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THE OFFICIAL PUBLICATION OF THE SOUTHERN LEPIDOPTERISTS' SOCIETY ORGANIZED TO PROMOTE SCIENTIFIC INTEREST AND KNOWLEDGE RELATED TO UNDERSTANDING THE LEPIDOPTERA FAUNA OF THE SOUTHERN REGION OF THE UNITED STATES (WEBSITE: www.southernlepsoc.org/)

J. BARRY LOMBARDINI: EDITOR

MEET THE CHAIRMAN

BY

JOHN F. DOUGLASS

I am very pleased to have been elected Chairman of a society I revere. My goals while in office are: 1) to recruit new and younger members; 2) to include botanical and 4-H groups in our field-trip planning; 3) to work toward concordance in some of the terminology and methods used in vertebrate zoology and lepidopterology; 4) to involve interested members in on-going faunistic and phenological studies.

John F. Douglass at Interlochen, June 1974

I was born in 1951 into a world in which natural-history pursuits were encouraged and celebrated, and because of this I've always felt like the luckiest kid in the world. My parents and brother and sister and I lived in an old stone house in Rochester, Minnesota, and, with the exception of summers, I spent my whole childhood there before going off to college. The most beautiful thing about the house was that my parents equipped it and ran it like a university. Rooms were set aside for art-history studies, for example, and for zoology exhibits and musical recitals and other pursuits.

My main interests throughout childhood were the Lepidoptera of Michigan, mammalian paleontology, and zoogeography (mammals of the world). My parents were wonderful at promoting their kids' interest in nature. On the top floor of our house my dad established

a magnificent natural-history library. Its emphasis was on zoogeography and on the exploration of Africa. From the library's windows, on tiptoes, I could peer out over miles of Minnesota's zhivagoesque landscapes. When the cold wind moaned outside, I had the warmth of lamplight and my dad's zoology books close at hand. My favorite books in those days were *Heroes of the Dark Continent* by Buel (1890) and T. Roosevelt's *African Game Trails* (1910). My dreams at night took flight from their precisely-wrought lithographs. When I was 5, my dad's old friend and mentor at the Field Museum, K. P. Schmidt (*Herpetology of the Belgian Congo*), died from the bite of a boomslang (*Dispholidus typus*), and I felt Africa tighten its grip.

Upstairs in the library, my dad and I somehow felt that our mission was to assemble a collection of the best existing illustrations of the world's great mammals. We subscribed to foreign periodicals and wrote to colonial offices and to every major museum in the world whose address we could find. In order to obtain information about animals, my parents encouraged me to develop 'pen pals' in many of the tropical countries in whose faunas I was most interested. Because they so-beautifully depict endemic animals and their environments, I became an avid collector of African postage stamps during grade school. This became especially exciting beginning in 1957, as country after country in Africa declared its independence (25 countries in the 1960's alone) and issued new stamps and new currency. Nowadays, while at the McGuire Center, coming upon old specimen labels bearing such antiquated place-names as Dahomey [now Benin], Ubangi-Chari [the C.A.R.], Nyasaland [Malawi], Bechuanaland [Botswana], and French Equatorial Africa always elicits happy memories of my geographically far-flung friends from long ago.

I had wonderful teachers in the Rochester Public Schools. Everything taught at school was reinforced at home, and *vice versa*. Things as important as geography and cursive writing were still being taught. My parents loved the English language, and had a lombardiniesque love of words. I took the study of French seriously, both to fit in with the older kids and because I could see that any future studies involving Equatorial Africa would require it.

My most-memorable outdoor experiences during childhood occurred at a family cottage adjoining the National Music Camp at Interlochen, in northwestern Lower Michigan. The site lies between two big inland lakes, and as kids we spent every summer there, living on Green Lake's shore, in an old lumberman's shack beginning in 1956 and later in a tiny cottage. Pristine waterways and expanses of wild ground stretched in every direction, and I was free to explore outside each day with other kids from down the beach.

It was at Interlochen that I first observed butterfly metamorphosis. One summer day when I was 8, I encountered a swarm of blackish caterpillars moving over the ground, each of them with red dorsal spots and long black spines. I can still picture the jagged-looking, jutting-edged chrysalises which formed soon after I brought the larvae into the shack. Frustratingly, a small, recently-published book (Klots 1951) was left in Minnesota, so I had no idea what to expect. The stage was set. The shock of seeing the trembling, oxblood-velvet adults, appearing noiselessly when I least expected it, was unforgettable. The butterflies I most enjoy hunting in Michigan nowadays are the anglewings (*Polygonia*), of which 6 species occur in the Upper Peninsula. Some of Michigan's most-interesting butterfly phenomena are the *Celastrina* species and their finicky requirements, the dynamic relationship between *Limenitis a. arthemis* and *L. arthemis astyanax* at the Straits of Mackinac, and the intensively-studied hybrid zone between *Papilio glaucus* and *P. canadensis*. I was 27 before I saw my first spring unfold at Interlochen. It became a fairyland in May. I had never before seen *Glaucopsyche lygdamus*, or the crazily-beautiful, green wing-marbling of *Euchloe olympia*.

One night in Michigan when I was 10, I noticed a female *Paonias excaecata* perched on the wall of our shack. When I touched her thorax, she flashed her blue-spotted hot-pink hindwings at me. I was completely seduced. When the school year began in Minnesota, I could hardly wait for summer to come so that I could get back to northern Michigan to seek that kind of experience again. The following summer, an *Arctia caja* on the wall of the shack provided my own personal preview of the psychedelic 1960's. Sadly, mothing can be tough as well as fun: having my first, completely-perplexed look at a hovering, just-out-of-reach *Amphion floridensis*, and then a hovering, out-of-reach *Sphecodina abbottii*, almost undid me in 1962. In 1984, I found a freshly-hit female *Eumorpha achemon* lying along a back road in Michigan; Charlie Covell's *Field guide to the moths* appeared that year, and I've never turned back. With my brother's two young sons during the 1990's, I enjoyed several exciting summers of non-stop mothing. My brother and his wife thoughtfully outfitted the boys with bright-orange, highway-workers' vests so that they could race more safely through brightly-lit lots to find hawkmoths on our nightly rounds. My interest in hawkmoths has been encouraged by the skilled work of others. The dedication shown by T. W. Carr and by J. R. Slotten, evident from results they have each obtained from hawkmoth-rearing work, sets a fine example. And as in all areas of lepidopterology they have addressed, the studies by V. A. Brou, Jr. (1970 to present), R. W.

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Guadalupe Mountains National Park (Photo by James Bowers)

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WELCOME TO OUR NEW MEMBERS 2016

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MOTHING IN THE NUCLEAR AGE
BY
TOM NEAL

Back in olden times (June, 1970) I returned to my hometown of Lititz, Lancaster County, Pennsylvania, after wrapping up my first year as a graduate student at the University of Florida. I had only been home a short time and had barely readjusted to being a largely useless mooch on my mother when I ran into a boyhood friend, John Spahr. He had also returned home for summer break after a year at the University of Maine. Since neither of us had any immediate prospects of gainful employment we decided to fall back on what we liked to do best; namely fishing and collecting leps.

We had a favorite fishing spot along the Susquehanna River which I had visited often with my uncle when I was younger and later with John as well. The steep serpentine hills along that stretch of river had the added appeal of providing butterfly habitat quite different from the rest of the county. This was the only locale where zebra swallowtails could be found, for example, and John had once collected a pair of regal fritillaries while visiting that spot. This was a species I searched the area for in vain on a number of occasions and always coveted the specimens in his collection. Even though it was early in the season, I had hope.

Now that we had a purpose in life, we assembled all our fishing and bug collecting gear and headed off the very next day. I took the precaution of actually getting a fishing license, but John decided that, given his relatively short stature and boyish looks, he would try to pass as underage and save his money for beer. He therefore failed to bring a wallet or any ID along at all.

After arriving at our destination we divided our time between fishing, poking about the surrounding woodlands and catching up on each other's lives since we last met. Fishing turned out to be mediocre at best, but we gave it the old college try and were still at it as evening arrived. As we were sitting there on the rocks we were struck by an odd phenomenon. It wasn't getting any darker. Upstream from our location and around a bend in the river a powerful light source was flooding the entire area with artificial daylight. We had no idea what it was, but we did know that where there was that much mercury vapor light there had to be moths. We decided to pull up stakes and join all the moths following the lights. We were running seriously short on beer in any event. Inasmuch as there is no road actually following the river we were obliged to take a lengthy, convoluted route to the light source.

What we found when we finally arrived was a vast construction site completely illuminated with enormous banks of bulbs. There were so many moths and other insects flying about that, from a distance the lights appeared to be shining through a fog. As we got closer we could see the ground beneath the light banks literally seething with insect life. Unfortunately, although there was no trouble driving to the immediate area, the construction site itself was completely surrounded by a 12 foot chain link fence topped with barbed wire. On the fence were "KEEP OUT" signs which also identified the site as the Three Mile Island Nuclear Plant construction zone. Well, what did lil' ol' "no trespassing" sign matter when there are millions of moths to be had? Even though it seemed like trying to break into a maximum security prison, we probed the perimeter and, amazingly, found a spot where a railroad cut left a 4-foot gap under a locked gate.

Under the powerful spell of the moth cloud and fortified with the courage of plenty of beer consumed, we bravely ventured inside and began making our way to the lights. Until we heard the dogs. As if the sudden presence of German Shepherd guard dogs wasn't frightening enough they were followed by two serious-looking guys in uniform with guns drawn, leaving me thinking how glad I was that I had just peed outside the fence. Well, they searched us and cuffed us and took us back to the security headquarters where they tried to make sense of the situation. The good news was we looked like two regular college guys who had been drinking and decided to go on a lark. The bad news was that they were on high alert after a number of sabotage attempts by some anti-nuclear group. More good news was that I had my wallet with my University of Florida ID. More bad news was that John had no ID whatsoever. Further good news was we looked like a couple of screwballs with bug nets. Further bad news were those killing jars clearly labeled "Cyanide".

After grilling us and keeping us in custody for a couple of hours our captors dithered over whether to have the state police come and arrest us. All the while tons of moths were hitting the window panes and flopping on the ground as if taunting us. Numerous phone calls regarding our presence were made back and forth to unknown entities. One of the guys, an ex-marine type, really wanted to turn us in. I wasn't sure whether they were playing "good cop, bad cop", but it was disturbing. Our little excursion "up the river"

threatened to take on a whole new meaning. Finally, without warning they just told us to get out of there and don't come back. What a relief! I so wanted to ask them if we could just give the lights a quick check before we left, but I decided that was pressing our luck.

(Tom Neal, E-Mail: chouwah@aol.com)

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PARANTHRENE ASILIPENNIS (GUÉRIN - MÉNEVILLE, 1829) IN LOUISIANA

BY

RICKY PATTERSON AND VERNON ANTOINE BROU JR.

Fig. 1. ***Paranthrene asilipennis*** ♂

On April 1, 2014, a single male specimen of the clearwing moth ***Paranthrene asilipennis*** (Fig. 1) was netted by the senior author as it rested on a leaf of *Baptisiae* in a roadside ditch beside FR K18E, off of PR (Parish Road) 380, off of Hwy 117, Kisatchie National Forest, Natchitoches Parish, Louisiana.

Despite operating a considerably large series of sesiid pheromone traps in the same surrounding National Forest areas for over 30 years by the junior author, this specimen of ***asilipennis*** represents the first documented record of this species within Louisiana.

Covell (1984) reported that ***asilipennis*** occurs from Nova Scotia to Florida, west to Wisconsin, Kansas, and Texas, April - July.

Eichlin & Duckworth (1988) and Heppner (2003) stated that ***asilipennis*** ranges from Massachusetts to Wisconsin and to Florida and to eastern Texas. These same authors also discuss Englehardt's (1946) statement that ***asilipennis*** also occurs in Mexico and Central America. Brown and Mizell (1993) and Heppner (2003) also reported ***asilipennis*** from Florida.

Taft, Smitley, & Snow (1991) stated ***asilipennis*** occurs in the US and Canada, east of the Rocky Mountains. Knudson & Bordelon (2010) reported ***asilipennis*** to be common in east Texas.

Literature Cited

Brown, L.N. and **R.F. Mizell,** 1993. The clearwing borers of Florida (Lepidoptera: Sesiidae). *Tropical Lepidoptera* Vol. 4, Supplement 4. 21 pp.

Covell, Jr., C.V., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Eichlin, T.D. and W.D. Duckworth, 1988. Sesoidea: Sesiidae. In Dominick, R.B. *et al.* (eds), *The Moths of America north of Mexico.* Fasc.5.1 Washington: Wedge Ent. Res. Found. 176pp.

Engelhardt, G.P., 1946. *The North American clearwing moths of the family Aegeriidae.* U.S. Natl. Mus. Bull., 190: 1-222.

Heppner, J.B., 2003. *Arthropods of Florida and neighboring land areas*, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Knudson, E. & C. Bordelon, (2010) *The Texas Lepidoptera Atlas*, vol.VII, Sesioidea, Texas Lepid. Surv. Privately printed.

Taft, W.H., D. Smitley, J.W. Snow, 1991. *A guide to the Clearwing Borers (Sesiidae) of the North Central United States.* North. Cen. Reg. Pub. Coop. Ext. Serv. Mich. St. Univ. 30pp.

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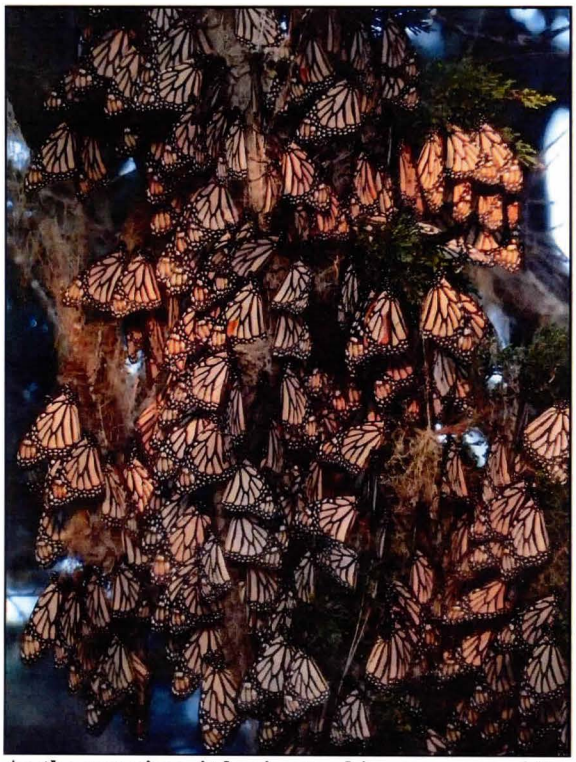
COUNTING WESTERN MONARCHS

BY

CANDY SARIKONDA

The fall monarch butterfly migration is a spectacular phenomenon. Since monarchs cannot survive freezing cold winter temperatures in the north, they must migrate to more suitable habitat to spend the winter. Most monarchs east of the Rocky Mountains migrate to overwintering sanctuaries in central Mexico. However, the majority of monarchs west of the Rockies choose to migrate to one of over 200 different overwintering sites along the California coastline. Thousands of western monarchs spend the winter at these sites along the coast, usually arriving in October and staying until mid-February. Many sites have been observed by monarch scientists, enthusiasts and volunteers for years, and trained volunteers conduct monarch counts at numerous sites annually during a 3-week period around Thanksgiving Day. Some overwintering sites are monitored more frequently throughout the winter, and I was given the opportunity to participate in the bi-weekly monarch population count at the Pacific Grove Monarch Butterfly Sanctuary (PGMBS) in Pacific Grove, CA.



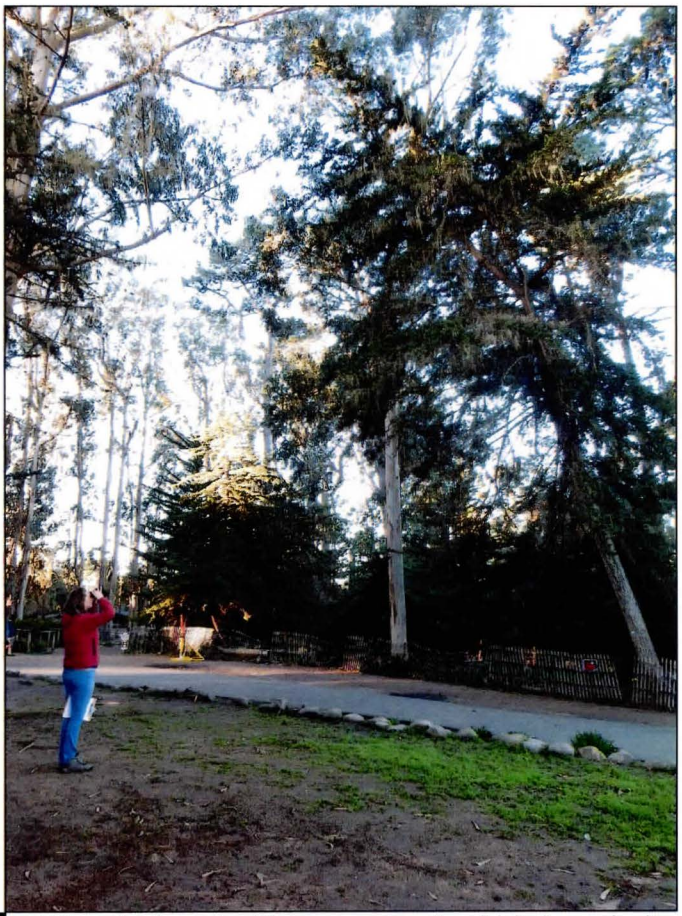
As the sun rises, it begins to shine on some of the clusters, and that soft light creates a golden glow on the unmoving monarchs.

The PGMBS has long been a preferred site of overwintering monarchs. Western monarch population counts have been conducted and documented annually at PGMBS and other California sites since 1997, via an effort coordinated by the Xerces Society. The population counts are invaluable for understanding the overall western monarch population, providing researchers with a picture of the status of the population and its conservation needs. Bi-weekly overwintering population counts are done at PGMBS, allowing researchers to note fluctuations in the grove's population over the season. In addition, tagging was conducted by the Pacific Grove Museum of Natural History at the sanctuary in 2014, enabling researchers to track monarch movements within and between overwintering sites. Parasitism studies were also conducted, allowing researchers to determine the prevalence of the Oe parasite in monarchs at the site. The tagging and parasitism data were shared with researchers at Cal Poly San Luis Obispo's Monarch Alert program and the University of Georgia's Monarch Health lab to further understand western monarchs' overwintering behavior and parasite prevalence. Valuable information about western monarchs has been gleaned from the efforts of volunteers and scientists at the PGMBS site, and I was honored to have the opportunity to participate in the PGMBS monarch count.

Allison Watson recording count data. The data sheet records information on the date, time and length of the count; as well as wind and weather conditions. The number of monarchs in each cluster is counted, and the height of clusters and tree species are noted. All monarchs – loners, fliers, grounders, clustered monarchs – are included in the count. The data sheet can be found at http://www. westernmonarchcount. org/wp-content/uploads/2014/10/Data-Sheet-Monarch-Count1.pdf

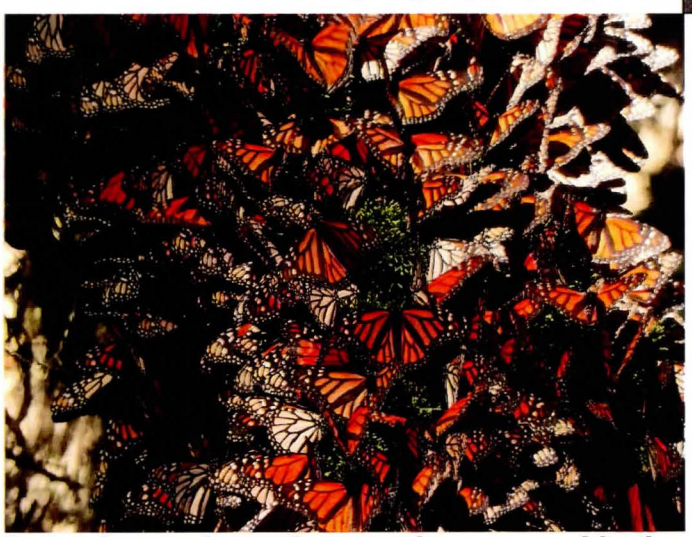
I joined Allison Watson, education programs manager for the Pacific Grove Museum of Natural History, to conduct a count of the monarch butterflies spending the winter at PGMBS. The grove is a forest of native Monterey cypress and Monterey pine, as well as non-native eucalyptus trees. In the winter, monarchs gather together in groups, or clusters, to roost in the tree branches during the cold nights. This overwintering season monarchs arrived to PGMBS early, arriving in early October and quickly increasing in number. By Thanksgiving, monarchs at the grove numbered 11,533.

Ms. Watson and I met in the grove at sunrise the morning of December 30, 2015. Early morning is the best time to observe inactive, roosting monarchs. That morning it was 42F, clear skies with calm winds, and we found the monarchs roosting primarily in a single Monterey cypress tree overhanging the driveway near the grove entrance. Ms. Watson explained that when monarchs first arrive to the grove at the beginning of the overwintering season, they typically cluster in the line of eucalyptus trees near the grove entrance. But when air temperatures begin to decrease as the overwintering season progresses, the monarchs move to trees near the center of the grove where there is more protection from wind and inclement weather. Each tree has a small identification tag placed on it, allowing volunteers to document exactly which trees the monarchs are using. Ms. Watson explained, "The grove is experiencing some decline. Drought and disease are affecting some of the trees. We lost two trees to pitch canker this year." By collecting data on the monarchs' tree usage along with concurrent temperature, wind and weather conditions, restorationists can determine how best to restore the grove to meet the needs of the overwintering monarchs.



Allison is observing the cypress tree in which the majority of the monarchs were clustered.

Ms. Watson and I observed each tree that hosted roosting monarchs. The cold air temperatures led the monarchs to cluster in tight groups, giving the appearance of clusters of dead leaves hanging from the tree branches. Ms. Watson examined the clusters with her binoculars, counting the monarchs on each tree branch. While eastern monarch population counts are done by calculating the area of forest occupied by monarchs, the western population is small enough that monarchs can be counted individually. Some tree branches contained a handful of monarchs, so each individual monarch was counted. Other branches contained hundreds of monarchs, and Ms. Watson used a method of estimation to count them. She explained, "I begin at the tip of the branch, and count ten monarchs grouped together in the cluster. Based on the amount of space those ten monarchs occupy on the branch, I then count by groups of ten up the branch, until I count all of the monarchs on the branch." One cypress branch, hanging almost straight down due to the weight of the monarchs, held 1000 monarchs!



In the afternoon hours, the monarchs are warmed by the sun and begin moving. Many open their wings wide, basking in the sun's rays. This is when their coloration is most brilliant – they look like pieces of stained glass or flames on the trees. Close-up photography is much trickier at this time, since the monarchs are moving. But it is a beautiful time to see their radiant colors in the midday sun.

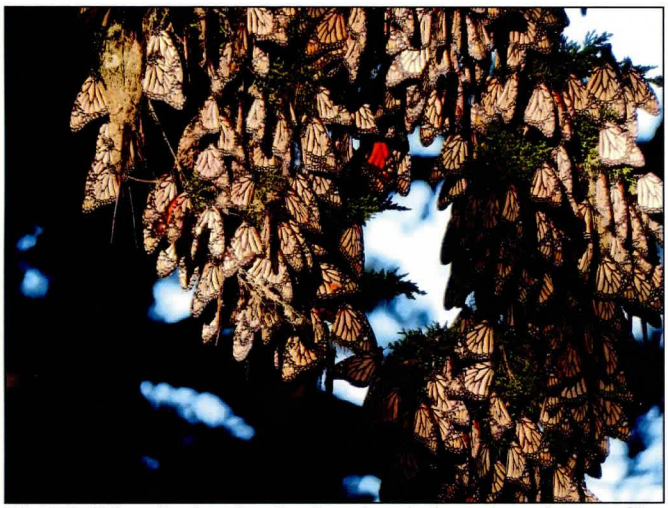
As we moved further into the center of the grove, Ms. Watson noted a very tall pine tree which held a few small clusters. "I don't normally see monarchs way up there, so this has been interesting to see," she explained. She also pointed to a small number of deceased monarchs on the forest floor, with their abdomens missing. While mice do prey on monarchs on the ground, volunteers have witnessed a squirrel removing monarchs from the clusters. Reports indicate that the squirrel approaches a cluster, removes a few monarchs, then returns to a protected spot near the forest floor where it consumes the monarch abdomens. "We were really surprised to see this. We think it is only one squirrel doing it, but it is really unusual."

A male and female monarch basking in the midday sun.

Early morning light shining on a cluster, bringing out the color of the monarchs.

As we walked in the cold morning air — hands chilled while holding binoculars, clipboard and camera — I noticed the strain on my neck. All that looking up in the trees for long periods was not easy! Ms. Watson laughed, "Yes, it is a bit of a strain. I definitely feel it in my shoulders but I am getting used to it. I might treat myself to a shoulder massage at the end of the season." I nodded in absolute agreement. After an hour of counting, the count was complete. Ms. Watson tallied the results. The final count was 10,236 monarchs at the grove!

We discussed the results of the count. Monarchs numbered 24,000 at PGMBS during the previous overwintering season, indicating this season's count was a drop from last season. But notably, preliminary results from the Western Monarch Thanksgiving Count suggest a slight increase from last season in the overall western monarch population. Reports are currently being gathered from more than 85 volunteers who surveyed more than 130 sites. According to Sarina Jepsen of the Xerces Society, "...the surveys so far indicate that sites north of Santa Cruz are hosting more butterflies than previous years; whereas sites in Monterey, San Luis Obispo, and Santa Barbara Counties are reporting fewer numbers of butterflies on average. Several new sites have been reported, including some from Marin County with up to 10,000 monarchs. The data are not yet



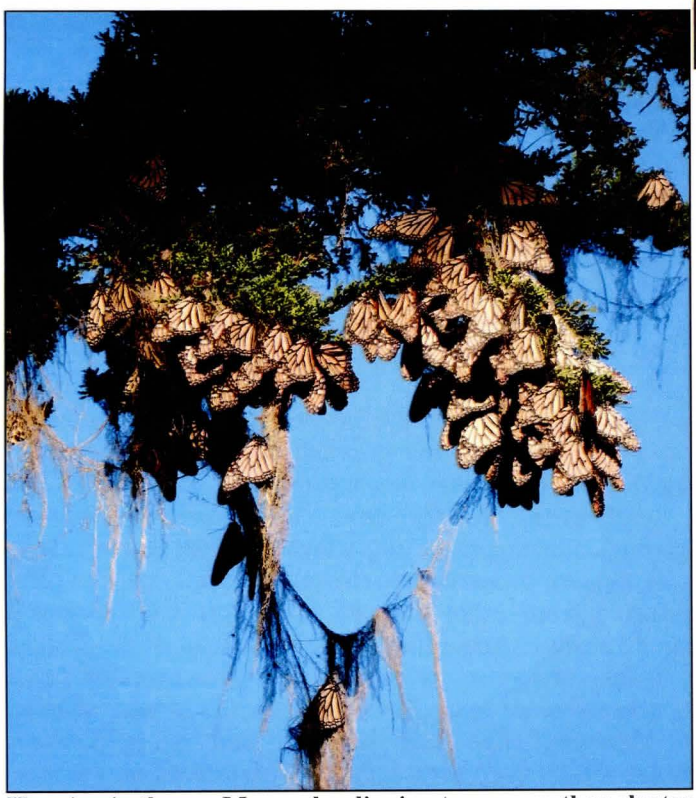
This is Maya's (author's daughter) favorite photo. She loves the heart shape of this cluster.

The monarchs cluster so tightly on the tree branches that they weigh the branches down. You can see how tightly they pack themselves together on the cypress tree limbs.

available for Santa Cruz County and many sites in southern California." Ms. Watson expressed excitement over the discovery of new overwintering sites, and how these new sites might fit into the picture of the overall western monarch population.

My visits to PGMBS are always an awe-inspiring experience. But having the opportunity to participate in a monarch count was a unique learning opportunity that I will treasure for years to come. If you are interested in participating in a monarch count at a site near you, please consider volunteering by contacting the Xerces Society. Training with experienced counters

This is a close-up photo of a monarch cluster in the early morning. The monarchs look ashen gray in the early morning hours, blending in perfectly with the trees. As the sun rises, their colors begin to show dramatically. This is one of the reasons I like to visit the grove and photograph them at all hours of the day.



Hanging in there. Monarchs clinging to moss as they cluster in a cypress tree.

is recommended for new citizen scientists. Volunteers are especially needed to commit to assessing a site year after year. Learn more here http://www.westernmonarchcount.org/about/. Get started today!

