Steve Grazer. He writes: **Above Left:** a Clodius Parnassian with sphragis that I took at Lake Tahoe, California on 7/24/02. It was flying near the base of a ski lift area and landing on the skunk cabbage and rocks. **Above Right:** a male Speyeria nokomis apacheana, taken in the field, that appeared to be newly hatched and in the last moments of drying itself. It was hanging upside down and allowed me to get extremely close to it. What I find interesting it that the ventral sub marginal chevrons are reflecting an iridescent blue color. The other males that I took pictures of (and even another picture of this same one) appear black in this area. Descriptions in books say that the chevrons are black. We also saw newly hatched females at the same time instead of 2 weeks later, but maybe there is always some overlap. The picture was taken near Mono Lake in California on 8/15/02.

Below: I was at the Yasuni Biological Research Station in Ecuador during September of this year. The plan was to photograph butterflies for 7 days. An unexpected opportunity occurred when a light was set up by a beetle collector. During 2½ nights of photography, I took 1,500 digital pictures of moths representing more than 600 species! The moths were as interesting and beautiful as the butterflies and even more diverse. It was also very fascinating to see them in their natural resting positions while landed on the sheet and nearby walls. The set up was at the top of a hill and the moon was not visible. The patterns on the small moths shown in this 3-part picture remind me of the top view of a frog. Does any one know if this is a defense mechanism for these species? I do not have books on tropical moths, so I welcome any help in identifying these insects. The left moth in the photo was taken on September 11 at 2:27 AM. The middle moth was taken on September 6 at 11:19 PM, and the right moth on September 10 at 11:59 PM.

I am curious if any of my moth photographs might be of unusual species. They can be seen at ***www.beautyofnature.net/photos/moths.htm***. With so many photos to sort through, it may be a while before they're all ready. The 1,800 butterfly photographs that I took at Yasuni are sorted and the web site now has more than 300 of them. They can be viewed at ***www.beautyofnature.net/photos/ecuador.htm***. My mail address is ***steve@beautyofnature.net*** and I would be grateful for any identification help from other members.

Membership

The Lepidopterists' Society is open to membership from anyone interested in any aspect of lepidopterology. The only criterion for membership is that you appreciate butterflies or moths! To become a member, please send full dues for the current year, together with your current mailing address and a note about your particular areas of interest in Lepidoptera, to:

Kelly Richers,
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9417 Carvalho Court
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Fax: (414) 278-6100

pjd@mpm.edu

WebMaster

John A. Snyder

Dept. of Biology, Furman University, Greenville, SC 29613-0001, (864) 294-3248, ***john.snyder@furman.edu***

Submission Guidelines for the News

Submissions are always welcome! Preference is given to articles written for a non-technical but knowledgable audience, illustrated and succinct (under 1,000 words). Please submit in one of the following formats (in order of preference):

1. Electronically transmitted file and graphics—in some acceptable format —*via* e-mail.

2. Article (and graphics) on diskette, CD or Zip disk in any of the popular formats/platforms. Indicate what format(s) your disk/article/graphics are in, and call or email if in doubt. Include printed hardcopies of both articles and graphics, a copy of the article file in ASCII or RTF (just in case), and alternate graphics formats. Media will be returned on request.

3. Color and B+W graphics should be good quality photos or slides suitable for scanning or—preferably—electronic files in TIFF or JPEG format at least 1200 x 1500 pixels for interior use, 1800 x 2100 for covers. Photos or slides will be returned.

4. Typed copy, double-spaced suitable for scanning aand optical character recognition. Original artwork/maps should be line drawings in pen and ink or good, clean photocopies. Color originals are preferred.

Submission Deadlines

Material for Volume 45 must reach the Editor by the following dates:

Issue	Date Due
1 Spring	**Jan. 31, 2003**
2 Summer	Apr. 25, 2003
3 Autumn	Jul. 25, 2003
4 Winter	Oct. 31, 2003

Reports for Supplement S1, the Season Summary, must reach the respective Zone Coordinator (see most recent Season Summary for your Zone) by Dec. 15. See inside back cover for Zone Coordinator information.