Resources

December 2015-January 2016 photos from PGMBS https://www.flickr.com/photos/candy_kasey/albums/72157662503617979/with/24085450342/

Article by Sarina Jepsen of Xerces Society on the current status of the western monarch population http://www.xerces.org/blog/a-first-glimpse-at-the-state-of-western-monarchs/

Western Monarch Count Resource Center website, including count data by site http://www.westernmonarchcount.org

MJV news article explaining the behavior of the eastern overwintering population and count methodology http://monarchjointventure.org/news-events/news/2015-population-update-and-estimating-the-number-of-overwintering-monarchs

Journey North slideshow showing how the eastern monarch population counts are done https://www.learner.org/jnorth/tm/monarch/sl/pop/0.html

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ENOUGH ALREADY !!

"Goliath" Snowstorm starting in California and reaching Texas (Lubbock) on December 27, 2015. This snowstorm initially, seriously affected New Mexico and Texas with blizzard conditions causing much destruction and death in its wake (tornadoes and 200 mph winds in the Dallas area). The storm then traveled northeast producing extensive, catastrophic results with sleet, freezing rain, snow, and flooding affecting states along the way (Missouri, Arkansas, Oklahoma) as distant as Minnesota, Wisconsin and Michigan and eventually into New England all the way to Maine.

Photos are of my home in Lubbock, Texas. City of Lubbock received 10.3 inches of snow but fortunately little serious damage. Figs. A. & B.: Snow drifts prevented me from going into my backyard – such a *trivial, minor, inconsequential inconvenience* compared to severe damage and total loss of homes (>600) and life (at least 11) in the Dallas area and similar tragedies in Missouri and other states (overall total of ~ 50 deaths). Fig. C.: Also could not get out of front door and to my car because of snow drifts (Lubbock has no snow removal or salting procedures on residential streets and not much on major thoroughfares through the City). *"Help, I am trapped, claustrophobic, panicking, going crazy! No butterflies/moths today.*"

Present Date: March 1, 2016 -- no sleet, no snow, no ice. Hurray!!! Spring is approaching, butterflies/moths should be hatching and the "New Season for butterflies/moths" is "on" in the West Texas region.

[The Editor]

ACRONICTA NOCTIVAGA GROTE, 1864 (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

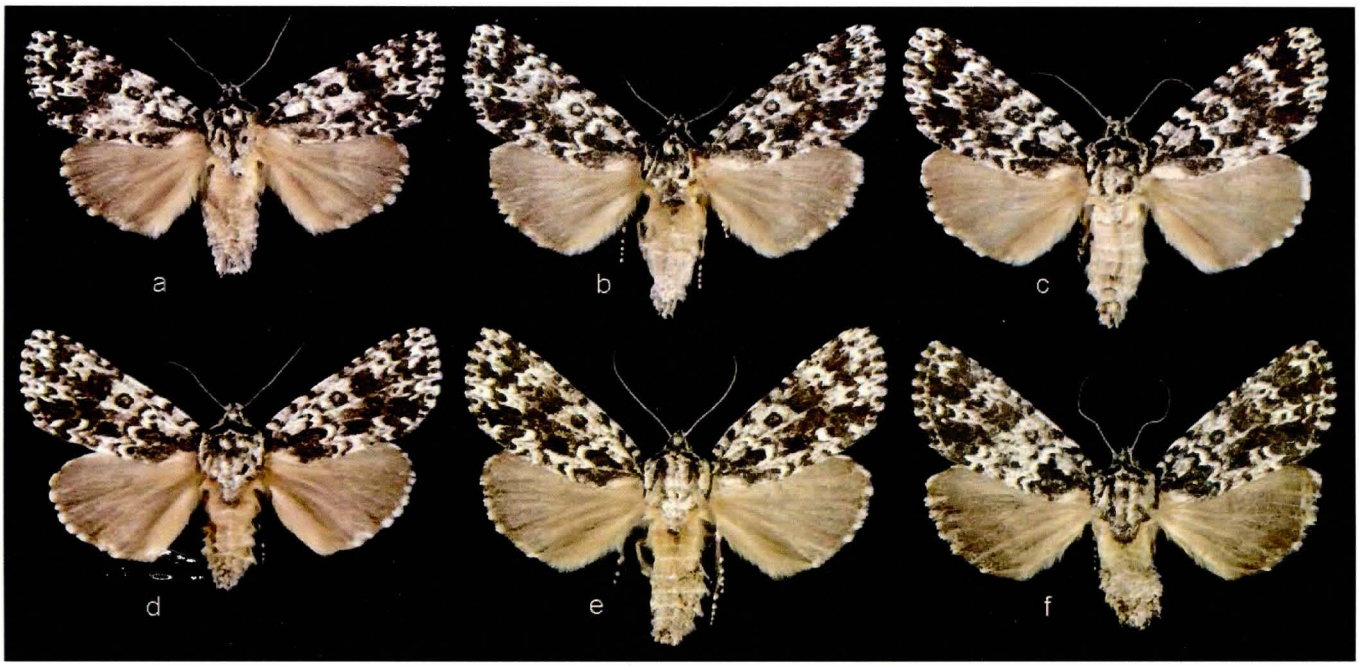

Fig. 1. ***Acronicta noctivaga*** phenotypes.

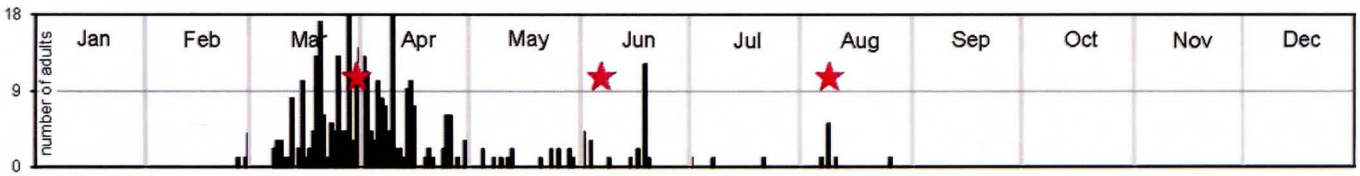

Fig. 2. Adult ***A. noctivaga*** captured in Louisiana. n = 338

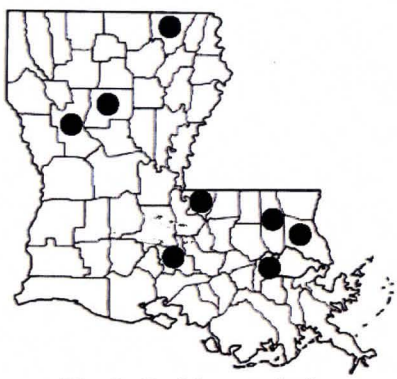

Fig. 3. Parish records for ***A. noctivaga***

The black and white noctuid moth ***Acronicta noctivaga*** Grote (Fig. 1) is not rare across Louisiana. Upon close examination, all of the white areas of the forewings are actually covered with a dusting of black scales.

A. noctivaga appears to have three annual broods within Louisiana, only the first brood is well populated, the second and third broods are not (Fig. 2).

The range of ***noctivaga*** is listed by Forbes (1954) to include Nova Scotia to the District of Columbia, Oregon, and New Mexico, and by Covell (1984) include the entire eastern area of North America, May-August, and uncommon southward. Knudson & Bordelon (1999) included ***noctivaga*** for the state of Texas. Heppner (2003) listed the range to include Nova Scotia to Florida, and Oregon to New Mexico.

The parish records are illustrated in Fig. 3.

Literature Cited

Covell, Jr., C.V., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Forbes, W.T.M., 1954. *Lepidoptera of New York and neighboring states, Noctuidae, Part III,* Cornell Univ. Agr. Exp. St. Mem. 329. Ithaca, New York, 433 pp.

Heppner, J.B., 2003. *Arthropods of Florida and neighboring land areas,* vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Knudson, E. & C. Bordelon, 1999. *Texas Lepidoptera Survey, Checklist of the Lepidoptera of Texas 2000 edit.* Privately printed.

SPRING FIELD TRIP TO THE FLORIDA — ALABAMA BORDER

APRIL 29 - MAY 2, 2016

BY

JOHN F. DOUGLASS

To first-time visitors, the Panhandle of Florida is a world apart. More species of carnivorous plants are found there than anywhere else in the country: 30 species of nitrogen-hungry flesh-eaters gape at the sky. Exotic wet-land floras are juxtaposed abruptly against pure-white sand dunes and beaches.

Please plan to participate in one or all of the three days and nights of photography and collecting we have planned, one week before Mother's Day. Kind permission has been extended to SLS members and friends by land managers in the area to explore, all day and into the night, the flora and lepidopteran fauna so unique to these areas.

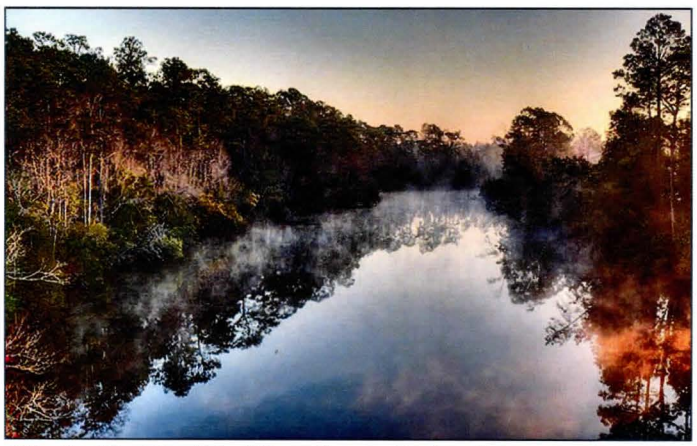

Fig. 1. The Perdido River forms the border between Florida and Alabama.

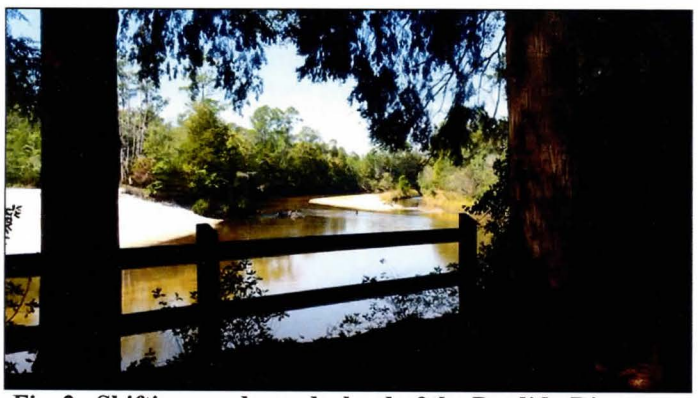

Fig. 2. Shifting-sand wonderland of the Perdido River.

We will embark on our explorations from the town of **Atmore**, Alabama. Atmore lies on the Florida line, at the headwaters of the Perdido River, and is close to a legendary carnivorous-plant site, Splinter Hill. The Perdido River **(Fig. 1)** is the highest-quality free - flowing blackwater river remaining in the southern Coastal Plain. It is 30- to 100-yards wide and offers exceptional recreational opportunities. The river's upper reaches represent a beautiful example of a 'shifting sand' riparian system **(Fig. 2)**. A good set of canoe-trail maps, with descriptions of access points, is available on-line (www.dep.state.fl.us/gwt/guide/designated_paddle/perdido_guide.pdf).

Scheduled activities [Please note that all times given are in CDT (Central time).]:

Friday, April 29, 1-10 PM CDT: Register in the Lobby of the Hampton Inn in Atmore. Exploration of surrounding habitats is unstructured.

Saturday, April 30, 7-9 AM: Registration. At **9:00 AM** we will depart from the parking lot at the Hampton Inn on an all-day trip to Splinter Hill and upper Perdido River sites. We can expect to see insectivorous plants numbering in the tens of thousands of individuals.

Sunday, May 1, 9:00 AM: Depart from parking lot at Hampton Inn on all-day trip to Rainwater Perdido River Preserve, coastal dunes, estuarine marshes.

Monday, May 2, All Day: Return to favorite areas by participants who can stay on.

Car pooling: For scheduled outings, we will meet at the parking lot of the Hampton Inn Atmore [Tel.: (251) 368-9090], where J. Douglass can be reached beginning Thursday, April 28.

Addresses of our destinations: Splinter Hill Bog Preserve, County Rd. 47, Bay Minette, AL 36507; Rainwater Perdido River Preserve, 5955 Hurst Hammock Rd., Pensacola, FL 32526. Detailed maps and directions to these preserves are accessible on-line.

Updates: For emerging/late - breaking details about where and when we will meet, or any schedule changes, participants are asked to check the SLS website (southernlepsoc.org, under "Spring 2016 Field Trip") beginning at noon on Friday, April 29, 2016.

Flora: More species of carnivorous plants are found in the wetlands of Florida than anywhere else in the country. These include 6 species of *Sarracenia*: the white-top (*S. leucophylla*) **(Fig. 3)**, yellow (*S. flava*) **(Fig. 4)**, parrot (*S. psittacina*), hooded (*S. minor*), sweet (*S. rubra*), and purple (*S. purpurea*) pitcher plants. The physiology of these extraordinary plants, and the complexity of commensal relationships within their gruesome 'stomachs', has been the subject of years of fascinating research. Other insect - trapping plants in the western Panhandle include species of butterworts (*Pinguicula*), sundews (*Drosera*), bladderworts (*Utricularia*), and the Venus' flytrap (*Dionaea*, naturalized in North Florida).

Fig. 3. White-top pitcher plants, *Sarracenia leucophylla.*

Fig. 4. Yellow pitcher plants, *Sarracenia flava.*

Moths: Numerous species of butterflies and moths are expected to be on the wing at the time of the trip. The area's diurnal and nocturnal lepidopteran faunas are poorly known, and participants are encouraged to bring MV and blacklighting gear (new moon is May 6). A special area of interest in our observations will be the larvae and adults of carnivorous-plant-feeding moths, some of which are obligate pitcher-plant and obligate sundew-leaf feeders. These include, on *Sarracenia*: the noctuids *Exyra fax* (Epauletted Pitcher - plant Moth, **Fig. 5**), *E. ridingsii* **(Fig. 6)**, *E. semicrocea* (Pitcher-plant Mining Moth, **Figs. 7 & 8)**, and *Papaipema appassionata* (Pitcher-plant Borer Moth, **Fig. 9)**, and the tortricids *Choristoneura parallela* (Parallel-banded Leafroller Moth, **Fig. 10)** and *Endothenia hebesana* (Verbena Bud Moth). On *Drosera*, we hope to find the pterophorid *Buckleria parvulus* (Sundew Plume Moth, **Fig. 11)**.

Fig. 5. *Exyra fax.*

Fig. 6. *Exyra ridingsii.*

Fig. 7. *Exyra Semicrocea.*

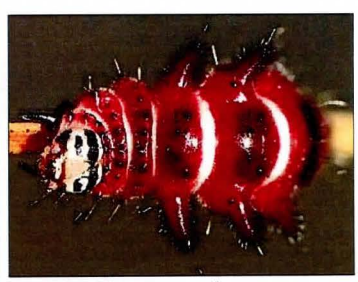

Fig. 8. *Exyra semicrocea* larva.

Motels in Atmore, Alabama (area code 251): Fairfield Inn & Suites, 368-1188; Greenlawn Motel, 368-3138; Hampton Inn, 368-9090; Holiday Inn Express, 368-1585; Muskogee Inn, 368-8182; Quality Inn, 368-9999; Wind Creek Casino & Hotel, 368-8007.

Contact: If you are able to participate in any or all of the weekend's events, please contact the Coordinator, John Douglass (jfdouglass7@gmail.com; (419) 389-9902 [24 hrs.]). Our explorations will certainly be fun, and of course: the more the merrier.

Photo credits: **Fig. 1**, J. Arthur Conway; **2**, www.PaddleFlorida.net; **3**, Barry Rice; **4**, Julie Tew; **5** & **6**, Jim Vargo; **7** & **8**, H. von Schmeling; **9**, Cindy Mead; **10**, Carol Wolf; **11**, Debbie Matthews.

Fig. 9. ***Papaipema appassionata.***

Fig. 10. ***Choristoneura parallela.***

Fig. 11. ***Buckleria parvulus.***

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PHOTOGRAPHS BY JAMES BOWERS

LUBBOCK, TEXAS, AREA

ACRONICTA HAMAMELIS GUENÉE, 1852 (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

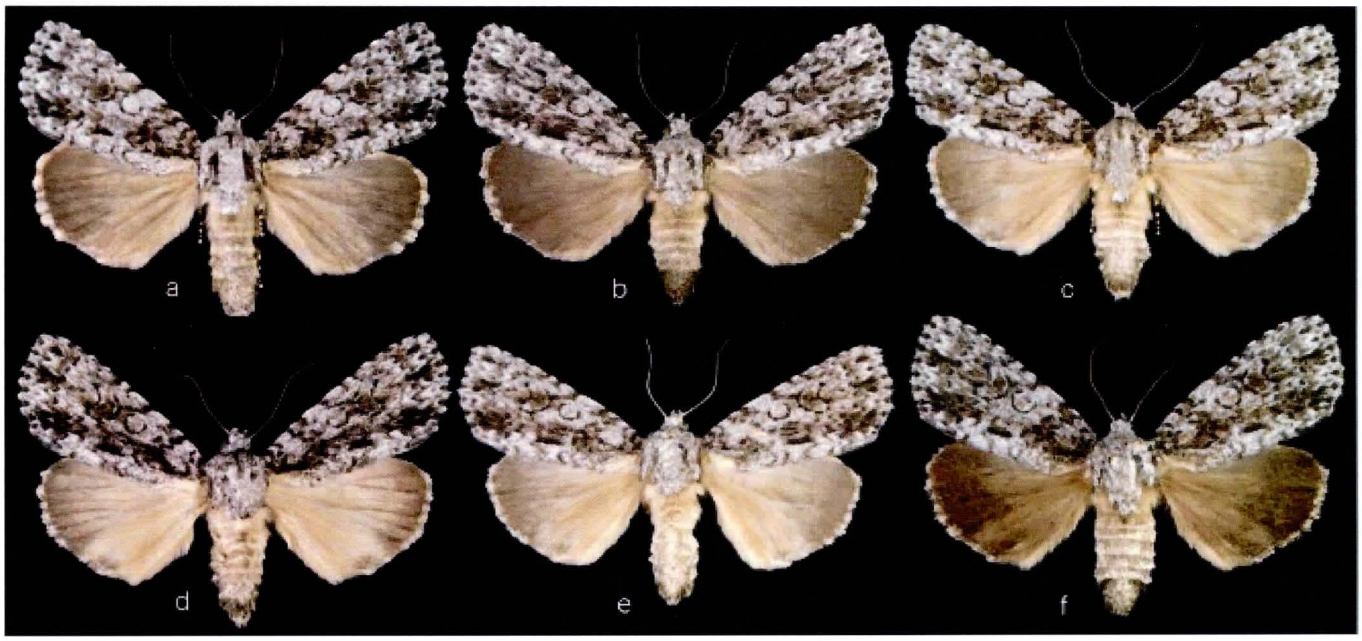

Fig. 1. ***Acronicta hamamelis*** phenotypes: a-f.

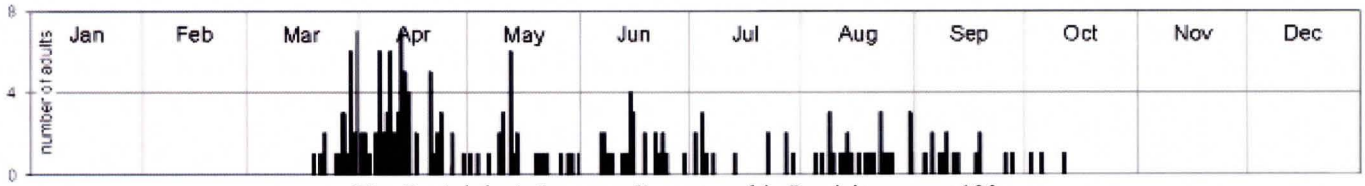

Fig. 2. Adult ***A. hamamelis*** captured in Louisiana. n = 190

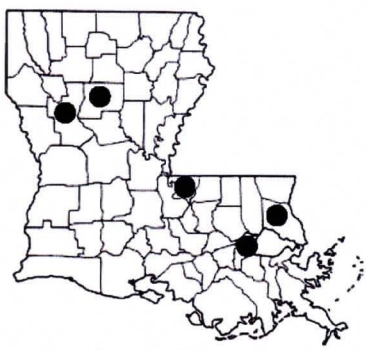

Fig. 3. Parish records for ***A. hamamelis***

Acronicta hamamelis Guenée (Fig. 1) is a fairly common and widespread medium-size species of the genus. Forbes (1954) listed ***hamamelis*** to occur from Nova Scotia and Ontario to Georgia, Wisconsin, and Colorado. This species was not covered by Covell (1984). Heppner (2003) listed the range to include Nova Scotia to Florida, Wisconsin, Colorado, and Texas. Knudson & Bordelon (1999) also listed ***hamamelis*** for the state of Texas.

Within Louisiana, adult ***hamamelis*** have been captured using ultraviolet light traps for the past 46 years and has three broods (Fig. 2). Adults exist for the months March to October. Forbes (1954) stated "May to August, apparently the usual two broods", and the larval foodplant as witch hazel. Heppner (2003) also added ***Aesculus***, ***Betula***, ***Castanea***, and ***Quercus*** as larval foodplants. The parish records are illustrated in Fig. 3.

Literature Cited

Covell, Jr., C.V., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30 Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Forbes, W.T.M., 1954. *Lepidoptera of New York and neighboring states,* Noctuidae, Part III, Cornell Univ. Agr. Exp. St. Mem. 329. Ithaca, New York, 433 pp.

Heppner, J.B., 2003. *Arthropods of Florida and neighboring land areas,* vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Knudson, E. & C. Bordelon, 1999. *Texas Lepidoptera Survey, Checklist of the Lepidoptera of Texas 2000 edit.* Privately-

(Vernon Antoine Brou Jr. 74320 Jack Loyd Road, Abita Springs, Louisiana 70420; E-Mail: vabrou@bellsouth.net)

WALTER INGLIS ANDERSON AND THE CASE OF THE LINOLEUM - WOOD BLOCK BUTTERFLY PRINTS

BY

GARY NOEL ROSS

INTRODUCTION

Walter Inglis Anderson (1903-1965) was a consummate artist with an undeniable passion for the natural world. Various masterly accounts describe him as "mythmaker, local legend, mystic poet, painter, and inveterate voyager" as well as "the South's most prolific artist." Anderson is best known for his vibrant and whimsical indoor murals, watercolors, pottery, and sculpture. Additionally, the artist carved more than 300 linoleum-wood-block prints — technically known as "linocuts" (see SIDEBAR). Some of these were the first monumental block prints in American art. When Picasso produced his first large prints in 1952, Anderson's sizable fairy tale linocuts were already mounted in museums in Memphis and New York. Anderson chose the linocut medium so that his art could be reproduced on a variety of surfaces: back of ordinary wallpaper, typing paper, plastered/cement walls, canvas, clothing and other textiles. Thus, much of Anderson's artwork was affordable not only to collectors but to virtually everyone.

[SIDEBAR. A linocut is a printmaking technique that is a variant of a woodcut. In the linocut, a sheet of linoleum, which is usually mounted on a wooden block, is used for the relief surface. A design is cut into the linoleum with a sharp knife. When inked, the block becomes a stencil for producing an image. This technique was pioneered in Germany between 1905 and 1913 for printing of designs on wallpaper.]

And yet, unless you make your home along the Mississippi gulf coast, chances are you have not heard of Walter Anderson. Only recently, in fact, have historians of American art begun to uncover Anderson's storied history. Reason? Although born in New Orleans and educated for the most part in prestigious art schools in the East and with a scholarship from the Pennsylvania Academy of Fine Arts that provided travel in France and Spain, Anderson's passion for nature led him away from the art centers of New York and Paris. Instead, he chose the Mississippi Gulf coast where he could concentrate upon understanding natural forms rather than establishing himself in the annals of art. The underdeveloped and animate Gulf coast of Mississippi proved both a sanctuary as well as a gateway for exploring Horn Island — an uninhabited barrier island about 12 miles offshore. In fact, some of Anderson's most renowned and popular works were executed on Horn Island. There, equipped with artists' tools, clothes, a small row boat that doubled as shelter, and minimal canned food, Anderson lived for weeks at a time documenting his experiences in journals and in paintings. Anderson portrayed the island with a unique intensity that resulted in thousands of works of art. Lawrence Campbell, art critic for *Art in America*, recognized Anderson as a significant southern artist, and wrote: "Originality merits him an honored place in the history of American twentieth-century art."

I was introduced to Walter ("Bob") Inglis Anderson during the summer of 2013. That was the result of a retrospective exhibit titled "WALTER INGLIS ANDERSON: EVERYTHING I SEE IS NEW AND STRANGE" mounted by the Louisiana State University Museum of Art in Baton Rouge between August 2 and October 13. Thumbing through several of the marketed books on Anderson, I was not surprised to find that the artist had included several butterfly and moth images in his extensive mural paintings. In addition, Anderson had featured several species as separate watercolor paintings.

Fig. 1. *Anartia jatrophae guantanamo* ("WHITE PEACOCK"): Left, male; Right, female. Golden Meadow, Lafourche Parish, LA, November 21, 1999. Published originally in Brou, Lefort, and Cunningham. Photograph by Vernon A. Brou, Jr. and used with permission.

Fig. 2. *Heliconius charithonia tuckeri* ("HELICONIAN"): Left, male: Abita Springs, St. Tammany Parish, LA, October 12, 2002. Right, female: Marrero, Jefferson Parish, LA. August 3, 1996. Photograph by Vernon A. Brou, Jr. and used with permission.

But what I didn't expect was that Anderson had begun a book on local butterflies. The preliminary images on linocuts included eleven easily identifiable species

Fig. 3. Title page for unfinished book on butterflies by Walter Inglis Anderson and Agnes Grinstead Anderson. Folding card produced by silk screen from an original linocut. REALIZATIONS, LTD.: THE WALTER ANDERSON SHOP, Ocean Springs, MS.

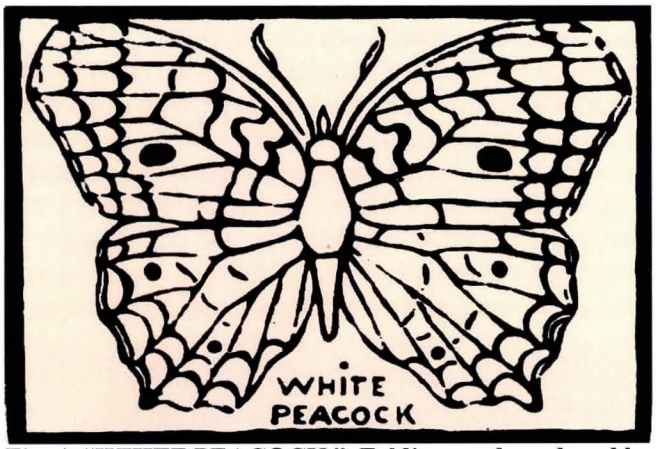

Fig. 4. "WHITE PEACOCK." Folding card produced by silk screen from an original black-inked linocut by Walter Inglis Anderson (WIA). REALIZATIONS.

accompanied by brief poetic verses. And here is where the mystery begins: Although nine of the butterflies are typical for the area, two are not: white peacock (*Anartia jatrophae*) and heliconian or zebra (*Heliconius charithonia).* Both species are tropical/subtropical, routinely breeding in southern Florida and southern Texas. The butterflies, however, are recorded in the scientific literature to occur as occasional strays — not breeding residents — on the Gulf coasts of Mississippi and Louisiana. Only a southern lepidopterist would have noticed the anomaly, of course. My mind flooded with questions: Did Anderson observe and sketch these two species in his homeland of coastal Mississippi and Horn Island, or had he observed the pair during a road trip elsewhere? And if the butterflies were sketched in Mississippi, did Anderson realize that the two species were only rare visitors, and not residents, and did that matter? Finally, could the two species have been more common during Anderson's lifetime? Perhaps to someone outside of southern Louisiana, such concern would seem, to quote Shakespeare, "Much Ado About Nothing." But my curiosity was piqued.

Several of the books published on Anderson provided limited information on butterflies, but nothing specific for the white peacock and heliconian. Patently, butterflies and moths were not unknown to Walter Anderson and not uncommon on Horn Island. Consider the following:

(1) *The Horn Island Logs of Walter Inglis Anderson*: On October 2, 1959, Anderson wrote from Horn Island: "The golden rod is barely beginning, but a kind of Marigold is well started. There is a bush with a flower something like ty-ty, usually covered with insects — Buckeyes, day Moths, Bees, Flies, Hornets, Skippers — while Mosquito Hawks hover above." page 156. On October 21: "Another nor'wester — flocks of ecstatic blackbirds-flocks of feeding Geese — grey sky — sea, flocks of Monarch butterflies are sheltering out of the wind everywhere...," page 160. And on November 3: "Beautiful butterflies on the way....fritillaries (surely Gulf), monarchs, large and small sulphurs (perhaps cloudless sulphur, sleepy orange, little yellow, dainty yellow), a Grapta (=*Polygonia interrogationis*), buckeyes," page 161 (my additions in parentheses). The book also contains colored plates of several watercolors: a pair of newly emerged cecropia moths (*Hyalophora cecropia*) (Plate 7); monarchs on goldenrod (Plate 21); several cloisonné sphinx (=virgin tiger moths) (*Grammia virgo*) amongst bullrushes (Plate 31); a single monarch on a shrub in a grove of trees (Plate 40).

(2) *Fortune's Favorite Child: The Uneasy Life of Walter Anderson.* Referencing entry date 1951, "On September 29, Bob celebrated his forty-eighth birthday...dreaming of another adventure: an unconventional bicycle trip...to see the orchids and butterflies of Costa Rica." One can deduce that the trip began with a flight from New Orleans, and then short jaunts by bicycle "in search of new flowers, birds, insects, and interesting people. "He returned to Ocean Springs with specimens he had purchased or dug himself — thirty-nine orchids, fifteen succulents, one tree fern — none of them destined to

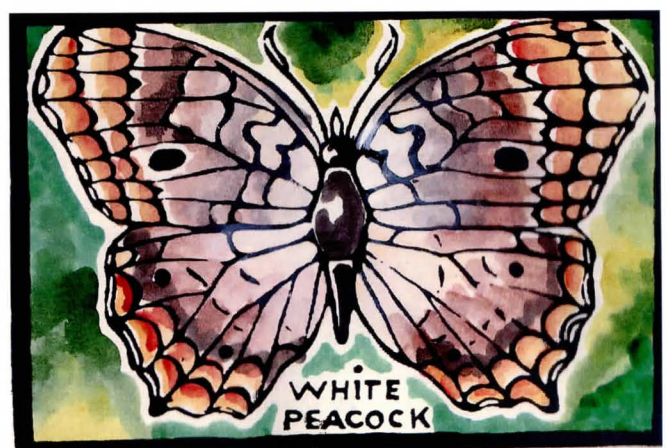

Fig. 5. "WHITE PEACOCK." Same as Fig. 4 but hand-colored.

survive" pages 261-262.

(3) *Form and Fantasy: The Block Prints of Walter Anderson.* Referring to Bob's recent marriage to Agnes ("Sissy") Grinstead: "Early in their marriage they collaborated on a book called *Butterflies,* for which Sissy wrote verses and Bob carved blocks of native butterflies and plants," page 6. From the chronology referencing 1941: "In January, begins printing butterflies and asks Sissy for accompanying poems, probably for the *Butterfly Book* (FFC 165), page 50. The eleven butterflies depicted and named in this work are (my additions in parenthesis): Snout (=American Snout) (*Libytheana carinenta*), Heliconian (=Zebra) (*Heliconius charithonia*), Comma Angle-wing (=Question Mark) (*Polygonia interrogationis*), Long-Tailed Skipper (*Urbanus proteus*), Cloudless Sulphur (*Phoebis sennae*), Monarch (*Danaus plexippus*), Basilarchia (=Red-spotted Purple), (*Limenitis arthemis astyanax*), White Peacock (*Anartia jatrophae*), Wood Nymph (=Common Wood Nymph) (*Cercyonis pegala*), Red Admiral (*Vanessa atalanta*), and Tiger Swallowtail (=Eastern Tiger Swallowtail) (*Papilio glaucus*), pages 110-112. All are easily identifiable, and all except Angle-wing are accompanied with short verse. Anderson also created "An Alphabet," a series of prints depicting each letter of the English alphabet. As might be expected, the letter "B" was illustrated with a nondescript butterfly.

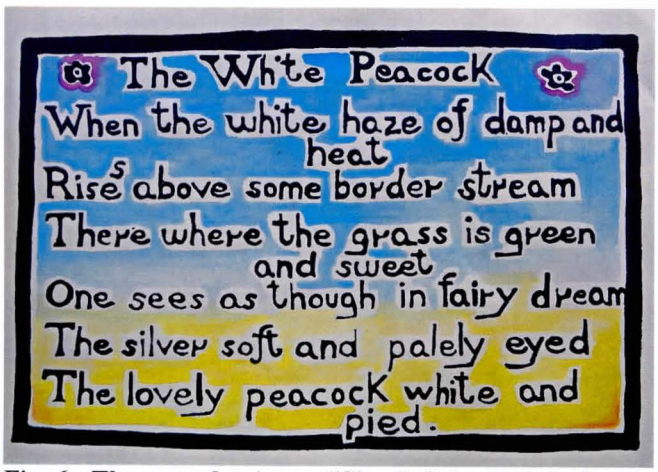

Fig. 6. The verse by Agnes "Sissy" Grinstead Anderson (wife of Walter) to accompany image of "WHITE PEACOCK." Framable print, 16 x 11.5 inches, produced by a silk screen and later hand-colored. From an original linocut by WIA. REALIZATIONS.

Fig. 7. The verse by Agnes "Sissy" Grinstead Anderson to accompany image of "HELICONIAN." Framable print, 16 x 11.5 inches, produced by a silk-screen and later hand-colored. From an original: linocut by WIA. REALIZATIONS.

Figs. 8-9. Two hand-colored variations of letter "B" from "Alphabet Series of WIA; produced by silk screen from original linocut by WIA. REALIZATIONS.

(4) *Horn of Plenty: Seasons in an Island Wilderness.* I learned that the author, April Newlin, who in 2001 tried to retrace some of Anderson's wanderings on the island, noted a variety of butterflies on October 20: "Within seconds of our arrival, the first monarch flits past, then a cloudless suphur, and a common buckeye. Clumps of goldenrod blossom, in monarch orange, stems with wings, flies with leaves. Flower and fly metamorphose into monarch bushes with five or more butterflies nectaring on a single shrub. Corollas open and close as if in time lapse as wings animate the standing tips of woody goldenrod, *Chrysoma pauciflculosa.* I count a monarch passing through camp every twenty seconds or so," page 134.

All significant information, but no mention of rare or unusual butterflies, and nothing about tropical species that Anderson may have sketched while visiting southern Florida or Costa Rica.

HISTORIC DATA

It was June 2015 before I could pursue research on what I had begun to call "The Anderson-Butterfly Mystery." I began by challenging the scientific literature on Mississippi and Louisiana butterflies. Bryant and Katharine Mather published several articles on Mississippi butterflies between 1958 and 1985 (see References). In the 1958 publication, the Mathers mention that "On April 1956, in the woods near the Shearwater Pottery, Ocean Springs, Jackson Co., Kilian Roever took four specimens" (*Heliconius charithonia*

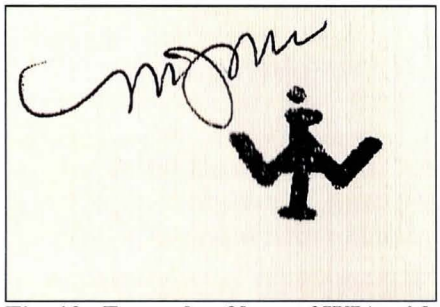

Fig. 10. Example of logo of WIA with signature of colorist. From a folding card of "WHITE PEACOCK."

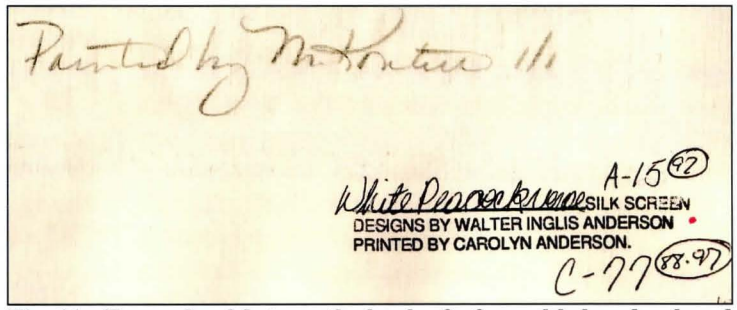

Fig. 11. Example of data on the back of a framable hand-colored print of the verse "THE WHITE PEACOCK" by Agnes Grinstead Anderson.

Fig. 12.

Fig. 12. Section of an original WIA linocut. Damage from wear, age, and floodwaters from Hurricane Katrina (2005) is visible; linocut is framed and exhibited in the WALTER ANDERSON MUSEUM OF ART.

Fig. 13.

Fig. 13. Close-up of a green canvas bag featuring a silk-screened monarch butterfly. REALIZATIONS.

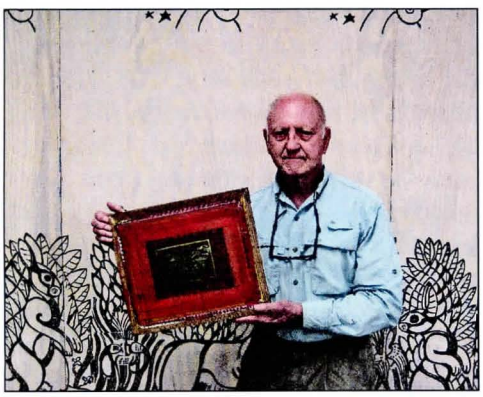

Fig. 14.

Fig. 14. Author displaying silk screen for "HELICONIAN" produced from a transparency of an original linocut by WIA. Photo by Marie Helm and used with permission.

Fig. 15.

Fig. 15. Close-up of "HELICONIAN" silk screen. SHEARWATER POTTERY.

Fig. 16-17. Marie Helm using a silk screen to decorate a pink-colored canvas bag. Marie is an assistant to Carolyn Rose Fournier Anderson, manager of silk-screening operations at SHEARWATER POTTERY.

tuckeri, the subspecies found in Florida and throughout the Caribbean islands). In the 1976 publication, *Anartia jatrophae guantanamo* (the subspecies found in Florida and the Caribbean islands) is added without any data. But Vernon Brou, Michael Lefort and Kevin Cunningham in 2008 reported that Brou captured 10 specimens of *Anartia jatrophae guantanamo* in October 1969 on Cat Island (Harrison Co., MS) — a barrier island approximately 20 miles west of Horn Island but with West Ship Island and East Ship Island positioned between.

MISSISSIPPI. Continuing with my effort to track down butterfly records, I contacted Richard L. Brown, Director of the Mississippi Entomological Museum, Mississippi State University to learn of the museum's holdings with respect to *A. jatrophae* and *H. charithonia* in Mississippi. Richard then put me in contact with Ricky Patterson, a butterfly enthusiast from Mississippi

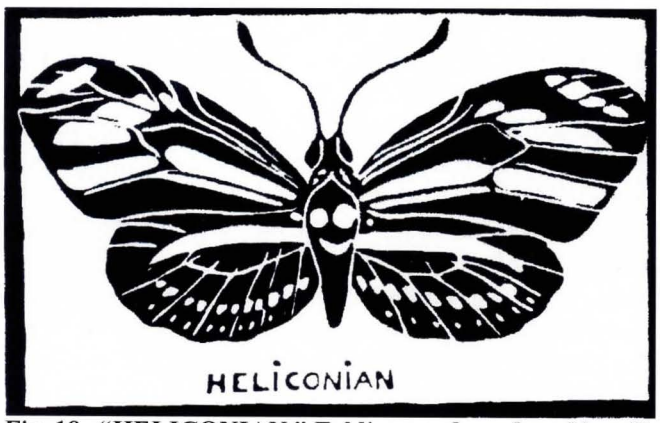

Fig. 18. "HELICONIAN." Folding card produced by silk screen from an original black-inked linocut by WIA. REALIZATIONS.

Fig. 19. Same as Fig. 6 but hand-colored.

who currently is in possession of the Mathers' collection. Below are the unpublished data from these two collectors:

HELICONIUS CHARITHONIA TUCKERI

No additional records or specimens other than the Mather record from Ocean Springs (Jackson Co.).

ANARTIA JATROPHAE GUANTANAMO

Hancock Co. (Bay St. Louis), 4-16 October 1970 (personal com., R. Brown)
Harrison Co. (Cat Island), 11 October 1970 (personal com., R. Brown)
Hancock Co. (Bay St. Louis), 23 August – 7 November, 1970, 22 specimens collected by Rick Kergosein and friend (personal com., R. Patterson)
Hancock Co. (Darwood), 23 August 1970 (personal com., R. Patterson)
Harrison Co. (Cat Island), 11 October 1970 (personal com., R. Patterson)
Jackson Co. (Pecan), 12 June 2014, 1 specimen collected by Ricky Patterson (personal com., R. Patterson)

(The three counties span the entire Mississippi coast.)

LOUISIANA. In 1954, Edward N. Lambremont listed *Heliconius charithonia tuckeri* as "not common in Louisiana, but…seen occasionally during the summer and early autumn in the southernmost parishes" (Jefferson, Orleans, Terrebonne). More recent sightings from publications and personal communication include: one female in Marrero (Jefferson Parish, August 3, 1996, Vernon A. Brou, Jr.); one male in Abita Springs (St. Tammany Parish, October 12, 2002, Vernon A. Brou, Jr.); one specimen at Asphodel Plantation (East Feliciana Parish, December 1, 2003, Michael L. Israel); one specimen, 3 miles south of Jackson (East Feliciana Parish, December 9, 2003, Michael L. Israel); two specimens in Lafayette (Lafayette Parish in 2005, Craig Marks). The species is restricted to varieties of passionflower (*Passiflora*) as hosts.

For *Anartia jatrophae*, the data are more detailed, host plants more numerous: Vernon A. Brou, Michael T. Lefort and Kevin J. Cunningham report that between November 1999 and October 2006, several specimens of *A. jatrophae guantanamo* were observed near Grand Isle State Park (Jefferson Parish), Golden Meadow (Terrebonne Parish), and Pointe-aux-Chenes (Lafourche Parish). In many cases, females were observed ovipositing on roundleaf bacopa (*Bacopa rotundifolia*) (Scrophulariaceae), one of several host plants for the butterfly; other recorded hosts are: *Phyla=Lippia* (Verbenaceae), *Blechum* and *Ruellia* (Acanthaceae), *Lindernia* (Scrophulariaceae), *Mentha* and *Melissa* (Lamiaceae). [As an aside, *Phyla* also serves as the host for two other butterfly species: phaon crescent (*Phyciodes phaon*) and common buckeye (*Junonia coenia*.)]

FIELD OBSERVATIONS

First excursion: June 1-6, 2015. I embarked on a road trip to Ocean Springs. First on my itinerary was THE WALTER ANDERSON MUSEUM OF ART (WAMA)

located in historic Ocean Springs. The structure, built in 1991, is modern and adjacent to the OCEAN SPRINGS COMMUNITY CENTER (OSCC) built in1950-1951. Both are the repository of many of Anderson's works. Because both buildings rest on high ground, the buildings escaped the floodwater of Hurricane Katrina.

Fig. 20. Folding card with detail from "COW AND MEADOW," a linocut by WIA and later hand-colored. Original 18 x 32 inches; owned by The Family of Walter Anderson. Card: REALIZATIONS.

[NOTE: On August 29, 2005, Hurricane Katrina slammed directly into the Mississippi Gulf coast. Of course, the area was no stranger to hurricanes. But Katrina was straight from Hell. Meteorologists record that a storm surge of twenty-eight feet followed by fifty-five-foot waves crashed into the Ocean Springs coastline. Water flowed inland as far as 11-12 miles. Wind speeds were estimated at 125 mph — a Category 3 storm. The Anderson family compound —24 acres purchased in 1918 and site of the family business named SHEARWATER POTTERY, LTD. established in 1928 by Peter Anderson (older brother of Walter) — fronted an inlet from the Mississippi Sound. Nothing escaped. Trees were toppled or uprooted; 17 of the 19 buildings (including six family homes) were destroyed or severely damaged; the Anderson's cottage was lifted off its brick pilings and the contents flushed into the Gulf; even the "vault" — a concrete block building designed to protect the crème de la crème of the family's artistic legacy — was flooded with six feet of water.]

Several of the floor-to-ceiling murals in the OSCC were accented with butterfly and moth images, some identifiable, some fanciful. The expansive murals, dating to 1951-52, were gifted to the city for a mere one dollar (today the murals are valued at more than 30 million dollars). In addition, the museum features a small addition to its south side. Referred to as the "Little Room" or "Cottage Murals," the room was originally a small annex to the Anderson cottage. This was Anderson's private retreat. There, behind a locked door, casement windows admitted light filtered through a profusion of outdoor greenery in the rural setting to create a place of solace. The murals depict animals and plants throughout a twenty-four hour day so that the room becomes an extension of the environment. Anderson had included several images of lepidopterans, especially large silk moths (family Saturniidae). Nowhere, though, is any image that could suggest either *H. charithonia* or *A. jatrophae.* Blessedly, this annex was moved from the Anderson property at Shearwater to the museum in 1991 during its construction. As a result, the murals escaped the flood waters of Hurricane Katrina.

At the time of my visit, most of the community of Ocean Springs had been restored from the devastation in 2005. This included the Anderson property. Even the original cottage of Walter ("Bob") and Agnes ("Sissy") Anderson had been reconstructed (2007) with as much of the original wood as could be salvaged. Today SHEARWATER POTTERY continues as a family business: pottery production and silk-screen printing are daily activities. Merchandise is marked on site in the spacious "Showroom" and at REALIZATIONS, LTD.: THE WALTER ANDERSON SHOP in downtown Ocean Springs.

The post-Katrina site of SHEARWATER POTTERY is again heavily wooded. I was delighted to find an abundance of *Passiflora lutea*, one of the hosts for *H. charithonia.* In addition, *Lantana camara*, a favorite nectar plant for most butterflies, was common along roadsides and buildings — all in all, a seemingly perfect setting for *H. charithonia.* However, after spending many hours over three days, I observed no adult *H. charithonia* and noticed no larval damage on the *Passiflora.* However, speaking with several members of the Anderson family and colleagues, I learned that two individuals were reasonably certain that they had observed the butterfly within the last five years. As for *A. jatrophae,* no one could recognize it. However, the host plant, frogfruit or fogfruit (*Phyla nodiflora*) — a ground cover with attractive white/lavender flowers on a spike — was abundant in sunny low-grassy areas.

Fig. 21. Isolation of butterfly /flower image from "ALPHABET SERIES" by WIA; produced by silk screen and later hand-colored. From a linocut by WIA. REALIZATIONS.

Conversations with members of the extended Anderson family were productive. For instance, I learned from Walter's youngest son, John, who owns and manages REALIZATIONS,LTD.:

THE WALTER ANDERSON SHOP (located in the heart of Ocean Springs, and a retail outlet for many of Anderson's recreated designs) that he remembers his father maintaining a small butterfly collection. However, lacking proper methods of housing and preservation, the specimens were eventually destroyed by insects and mold. John also remembered that his father used a copy of the monumental *The Butterfly Book* by W. J. Holland to identify butterflies. (The popular *A Field Guide to the Butterflies of North America, East of the Great Plains* by A.B. Klots in *The Peterson Field Guide Series* was published only in 1951.) No one had insight into the venues for the original butterfly paintings. But in 1960 Anderson had ridden his bicycle to southern Florida where he might have sketched butterflies.

Several members of the Anderson family reassured me that the 1941 project of Bob and Sissy to produce the

Fig. 22. Interior of OSCC with murals of WIA. From: *Walls of Light: The Murals of Walter Anderson* by A.R. King. Used with permission of The Family of Walter Anderson.

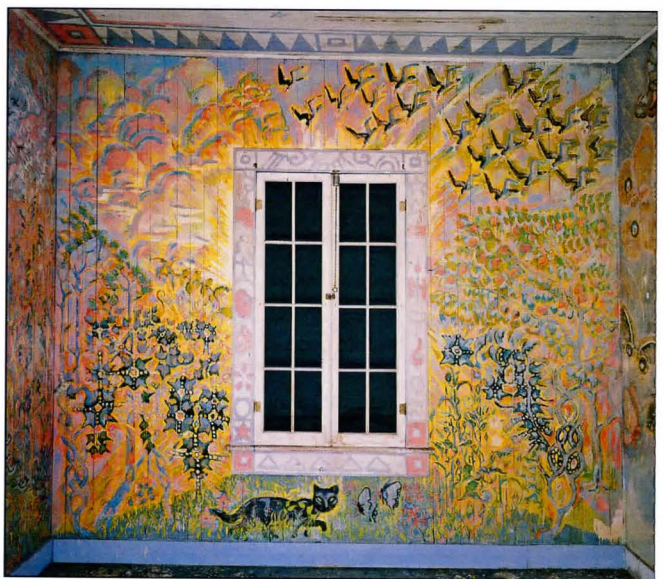

Fig. 23. Interior of "The Little Room." "West Wall." From: *Walls of Light: The Murals of Walter Anderson* by A.R. King. Used with permission of The Family of Walter Anderson.

Butterfly Book did not materialize, that is, except for a single copy that was gifted to a female admirer. The medium for the images was the linocut. But as far as anyone knew, that book contained only the eleven species that are illustrated in *Form and Fantasy*. The reproductions in this book were possible because although most of the linoleum blocks were ruined due to wear over time and in 2005 by salt water from Hurricane Katrina, as many as 300 images were photographed on film and then transferred to silk screens beginning in the late 1970s. (Specifically, most of the original butterfly images on the linocuts were transferred to silk screens between 1984 and 1988.) And although many of these silk screens were later destroyed by Katrina, the photographs of the blocks were not because the transparencies were stored out of state (Arkansas and Tennessee). It was these transparencies that were later used to create new silk screens that are used to this day.

But as with linocuts, screens produce only skeletal forms — usually in black. Later, watercolors were painstakingly applied by hired talented "colorists." Originally, all hues imitated the true colors of live specimens. But more recently, various brilliant colors have been introduced in order to appeal to a wider audience. All eleven of these silk-screened prints are marketed today usually in the form of folding 5 x 7 inch cards. There are two types: hand-colored and simply black outlines. In the case of the colored formats, no two are exactly alike, of course, and the colorist is identified by initials on the back of the card. Too, some cards contain the original verses of poetry by Anderson's wife, Sissy. Several of Sissy's verses with hand-colored backgrounds are marketed separately as 16 x 11.5 inch prints suitable for framing; each bears an identifying number, the name of the printer, and the autograph of the colorist.) Because of this current and painstaking method of production, these "recreations" are authentic to the original designs that Anderson produced during his lifetime. Silk-screening is supervised by Carolyn Rose Fournier Anderson (wife of William Walter ("Billy') Anderson, one of four children of the historic Walter I. Anderson. And because screens act as stencils, designs can be transferred to any dry, absorbent surface such as clothing, wood, and even walls in buildings. As such, the method of production permits a pricing structure that is affordable by much of the public at large — a factor that was important to Anderson during his lifetime, and a continuing legacy of the artist.

Next I visited the "William M. Colmer Visitor Center at Davis Bayou," headquarters for the MISSISSIPPI DISTRICT OF GULF ISLANDS NATIONAL SEASHSORE (GINS) located in eastern Ocean Springs off U.S. Highway 90. This unit of the National Park Service was established in January 1971 to protect seven primarily uninhabited barrier islands that parallel the coasts of Mississippi and Florida about 10-12 miles

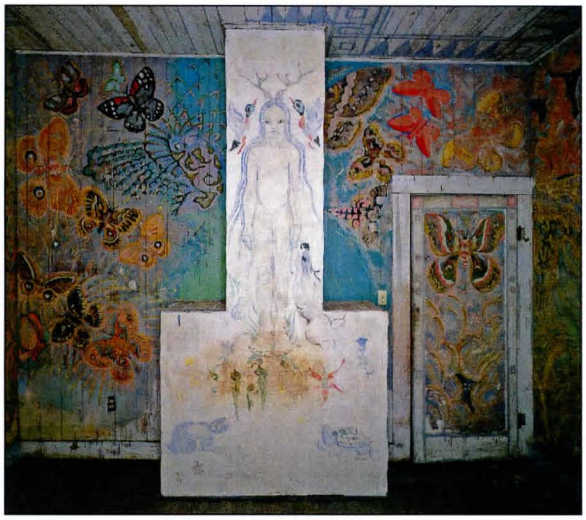

Fig. 24.

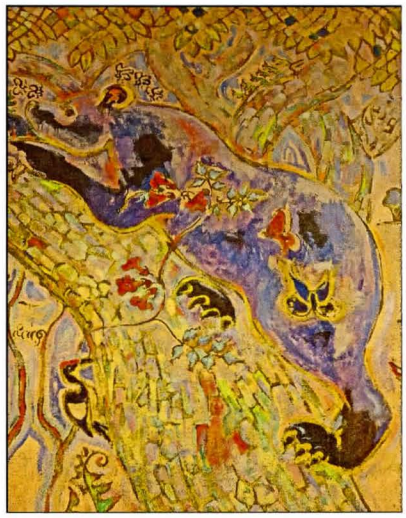

Fig. 25.

Fig. 24. Interior of "The Little Room" (or "Cottage Murals") now an annex to WALTER ANDERSON MUSEUM OF ART. "North Wall." From: *Walls of Light: The Murals of Walter Anderson* by A.R. King. Used with permission of The Family of Walter Anderson.

Fig. 25. Detail in "Saturn" mural in OCEAN SPRINGS COMMUNITY CENTER. Note nondescript lepidoptera inside bear. Photograph by G.N. Ross. Used with permission of The Family of Walter Anderson.

Fig. 26. WALTER ANDERSON MUSEUM OF ART, right, and OCEAN SPRINGS COMMUNITY CENTER, left, in downtown Ocean Springs. Because the buildings rest on the highest ground in the city, they escaped the floodwaters of Hurricane Katrina.

Fig. 27. Entrance sign for WALTER ANDERSON MUSEUM OF ART (WAMA).

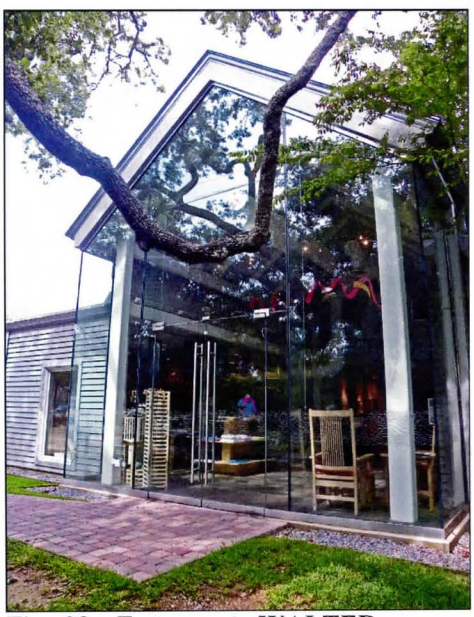

Fig. 28. Entrance to WALTER ANDERSON MUSEUM OF ART.

Fig. 29. Front of OCEAN SPRINGS COMMUNITY CENTER. Contains WIA murals.

offshore. These are: Cat Island (western portion only), West Ship Island, East Ship Island, Horn Island, Sand Island, Petit Bois Island (all south of Mississippi), and Santa Rosa Island (south of Florida); Dauphin Island, south of the Alabama coast, was not included because of its historic and present human settlement. The reserve begins with Cat Island in the west near the Louisiana-Mississippi border, and then stretches eastward for about 160 miles to Santa Rosa Island south of the Florida Panhandle. The visitor center is located on the mainland in the eastern sector of Ocean Springs. The center is

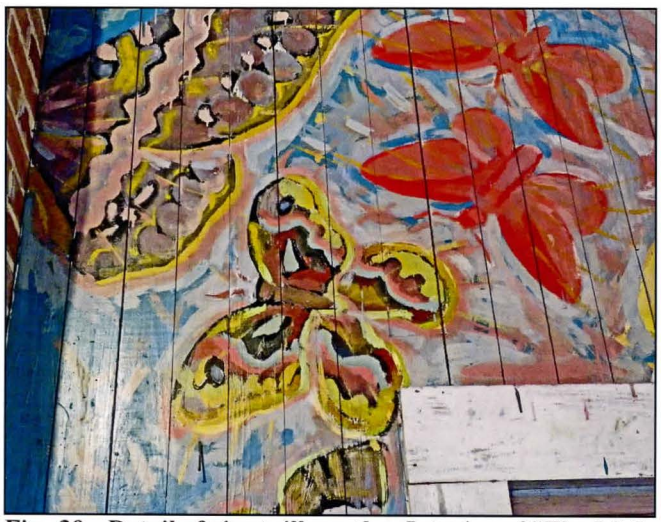

Fig. 30. Detail of giant silk moths. Interior of "The Little Room." Photograph by G.N. Ross. Used with permission of The Family of Walter Anderson.

Fig. 31. Detail of luna moth (*Actias luna*). Interior of OSCC near back door. "West Wall: Moon." Photograph by G.N. Ross. Used with permission of The Family of Walter Anderson.

surrounded by forest with good trails and roads *Passiflora incarnata* was quite common along sunny forest edges — particularly along the boardwalks near the headquarters building. In addition, *Phyla* was common in low grassy areas, including the mowed areas adjacent to the headquarters building. None of the staff could confirm the presence of either *A. jatrophae* or *H. charithonia* from photos I showed them. The leader ranger indicated that no butterfly survey had ever been conducted on any Island. He suggested that I prepare a general proposal for such. Another ranger suggested that I visit the GULF COAST RESEARCH LABORATORY (GCRL), a facility operated by The University of Southern Mississippi, located in Ocean Springs. A search of the grounds there proved negative for the two butterflies under question. I did confirm, however, that *Phyla* was abundant throughout the mowed grounds.

Although I had hoped to secure passage to Horn Island either through GINS or GCRL, neither could accommodate me. Furthermore, private boat captains quoted what seemed an unreasonably high fare. As a result, I did not visit Horn Island.