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Dept. Entomology, NHB 105, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0105

Konrad Fiedler
Dept. Animal Ecology I, Univ. Bayreuth, P.O. 101251, D-95440 Bayreuth, Germany
konrad.fiedler@uni-bayreuth.de

Secretary

Ernest H. Williams
Department of Biology, Hamilton College, Clinton, NY 13323
(315) 859-4387
ewilliam@hamilton.edu

Assistant Secretary

Julian P. Donahue
Natural History Museum, 900 Exposition Boulevard, Los Angeles, CA 90007-4057, (213) 763-3363 (office), (213) 746-2999 (fax)
donahue@caroli.usc.edu

Treasurer

David C. Iftner
8 Alpine Trail, Sparta, New Jersey 07871, (973) 729-1350
iftner@worldnet.att.net

Asst. & Treasurer-Elect

Kelly M. Richers
9417 Carvalho Court, Bakersfield CA 93311, (805) 665-1993 (home)
krichers@bak.rr.com

Publications Manager

Ken Bliss
P. O. Box 1366, Edison, NJ 08817
KBliss0568@aol.com

Editor, News of the Lepidopterists' Society

Phil Schappert
Integrative Biology, 1 University Station, C0930, University of Texas at Austin, Austin, TX 78712-0253, (512) 475-6285 (lab), (512) 471-3878 (fax), (512) 237-3864 (home),
philjs@mail.utexas.edu

Editor, Journal of the Lepidopterists' Society

Carla M. Penz
Curator of Invertebrates, Dept. of Invertebrate Zoology, Milwaukee Public Museum, 800 West Wells St., Milwaukee, WI 53233, Phone: (414) 278-6936, FAX:(414)278-6100,
flea@mpm.edu

Editor, Memoirs of the Lepidopterists' Society

William E. Miller
Department of Entomology, University of Minnesota, St. Paul, MN 55108, (612) 624-7493 (office)
mille014@maroon.tc.umn.edu

Book Review Editor

Philip DeVries
*(see **Book Reviews** opposite)*

Members-At-Large

James Adams, Jeffrey Slotten, Wayne Wehling (2003); David Ahrenholz, Philip DeVries, J. Bolling Sullivan (2004); William Conner, Rebecca Simmons, Charles Covell, Jr. (2005)

Season Summary Zone Coordinators

Refer to Season Summary for Zone coverage details.

Chief Season Summary Coordinator And Editor

Jim Tuttle
4285 N. Homestead Avenue
Tucson, Arizona 85749-9437
(520) 749-1806 (home)
jtuttle@theriver.com

Zone I, The Far North:

Kenelm W. Philip
Institute of Arctic Biology
University of Alaska
P.O. Box 75700
Fairbanks, Alaska 99775-7000
(907) 479-2689
fnkwp@aurora.alaska.edu

Zone 2, The Pacific Northwest:

Jon H. Shepard
R.R. #2, S.22, C.44
Nelson, British Columbia
V1L 5P5 Canada
(250) 352-3028
shep.lep@netidea.com

Zone 3, The Southwest:

Ken Davenport
6601 Eucalyptus Dr., #325
Bakersfield, CA 93306-6856
(805) 366-3074 (home)
flutterflies@juno.com

Zone 4, The Rocky Mountains:

Ray E. Stanford
720 Fairfax Street
Denver CO 80220-5151
(303)377-1332 (home)
raystanford@stanfordalumni.org

Zone 5, The Plains:

Ronald Alan Royer
Division of Science
Minot State University
Minot, North Dakota 58707-0001
Office: (701)858-3209
FAX: (701)839-6933
royer@warp6.cs.misu.nodak.edu

Zone 6, Texas:

Charles Bordelon, Jr.,
8517 Burkhart Road, Houston, TX 77055, (713) 822-8731 (cell)
legitintellexit@earthlink.net

Zone 7, Ontario And Quebec:

Alan J. Hanks
34 Seaton Drive, Aurora, Ontario L4G 2K1 Canada
(905) 727-6993 (home)
A.Hanks@aci.on.ca

Zone 8, The Midwest:

Leslie A. Ferge
7119 Hubbard Avenue
Middleton, Wisconsin 53562-3231
(608) 836-9438
ferge@chorus.net

Zone 9, The Southeast:

Brian G. Scholtens
Biology Department
College of Charleston
Charleston SC 29424-0001
(803) 856-0186
scholtensb@cofc.edu

Zone 10, The Northeast:

Mark J. Mello
c/o Lloyd Center,
430 Potomska Rd
Dartsmouth, MA 02748
mothman@attbi.com

Zone 12, Mexico & the Caribbean:

Isabel Vargas Fernandez
Museo de Zoologia,
Facultad de Ciencias,
Univ. Nacional Autonoma, Mexico,
Apartado Postal 70-399,
Mexico 04510 D.F., Mexico
ivf@hp.fciencias.unam.mx

The Lepidopterists' Society
c/o Allen Press
P.O. Box 368
Lawrence KS, 66044

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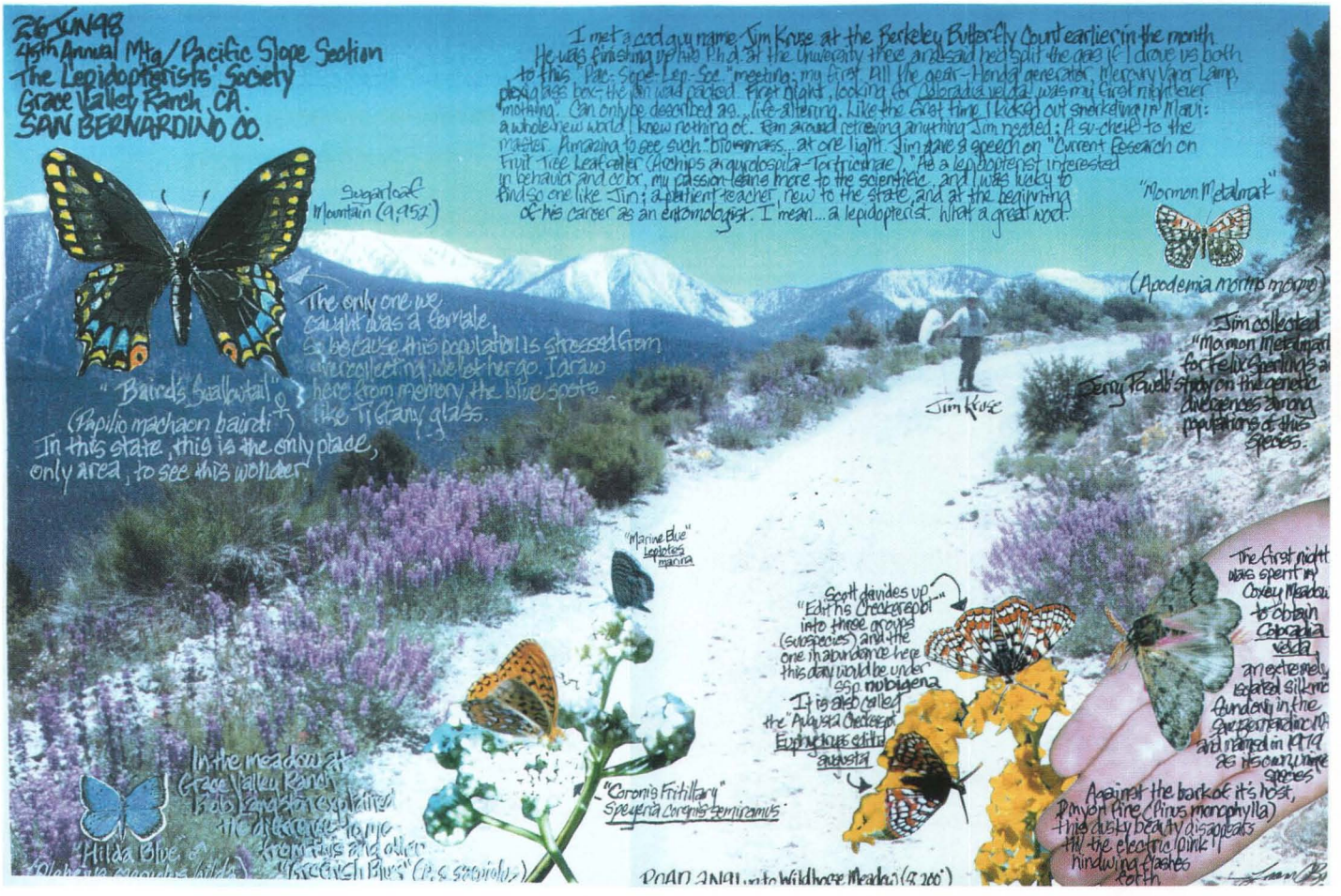

Another page from Lian O'Brien's journal... See pp. 132 for another example of Liam's artwork.