But before returning to my home in Baton Rouge, I embarked on an all-day commercial excursion to West Ship Island. The boat trip from Gulfport to West Ship spanned one hour. Upon disembarking, I was surprised to find that the island was devoid of trees; low vegetation typical of sand dunes and marshes dominated. During my four-hour walk under a clear sky, I encountered not a single butterfly of any species! (Perhaps the previous cold/wet winter had reduced populations to a minimal level and my visit was between adult generations?) *Phyla* was common and flowering, particularly in the central patio of historic Fort Massachusetts (1859).

Upon my return to Baton Rouge, I quickly prepared a research proposal: a non-compensated five-day survey on Horn Island in early October. This was submitted on June 9. After receiving no correspondence from GINS by mid August, I re-contacted that office. I was advised that I needed to fill out specific forms detailing my work.

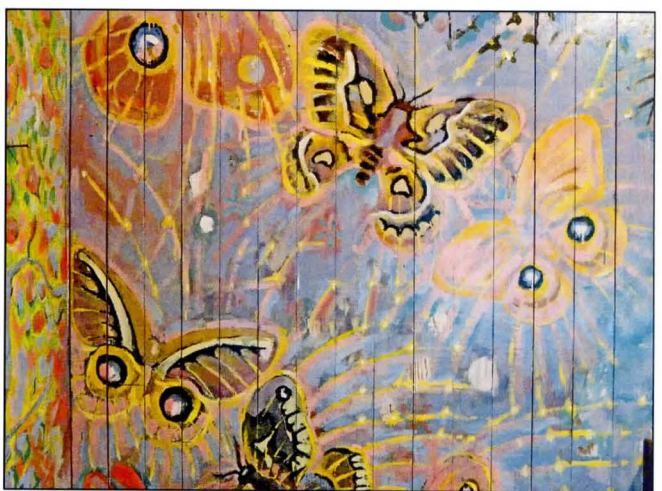

Fig. 32. Detail of giant silk moths. Interior of "The Little Room." Photograph by G.N. Ross. Used with permission of the Family of Walter Anderson.

These would then be evaluated during the upcoming months. However, GINS would not be able to provide transportation or housing during my work. In frustration, I abandoned the idea.

Second excursion: October 12-24, 2015. I returned to Ocean Springs. In addition I visited Horn Island (MS) and Dauphin Island (AL). My broad observations are below; more detailed descriptions and butterfly observations are scheduled to appear in the Fall Issue of NEWS.

(1) Fall flowers were at their peak: at least two species of goldenrod (*Solidago* spp); narrow leaf sunflower (*Helianthus angustifolius*); blue mist flower (*Eupatorium coelestinum*); bidens, Spanish needle or beggar ticks (*Bidens pilosa*); and eastern baccharis, saltbush, groundsel bush, or cotton-seed tree (*Baccharis halimifolia*). All were common and attractive to butterflies. Surprisingly, *Bidens* was the favored source of nectar throughout all areas (I was expecting goldenrod to top the list).

(2) *Passiflora incarnata* was doing well at the headquarters to GINS. I observed no signs of caterpillar damage — odd since the Gulf fritillary (*Agraulis vanillae*) is fairly common in the region. I concluded that *H. charithonia* had not been in the area that summer.

(3) *Phlyla nodiflora,* a known host for *A. jatrophae* was still common (and flowering) on the grounds of GCRL and in various venues on West Ship Island. The images of both *A. jatrophae,* and *H. charithonia,* which I showed to several biologists at GCRL and the ranger at West Ship Island, were not familiar.

(4) *Bacopa monnieri* (coastal waterhyssop), a host of *A. jatrophae,* was growing and flowering in the ditches of at least two vacant lots in the Ocean Springs area (ditches bordered East Beach Drive). Surrounding property was overgrown with abundant sources of nectar plants.

(5) *Passiflora lutea*, host of *H. charithonia*, was more abundant than in June on the grounds of SHEARWATER POTTERY. I noticed no flowers and spotted no evidence of caterpillar damage.

(6) *Lantana camara* was in full bloom on the grounds of SHEARWATER POTTERY. The flowers were a major source of nectar for local butterflies. However, numerous hours of observations over several days proved unproductive for *A. jatrophae* and *H. charithonia*. Furthermore, the potters who worked in the pottery shed, and who had promised to keep a watchful eye on the lantana bushes just outside the building, assured me that they had not noticed the two butterflies in question throughout the entire summer.

(7) A one-day boat excursion to Ship Island was more productive than the one in June. Weather was inclement: windy with mists from mid-morning to departure time at 2:30 o'clock pm. *Phyla* was still evident in and around Fort Massachusetts. A few clumps of goldenrod, a small yellow, aster-like composite, and possibly *Croton punctatus* were common, but not abundant. Sea oats were in full seed. The croton was the most attractive to butterflies. I observed three species of butterflies.

Fig. 33. Detail of nondescript butterflies. Interior of "The Little Room." "West Wall: Sunset" Photograph by G.N. Ross. Used with permission of The Family of Walter Anderson.

Fig. 34. Detail of giant silk moths. Interior of "The Little Room." "North Wall: Night." Photograph by G.N. Ross. Used with permission of The Family of Walter Anderson.

(8) A one-day boat excursion to Horn Island proved the highlight of the October trip. Arranging a trip to the island proved difficult. But thanks to Danny Jalanivich (Harbor Master, OCEAN SPRINGS SMALL CRAFT HARBOR) and son, Daniel, I secured passage. The day was calm and sunny. I spent seven hours and covered approximately three to four miles about the island. The island was more extensive than I had anticipated and walking was difficult due to the sand, dunes, thick vegetation, and high mosquito population. I observed no *Passiflora* or *Phyla* — although my sample area was very limited. [NOTE: "Barrier Island Wildflowers," published for GINS lists *Passiflora incarnata* as "rare on

dune, forest, and disturbed habitats." However, the publication covers **all** the barrier islands, not just Horn, although I presume the designation of "forest" most likely refers to Horn.] *Solidago* was uncommon, but woody goldenrod (*Chrysoma pauciflosculosa*), yellow buttons (*Balduina angustifolia*), *Baccharis halamifolia,* and yaupon holly (*Ilex vomitoria*) were locally abundant and attractive to pollinators. I observed eleven species of butterflies.

Fig. 35. Watercolor by WIA. "Cecropias...the heavenly twins." From: *The Horn Island Logs of Walter Inglis Anderson* by R.S. Sugg, Jr., (Plate 7). Used with permission of The Family of Walter Anderson.

(9) Almost daily excursions around Ocean Springs to check residential gardens, vacant property, and beaches. Because a considerable number of residents did not rebuild post-Katrina, the area still contains many vacant property. Most of these were populated by fall wildflowers such as those mentioned earlier; hence most proved to be excellent habitats for butterflies. In addition, several current residents had created formal butterfly and hummingbird friendly landscapes. I identified two productive venues: Gulf Hills Residential Community and East Beach Drive — an eastern extension of the coastal highway between the Ocean Springs Small Craft Harbor and GCRL. Conversations with two residents indicated that they had never observed *A. jatrophae* or *H. charithonia,* but that because of the county's mosquito abatement program, butterflies are not as common as in the past. In the end I logged in a total of 22 species of butterflies.

(10) A three-day excursion to Dauphin Island, Alabama, a barrier island seven miles east of the Mississippi District of GINS and just southwest of Mobile Bay. Dauphin is excluded from the system because of the island's historic and current human development — although islanders keep commercialization to a minimum. Dauphin is the most vegetated of the three islands that I visited. I observed many habitats that seemed appropriate for *A. jatrophae* and *H. charithonia.* Neither species, however, was observed in spite of a profusion of wildflowers — especially *Bidens pilosa* and *Lantana camara*. *Phyla* was common and *Bacopa* less so in some of the roadside ditches. I could not locate *Passiflora* — a surprise since I spent the greater part of two days walking the trails of DAUPHIN ISLAND AUDUBON BIRD SANCTUARY — a reserve with extensive wooded habitats. However, Connie Roan, a retired school teacher from the island's only school ("Little Red Schoolhouse") informed me that when she was an active school teacher she grew a red-flowering *Passiflora* on the railing to the front steps of the school. Each year the plant was defoliated by caterpillars of *Agraulis vanillae*. But because the plant would always become unsightly due to defoliation, she was asked to discontinue the practice. Mrs. Roan was certain that she had not observed *H. charithonia* near the school or anywhere else on the island. I counted a total of 11 species of butterflies.

DISCUSSION AND CONCLUSION

Although meager, the scientific records of *A. jatrophae* and *H. charithonia* from both Mississippi and Louisiana are instructive. Both species most likely are occasional strays (probably in autumn) from Florida that periodically establish small temporary breeding populations on native hosts in coastal Mississippi and Louisiana. If the following winter is not too severe and both nectar and host plants persist throughout the cold months, the butterfly populations can remain viable until warmer spring temperatures ensue, at which time they then begin reproduction. [NOTE: Observations in my home garden indicate that when it comes to subtropical/tropical butterflies, moderately cold temperatures per se do not kill adults and larvae. Rather it is the unavailability of fresh nectar for adults and fresh leaves for larvae that cause the insects to suffer severe physiological stress and become vulnerable to predators.] But the following cannot be ruled out: (1) purposeful releases of commercial stock by well-meaning individuals for research or at ceremonies; (2) accidental escapes from butterfly conservatories; (3) adults from immature stages accidently imported via commercial nursery stock from Florida.

Fig. 36. Watercolor by WIA. "Golden rod...and Monarch butterflies." From: *The Horn Island Logs of Walter Inglis Anderson* by R.S. Sugg, Jr., (Plate 21). Used with permission of The Family of Walter Anderson.

Fig. 37. Entrance sign to SHEARWATER POTTERY, LTD. — the Anderson family homestead since 1918. Most buildings were destroyed by Hurricane Katrina in 2005. Today this family owned business continues as a prime tourist attraction for Gulf coast visitors.

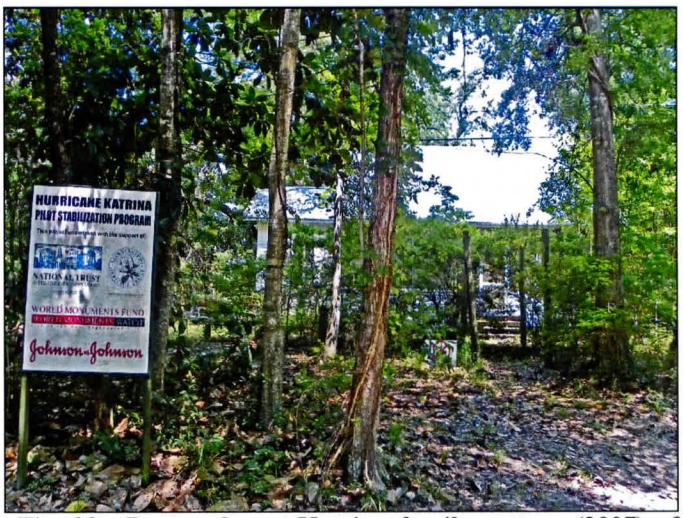

Fig. 38. Restored post-Katrina family cottage (2007) of Walter and Agnes Anderson.

Fig. 39. Restored post-Katrina family cottage (2007) of Walter and Agnes Anderson.

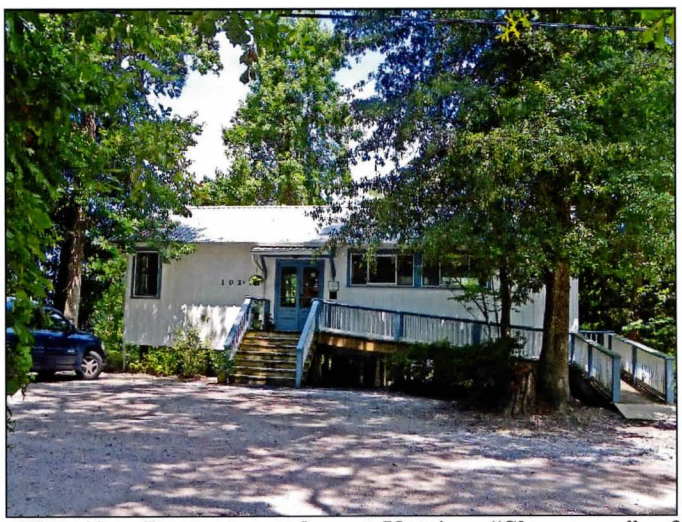

Fig. 40. Reconstructed post-Katrina "Showroom" of SHEARWATER POTTERY.

Fig. 41. *Passiflora lutea,* a common vine in trees along roadsides at SHEARWATER POTTERY.

Fig. 42. Blossom of *Passiflora incarnata* along boardwalk behind "William M. Colmer Visitor Center" of GULF ISLANDS NATIONAL SEASHORE, DAVIS BAYOU, MISSISSIPPI DISTRICT.

From my personal observations and interviews, I am quite positive that *A. jatrophae* and *H. charithonia* were not present along the Mississippi and Alabama Gulf coasts during the summer and fall of 2015. But be that as it may, I theorize the following:

(1) Walter Inglis Anderson and his wife Agnes Grinstead Anderson ("Sissy") appreciated the aesthetics of butterflies and moths.

(2) Host plants for both *A. Ijatrophae* and *H. charithonia* are native to the northern Gulf coast — especially in the vicinity of Ocean Springs, and specifically on the Anderson property. I think it reasonable to presume that this was also the case during the early 1940s when Walter Anderson was painting butterflies and Sissy was composing poetry. Whether or not these plants ever hosted *A. jatrophae* or *H. charithonia* is, of course, conjecture.

(3) Based on data proving that the two species of butterflies did immigrate into the Mississippi coastal area over the last several decades, I find it reasonable to presume that similar immigrations occurred during the lifetime of Walter Anderson. Immigrations most likely would have occurred in late summer and autumn of a year following a particularly mild winter.

(4) Given occasional immigrations of *A. jatrophae* and *H. charithonia*, the striking colors and markings of both species would easily have captured the attention of an artist who was noted for eyes exceptionally sensitive to the aesthetics of nature. And because all butterfly species that Anderson painted were featured in a newly published nature book, *The Butterfly Book* by W. J. Holland, Anderson would have been able to identify species that he observed. Additionally, the illustrations in the Holland book would have provided details for Anderson's palette if he had not captured individuals to mount for models. (Remember, the mounting of dead specimens was a common technique used by natural history artists — John James Audubon, for example — before photography became widespread.) I think it probable, too, that Anderson possessed or had access to Holland's long-standing *The Moth Book* for identifications of local moths. Whether or not *A. jatrophae* and *H. charithonia* were residents or simply vagrants in his landscape probably were of little importance. Understandably, Anderson was not a scientist. He instead was an artist who painted in his own style the natural world that he observed and admired.

(5) I think that Anderson did not have to rely on observations of *A. jatrophae* and *H. charithonia* during his excursions to Florida, Costa Rica, and Texas in order to create his paintings.

(6) All in all, the eleven species of butterflies selected by Anderson for a book-in-progress did indeed represent the landscape of coastal Mississippi. Simply put, Walter Anderson's selection of *A. jatrophae* and *H. charithonia* is not only appropriate but a reflection of the artist's unique creativity and passion that he wished to share with humanity.

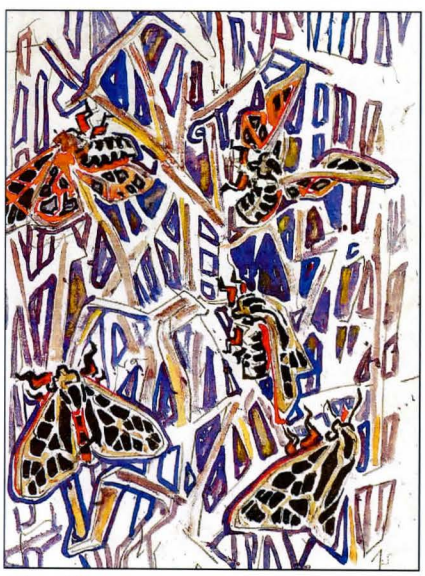

Fig. 43.

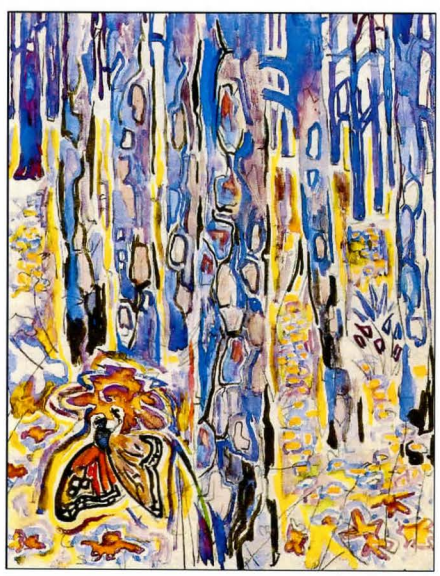

Fig. 44.

Fig. 43. Watercolor by WIA. "...found the black and gold cloissoné sphinx...against a mosaic pattern of lilac and gold bullrushes..." From: *The Horn Island Logs of Walter Inglis Anderson* by R.S. Sugg, Jr., plate 31. [NOTE: Moths are actually virgin tiger moths (*Grammia virgo*).] Used with permission of The Family of Walter Anderson.

Fig. 44. Watercolor by WIA. "...so incredible is the relationship of matter to spirit." [NOTE: A lone monarch rests on a bush within a grove of trees.] From: *The Horn Island Logs of Walter Inglis Anderson* by R.S. Sugg, Jr., Plate 40. Used with permission of The Family of Walter Anderson.

ACKNOWLEDGEMENTS

This project was personally funded. All art works depicted in my photographs are now in my possession but will ultimately reside at the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville. I am indebted to the assistance and graciousness of many individuals. But I extend a special THANK YOU to:

Richard L. Brown (Director, MISSISSIPPI ENTOMOLOGICAL MUSEUM, Mississippi State University, Mississippi State (Starkville), MS) for providing data from the museum's holdings; Ricky L. Patterson (Vicksburg, MS) for providing his personal butterfly records for MS; Bill Barley and colleagues (GULF ISLANDS NATIONAL SEASHORE, MISSISSIPPI DISTRICT, Park Rd. off U.S. Hwy. 90, National Park Service, U.S. Department of the Interior, Ocean Springs, MS) for providing information regarding research on Horn Island; Douglas Myatt (Curator) and Heather Rumfelt (Director of Education), WALTER ANDERSON MUSEUM OF ART, 510 Washington Ave., Ocean Springs) for information on Horn Island; the extended Anderson family (Ocean Spring) for their overall interest with my project and for sharing their historical information with me during my visits to SHEARWATER POTTERY, LTD. (102 Shearwater Dr., Ocean Springs) and REALIZATIONS, LTD.: THE WALTER ANDERSON SHOP (1000 Washington Ave., Ocean Springs); James (Jim) Anderson, Peter Wade Anderson, and David Taylor (potters) for monitoring butterflies on lantana plants growing outside their workshop during the summer of 2015 and for conversations on the history and biology of the Anderson family; Ms. Marie Helm (SHEARWATER POTTERY, LTD.) for assistance with photographing the silk-screening process and providing a photograph of me; Danny Jalanivich (Harbor Master, OCEAN SPRINGS SMALL CRAFT HARBOR, 1310 Harbor Rd.) and his son, Daniel, for providing transportation and personal assistance to and from Horn Island; Larry and Rose Mary Ward (GULF HILLS RESIDENTIAL COMMUNITY, Ocean Springs) for guiding me through their extensive wildlife friendly landscape; Connie (John) Roan (DAUPHIN ISLAND WELCOME CENTER, 1101 Bienville Blvd., Dauphin Is., AL) for information on local butterflies; the Law Enforcement Ranger on Horn Island for information regarding the natural inhabitants of the island; John Grinstead Anderson of REALIZATIONS, LTD. and representative for THE FAMILY OF WALTER ANDERSON for suggestions regarding the pre-final manuscript and for permission to use seven photographs from two books published by the UNIVERSITY PRESS OF MISSISSIPPI/WALTER ANDERSON MUSEUM OF ART; Craig Marks (Lafayette, LA) for submitting photos of *Anartia jatrophae* and *Heliconius charithonia* for my consideration; Vernon Antoine Brou, Jr. (ABITA ENTOMOLOGICAL STUDY SITE, Abita Springs, LA) for collection data and for use of his photographs of *Anartia jatrophae guantanamo* and *Heliconius charithonia tuckeri.*

Fig. 45. Frogfruit (*Phyla nodiflora*) blooming in a ditch along East Beach Road, Ocean Springs.

Fig. 46. Waterhyssop (*Bacoopa monnieri*) blooming in a ditch along East Beach, Road Ocean Springs.

REFERENCES

Bass, H. & E.B. Lewis, 2009. *The Secret World of Walter Anderson.* Candlewick Press, Somerville, Massachusetts. 48 pages.

Brock, J.P. and K. Kaufman, 2003. Kaufmann Field Guide to Butterflies of North America. Houghton Mifflin Company, New York, New York. 391 pages.

Brou, V.A., Jr., M. T. Lefort, & K.J. Cunningham, 2008. *Anartia jatrophae guantanamo* Munroe in Louisiana. *Southern Lepidopterists' News*, Vol. 30, No. 3, Pages 100-101. Lubbock, Texas.

Editors, 2004. Zone 9: *News of the Lepidopterists' Society.* 2003 Season Summary, Southeast: Louisiana. Pages 69-70.

Editors, 2013. Walter Inglis Anderson: "Everything I See Is New and Strange." August 2 - October 13. *Art Talk. LSU Museum of Art News. LSU Museum of Art.* Summer, pages 4-5.

Glassberg, J., 1999. *Butterflies through Binoculars: The East.* Oxford University Press, New York, New York. 242 pages.

Holland, W.J., 1931. Original copyright 1893. *The Butterfly Book.* Revised Edition. Doubleday & Company, Inc., Garden City, New York. 424 pages, 77 plates.

Holland, W.J., 1941. Original copyright 1903. *The Moth Book.* Doubleday, Doran, & Company. New York, New York. 479 pages, 48 plates.

King, A.R., 1999. *Walls of Light: The Murals of Walter Anderson.* University Press of Mississippi, Jackson, Mississippi, and Walter Anderson Museum of Art, Jackon, Mississippi. 117 pages. .

Klots, A.B., 1951. *A Field Guide to the Butterflies of North America, East of the Great Plains.* The Peterson Field Guide Series. Houghton Mifflin Company, Boston, Massachusetts. 349 pages.

Lambremont, E.N., 1954. The Butterflies and Skippers of Louisiana. *Tulane Studies in Zoology*, Vol. 1, No. 10, pages 127-164. Tulane University, New Orleans, Louisiana.

Lambremont, E.N. & G.N. Ross, 1965. New state records and annotated field data for Louisiana butterflies and skippers. *Journal of the Lepidopterists' Society*, Vol. 19, No. 1:47-52.

Marks, C.W., 2007. The butterflies of Acadiana. *Southern Lepidopterists' News*, Vol. 29, No. 4: 140-144.

Marks, C.W., 2015. September on the Gulf Coast. *Southern Lepidopterists' News*, Vol. 37, No. 4:165-168.

Mather, B. & K. Mather, 1958. The butterflies of Mississippi. *Tulane Studies in Zoology*, Vol. 6, No. 2, pages 63-109. Tulane University, New Orleans, Louisiana.

Mather, B. & K. Mather, 1959. The butterflies of Mississippi. Supplement No. 1. *Journal of the Lepidopterists' Society*, Vol. 13, No. 2: 71-72.

Mather, B. & K. Mather, 1976. The butterflies of Mississippi. Supplement No. 2. *Journal of the Lepidopterists' Society*, Vol. 30, No. 3: 197-200.

Mather, G. & K. Mather, 1985. The butterflies of Mississippi. Supplement No. 3. *Journal of the Lepidopterists' Society*, Vol. *39, No.* 2: 134-138.

Maurer, C., 2003. *Fortune's Favorite Child: The Uneasy Life of Walter Anderson.* University Press of Mississippi, Jackson, Mississippi. 367 pages.

Maurer, C., 2010. *Dreaming in Clay on the Coast of Mississippi.* Paperback Edition. Univeristy Press of Mississippi., Jackson, Mississippi. 357 pages.

Newlin, A., 2005. *Horn of Plenty: Seasons in an Island Wilderness.* University Press of Mississippi, Jackson, Mississippi. 249 pages.

Opler, P.A. & V. Malikul, 1992. *A Field Guide to Eastern Butterflies.* The Peterson Field Guide Series. Houghton Mifflin Company, Boston, Massachusetts. 486 pages.

Pickard, M. A. & P. Pinson with C. Maurer, 2007. *Form and Fantasy: The Block Prints of Walter Anderson.* University Press of Mississippi, Jackson, Mississippi. 127 pages.

Ross, G.N. & E.N. Lambremont, 1963. An annotated supplement to the state list of Louisiana butterflies and skippers. *Journal of the Lepidopterists' Society*, Vol. 17, No. 3: 148-158.

Ross, G.N., 2005. *Wise guys.* IN Endpaper. Natural History mag., October, Vol, 114:8 (sic 115), page 72.

Ross, G.N., 2008. What kills tropical butterflies in marginal temperate zones? *Butterfly Gardener mag.*, Fall (Vol. 13:3), pages 4-5, 7.

Ross, G.N., 2010. *A tale of homing in zebra heliconians.* Notes, Association for Tropical Lepidoptera. June, pages 1-2.

Ross, G.N., 2016. Notes on October butterflies of the Mississippi and Alabama Gulf coasts. *Southern Lepidopterists' News* (in press).

Scott, J.A., 1986. *The Butterflies of North America: A Natural History and Field Guide.* Stanford University Press, Stanford, California. 583 pages.

Sugg, Jr., R.S. , 1985. Revised Edition. *The Horn Island Logs of Walter Inglis Anderson.* University Press of Mississippi, Jackson, Mississippi. 240 pages.

Fig. 47. Mixture of *Bacopa* and *Phyla* blooming in a ditch along East Beach Road, Ocean Springs. Both species often share moist habitats with round-leafed pennywort (*Hydrocotyle*) – pictured in upper left.

(Gary N. Ross, E-Mail: gnross40@yahoo.com)

PROBLEM FOR MONARCHS AND QUEENS! ! !
OPHRYOCYSTIS ELEKTROSCIRRHA (OE)

"***Ophryocystis elektroscirrha*** *is an obligate, neogregarine protozoan parasite that infects Monarch (Danus plexippus) and Queen (Danaus gilipus) Butterflies.*" [1,7]

First, some definitions of words in the above description of ***Ophryocystis elektroscirrha*** **(OE)**:

Obligate - generally means to compel or to force an entity (*e.g.*, person) to do something. However, in biology it means "*by necessity*". Some examples would be an *obligate aerobe*, an organism that can not survive without oxygen, or an *obligate carnivore*, an organism dependent for survival on a diet of animal flesh. [2];

Protozoan - unicellular eukaryotic organisms. [5] Simply stated — single-celled organism whose cell contains a nucleus and other organelles surrounded by membranes. [6]

Neogregarine - is a taxonomic name for a type of parasitic protozoa (and it gets very complicated from there on) [3]. The neogregarines have been classified as biological control agents. [4] To confuse the situation **OE** may actually be an eugregarine and not a neogregarine from analysis of genetic material. The difference between the eu- and neogregarines is in their reproductive cycle. [4]

Back to ***Ophryocystis elektroscirrha*** which infects both the Monarch and Queen (only known hosts for this parasite). Dormant spores of **OE** are contained on the exterior of the female's abdomen. When she lays her eggs the spores are transferred to the eggs and to the milkweed leaves on which the egg is placed. The newly hatched caterpillar eats the egg shell and then the milkweed leaves and will become infected. The dormant spores then migrate to the gut of the caterpillar and digestive enzymes dissolve the wall of the spore releasing the active **OE** parasite. **OE** must live within the host to multiple and survive thus it is designated an "*obligate parasite*". [7]

Most of the consequent damage of **OE** on the adult butterfly occurs in the pupal stage which can be observed when the butterfly emerges from the chrysalis. If the adult emerges properly this usually signifies a moderate infection. However, if a serious infection the butterfly can be weak, have difficulty emerging from the chrysalis, and may have difficulty clinging to the pupal case. Some butterflies die before emerging. [7] Adults that are seriously infected may be smaller than normal, have shorter forewing lengths, damaged cuticle (outside layer) of the abdomen, and other abnormalities. These butterflies do not fly as far as normal butterflies. Infected males may not mate and thus not produce offspring. The infected females appear to reproduce normally. [7]

1. https://en.wikipedia.org/wiki/Ophryocystis_elektroscirrha
2. https://en.wikipedia.org/wiki/Obligate
3. https://en.wikipedia.org/wiki/Neogregarinorida
4. http://wwx.inhs.illinois.edu/research/biocontrol/pathogens/typesofpathogens/gregarines/
5. https://en.wikipedia.org/wiki/Protozoa
6. https://en.wikipedia.org/wiki/Eukaryote
7. http://monarchparasites.uga.edu/whatisOE/

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DEFINITIONS:

Endophyte - a parasite living inside another organism. An organism, such as a fungus or microorganism, that lives inside a plant, in a parasitic or symbiotic relationship. [1]

Spinneret - A tubular structure on spiders and various other insect larvae that secrete silk threads which produce a web (such as in spiders) or cocoons (as in moths). [2]

1) http://www.thefreedictionary.com/endophyte
2) http://www.thefreedictionary.com/Spinnerets

GRAY CRACKER (*HAMADRYAS FEBRUA*) LIFE HISTORY

BY

BERRY NALL

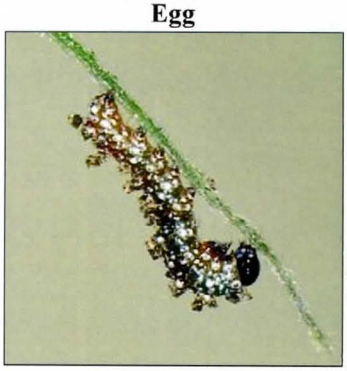
In 2013, Gray Crackers started showing up in July, which was the earliest I had ever seen them. They continued to appear, often in good numbers, until late October. I had plenty of the host plant, *Dalechampia scandens,* growing in pots when they arrived, and it was the perfect opportunity to raise them.

Egg

Hatchling

In July I placed several adults in my greenhouse, where most of the *Dalechampia* was growing. It took about a week for them to start ovipositing. Later in the summer, after we had good rains, free-flying females also regularly deposited eggs on outside vines.

The caterpillars developed rapidly; they usually were entering the fourth instar only five days after eclosing from the egg. The first and second instars rested on a vein they cut out from a *Dalechampia* leaf. They decorated their bodies with frass, and sometimes extended the vein with a frass chain. The later instars did not show this behavior.



First instar resting on leaf vein

Second instar

Face of Gray Cracker

There was significant color variation in the final-instar caterpillars. They ranged (in general appearance) from green to red to black. Red was the most dominant color. (See the fifth instar's picture on the next page.) Adults also showed interesting differences in color. Gray predominated in the summer, but in the fall many adults had a beautiful rich tapestry of browns and blues added to the gray background.

Third instar

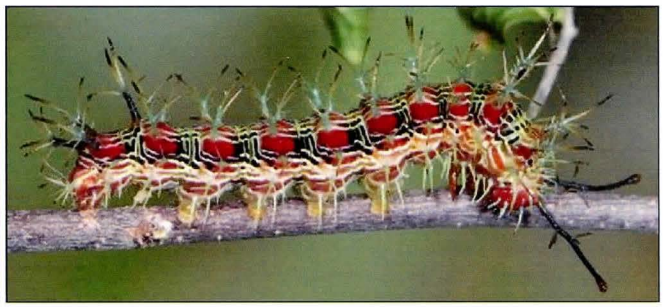
Fourth instar

Numerous sources suggest that Gray Crackers will use *Tragia* (Noseburn) as a host plant. I had plenty on hand, but the caterpillars refused to eat it. They did eat Costa Rican Butterfly Vine (a cultivated *Dalechampia* species widely available). Cat Stevens of Edinburg, TX, raised some from eggs laid on a large vine in her yard.

Fifth instar, "green" form

Caterpillars emerged from the first eggs I obtained after about three days; they pupated about 2 weeks later. I was out of town and did not get to see the first generation emerge. In later broods, adults emerged about a week after pupation began.

Fifth instar, dark form



Fifth instar, red form

Prepupal larva

Chrysalis

Fresh adult female Gray Cracker, dorsum, 26-VIII-2013

Fresh adult female Gray Cracker, ventrum, 26-VIII-2013

The SL Society and the Editor thank Mr. Berry Nall for allowing us to reprint his life history of the Gray Cracker (*Hamadryas februa*) in the SLS NEWS. The original publication on the internet is listed as: http://leps.thenalls.net/content2.php?ref=Species/Biblidinae/februa/life/februa_life.htm

Mr. Nall's website "*Berry's Butterfly Photos*" can be viewed at http://leps.the nalls.net/ His contact E-mail is lb@the nalls.net

[Note: caterpillars were all raised at Mr. Nall's home in Falcon Heights, Texas.]

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PHYLLODESMA OCCIDENTIS (WALKER, 1855) (LEPIDOPTERA: LASIOCAMPIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

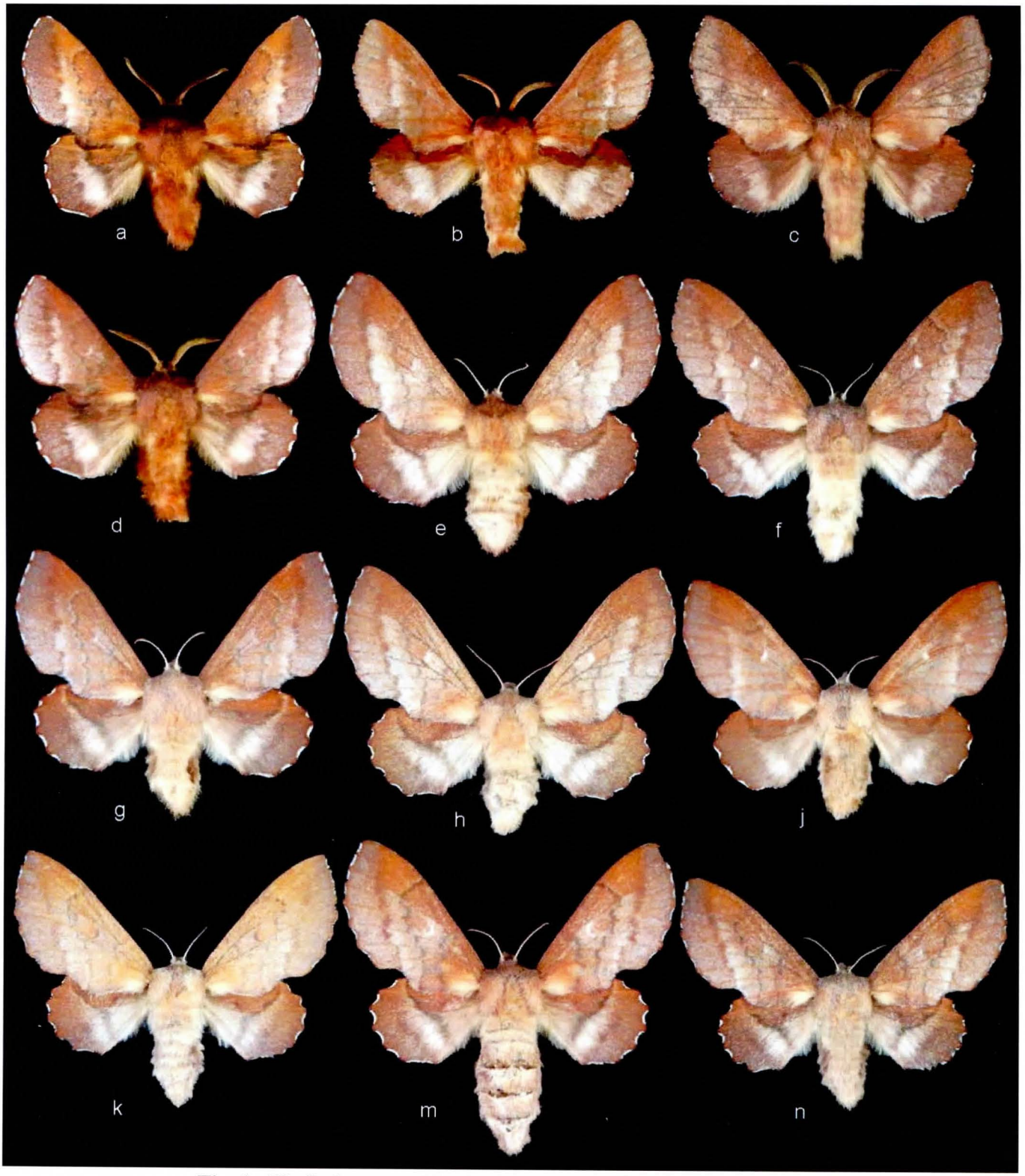

Fig. 1. ***Phyllodesma occidentis*** phenotypes: a-d. males, e-n. females.

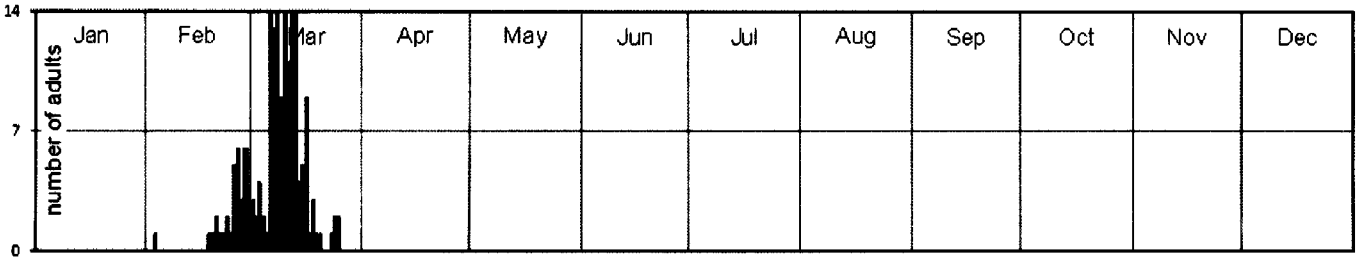

Fig. 2. Adult ***P. occidentis*** captured at the *Abita entomological study site. n = 197

Fig. 3. Parish records for ***P. occidentis***.

The Lasiocampid moth ***Phyllodesma occidentis*** (Walker) (Fig. 1) is among apparently three currently recognized species of the genus in North America. The taxonomy of this genus is a dizzying myriad of synonymies of species names and numerous subspecies and form names.

This species was reported by Franclemont (1973) under the name ***Phyllodesma carpinifolia*** (Boisduval), and he discussed in depth the confusion of form names, and species synonyms involved in this genus. Franclemont (1973) and Heppner (2003), both listed the range for this species to be from coastal South Carolina, Georgia and Florida, and eastern Texas. Apparently there were no known records at those times from any of the intermediate Gulf coastal states. Covell (1984), includes Kentucky as part of the range for this species.

I have taken ***occidentis*** for the past 35 years at the **Abita entomological study site,* in one annual brood peaking early March (Fig. 2). Heppner (2003) reported adults January-March. Covell reported specimens also in the month of April. Franclemont (1973) reported one annual brood.

The Parish records are illustrated in Fig. 3.

***Abita entomological study site**: sec.24,T6S, Range 12 East, 4.2 miles northeast of Abita Springs, St. Tammany Parish, Louisiana.

Literature Cited

Covell, Jr., C.V., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Franclemont, J.G. in Dominick, R.B., et al., 1973. *The Moths of America North of Mexico*, Fasc. 20.1, Mimallonoidea; Bombycoidea (in part) E.W. Classey Ltd. and R.B.D. pub. Inc., London.

Heppner, J.B., 2003. Arthropods of Florida and neighboring land areas, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

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DEFINITIONS:

Phytophagous - basically and most simply this word means "eating plants". [1] Or perhaps a bit more sophisticated "feeding on plants", *i.e.*, herbivorous. [2]

Prognathous - a jaw on any animal that has either its upper or lower jaw projecting forward. [3]

1) http://www.merriam-webster.com/dictionary/phytophagous
2) https://en.wiktionary.org/wiki/phytophagous
3) http://www.thefreedictionary.com/prognathous

NATURAL HISTORY NOTES ON SPHINX MOTHS (SPHINGIDAE) OF THE CATSKILL MOUNTAINS, NEW YORK

BY

ROBERT DIRIG

This is the second paper on large moths of the Catskills. The first, which treated the Saturniidae, described the study area and general methods (Dirig, 2015). By synthesizing unpublished records with information that originally appeared in ephemeral sources, this article provides a thorough baseline of historical sphinx moth flight dates and life histories from a heretofore poorly documented region.

Sphingids are familiar and easy to identify (Hodges, 1971; Tuttle, 2007; Beadle & Leckie, 2012), but their local life histories, like those of saturniids, have remained largely unrecorded. These notes supplement the regional faunal lists of Cleveland (1896) and Forbes (1928, 1948). Scientific names of moths in this article follow Tuttle (2007); "Hodges numbers" are provided from Hodges *et al.* (1983:109-112); and plant nomenclature follows the online *New York Flora Atlas* [*http://newyork.plantatlas.usf.edu/browse.aspx?cat=Scientific+Name*]. Clock hours are presented in Eastern Daylight Savings Time.

The dark red line in Fig. 1-B surrounds the **Catskill Plateau**, as defined by Fenneman (1938) and Brooks (1979). My field work was centered at **FRENCH WOODS** (**F.W.** in Fig. 1-B), with a few records of moths at a mercury vapor safety light added by Ronnie Miller (Dirig, 1975c) from BOVINA CENTER, Delaware Co. (**B.C.**). **M.R.** locates MAX RICHTER'S BUTTERFLY FARM (Fig. 31) in East Durham, Greene County. We are fortunate to have a historical annotated list of sphinx moths collected at ONEONTA, Otsego Co. (**O**), in the Susquehanna River valley, in the foothills north of the Catskills, during the 1893-1894 seasons, within three miles of a residence at 17 Elm St. (Cleveland, 1895, 1896; Fig. 22). In the 1960s and 1970s, a group of enthusiastic 4-H members and leaders (especially the Seeley, Cole, and Henderson families) collected sphinx moths at UV lights in the Oneonta area, providing a more recent window of information about these moths (C. Seeley, 1963a; Figs. 27-28). These are indicated as **4-H colls. (1960s-1970s)** in the SPECIES LIST below. In August 2015, I acquired ***Robert Hendrickson, Jr.***'s extensive 4-H insect collection, which was assembled at Oneonta from 1967-1971. It included 33 sphinx specimens (and a few from Sullivan Co., collected by C. Bunt and B. Bunt in 1973-1974). His flight dates are given at the end of the section on RECORDS in applicable species accounts, credited as (**RH**).

My records of F.W. sphinx moths began in 1963, being especially thorough from 1964-1969 and 1972-1976, but less so in 1970-1971; usually on weekends from 1977-1983; and occasionally thereafter. Most were of adult captures at UV; some of wild larvae; and a few were of *Hemaris* spp. nectaring in daylight hours, plus *H. thysbe*, *H. diffinis*, *Amphion floridensis*, and *Sphinx chersis* feeding at flowers at dusk. Fig. 2 shows specimens of sixteen sphinx species that were found at F.W. from 1963-1967.

Collecting and rearing methods were detailed in Dirig (1975a, 1977, 2015). Wild sphingid larvae were usually noticed when they crawled off the foodplant to seek a pupation site. Woody plants of the F.W. area that might serve as larval hosts for sphingids were listed in Dirig (2015:132-133). In 1965, during my initial flush of enthusiasm for rearing moths, I made drawings of egg placement, larval instars, pupae, and foodplants for several sphinx species that were grown on cut food indoors, as an additional method of recording information (Figs. 5, 9-14, & 21). Fig. 16 was drawn in 1967.

A few other **abbreviations and symbols** are used in this article: **Co.** = County. **UV** = attracted to ultraviolet light. * = a non-native, naturalized plant, † = a cultivated plant. **1-I** = first instar, **2-I** = second instar (*etc.*). ♂ = male, ♀ = female. Other F.W. collectors included Bette J. Dirig O'Brien (**BJD**), John M. Dirig (**JMD**), J. Francis Dirig (**JFD**), Matthew F. Dirig (**MFD**), Andrea Barron (**AB**), and Colleen Connolly (**CC**). **BH** = the Bailey Hortorium Herbarium at Cornell University, my repository for botanical vouchers of Lepidoptera nectar sources and larval foodplants.

SPECIES LIST

Large Sphinx Moths
Subfamily Sphinginae

***Ceratomia amyntor* (Geyer) 7786**
(Elm Sphinx, Four-horned Sphinx)

RECORDS: F.W. (Fig. 23): Apparently one extended brood from late June to mid-Aug. **1965:** 4 Aug. (♀, porch light), 8 Aug. (***melanic*** ♂, UV), & 13 Aug. (UV). **1966:** July (2, UV); few seen (Dirig, 1966d:10). **1967:** June (♀, UV, AB), 25 June to July (6 ♂♂, UV). **B.C.:** R. Miller (Dirig, 1975c). **O:** "Rare," 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 28); 13 July 1970 (RH).

Life History (Figs. 9-10): 77 jade green, spherical, pearl-like **eggs** (Fig. 9) were laid singly and in small patches on 5-6 Aug. 1965, hatching on 10-11 Aug. The **1-I larvae** were unmarked, slender, pale greenish-white with an anal horn. They were fed Grey Birch (*Betula populifolia*) and Paper Birch (*B. papyrifera*). [Reared larvae also readily ate leaves of American Elm (*Ulmus americana*), American Basswood (*Tilia americana*), Yellow Birch (*B. alleghaniensis*), Black Birch (*B. lenta*), Hop Hornbeam (*Ostrya virginiana*), Bitternut Hickory (*Carya cordiformis*), Spicebush (*Lindera benzoin*), Black Cherry (*Prunus serotina*), and hawthorn (*Crataegus* sp.), which I offered to test potential foodplant range. Wagner (2005:250) listed basswood and elm as *amyntor*'s principal hostplants; also birch, but doubted a record of cherry.] The caterpillars grew rapidly, showing four "horns" on the thorax before molting on 20 Aug. The **2-I larvae** (Fig. 9) were similar, green, with oblique lateral stripes, and the thoracic "horns" more evident. They molted on 24 Aug., the **3-I** caterpillars (Fig. 9) ***exhibiting three color forms: green, brown, and intermediate*** in a 9:5:4 proportion. The **green form** was pale green with a hint of yellow; the anal horn darker yellow-green; had a paler toothed line on the mid-dorsum, and oblique side-stripes of the same color and texture; very small black spiracles; four thoracic "horns" with whitish and yellowish spines; and a pale green face cap. The **brown form** was dark greenish-brown, with pink mid-dorsal and lateral stripes, a yellowish-green horn, brownish-black face cap, and pink and yellowish thoracic "horns." Larvae of the **intermediate form** varied, most being pale greenish-brown, with a yellow-green anal horn, pale pinkish-white mid-dorsal and lateral stripes, a brownish-green face cap, and yellowish thoracic horns; one was much like the green form, but with browner prolegs and venter, and a darker face cap. They molted again between 31 Aug. and 3 Sept. In the **4-I** (Fig. 9), brown caterpillars became darker chocolate-brown with whitish thoracic "horns," and *the green and intermediate forms all turned brown*. The final molt (**5-I**) occurred on 9-10 Sept., and *all larvae retained the dark brown color to pupation*. Dark reddish-brown **pupae** (Fig. 10) formed on 20-25 Sept.

Ceratomia undulosa (Walker) 7787
(Waved Sphinx)

RECORDS: F.W. (Fig. 23): This very common moth apparently had one extended brood from late May to mid-Aug. **1963:** 18 & 28 July (♂♂ at window). **1965:** 8 Aug. (♀, UV, ova, *see notes below*), 9-12 Aug. (UV & porch light). **1966:** June-Aug. (21 noted, UV). **1967:** 5 June (♂, UV), June-late July (very common, 2-3 adults per night, UV), 13 June, 30 July, 1 & 4 Aug. (BJD). **1968:** 24 June (♂, UV, AB). **1974:** 3 & 7 June (♂♂, UV, MFD), 8 June (***melanic*** ♂, with almost wholly black dorsals, UV), & 10-11 Aug. **1975:** 31 May & 5 July (♂♂, UV). **1976:** 11 June (UV). **1982:** 16 June (at window). **2001:** 27 June (photo). **B.C.:** R. Miller (Dirig, 1975c). **Sullivan Co.**, 10 July 1973 (C. Bunt), 21 July 1974 (B. Bunt). **Edgewood & Onteora Mt., Greene Co.** (Forbes, 1928:610). **O:** "*Very common*" in 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 28); 14 & 18 June 1970 (RH).

Life History: 230 jade green, spherical **eggs** were laid singly or in small patches (Fig. 11) on 8-9 Aug. 1965, hatching on 13 Aug. The **1-I larvae** were pale green with a proportionately long horn (Fig. 11), eating White Ash (*Fraxinus americana*), often resting on leaf undersides. They molted to **2-I** on 20 Aug., showing pink oblique lateral stripes and black spots, a lighter green lateral line, and maroon anal horn. One sleeved larva was brownish-red. A red and green **3-I** larva was drawn on 29 Aug. (Fig. 11). On 17 Sept., three of fifteen sleeved larvae were tannish-orange with lateral stripes and dark brown spots. A **5-I** caterpillar of the brown form was sketched on 23 Sept. (Fig. 12). Larvae **pupated** 26 Sept. to 2 Oct.; pupa whitish-green and amber when fresh, later turning black (Fig. 13). Many of the larvae succumbed to disease, probably from overcrowding, and most were sleeved outside, which precluded close observation. In June-July 1967, a wild larva was found on White Ash and reared to the imago. On 21 July 1980, a larva was found crawling under a White Ash tree before pupation (JFD).

Sphinx chersis (Hübner) 7802
(Great Ash Sphinx)

RECORDS: F.W. (Fig. 23): Evidently single-brooded, from mid-June to mid-Aug. **1964:** 6 July (♂, porch light). **1966:** July to early Aug. (ca. 8 adults, UV, including 3 ♀♀), 18 June (♂ on White Ash trunk, with expanding wings), 10 July (♀, UV). **1967:** very common, 6 ♀♀ & many more ♂♂, UV, larvae abundant, late Aug., larvae reared on White Ash; 5 Aug. [♀ hovering to feed at Evening Primrose (*Oenothera biennis*) flowers at dusk (BJD); Dirig 1967]. **1968:** 19 Aug. (old ♂, UV, AB). **1988:** 20 Aug. (larva crawling, blue horn). **O:** One specimen in 1894, "*there have been only three taken here*" (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 28); 3 & 8 Aug. 1970 (RH).

Life History: Larvae were frequently noticed crawling to pupate beneath White Ash trees in late Aug. (F.W.). On 6 Sept. 1965, JFD found a **5-I wild larva** on a White Ash sapling in a yard at **Goulds, Delaware Co.** (Fig. 14). Its fore and anal ends, and ventral part of the body were dark bluish-green; the dorsal areas whitish blue-green; there were seven oblique white side-

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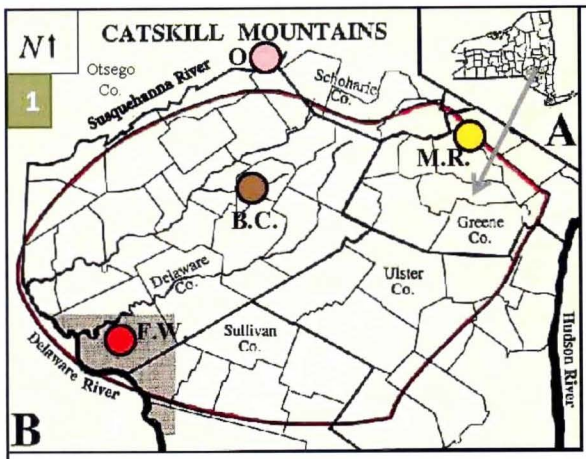

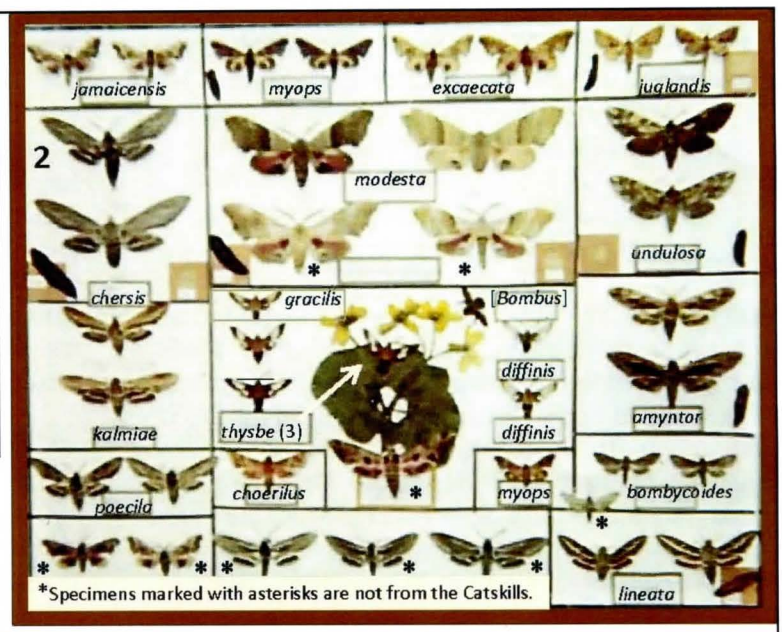

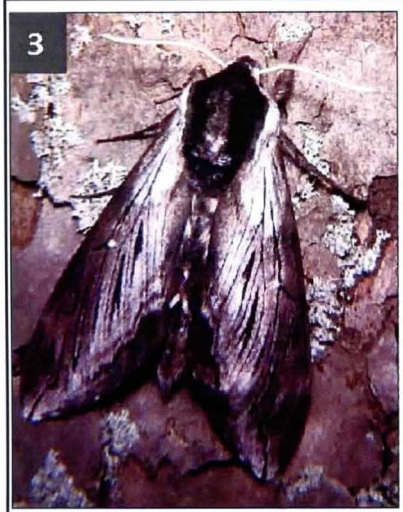

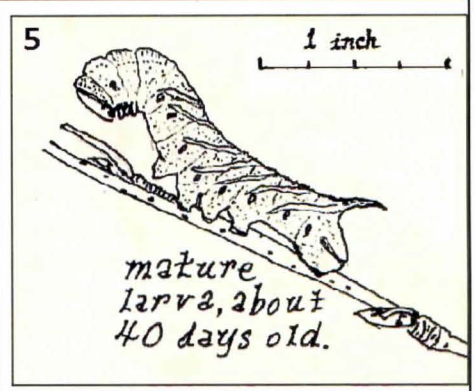

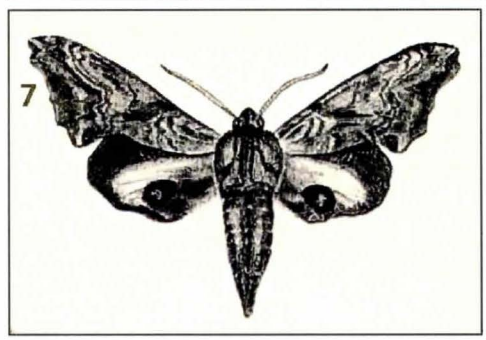

CATSKILL SPHINGIDS I: **(1) Catskill Region** (red line), showing French Woods **(*F.W.*)**, Bovina Center **(*B.C.*)**, Oneonta **(*O*)**, and Max Richter's Butterfly Farm **(*M.R.*)**. **(2)** My **4-H display case of southern Catskill sphinx moths** (including pupae of species that were reared) at the New York State Fair, Aug. 1967. **(3)** Wild ♂ ***Sphinx poecila***, posed on *Wild Apple (*Malus pumila*) bark, 2 June 1974. **(4-5)** ***Paonias excaecata***, posed wild ♂, 11 Aug. 1974; ink drawing of 5-I larva, reared on birch (*Betula* sp.), 1965. **(6-7)** Wild ♂ ***Paonias myops***, posed on leaves, 12 June 1997; pencil drawing from specimen, 1974. **(8)** ♂ ***Hemaris thysbe***, nectaring at Mountain Laurel (*Kalmia latifolia*), 5 July 1997.

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-stripes, bordered above with dark green; small, narrow black spiracles with white edges; a blue anal horn; and the face cap with yellow sides and green center. It was crawling to pupate (inside a rearing container) on 8 Sept. Fig. 15 illustrates the mummy of a wild *chersis* larva with puparia and an adult tachinid **parasitoid** (1970-1974); compare the image in Dirig (1975a:19, #27c). Five tachinids have been recorded as parasitoids of *S. chersis* (Tuttle, 2007:219).

***Sphinx kalmiae* J. E. Smith 7809**
(Laurel Sphinx, Fawn Sphinx)

RECORDS: F.W. (Fig. 23): Likely single-brooded, with adults from early June to early Aug. **1965:** 4 Aug. (♀, porch light). **1966:** 15 June [♂, UV, proboscis as long as the body (1.3 in.)]. **1968:** 16 July (♂, UV, AB). **1974:** 10 June (♂, UV). **1990:** 27 June (at window). **Hungry Hill Bog near Delaware Lake**, Delaware Co.: **1976:** 8 June (emerging ♀, *see below*). **O:** Common, 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 28); 12 & 13 June 1969 (RH).

Natural History: A ♀ found on 8 June 1976 (a warm day, 85°F.) had just emerged from the pupa, and was crawling through knee-high shrubs on an open *Sphagnum*-heath bog mat at 12:15 p.m. She settled 1 ft. up in a dense thicket of Leatherleaf (*Chamaedaphne calyculata*) and Sheep Laurel (*Kalmia angustifolia*) at 12:30, her limp wings hanging down with their dorsal surfaces together. The wings were nearly full size by 12:40, and at 1:00, the normal rest position was assumed, with the forewing dorsals exposed and flat. This very well camouflaged position was maintained throughout the afternoon, until the moth was collected at 7:00 p.m. A careful search did not reveal the pupal shell. Bog Laurel (*K. polifolia*) also grew on the bog mat, with Mountain Laurel (*K. latifolia*) in the surrounding shrub zone. The larva that produced this moth may have fed on one of these laurels; or on White Ash, which is a major hostplant, according to Wagner (2005:259), who only listed Oleaceae as hosts. [Forbes (1948:191) suggested that larvae do not actually feed on *Kalmia*.]

***Sphinx poecila* Stephens 7810.1**
(Northern Apple Sphinx)

RECORDS: F.W., *all at UV* (Fig. 23): Rarely seen, apparently single-brooded, with adults from early June to late July. **1966:** 3 & 6 June (♀♀), 11 June (♂). **1967:** 19 June (♂, AB). **1970:** 29 July (♀). **1974:** 2 June (♂, 6:30 a.m., Fig. 3). **1976:** 2 June (♂). **O:** [as *Sphinx gordius*]: "*very rare*" in 1894, but "*plentiful in 1893*" (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 4 July 1967, 13 June 1969, 20 June 1970 (RH).

Life History: A wild ♀ captured in June 1967 laid 90 bright yellow-green, pearl-like eggs, which all hatched, but the larvae refused to eat *Wild Apple (*Malus pumila*) leaves. Larvae from another ♀ that oviposited in late July 1970 likewise died soon after hatching, refusing the same plant. A native foodplant might have worked; Northern Meadowsweet (*Spiraea alba*, var. *latifolia*), shadbush (*Amelanchier* sp.), Choke Cherry (*Prunus virginiana*), Black Cherry (*P. serotine*), White Ash, willow (*Salix* sp.), and blueberries (*Vaccinium* spp.), other known foodplants, grew in and near the yard. Tuttle (2007:88) also experienced non-feeding larvae, even when offering native foodplants. F.W. adults (Fig. 3) most closely resembled a specimen from Lakehurst, N.J., shown in Hodges (1971: Plate 5, #5).

***Sphinx luscitiosa* Clemens 7811**
(Clemens' Sphinx)

RECORD: Halsey Hill, northwest of **Fernwood, Fremont Town, Sullivan Co.**, 5-I **larva** on a shrubby willow (*Salix* sp.) bordering a wet ditch in an old field, in early July **1967**. This is the only known record of this rare sphinx in the region, from the Basket Creek (East Branch) drainage, ca. 3 miles from the Delaware River corridor, where it may be more abundant. The caterpillar pupated, but no adult emerged. The larva and pupa were identified from meticulous descriptions and a larval photograph in Eliot & Soule (1902:147-149).

***Lapara bombycoides* Walker 7817**
(Northern Pine Sphinx)

RECORDS (Fig. 23): Probably univoltine, one record. 4-H Camp Shankitunk near **Delhi, Delaware Co.**, 19 July **1967** (2 worn, UV). Much White Pine (*Pinus strobus*), with which this moth is often associated (Wagner, 2005:254), grew at the site. (The foodplant was scarce at F.W., being more frequent near the river.) **O:** (as *Ellema harrisii*): "*More common than usual*" in 1894 (Cleveland, 1896); 5 June 1969 (RH).

Eyed Sphinx Moths
Subfamily Smerinthinae

***Smerinthus jamaicensis* (Drury) 7821**
(Twin-spotted Sphinx)

RECORDS: F.W. (Fig. 23): Common, probably single-brooded, with most records in June, two in late July and early Aug. **1965:** 24 June (porch light). **1966:** 8 June (♂, UV); ca. 20 more (UV), one ♀ laid ova. **1967:** very common (UV), 27 June (♂, UV). **1974:** 27 July (rubbed ♂, UV), 9 Aug. (♂, UV). **1975:** 1 June (♂, UV). **1976:** 2 June (♂, UV). **Sullivan Co.**, Roscoe, 7

June 1976 (at light, F. C. Schlauch). **B.C.:** R. Miller (Dirig, 1975c). **O:** [as *Smerinthus geminatus*]: "*Not as plentiful as in 1893*" (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 3 July 1967, 14 June 1968, 18 June 1970 (RH).

***Paonias excaecata* (J. E. Smith) 7824**
(Blinded Sphinx)

RECORDS: F.W. (Fig. 23): Apparently with one extended flight from early June to mid-Aug. **1964:** 6 July (porch light). **1965:** 7 Aug. (♀ inside old barn, laid eggs on window, AB, reared (*see below*), 14 Aug. (♂, UV). **1966:** common, June-Aug. (1 ♀, several ♂♂), 8 June (♂, UV), 5 Aug. (♂&♀, UV). **1967**: very abundant, as usual. **1974:** 8-9 June & 27 July (♂♂, UV), 11 Aug. (♂, UV, Fig. 4). **1975:** 4, 6, & 12 July (♂♂, UV). **1976:** 24 July (rubbed ♂ at light). **O:** "rare" in 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 14 June 1969, 6 & 10 June 1970 (RH).

Life History: Ova small, spherical, pale jade green, laid 7 Aug. 1965, hatching in ca. 4 days. From hatching, the **larvae** were a distinctive dark yellow-green color, and roughly textured like those of *Pachysphinx modesta*. Larvae ate Beech (*Fagus grandifolia*), Grey Birch (*Betula populifolia*), Paper Birch (*B. papyrifera*), and Black Birch (*B. lenta*) leaves, but refused Red Maple (*Acer rubrum*). Larvae from the same eggs, reared on †Sour Red Cherry (*Prunus cerasus*) by AB, grew more slowly. A **5-I caterpillar**, drawn on Sept. 19, the 40th day (Fig. 5), was 1¾ inches long; face cap green with paler sides; general color a granular, deep, beautiful yellow-green, with an anal horn, and seven oblique yellow side-stripes; prolegs tan; spiracles inconspicuous, white bordered with black; the venter darker green than the dorsal area. The blackish-brown **pupa**, formed on 23 Sept., the 44th day, was 1 inch long.

***Paonias myops* (J. E. Smith) 7825**
(Small-eyed Sphinx)

RECORDS: F.W. (Fig. 23): This very common moth (Figs. 6-7) apparently had one adult flight from June and July into early Aug. **1964:** 6 July (porch light). **1965:** 19 June (caught by bat, at window, *details below*), 21 July (porch light), 10 Aug. (UV). **1966:** 4 July (♂♂, UV). **1967:** 10 June (♂♂, UV), 12 June (♀, AB), 20 June, 24, 27, & 29 July (♂♂, UV). **1968:** 25 June (♂, AB). **1974:** 9 June (♂♂, UV); pencil drawing (Fig. 7). **1975:** 6 & 14 July (♂♂, UV). **1976:** 10-11 June (fresh ♂, UV at 11:00 p.m., still in the same place at 5:00 a.m.). **1997:** 12 June (♂, Fig. 6). **B.C.:** R. Miller (Dirig, 1975c). **O:** "*Rare this year, but plentiful in 1893*" (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 2 July 1967, 18 & 20 June 1968, 8 July 1970 (RH).

Life History: Ova were obtained from a ♀ at UV, and the larvae fed Choke Cherry (*Prunus virginiana*) in 1967; **caterpillars** pupated in fresh, damp *Sphagnum* moss lining a plastic box, and a few small **adults** emerged, 2 Aug. *ff.*, and others in spring 1968. Another ♀ (UV) laid eggs on 11-17 June 1970. I kept no detailed notes for either brood, probably because the larvae were sleeved outside.

Bat Predator: At 11:10 p.m. on 19 June 1965 at F.W., I entered an upstairs room with a south-facing dormer window and turned on the light. A faint thump sounded outside, against the glass. A Little Brown Bat (*Myotis lucifugus*) had landed on the windowsill, holding a male *myops* in its mouth by the abdomen, and moving its jaws as if it were sucking out the internal fluids. This continued for about two minutes while I watched through the glass at a distance of 16 inches. While attempting a photograph, I scared the bat, which dropped the moth and dashed away (Dirig, 1975b). Barbour & Davis (1969) stated that smaller insects are eaten by this bat in flight, but larger ones are held in the mouth until it alights to feed. The bat measured about 2½ inches from nose to tail, and had glossy brown fur, slightly paler on its throat. This sphinx has a 1-inch body length and 2¼-inch wingspan.

***Amorpha juglandis* (J. E. Smith) 7827**
(Walnut Sphinx)

RECORDS: F.W. (Fig. 23): Univoltine and regularly seen in June and early July, although not common. **1965:** 12 June (at window). **1966:** 30 June (♂, UV), June & early July (4, UV). **1967:** 5 June (♀, UV), 9 June (♂, UV, AB). **1968:** 1 June (♀, JFD). **1969:** 2 June (♀). **1974:** 2 June (♂, UV). **1975:** 4 July (♂, UV). **1980:** 15 June (at window). **O:** 1♀, 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 9 June 1968, 29 May 1969 (RH).

Life History: A ♀ captured 5 June 1967 deposited many pale green **eggs** on 6-7 June that hatched on 13 June. All **larvae** but one refused Bitternut Hickory (*Carya cordiformis*), the only member of the Juglandaceae that grew in the vicinity, except a single Butternut (*Juglans cinerea*). [Tuttle (2007:125) stated that northern larvae prefer Betulaceae and Fagaceae.] This larva, of the ***green form*** (Hodges, 1971:88; Tuttle, 2007:124-125), pupated on 19 July, producing a ♂ on 2 Aug. The rough, granular larval body and ventrally flattened terminal abdominal segments of the **pupa** (Fig. 16) are characteristic. Another ♀ captured 2 June 1969 laid eggs the night of 3-4 June that hatched on 10 June. A ♀ collected on 1 June 1968 was resting 10 ft. above ground on the trunk of a large tree in a dense old-growth forest, where it remained for several hours; it probably had emerged that day. This ♀ was very pale beige and

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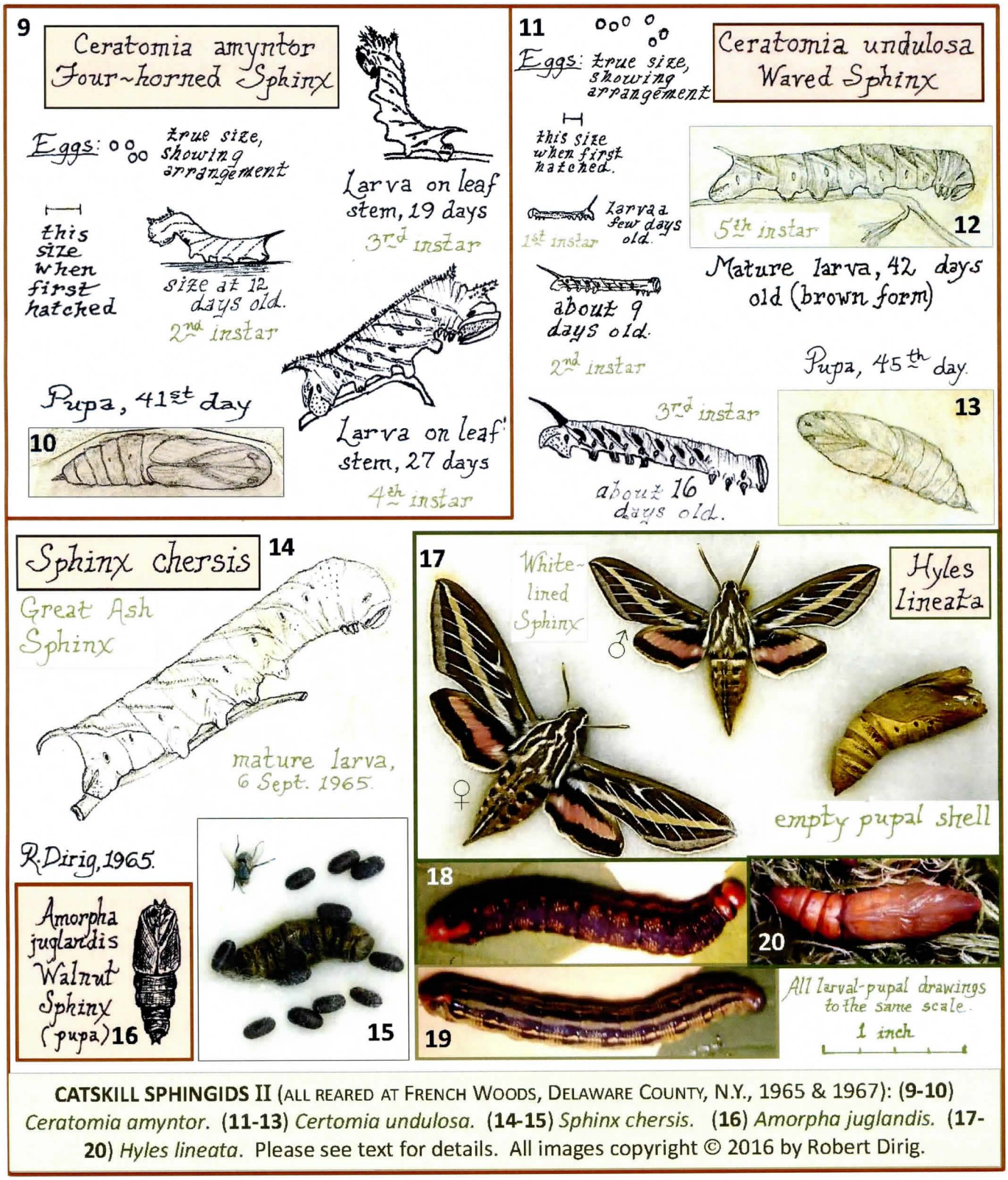

CATSKILL SPHINGIDS II (ALL REARED AT FRENCH WOODS, DELAWARE COUNTY, N.Y., 1965 & 1967): **(9-10)** *Ceratomia amyntor*. **(11-13)** *Certomia undulosa*. **(14-15)** *Sphinx chersis*. **(16)** *Amorpha juglandis*. **(17-20)** *Hyles lineata*. Please see text for details.

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weakly marked, in contrast to heavily maculated ♂♂ from this area, which are similar to Ferguson's specimen from Nova Scotia, figured in Hodges (1971: Plate 7, #17).

***Pachysphinx modesta* (Harris) 7828**
(Modest Sphinx)

RECORDS: F.W. (Fig. 23): Single-brooded, with adults from 7 June to 9 Aug. **1965:** 23 June (♂, at window), 4 Aug. (♂ & ♀, porch light, reared (*see below*). **1966:** very common (15 at UV; known dates 7, 14, & 23 June, 13 & 21 July). **1967:** 5 ♂♂, 1 ♀ (UV). **1968:** 20 June (♂&♀, UV, BJD). **1975:** 6 July (♂, UV). **1980:** 17-18 July (♂♂ at window, MFD). **B.C.:** R. Miller (Dirig, 1975c). **Sullivan Co.**, 9 Aug. 1972 (C. Bunt). **"Catskills" (Ulster Co.):** Forbes (1928: 611). **O:** 15 specimens, 25 June to 10 July 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 9 June 1968 (RH); Fig. 22 (availability of eggs in 1895, from Leigh I. Holdredge, 27 Ford, Ave., Oneonta).

Life History (Figs. 21, 32): A ♀ caught 4 Aug. 1965 laid 81 large, pearl-like, brown **eggs** from 4-6 Aug., glued singly or in small groups, later turning maroonish-plum, then greenish-grey and dented, as the larvae developed, before hatching in 6 days (10-12 Aug.). Larvae were fed Trembling Aspen (*Populus tremuloides*). Newly hatched **larvae** (**1-I**) were ¼ in. long, dark green with paler green longitudinal lateral stripes, oblique jade side stripes, and a dark brown horn. They grew rapidly, developing two pale green stripes around the dorsal thorax, and reaching ¾ in. long in 7 days. They molted on the 10th-11th day (**2-I**, 19-20 Aug.), being ca. 1 in. long, with two bright yellow stripes around the thorax, dark green color, and paler green slanting lateral stripes. The face cap was green bordered with bright yellow, and the anal horn white, continuing in an abdominal stripe of the same color. The next molt (**3-I**, 14th-15th day, 23-24 Aug.) was very similar, with red spiracles and paler yellow thoracic stripes. When the larvae molted again (**4-I**, 20th-23rd day, 29 Aug.–1 Sept.), the spiracles became pink, the face cap pink and greyish-lavender, and the horn was almost absent. They were 2¼ in. long by 6 Sept (28th day). On 14 Sept. (**5-I,** 36th day), they were a rough granular green with white oblique lateral stripes, and a white or pink stripe and nearly obsolete horn, pink-and-lavender face cap, and pink spiracles. Larvae turned brown and became quiescent as pupation approached. **Pupae** formed on 17-20 Sept. (39th-42nd day), at first pale, translucent yellow-green, with a white spot on the amber abdomen, later turning reddish-brown, and eventually black. Pupae were formed on top of dry sand in a plastic box. Part of the larvae, sleeved outdoors, matured more slowly as autumn approached, pupating from 1-12 Oct. (53rd-64th day). I made frequent ink and pencil sketches to record changes (Fig. 21). These were redrawn for a life cycle diagram in *Growing Moths* (Dirig, 1975a:6).

Small Sphinx Moths
Subfamily Macroglossinae

***Hemaris thysbe* (Fabricius) 7853**
(Hummingbird Clearwing)

RECORDS: F.W. (Fig. 23): Two distinct broods, 29 May to 5 July, and 27 July to 1 Sept. **1966:** 29 May [at *Dandelion (*Taraxacum officinale*), AB], June [at *Bull Thistle (*Cirsium vulgare*)], 27 July (♀). **1967:** 4 June [at †Purple Lilac (*Syringa vulgaris*), 6:00 p.m.], 30 July to 3 Aug. [at Common Milkweed (*Asclepias syriaca*)]. **1975:** 9 Aug. (at Common Milkweed). **1976:** 8 June [Pea Brook: **Hungry Hill Bog**, rubbed ♀ at Early Azalea (*Rhododendron prinophyllum*)]. **1981:** 17 Aug. [at Joe Pye Weed (*Eutrochium purpureum*)]. **1982:** 6 Aug. [at †Garden Phlox (*Phlox paniculata*), M. Newman]. **1984:** 6 June (at †Purple Lilac). **1997:** 8 June (at †Purple Lilac); 11 June (at *Robin's Plantain, *Erigeron pulchellus*); 12 June (at *Dame's Rocket, *Hesperis matronalis*); 5 July (**Pea Brook**, at Mountain Laurel, Fig. 8); 31 Aug. (**Halsey Hill, Sullivan Co.**, near Fernwood, at Joe Pye Weed); 1 Sept. [**Wolf Hollow near Andes**, along the Tremper Kill, Delaware Co., at Blue Vervain (*Verbena hastata*) & Grass-leaved Goldenrod (*Euthamia graminifolia*), with Spider Barbour]. **O:** 4-H colls. (1960s-1970s, Fig. 27); 2 Aug. 1967, at Joe Pye Weed (R. Dirig, C. Seeley, R. Arnold); 20 June 1970 (RH).

Natural History: This lovely moth was usually seen singly in daylight hours, feeding at mostly pink and lavender, or sometimes yellow flowers; but on 2 Aug. 1967, ten were hovering at Common Milkweed blooms at dusk (7:00-7:30 p.m.), all within a few feet of one other, at F.W. (Dirig, 1967). All adults have been of Hodge's (1971:116) "southern form," with a "tooth" of colored scales extending inward between the veins from the broad brown forewing margin. A wild **larva** was found on Arrowwood (*Viburnum dentatum*) at Pea Brook in Sept. 1972.

***Hemaris gracilis* (Grote & Robinson) 7854**
(Slender Clearwing)

RECORDS (Fig. 23): This rare single-brooded, June-flying sphinx is known from two sites, evidently the first reports from this region: **F.W.** (22 June **1967**), and **Sands Creek Rd.,** NW of **Hancock**, Delaware Co. (3 June **1968**, JMD). Highbush Blueberry (*Vaccinium corymbosum*) and Early Low Blueberry (*V. angustifolium*), known larval hosts (Wagner, 2005:276), occur sparingly in damp, south-sloping old fields at F.W., and the latter plant is common in oak woods near

the Delaware River. Schweitzer *et al.* (2011:280-284) reviewed its disappearing status in the Northeast.

***Hemaris diffinis* (Boisduval) 7855**
(Snowberry Clearwing, Bumble Bee Moth)

RECORDS: F.W. (Fig. 23):Two clearly separated flights, in late May-early June, and mid-July to early Aug., the second a bit earlier than *thysbe*'s. **1967:** 8 June; 5 Aug. [at *Brittle-stemmed Hemp Nettle (*Galeopsis tetrahit*), 5:00 p.m.]. **1969:** 31 May. **1981:** 13, 15, & 18 July (at Common Milkweed, 7:30 p.m., MFD); May [at Early Azalea, photo by Rebecca Nevin]. **1985:** 4 June [at *Red Clover (*Trifolium pratense*) & *Robin's Plantain at noon]. **O:** 3 specimens, 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); 24 June 1967 (RH).

Natural History: All flowers visited were pink or purple. See Dirig (2012) for additional observations of adult feeding in Maine, New York, New Jersey, and Kentucky. Available **potential larval hosts** were Spreading Dogbane (*Apocynum androsaemifolium*), Indian Hemp (*A. cannabinum*), Bush Honeysuckle (*Diervilla lonicera*), and Fly Honeysuckle (*Lonicera canadensis*). †Snowberry ("Snowball Bush," *Symphoricarpos albus* var. *laevigatus*), a favorite ornamental shrub of Victorian gardens, persists around old homesteads, and might also have served.

***Amphion floridensis* Clark 7873**
(Nessus Sphinx)

RECORDS: **F.W.** (Fig. 23): Adults nectared at highly fragrant clusters of lavender flowers during one June brood. Not seen locally before **1980:** spring (♂♂ at †Purple Lilac, **Baudendistel Rd.** near the East Branch of the Delaware River, CC). **1984:** 5 June (at †Purple Lilac, 5:00 & 6:45 p.m., in full sun). **Firemen's Park, Hancock: 1976:** 9 June (at *Dame's Rocket, in ecotone along the Delaware River, 7:10 p.m.). **1997:** 8 June (**Pea Brook**, Delaware Co., along brook, 3:00 p.m.); 9 June (at *Dame's Rocket, 1:45 p.m., **Green Flats near Cadosia**, edge of Delaware River). **O:** 7 June 1894 (Cleveland, 1896); Forbes (1928); 4-H colls. (1960s-1970s, Fig. 27).

***Darapsa choerilus* (Cramer) 7886**
(Azalea Sphinx)

RECORDS: **F.W.** (Fig. 23): All ♂♂ at UV, infrequently encountered, a single brood in June and July. **1967:** late June & 30 July. **1969:** June or July (BJD). **1971:** 20 June. **1974:** 7 June. **1975:** 5 July. **B.C.:** R. Miller (Dirig, 1975c). **Sullivan Co.:** Fremont, 15 June 1974 (B. Bunt). **O:** "*Quite common*," 1894 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig. 27); adults on 14 July 1969, 3 June 1970, 4 June 1971[♀: *eggs* 10 June, *hatched* 19 June, *larvae* fed Northern Wild Raisin (*Viburnum nudum* var. *cassinoides*), *pupae in fine cocoons* began forming 10 July (Fig. 33)], RH.

***Hyles gallii* (Rottemburg) 7893**
(Galium Sphinx)

RECORD: 2002: 6 Oct., a **5-I larva** crawling on the highway verge at exit 84 from State Rt. 17 (which parallels the Delaware River's West Branch), at **Deposit, Delaware Co.**: Body black, face cap and anal prolegs brick red, segments elegantly seamed, with taupe lateral spots above the spiracles [similar to the upper left photo in Wagner (2005:274)]. **O:** 1893, "*quite common*," rare in 1894 (Cleveland, 1896); Forbes (1928:613); 4-H colls. (1960s-1970s, Fig. 28). [Not seen at F.W.]

***Hyles lineata* (Fabricius) 7894**
(White-lined Sphinx)

RECORD: **F.W.** (Fig. 23): **1967:** 16 June (♀ migrant, UV, BJD, the only one seen). **O:** Rare in 1894, quite common in 1893 (Cleveland, 1896); 4-H colls. (1960s-1970s, Fig 27).

Life History: The F.W. ♀ deposited 260 **eggs** on 17-18 June. These hatched in 5 days on 22-23 June. Two dozen **larvae** were fed Frost Grape (*Vitis riparia*), later mixed with *Broad-leaved Dock (*Rumex obtusifolius*). The caterpillars were variable, some largely black, others bright green with black and yellow longitudinal stripes in the final instar (Figs. 18-19). They fed for 21-23 days, pupating on 13-16 July. Prepupal larvae were put in a large plastic box filled with fresh damp *Sphagnum* moss from a nearby swamp, into which they burrowed to transform (Fig. 20). Moths emerged from the **orange pupae** between 31 July and 8 Aug. (Fig. 17).

DISCUSSION

Nineteen species of sphingids were documented in southern Delaware and Sullivan Counties since 1963. Three species flew on the last days of May, all but one in June, thirteen into July, ten into Aug., and one to Sept. 1. Following Tuttle's (2007) and Dale Schweitzer's (2016, *pers. comm.*) interpretations, these are mostly univoltine, except for *Hemaris thysbe* and *H. diffinis* (Fig. 23). In his annotated list of New York sphinx moths, Forbes (1928:611) added the **Ello Sphinx, *Erinnyis ello* (Linnaeus) 7834**, as "*a stray from the Tropics*" in the "*Catskills*," without giving a specific locality. The most important records reported in this paper are of the rare species *Sphinx luscitiosa* and *Hemaris gracilis*.

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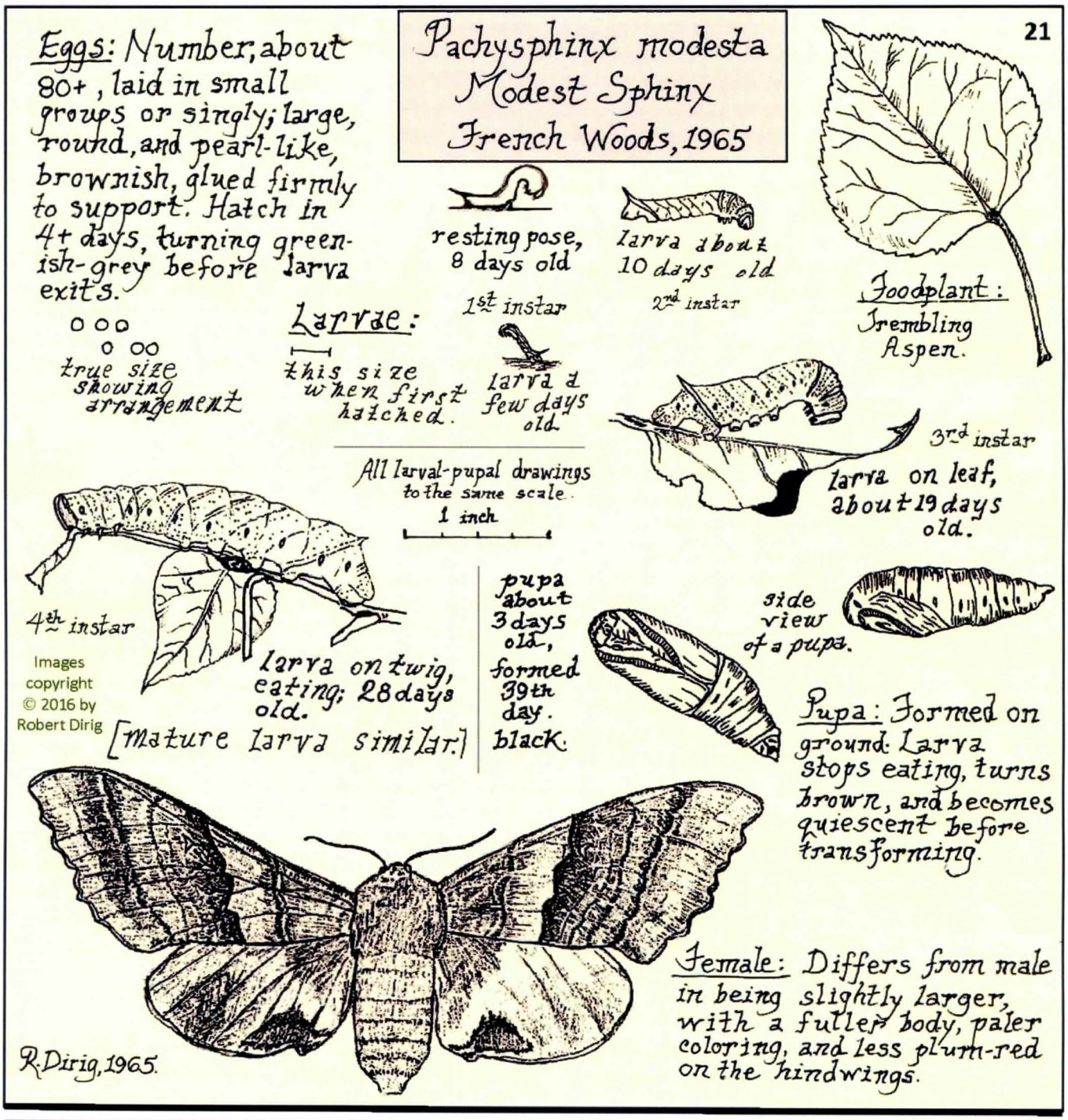

22	ENTOMOLOGICAL NEWS.	[VI(1) & V(10), p. ii, 1895]

Lepidoptera.—Eggs of *Smerinthus modesta;* will purchase or give in exchange good material from N. Y State.—L. I. Holdredge, 27 Ford Ave., Oneonta, N. Y

Lepidoptera.—I have on hand a large number of duplicates for exchange. Address, with lists, G. F Cleveland, 17 Elm St., Oneonta, N. Y

Lepidoptera.—Cocoons of *Luna*, *Io*, *Cecropia*, *Promethia* and *Polyphemus* to exchange for sp. not in my collection. Also good pinned and papered material for ex.—Leigh I. Holdredge, Oneonta, N. Y., U. S. A.

CATSKILL SPHINGIDS III:
(21) *Pachysphinx modesta* life cycle. Please see details in the text.
(22) Historical advertisements offering Modest Sphinx eggs and other Oneonta Lepidoptera (1895).

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Six additional sphinx species were found at and near Oneonta in the Susquehanna River valley, at the northern edge of the Catskills (Fig. 1). These were documented in 1893-1894 by Cleveland (1896), recorded before 1926 by Forbes (1928:609-613), and collected at UV by 4-H members, 40-50 years ago (Figs. 27-28, 33; and RH records). They include the **Carolina** or **Tomato Sphinx**, *Manduca sexta* (Linnaeus) 7775; **Wild Cherry Sphinx**, *Sphinx drupiferarum* J. E. Smith 7812; **One-eyed Sphinx**, *Smerinthus cerisyi* Kirby 7822 [3 July 1969, 15 June 1970, 30 June 1971, RH]; **Pandora Sphinx**, *Eumorpha pandorus* (Hübner) 7859 [20 July 1975, RH]; **Abbott's Sphinx**, *Sphecodina abbottii* (Swainson) 7870; and the **Virginia Creeper Sphinx**, *Darapsa myron* (Cramer) 7885 [24 June 1970, RH; 17 July 1972, P. Ulm]. Eric C. Reuter (2014) added the **Huckleberry Sphinx**, *Paonias astylus* (Drury) 7826, from southern Delaware County.

Of these 27 species, *E. pandorus*, *S. abbottii*, and *D. myron* ***feed on Vitaceae*** (grape family) — as do *A. floridensis*, and sometimes *H. lineata*, which were also recorded at Oneonta and F.W. ***The apparent absence at F.W. between 1963-1980 of adults or larvae of any sphinx species that feeds on Vitaceae is puzzling***. Frost Grape (*Vitis riparia*) was abundant, Woodbine (*Parthenocissus inserta*) and Virginia Creeper (*P. quinquefolia*) occurred locally in that area, while Summer Grape (*Vitis aestivalis*) grew in the Delaware River corridor (*R. Dirig 2620,* BH), and Brooks (1985) also listed Northern Fox Grape (*V. labrusca*) as native in the region. Wild grapevines festoon the banks of waterways and edges of woodlands, at times forming a curtain that reaches the canopy. I found adult Nessus Sphinxes on the shore of the Delaware River in 1976 and 1997. ***Perhaps sphinx species that feed on Vitaceae are primarily associated with riparian habitats?*** Other unrecorded sphinxes that might use *Vitis* and *Parthenocissus* hostplants in the Catskill region include the Achemon Sphinx, *Eumorpha achemon* (Drury) 7861, and the Lettered Sphinx, *Deidamia inscriptum* (Harris) 7871.

I also never encountered larvae of ***Manduca sexta*** on native Carolina Horse Nettle (*Solanum carolinense*, Solanaceae), on cultivated tomatoes or potatoes, or on naturalized European *Bittersweet Nightshade (*Solanum dulcamara*) in this region. *Solanum carolinense* grew in disturbed soil along the Delaware River near Harvard in Delaware Co. and at Callicoon in Sullivan Co. (*R. Dirig 8566*, BH), so it is likely more widespread in the upper Delaware watershed. At the first meeting of the Delaware County Entomology Club in December 1965 (Dirig, 1966a:22, 1966b; Figs. 24-25), I saw "jug-handled" pupae of this species, reared by the Hardman family from larvae found on tomatoes in their garden at Stamford, Delaware Co.

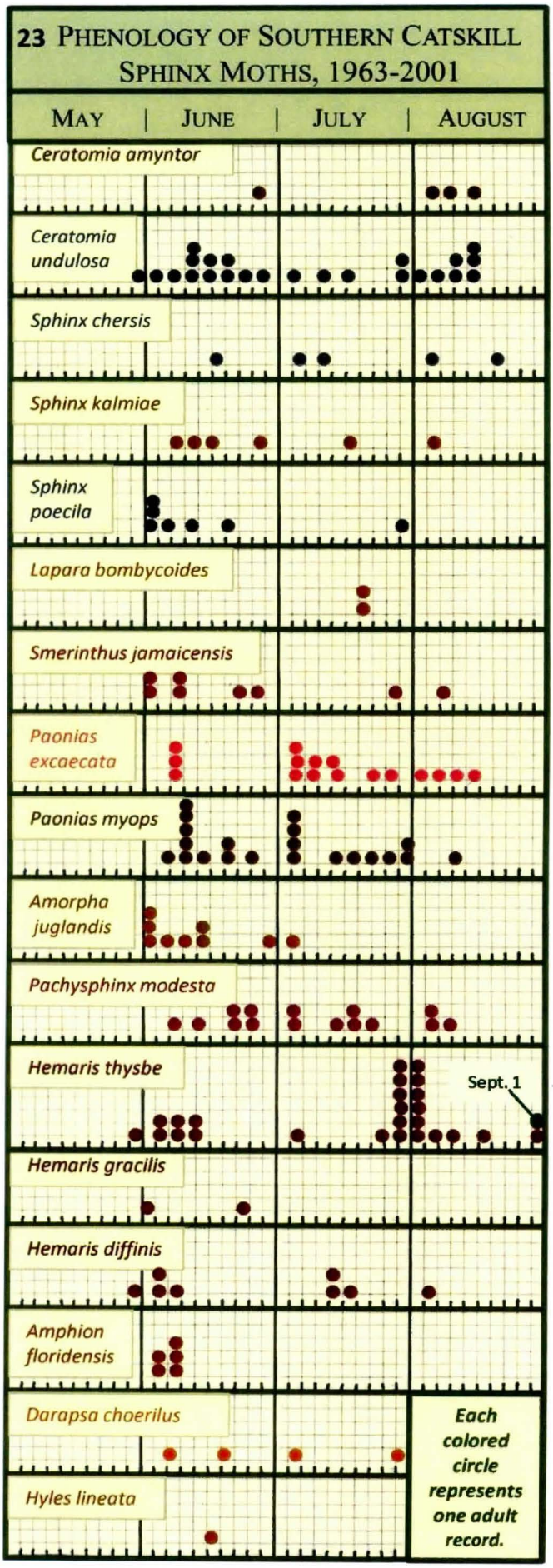
It is possible that ***Eumorpha pandorus*** occurred historically (1902-1918) on Halsey Hill in **Rock Valley**, Delaware Co. One of my maternal grandmother's girlhood chores was trimming the vines around the windows of their homestead house, which was covered with Woodbine on the south side. When she told me in the 1960s that she always dreaded this because of the "*large, horrid worms, with big eyes*" that fed on the leaves, I began regularly checking those vines, but never found any sphinx larvae there.

Since June 2009, the **Emerald Ash Borer** (*Agrilus planipennis*, Buprestidae), an invasive Asian beetle, has been spreading into New York (King, 2009). It will likely kill most White Ashes (*Fraxinus americana*) and Black Ashes (*F. nigra*, a scarcer swamp species) in the region. This may catastrophically topple the present guild of primarily ash-dependent sphingids (Wagner, 2005; Tuttle, 2007), including *Ceratomia undulosa, Sphinx chersis, S. kalmiae,* and *S. poecila* locally, plus *Manduca jasminearum, S. canadensis,* and *S. franckii* in the wider sphere. **Dutch Elm Disease**, caused by ascomycete fungi (*Ophiostoma* spp.) that are spread by several Elm Bark Beetles (Curculionidae, subfamily Scolytinae), has killed large American Elms (*Ulmus americana*) throughout the region since the 1970s (some saplings and small trees persist), likely impacting *Ceratomia amyntor*, although its larvae will also eat leaves of other trees — see its species account above. Effects on regional sphingids of spraying **DDT**, **Carbaryl**, and ***Bt*** in the 1950s-1970s [to control Gypsy Moth (*Lymantria dispar*) — see Dirig, 2015:141] are unknown; but half of the 27 Catskill species (*Manduca sexta, Ceratomia amyntor, C. undulosa, Sphinx chersis, S. kalmiae, S. luscitiosa, Smerinthus jamaicensis, Paonias excaecatus, P. myops, P. astylus, Pachysphinx modesta, Hemaris gracilis*, and *Amphion floridensis*) have noticeably declined in Connecticut in recent years (Wagner, 2012:54). Only one tachinid **parasitoid** was seen (Fig. 15).

CONTEXT OF MOTH COLLECTING BY CATSKILL TEENAGERS

Most of the information about sphinx moths that is recorded herein was compiled 40-50 years ago by teenaged lepidopterists, who shared a vibrant interest in Catskill species (Figs. 24-26). Their collecting and rearing of local moths established a baseline of knowledge that may help inform current conservation needs of these elegant insects (Schweitzer *et al.*, 2011; Wagner, 2012).

In the 1960s and 1970s, the **N.Y.S. 4-H ENTOMOLOGY PROJECT**, led by ***Dr. Warren T. Johnson*** at Cornell University (Hudler *et al.*, 1994), provided a context for this work. Club members were encouraged to collect,



pin, and label insect specimens (Figs. 2, 24, 26-28), study life cycles (Figs. 5, 9-21, 32-33), take photographs of insects (Figs. 3, 18-20), keep written records, and share their ever-increasing knowledge through talks and demonstrations at schools, camps, fairs, and on TV (C. Seeley, 1966b; Fig. 24). Related botanical projects (making pressed collections of weeds, trees, and wildflowers) helped them find and identify caterpillar foodplants. Resulting entomological and botanical collections could be exhibited at county fairs and the New York State Fair, earning recognition and modest monetary awards. After several years of work in entomology, older members could compete on State, and then National levels for six $500 4-H college scholarships that were awarded annually by the Hercules Powder Co. The Catskill region produced National Winners in Entomology in 1964 (Newcomer, 1965) and 1967 (Thouron, 1967).

PARENTS, 4-H LEADERS AND AGENTS, AND MENTORS were vital adjuncts to this effort. Outstanding **4-H club leaders** (Irene Andersen, Mildred & Vernon Seeley, Rose Hendrickson), **county 4-H agents** (Ward MacMillen, Dorothy Keyes, Bill S. Wilson), and **Cornell entomology faculty** (Warren T. Johnson) provided continuing support (Dirig, 1971a). ***Rev. David W. Bouton***, an accomplished avocational lepidopterist and dealer, stimulated a nucleus of young moth collectors in northern Delaware Co.; while ***Max Richter***, the famous Catskill butterfly farmer (Fig. 31), inspired many others.

COUNTY-WIDE 4-H GROUPS developed around the Entomology Project, always driven by enthusiastic leaders or families (M. Seeley, 1994:90-91). The **Delaware County Entomology Club** (Dirig, 1966a-c; Figs. 24-25) and the **Entomologists' Club of Oneonta** (Hendrickson, 1971; Fig. 26) continued for several years, providing arenas to focus interest, coach on methods, ask questions, and learn from one another.

The **TEEN INTERNATIONAL ENTOMOLOGY GROUP** (TIEG), founded at Oneonta in 1964 by ***Colleen Seeley*** (Dirig & Johnson, 1971; M. Seeley, 1994:83; Fig. 26) and ***Carol Tubbs*** (Dirig, 1971b), was an unexpected outgrowth of entomological networking by a Catskill-area 4-H club (Fig. 30). TIEG was the first insect-oriented youth organization with an international membership, many of them interested in Lepidoptera (Arnold, 1972). Thirty-eight issues of the *TIEG Newsletter* (which later became a small entomological magazine; Fig. 29) were published 2-4 times a year between 1965 and 1981, and facilitated exchange of information, correspondence, and insect specimens. In its original format, this organization was supported by Cornell University Cooperative Extension, the Entomological Society of America, Entomological

Society of Canada, American Mosquito Control Association, and many individual donors, plus members' annual dues of $1- $2 in later years. There were 800 members in 1967, over 2000 by 1971, and nearly 3000 in 1975, from every U.S. state, and more than thirty other countries. Soon after, financial support dwindled, curtailing regular publication of the *Newsletter*. The group moved its headquarters to Michigan State University in 1977 (Hoopingarner, 1978). It was reorganized as the **Young Entomologists' Society** in 1984 (Dunn, 1985, 2002).

TIEG created a unique, inspiring, now-vanished teen culture (C. Seeley, 1968; Arnold, 1972; Dunn, 1990:1-3) through its synergy of widespread entomological interest with available adult guidance, professional financial support, and attractive publications (Fig. 29). Its early growth was advanced by Colleen Seeley's charismatic guides to collecting and rearing moths and butterflies, including notes on her apprenticeship at L. Hugh Newman's famous English butterfly farm in summer 1965 (C. Seeley, 1963a-b, 1966a-c; Newman, 1967:176; M. Seeley, 1994:83, 92-93). Colleen also served as Editor-in-Chief of the *Newsletter* from 1965 to 1971 (C. Seeley, 1971).

Four TIEG acquaintances (Scott Ellis, Carolyn Klass, Colleen Seeley, and I) matriculated at Cornell University in 1967 as entomology majors, joined the following year by Dick Arnold. We were all deeply engaged with Lepidoptera, and excited by the world-class resources and faculty, including ***Dr. John G. Franclemont***, a moth taxonomist (who had answered my beginner's questions about saturniids and underwings in 1963). After graduate school, it was my good fortune to work at Cornell from 1973-1976, assisting Warren Johnson in coordinating the 4-H Entomology Project and TIEG, and editing the *Newsletter*. Thereafter, ***Carolyn Klass*** maintained N.Y.'s 4-H Entomology program for many years.

In addition to helping us learn a great deal about Lepidoptera (including sphinx moths, which were always a favorite group), our involvement with 4-H Entomology and TIEG developed a habit of sharing information, specimens, and literature — which is a cornerstone of academic, scientific, and personal success in this field. I remain intensely grateful for the opportunities, excitement, and magic of those fresh years of personal discovery, which forged a lifelong dedication to Lepidoptera and the natural sciences.

ACKNOWLEDGEMENTS

These people shared Sphinx specimen records, livestock, and useful information: DELAWARE & SULLIVAN COUNTIES: Andrea Barron, Kristin Barron, B. Bunt, C. Bunt, Colleen Connolly, Thomas Dent (Fig. 25), J. Francis Dirig, John M. Dirig, Marjorie Dirig, Matthew F. Dirig, Rodney Dirig, Bette Jo Dirig O'Brien, Nancy Hardman (Fig. 25), Mabelle Maxson, Ronnie Miller, Rebecca Nevin, Michael Newman, and Frederick C. Schlauch. OTSEGO COUNTY: Tammie Cole, Melody Cole, Robert Hendrickson, Jr. (Fig. 26), Rose F. Hendrickson, Colleen Seeley (Fig. 26), Mildred D. Seeley, and Patti Ulm. My **parents and family** supported and facilitated my entomological efforts, including the Delaware County Entomology Club in 1965-1967. Important mentors, 4-H leaders, and Cooperative Extension agents and faculty were mentioned above. Torquato D. Rango allowed access to the Hungry Hill Bog in Delaware County. **Picture Credits:** Torben Russo shared feedback on my illustrations and advised on computer technology. Fig. 24 is by Marjorie Dirig; Fig. 25, by Ward MacMillen, is from the Delaware County Entomology Club archive; Figs. 26 & 31 are from *TIEG Newsletter* 6(4), winter 1971, pp. 6 & 25, respectively; and Figs. 27-28 are from the N.Y.S. 4-H entomology archive. All other figures are copyright © 2015 by Robert Dirig. **Reviewers:** Carolyn Klass, Scott LaGreca, Daniel Z. Rubinoff, Dale F. Schweitzer, and James P. Tuttle offered feedback on the manuscript and illustrations before publication.

LITERATURE CITED

Arnold, R., 1972, April. Butterflies In Mailbox. *Cornell Countryman* 49(6):10-11.

Barbour, R. W., & W. H. Davis, 1969. *Bats of America.* Lexington, Univ. of Kentucky Press, 286 pp.

Beadle, D., & S. Leckie, 2012. *Peterson Field Guide to Moths of Northeastern North America.* Boston & New York, Houghton Mifflin Harcourt, xii + 611 pp.

Brooks, K. L., 1979. *A Catskill Flora and Economic Botany. I. Pteridophyta, the Ferns and Fern Allies.* New York State Museum Bulletin 438: i-x, 1-276.

Brooks, K. L., 1985. *A Catskill Flora and Economic Botany V (Part 1). Sympetalae, Geraniaceae through Nyssaceae, Records of Distribution.* Typescript, [ii] + vi + 114 pp. [Vitaceae on pp. 37-42].

Cleveland, G. F., 1895, January. Exchanges, Lepidoptera. *Entomological News* 6(1):ii.

Cleveland, G. F., 1896. A List of Lepidoptera Taken at Oneonta, N.Y., 1894. *Entomological News* 7:72-74 [also includes a few records from 1893].

Dirig, R., 1966a. *Beginner's Guide to Collecting Insects.* Hancock, New York, v + 36 pp.

Dirig, R., 1966b. Formation of a County-wide Entomology Club. *TIEG Newsletter* 2(1): 6-7.

Dirig, R., 1966c. An Entomology Field Trip. *TIEG Newsletter* 2(2): 7-8.

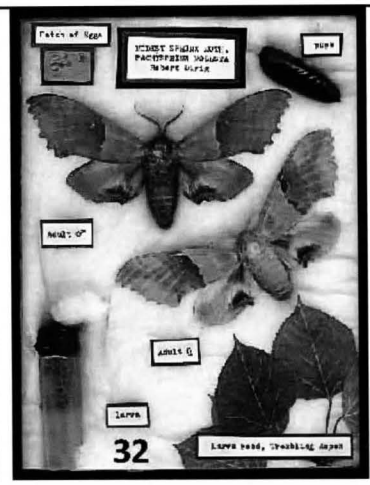
Dirig, R., 1966d. New York, pp. 9-10. ***In:*** Arnold, Dick (ed.), *First Annual TIEG Season's Insect Collection Summary for the 1966 Season.* Teen International Entomology Group, Cornell University, Ithaca, New York, 12 pp.

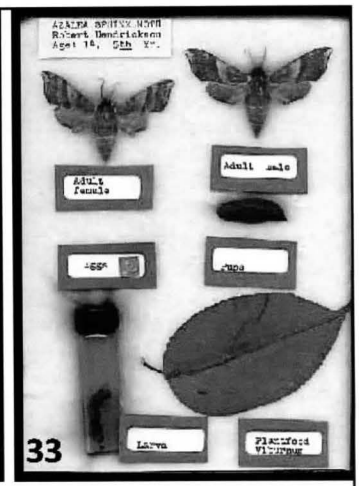
Dirig, R., 1967, Fall. Regional Reports. New York. *TIEG Newsletter* 3(4):9-10.

Dirig, R., 1971a. Hats Off To You! [Max Richter, Mildred & Vernon Seeley, Rose F. Hendickson]. *TIEG Newsletter* 6(4): 5-7.

Dirig, R., 1971b. Items of Interest [Carol Tubbs]. *TIEG Newsletter* 7(2):14-15.

Dirig, R., 1975a. *Growing Moths.* Ithaca, N. Y., College of Agriculture & Life Sciences, Cornell University, 4-H Members' Guide M-6-6, 39 pp.





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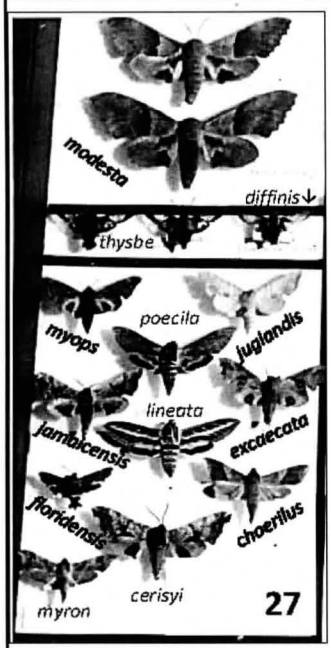

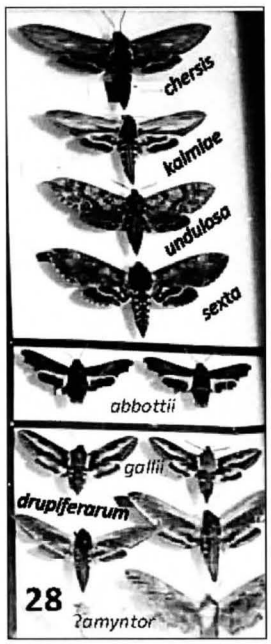

TEENAGED CATSKILL LEPIDOPTERISTS

CATSKILL SPHINGIDS IV: (**24**) At the first meeting of the **Delaware County Entomology Club** in Walton, N. Y., on 4 Dec. 1965, ***Robert Dirig*** demonstrated how to pin a moth. (**25**) New members ***Nancy Hardman*** & ***Tom Dent*** had already begun to collect. (**26**) A meeting of the **Entomologists' Club of Oneonta**, showing (*left to right*) ***Robert Hendrickson, Jr.***, ***Penny Groves***, and ***Colleen Seeley***, with Colleen's magnificent cases of tropical butterflies in the background. (**27-28**) ***Colleen***'s collection of **Oneonta sphinx moths, ca. 1963**. (**29**) The **Teen International Entomology Group** (TIEG) was founded in Oneonta in 1964; it published a quarterly newsletter/magazine 2-4 times each year (*Vol. 10, No. 1, May 1975*, is shown). (**30**) The **TIEG symbol** was derived from the **4-H Clover** (1967). (**31**) ***Max*** & ***Anna Richter*** welcoming visitors at their **Butterfly Farm**, 1970. Life cycle displays of **Modest Sphinx** (**32**) and **Azalea Sphinx** (**33**), prepared by 4-H members, preserved all life stages in Riker mounts, with associated notes on foodplants and timing of each life stage.

Dirig, R., 1975b. Bat Observed Feeding on a Small-eyed Sphinx, *Paonias myops*. *The Pitch Pine Naturalist* No. 3:5.

Dirig, R., 1975c, January. Regional Reports. New York State. [Ronnie Miller's B.C. records.] *TIEG Newsletter* 9(2-3):24-25.

Dirig, R., 1977. *Labelling and Storing an Insect Collection.* Ithaca, N.Y., New York State College of Agriculture and Life Sciences, Cornell University, 4-H Members' Guide M-6-7, 21 pp.

Dirig, R., 2012. Adult Feeding of the Snowberry Clearwing (*Hemaris diffinis*, Sphingidae), Including Drinking at a Stream. *Southern Lepidopterists' News* 34(2):107-108.

Dirig, R. 2015. Natural History Notes on Giant Silkworms (Saturniidae) of the Catskill Mountains, New York. *Southern Lepidopterists' News* 37(3):132-143.

Dirig, R., & W. T. Johnson, 1971, summer. Colleen Seeley. *TIEG Newsletter* 6(2):45.

Dunn, G. A., 1985, summer. TIEG/Y.E.S. 20th Anniversary: A Synoptic History of the Teen International Entomology Group and the Young Entomologists' Society. *Y.E.S. Quarterly* 2(3):1-5.

Dunn, G. A., 1990, Apr/Jun. Twenty-five Years of Youth and Amateur Entomology: A Historical Review of the Young Entomologists' Society. *Y.E.S. Quarterly, A Journal of International Amateur Entomology* 7(2): 1-8.

Dunn, G. A., 2002, Oct/Dec. A Historical Review of the Periodical Publications of the Young Entomologists' Society. *Y.E.S. Quarterly, A Journal of International Amateur Entomology* 19(4):1-8.

Eliot, I. M., & C. G. Soule, 1902. *Caterpillars and Their Moths*. New York, The Century Co., xiv + 302 pp. + 80 plates.

Fenneman, N. M., 1938. *Physiography of the Eastern United States*. McGraw-Hill Book Company, Inc., N.Y., xiv + 714 pp.

Forbes, W. T. M., 1928. Sphingidae, pp. 609-613. ***In*** Leonard, M. D. (ed.), A List of the Insects of New York, *Cornell Univ. Agricultural Experiment Station Memoir* 101:1-1121 + locality map.

Forbes, W. T. M., 1948. Sphingidae, pp. 176-202. ***In*** his *Lepidoptera of New York and Neighboring States*, Part II. *Cornell Univ. Agricultural Experiment Station Memoir* 274:1-263.

Hendrickson, R., 1971. Regional Reports, Central New York Area [Entomologists' Club of Oneonta]. *TIEG Newsletter* 6(2):12.

Hodges, R. W., 1971. *The Moths of America North of Mexico, Fascicle 21, Sphingoidea, Hawkmoths*. London, E. W. Classey Ltd. & R. B. D. Publications Inc., xii + 140 pp. + 14 plates.

Hodges, R. W., T. Dominick, D. R. Davis, D. C. Ferguson, J. G. Franclemont, E. G. Munroe, & J. A. Powell (eds.), 1983. *Check List of the Lepidoptera of America North of Mexico, Including Greenland.* London, E. W. Classey Ltd. & The Wedge Entomological Research Foundation, xxiv + 284 pp.

Hoopingarner, R., 1978. The Teen International Entomology Group. *Bulletin of the Entomological Society of America* 24(4):411.

Hudler, G., C. Klass, R. Hoebeke, & R. Morse, 1994. Warren T. Johnson, April 22, 1925 – November 9, 1994. Cornell University Faculty Memorial Statement: http://ecommons.library.cornell.edu/handle/1813/17813.

King, M., 2009, June. Tiny Beetle, Big Problem: DEC Battles the Emerald Ash Borer. *New York State Conservationist* 65(6):24-27.

Newcomer, E. J., 1965, Jan. 15. Scholarship Won. *News of the Lepidopterists' Society* No. 1:1.

Newman, L. H., 1967. *Living with Butterflies*. London, John Baker Publishing Ltd., x + 228 pp. + 63 photo-plates.

Reuter, E. C., 2014. *National Moth Week: Exploring Nighttime Nature. Discovering Moths in The Southern NY Catskill Mountains;* Nationalmothweek.org/2014/01/15 [accessed 19 Feb. 2016.]

Schweitzer, D. F., M. C. Minno, & D. L. Wagner, 2011, September. *Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forests and Woodlands in the Eastern United States.* Forest Health Technology Enterprise Team, FHTET-2011-sphinx01, vi + 517 pp.

Seeley, C., 1963a. *Moths of the Woodside*. Laurens, N.Y., Village Printer, 40 pp.

Seeley, C., 1963b. *How To Raise Butterflies and Moths.* Educational Leaflet, N.Y.S. Dept. of Environmental Conservation, 2 pp. [reprinted from the April-May 1963 issue of *The Conservationist* 17(5):48-49].

Seeley, C., 1966a. The Termination of Saturniids' Diapause. *Journal of the Lepidopterists' Society* 20:47-48.

Seeley, C., 1966b. *Youth Can Teach: A Demonstration in 4-H Entomology* [how to collect & raise moths]. A 16 mm color film, 30 minutes. Media Services, N.Y.S. College of Agriculture & Life Sciences, Cornell University, Ithaca, N.Y.

Seeley, C., 1966c. To England on Butterflies. *TIEG Newsletter* 2(3):7-9 [reprinted in 1975, *TIEG Newsletter* 10(1):23-26].

Seeley, C., 1968, March 16. Butterflies in My Mailbox. *National Geographic School Bulletin* 46(25):394-397.

Seeley, C., 1971, spring. Editor's Page. *TIEG Newsletter* 6(1):1-2.

Seeley, M., 1994. Part 4, "The Children," pp. 78-93. *In For the Love of Dolls and Roses, A Story of the Author, Her Life, Her Successes and Failures.* Livonia, Michigan: Scott Publications, viii + 182 pp.

Thouron, H. A., 1967. *Honoring the 1967 Winners of Entomology Awards Program.* Hercules Inc., 9 pp.

Tuttle, J. P., 2007. *The Hawk Moths of North America, A Natural History Study of the Sphingidae of the United States and Canada.* Washington, D.C., The Wedge Entomological Research Foundation, xvix + 253 pp. + 24 color plates.

Wagner, D. L., 2005. *Caterpillars of Eastern North America, A Guide to Identification and Natural History.* Princeton and Oxford, Princeton University Press, 512 pp.

Wagner, D. L., 2012. Moth Decline in the Northeastern United States. *News of the Lepidopterists' Society* 54(2):52-56.

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LITHOPHANE VIRIDIPALLENS GROTE, 1877 (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

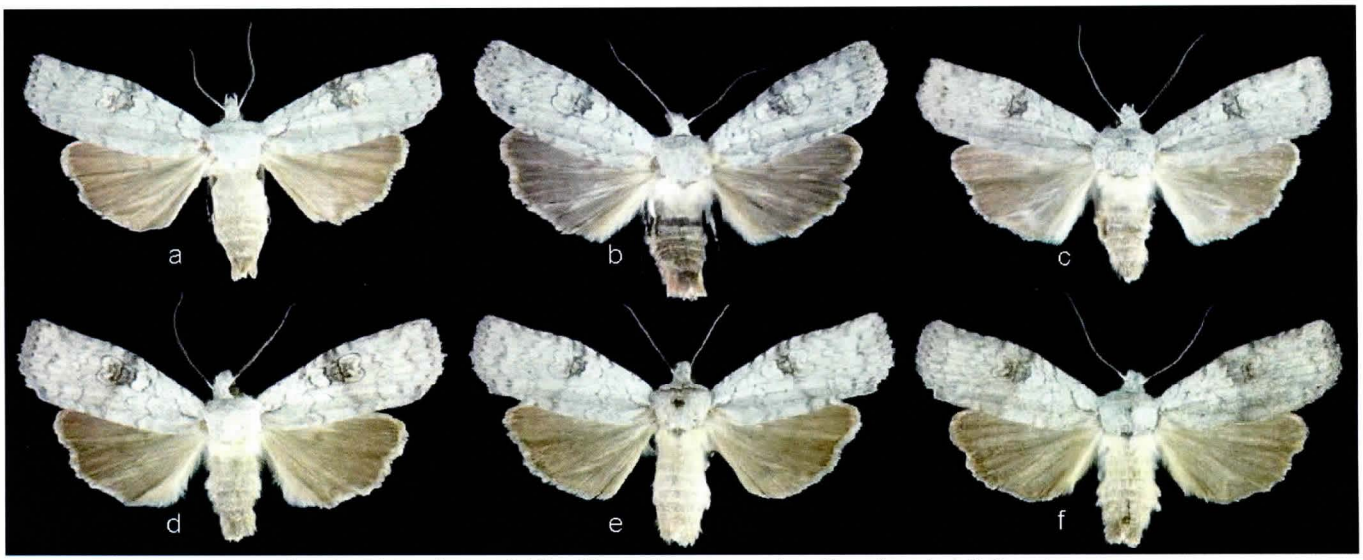

Fig. 1. ***Lithophane viridipallens*** phenotypes: (a - d) males, (e - f) females.

The rarely encountered winter moth ***Lithophane viridipallens*** Grote (Fig. 1) is reported here as being new for the state of Louisiana. Only 16 adults have been captured over 46 years (1969-2015) of non-stop, continual nightly light trapping in locations across the state. Despite this herculean light trapping effort, these few adult specimens were all captured at one location in eastern Louisiana, the **Abita entomological study site*.

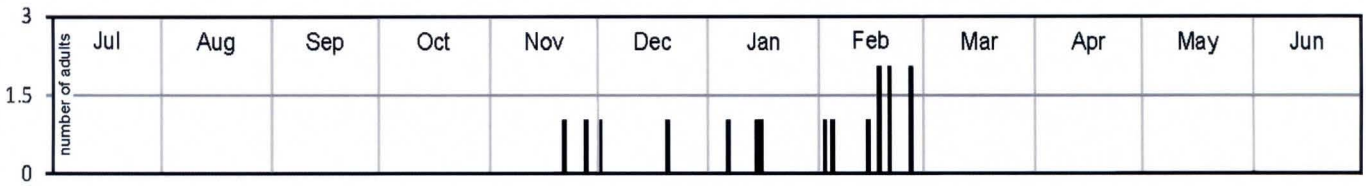

Fig. 2. Adult ***Lithophane viridipallens*** captured in Louisiana. n = 16

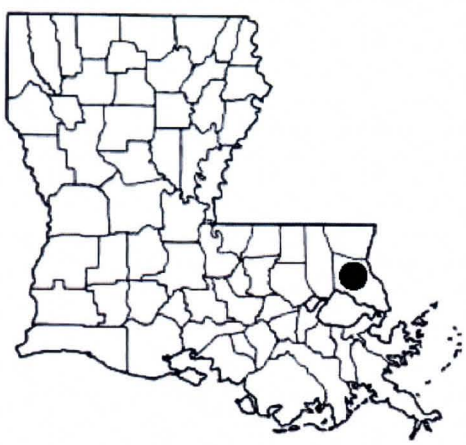

Fig. 3. Parish records for ***Lithophane viridipallens***.

L. viridipallens appears to occur most notably at very near Atlantic coastal localities in mostly Atlantic coastal states from Maine to South Carolina and Georgia, with the apparent disjunct records in southeast Louisiana, and east Texas [one record from Sabine County, Texas (per. comm. Edward Knudson)]. ***L. viridipallens*** was not addressed by Covell (1984). Three species of ***Lithophane*** were listed by Heppner (2003), but none of these are ***viridipallens***. Forbes (1954) listed specimens of ***viridipallens*** from Massachusetts, Connecticut, New York, New Jersey, Georgia, and in Texas as ***Lithophane pruena*** (Dyar,1910), originally as (*Graptolitha pruena* Dyar, 1910 190, Type locality: Texas, Calhoun Co.), now a synonym of ***viridipallens*** (Lafontaine & Schmidt, 2015).

Recently, (Ken Childs, per. comm.) posted on the public Facebook group, 'Mothing and Moth watching', an excellent photo of ***viridipallens*** from his farm in Chester County, western Tennessee. Ken reports capturing dozens of adults primarily using bait placed upon Holly leaves in the months of February to April and especially early to late November of 2015. Eric C. Reuter reported a nice example of ***viridipallens*** photographed at Coffeyville, Montgomery County, Kansas, apparently a state record and the most westerly known location for this species.

The dates of capture in Louisiana are illustrated in Fig. 2, and the parish records are illustrated in Fig. 3.

I thank Ken Childs for compiling the dates and records cited here for this species in Tennessee, and for calling my attention to the Kansas record and to Eric C. Reuter for confirming the data for the Kansas record and to Edward C. Knudson for providing the additional Texas record.

***Abita entomological study site**: sec.24, T6S, Range 12 East, 4.2 miles northeast of Abita Springs, St. Tammany Parish, Louisiana

Literature Cited

Covell, Jr., C.V., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Forbes, W.T.M., 1954. *Lepidoptera of New York and neighboring states, Noctuidae, Part III*, Cornell Univ. Agr. Exp. St. Mem. 329. Ithaca, New York, 433 pp.

Heppner, J.B., 2003. *Arthropods of Florida and neighboring land areas*, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Lafontaine, J.D, & Schmidt B.C., 2015. *Additions and corrections to the check list of the Noctuoidea (Insecta, Lepidoptera) of North America north of Mexico III.* In: Schmidt BC, Lafontaine JD (Eds) Contributions to the systematics of New World macro-moths VI. ZooKeys 527: 127-147. doi: 103897/zookeys.527.6151

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November 17, 2015, Ricky Patterson visiting Vernon Antoine Brou Jr. and Charlotte Dozar Brou at the Abita Entomological Study Site.

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OKLAHOMA: SOONER & LATER

BY

CRAIG W. MARKS

Before my Dad (and my Mom) moved to Tennessee to pursue employment opportunities, both of my parents had resided in and around the Oklahoma City (OKC) area since childhood. My Dad had attended Oklahoma State (then A&M) University before joining the US Army. As I grew up, our annual vacations were typically back to Oklahoma to visit the many relatives that still lived there. My maternal grandfather had a ranch northeast of OKC, and my great uncle farmed wheat northwest of OKC. We rotated back and forth between those locations, both providing ample opportunity to explore the unique Oklahoma landscape (which was quite different from West Tennessee's delta). Between the horned toads, tarantulas, scorpions, collared lizards and prairie dogs, there was always something exciting to investigate.

Even after my brother and I moved to Louisiana and started to raise our own families, my parents would occasionally return to Oklahoma to see remaining relatives. My Mom stopped going once diagnosed with multiple myeloma, but my Dad continued to go for a few years. Eventually, even his trips stopped so he could stay close to home and my Mom. After Mom passed and Dad moved to Louisiana, he and I discussed going back to Oklahoma to see his Great Aunt and visit some of the places of his youth as well as some he had always heard about but never seen.

Our first trip was during the first week of August of 2014. My father and I spent a week visiting various locations around the State. In addition to visiting family, he showed me where he, his Dad and his Dad's dad lived, worked and went to school. And, we made time to see some butterflies. Our first butterfly stop was at Lexington Wildlife Management Area (WMA), south of Norman. I was able to spend about two hours searching the site, mostly along the road to and in the area of Dahlgren Lake. There were a lot of butterflies flying, and I ended up seeing 23 species. The next butterfly stop along the western Oklahoma-Texas border, first at the Washita Battlefield, then Black Kettle Rec Area in the Black Kettle Grasslands and finally the Antelope Hills. We next moved south into the Wichita Mountains with one day spent at Quanah Parker Lake and then on the Elk Mountain Trail. The next day was at Lost Lake. We saw a total of 49 species, including two lifers for me [Bronze and Nysa Roadside Skippers (*Amblyscirtes aenus* and *nysa* respectively), both in the Wichita Mountains].

I very much enjoyed both the history lessons (about our family and Oklahoma) as well as the butterflies, so when my Dad asked if I would drive him back to OKC for his high school reunion in September, 2015, I agreed readily. Some additional background is required here. I am working on a large scale research project that will, I hope, result in a published book about what butterflies have been found in Louisiana (and where). Historical records include one questionable mention of a Leonard's Skipper (*Hesperia leonardus*) recorded in northwestern Louisiana back in 1939. Kilian Roever had been kind enough to give me some additional background on that record, and, knowing that I had visited Oklahoma in 2014, Kilian let me know that he had previously seen Leonard's Skippers at McGee Creek WMA in southeastern Oklahoma in September. I had never seen Leonard's Skippers before so, with Kilian's information, I began to put together an itinerary that would get Dad to OKC for his reunion and allow me some time to visit McGee Creek WMA. Thinking I could work in two days in the field looking for butterflies, I contemplated a second location. It just so happened that I discovered a series of e-mails on the Oklahoma butterfly listserv about Dotted Skippers (*Hesperia attalus)* in Oklahoma which revealed that skipper had been found at Lexington WMA in June and September.

The Dotted Skipper was another questionable record I had found while researching my book on Louisiana butterflies. Available information suggested it was found once in the late 1970's during a Xerces Society 4th of July Count in St. Tammany Parish. There were no specifics, and I found no other records to indicate that skipper's presence within the State before or since. The Dotted Skipper is another skipper I had not previously seen, so I chose it as my second target during the trip to Oklahoma. Our plan was to leave Wednesday night after my work and go to Shreveport. On Thursday, we would stop at McGee Creek WMA on the way to OKC. Friday would be spent visiting relatives, then I would drive down to Lexington on Saturday while my Dad attended his reunion.

My Dad and I visited McGee WMA Thursday afternoon, September 10, 2015, from about 1:45-4:15. McGee Creek WMA encompasses about 10,000 acres in Atoka County, near Atoka OK, on Greasy Bend Road. It is located just east of McGee Creek Lake, well known for outstanding fishing. It is also adjacent, in part, to McGee Creek

State Park. The habitat is a mixture of oak and hickory forests with stands of short-leaf pine. Located in the Jack Fork Mountains, the terrain can be moderately steep with rocky outcrops. The WMA is managed for hunting through the creation of wildlife habitat plots and prescribed burns. There are several roads through the area with a main road running north and south and a few side roads running mostly west.

I was primarily around parking lots 1 & 2 on the main north-south road. A helpful member of the WMA's staff who was preparing areas of the unit for the upcoming deer season advised me of a small creek down the road/hill from parking lot #2. The unit was pretty dry so I thought it best to continue my searching where there would be some moisture. As I started down the road/hill, I could see stands of tall, blooming boneset back in the trees to my left (east). The woods were open without much underbrush so that I could see about 100 feet into the woods. Once I walked into those woods, I discovered there was a lot of thistle in bloom along with the boneset. I had already see several Crossline Skippers (*Polites origenes*) on low growing asters in the grass parking lots, but those stands of boneset and thistle were literally crawling with Crossline and Tawny-edged Skippers (*P. themistocles*). I easily saw 100 Crosslines. I had been there about 2 hours when I saw my first Leonard's Skipper, a female taking nectar at a tall boneset. Because of her unique coloring, I saw her from several feet away as I was approaching.

Leonard's Skippers are a fairly large sized member of the Hesperia subfamily, about the same size as a Sachem (*Atapedes campestris*). It ranges across the northern U.S, from Maine to the Dakotas, as well as extending southward into the Carolinas along the east coast and then into Oklahoma and Arkansas as the most southwestern extension of it range. In the south and the east, the subspecies is *H. l. leonardus*, while in the west (a transition line runs from Minnesota into Iowa), it is the much more plainly marked and lighter colored, *H. l. pawnee*. Spencer (2006) described it as an "irregular emigrant" present in scattered locations from northern and central Arkansas, and there are several reports on the Arkansas listserv of September sightings, including some by Cheryl (C) and Norman Lavers (NL) who provided the photos for this article. With its size and rusty, red-brown ventral coloring, this handsome skipper is distinctive. When feeding at flowers with other skippers, its size and color makes it easy to recognize, even from several feet away. On the ventral hindwing, both sexes will show an sideways "V" shaped row of white (female) or yellow (male) spots. This species is further unique in that it is single brooded, flying in September into October in the southern portion of its range.

Over most of its range it is reported as local and uncommon. Its preferred habitat is varied, but it tends to frequent open areas such as dry, upland prairie savannas, scrub oak and pine clearings, old fields and roadsides where its host plants are found, to include bentgrass (*Agrostis ssp*), switchgress (*Panicum virgatum),* tumble-grass (*Eragrostis specabilis*), Little Bluestem (*Andropogan scopartius*) and grama grass. Males are reported to both perch and patrol. It is attracted to plants with tall flower stems, particularly blue and purple flowers such as ironweed, thistle, blazing star and asters. Boneset is also referenced.

It was another hour or so (around 4:00 pm) before I found another Leonard's, this one on thistle, but I then quickly saw two more, also at thistle. All four found were fresh females, and they were quite docile as they feed. Pearl Crescents (*Phyciodes tharos*), Little Yellows

Dorsal female, October 2, 2011, Saline Co., AR (C/NL)

Ventral female, May 2, 2009, Pope Co., AR (C/NL)

(*Eurema lisa*), Crossline and Tawny-edged Skippers were abundant, and Cloudless Sulphurs (*Phoebis sennae*) and Southern Broken-dashes (*Wallengrenia otho*) were common. I ended up seeing 29 species, including three Delaware Skippers (*Anatrytone logan*) and 2 roadside skippers that were too worn to identify by species.

The next day we visited my 92 year old Great Aunt Helen Waller in Cashion, OK. Helen was married to my Great Uncle Wesley Waller (the afore-mentioned wheat farmer). Uncle Wesley was the brother of my Dad's mother, Viva Waller Marks. Their mother was Eda Hess Waller, who I called my grandmother but was actually my great grandmother (pay attention, you'll be tested on this later). Eda's father was CJ Hess, who came down from Kansas in 1889 to participate in the

Oklahoma land rush. He ended up picking a quarter section (160 acres) about 5 miles north of the current town of Piedmont as his homestead.

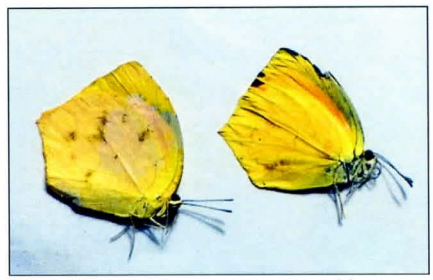
The process was this, he had to go to the four corners of the quarter section and retrieve a chit (one version of the story indicates the chit was a piece of paper stored under a rock, the other had it as a stake with a ribbon on it). The chits were then turned over to the Land Office, and if the property was occupied for a sufficient period of time, ownership would be vested in the homesteader. Well, CJ had gathered three of the chits and arrived at the southeast corner to find a man squatting in the shade of his horse. That man (referred to in those times as a "Sooner" because he went in too soon, giving genesis to the nickname of the University of Oklahoma) had the fourth chit along with a pistol tucked in his belt. CJ ended up giving him a $20.00 gold piece for the forth chit. He initially built a "soddy," then a one room house made with rough hewn boards (for he, his wife and four children), and finally a multi-room two story house on that homestead.

My Dad and I were able to find that homestead. There is a crude oil/ natural gas pumping station on the SE corner where the Sooner had squatted. The area where the soddy and houses stood is open field, but most of the property is being turned into a residential community. There was/is a creek with a high cut west bank along the western edge of the quarter section. My Dad has a picture of CJ standing down in that creek bottom alongside a horse drawn wagon containing several members of his family. Although numerous trees have grown up and now line the creek, we were able to find that exact spot where the picture was taken over 100 years ago.

On September 12, 2015, I drove down to Lexington WMA, arriving about 9:30 am. Further to the north and west than McGee Creek but still south and east of OKC, Lexington WMA is about 9,500 acres in size near Noble, OK, in Cleveland County, off of Highway 77. It has two lakes, the larger being Dahlgren Lake where fishing is allowed. There are also several creeks that cross the WMA. The habitat is post oak-blackjack (referred to as "crosstimbers" habitat), with several large open, grassy meadows. As with McGee Creek, this WMA is managed for hunting with prescribed burns and wildlife food plots. There are several roads allowing access into the WMA, with one to each of the lakes.

My day was spent primarily in the vicinity of Dahlgren Lake. I started in a grassy meadow west of and above that lake where I found numerous Arogos Skippers (*Atrytone arogos*). Although not so in Oklahoma, Arogos Skippers are a rare find in Louisiana, and this was the first time I had seen the plains subspecies, *A. a. iowa.* In that same field, out in the open areas as well as in the woods, I counted 45 Common Wood Nymphs, mostly the large, paler colored females. Just before I moved away from the field I witnessed an American Lady get caught by a yellow crab spider that had staked out one of the numerous yellow coreopsis flowers.

While working around the lake, I saw two Mexican Yellows (*E. mexicana)* and three Tailed Oranges (*E. proterpia*), the latter of which, according to John Fisher, constituted a state record. I had previously seen that sulphur at Big Bend and in Arizona, so I knew what I was looking at when I saw it. Glassberg has referred to it as a rare stray ranging up to Kansas and Nebraska, and because I was also seeing Mexican Yellows (present in even greater numbers the year before), I never considered that its presence in Oklahoma had not previously been recorded.



Tailed Oranges, September 12, 2015, Lexington WMA

At the lake, Gemmed Satyrs (*Cyllopis gemma*), Eastern Tailed-blues (*Everes comyntus*) and Pearl Crescents were abundant, and Viceroys (*Limenitis archippuis*) were common. Behind the levee on the east end of the lake, I found numerous stands of tall thistle. As had been the case at McGee Creek, the prominent butterflies at that thistle were Crossline and Tawny-edged Skippers. I also found Delaware Skippers and Little Glassywings (*Pompeius verna*), the latter which, again per John Fisher, was a county record. Around 2:00 pm, I approached a stand of thistle on which I could see several skippers, one of which was larger and lighter colored that the others, a female Dotted Skipper.

The Dotted Skipper is another member of the Hesperia subfamily, with two subspecies, *H. a. attalus* and *H. a. slosonae.* The former is indigenous to the southern plains, including southern Kansas, Oklahoma and the panhandle region of northern Texas. The latter subspecies is found in the eastern U.S in the Pine Barrens of New Jersey, the Sand Hills region of North Carolina and northern and central Florida. There are old and scattered records from Georgia, Alabama and Mississippi, as well as Pennsylvania, Maryland, New York and Massachusetts. In the northern portion of its range, it is single brooded. Throughout the rest of its range, there are two broods, May to June and August into September.

Its preferred habitat is grassy places in open, wooded areas of mostly

Male, ventral, Okaloosa Co., FL, April 9, 2005 (MAF)

Female, ventral, Okaloosa Co., FL, August 20, 2007 (MAF)

pines and small oaks. The Southern Plains subspecies inhabits sandy, short grass prairie near pine woodlands and oak savannas Males are reported to be territorial, and both sexes visit flowers. Liatris and thistle are listed a favorites. About the size of Meske's Skippers (*H. meskei*) and similar in appearance to male Crosslines, it can be distinguished from those and other similarly sized and colored grass skippers by the row of small but sharply defined spots on the ventral side of the lower wing; however, those spots are sometimes absent on the males. On the female, there is also a spot band on the dorsal lower wing that is diagnostic. It has been described as local and uncommon to rare across its eastern range and uncommon on the Plains.

As part of my efforts to learn more about this skipper I sought "first hand" information from others familiar with it. One invaluable source was Mary Ann Friedman (MAF). She was also kind enough to send me the pictures included within this article. She has found this skipper in the extreme western section of the Florida panhandle in habitat she described as Pine Flatwoods. Of interest to me was her comment that she had seen Arogos Skippers on the same day in the same locale. She further reported seeing *arogos* and *attalus,* both in wet pitcher plant-type areas and in more upland, drier habitats. Her impression was that the two species often flew at the same time. One common thread was abundant nectar such as *Balduina*, Buckwheat, *Liatris*, Rosinweed or ironweed. She has found it in upland areas with grasses like *Conradina conescens* (April) and *Balduina angustifolia* (October). The food plant in Florida has been reported to be wiregrass (*Aristidia stricta* var. *beyrichiana*). It also may use bluestems (*Andropogon* and *Schizachyrium* species), or lopsided Indiangrass (*Sorghastrum secundum*). On the Southern Plains, it is reported to use sideoats (*Bouteloua curtipendula*), fall witchgrass (*Leptoloma cognatum*) and fall switchgrass (*P. virgatum*).

I ended up seeing 40 species at Lexington that day, including one more Dotted Skipper, a male. About 4:00, I had moved back up the road toward the open meadow visited earlier in the day, but this time I walked into the woods (a combination of open pines and scrub oak) where I had seen stands of blooming thistle. As with the female, the Dotted male was sharing a thistle bloom with a couple of Crossline Skippers, and he caught my attention because of his lighter coloring.

My Dad and I are already in the planning stages for our 2016 trip to OK. We will first head back to OKC to visit Aunt Helen again, then start west to Fort Reno and Fort Supply. From Fort Supply (just east of the panhandle), we will head down to Four Canyon Preserve, and then probably back to the Wichita Mountains. We are looking at making the trip in early June, and I'm now working on identifying what western species might be flying and where.

References

Brock, Jim P. and Kaufman, Kenn, 2003. *The Kaufman Focus Guide to Butterflies of North America.* Houghton Mifflin Co., 384 pp.

Cech, R., and G. Tudor, 2005. *Butterflies of the East Coast: An Observer's Guide.* Princeton University Press, Princeton, NJ. 345pp

Dole, John M., Walter B. Gerard and John M. Nelson, 2004. *Butterflies of Oklahoma, Kansas and North Texas.* University of Oklahoma Press, Norman, OK. 282 pp.

Ely, Charles A., Marvin D. Schwilling and Marvin E. Rolfs, 1986. *An Annotated List of the Butterflies of Kansas.* Fort Hays State University, Hays, KA. 224 pp.

Glassberg, Jeffrey, 1999. *Butterflies through Binoculars: The East.* Oxford University Press, New York and Oxford. 242 pp.

Glassberg, Jeffrey, 2012. *A Swift Guide to Butterflies of North America.* Sunstreak Books, Inc. China, 415 pp.

Harris, L. Jr., 1972. *Butterflies of Georgia.* University of Oklahoma Press, Norman, OK. 326 pp.

Heitzman, Richard J. and Joan E. Heitzman, 1987, 1996. *Butterflies and Moths of Missouri.* Missouri Department of Conservation, Jefferson City, MO. 385 pp.

Howe, William H., 1975. *The Butterflies of North America.* Doubleday and Company, Inc., Garden City, NY, 631 pp.

Opler, P.A. and V. Malikul, 1984. *Butterflies East of the Great Plains.* Houghton Mifflin Co., Boston MA. 486 pp.

Patterson, Jim, 2006, 2011. *The Butterflies of Minnesota, A 'flier's manual.* Trafford Publishing, LaVergne, TN. 410 pp.
Pelham. J.P., 2008. A Catalogue of the Butterflies of the United States and Canada, *The Journal of Research on the Lepidoptera.* 40: 91.
Raney, Hershel, 2008. Butterflies of Arkansas. www.hr-rna.com/RNA/Butterfly%20main.htm.
Schlicht, Dennis, John Downey and Jeff Nekola, 2007. *The Butterflies of Iowa.* University of Iowa Press, Iowa City, IA. 252 pp.
Schweitzer, D. F., M. C. Minno, and D. L. Wagner, 2011. *Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forests and Woodlands in the Eastern United States.* U.S. Forest Service, Forest Health Technology Enterprise Team, FHTET-2011-01.
Sedman, Yale and David F. Hess, 1985. *The Butterflies of West Central Illinois.* Western Illinois University, Department of Biological Sciences, Macomb, IL. 120 pp.
Spencer, Lori A., 2006. *Arkansas Butterflies and Moths.* University of Arkansas Press, Fayetteville, AR. 300 pgs.
Wauer, Roland H., 2006. *Finding Butterflies in Texas, A Guide to the Best Sites.* Johnson Books, a division of Big Earth Publishing, Boulder CO, 327 pp.
www.wildlifedepartment.com/facts_map/wma/mcgee.htm
www.wildlifedepartment.com/facts_map/wma/lexington.htm

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Fig. 1.

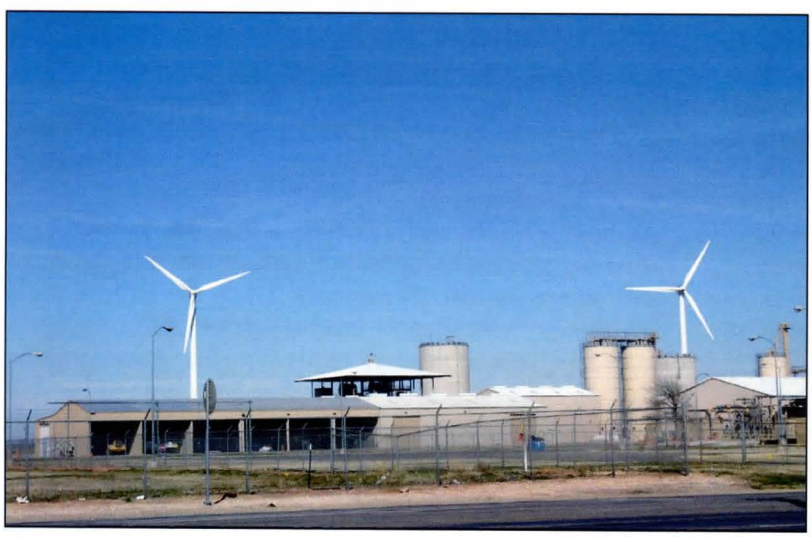


Fig. 2.

WINDMILLS IN THE CITY OF LUBBOCK, TEXAS, AND AREAS SOUTHEAST OF LUBBOCK [1,2]

Huge cotton processing plant within the City of Lubbock, Texas (close to the edge of the City), is powered by ~15 windmills (Fig. 1 & 2). This industrial area is only 4 miles from Buffalo Springs Lake which is a "*great*" butterfly collecting location.

Approximately 90 miles south of Lubbock in Scurry County are located six wind farms with turbines that number in the many hundreds.

In Nolan County (kitti-corner to Scurry County), Texas, the small city of Roscoe (estimated population 1324 in 2014) located at the intersection of Interstate 20 and US Highway 84 (~110 miles southeast of Lubbock, Texas) is one of the world's largest capacity wind farms. When completed in 2009 it had 634 wind turbines with a total capacity of 781.5 megawatts. (California currently is the leader with a wind farm with a 1020 megawatt capacity.) The Roscoe wind farm cost >1 billion dollars to construct. It can provide enough energy to power 250,000 average homes. The landowners in the area realize anywhere from 500 to 1000 dollars for lease of their land for each windmill per year.

(Continued from page 2.)
Hodges (1971), and J. P. Tuttle (2007) are exemplary.

The publication of C. Covell's *Field guide* in 1984 was transformative. For the first time ever, I had a chance to identify most of the macromoths around outdoor lights. I am most fond of the Geometridae (especially Ennominae): in terms of pure beauty, in color and composition, they have it all. During my free time in the latter 1980's, I pursued geometrids and little else. I black-lighted incessantly in Minnesota and Michigan, and was reluctant to come indoors at night for fear I'd miss the one Purple Plagodis I had seen, or thought I'd seen. I accumulated a long list of unforgettable geometrid 'first encounters', thanks to the use of Charlie's book. I caught my breath in near-disbelief when I saw my first Snowy Geometer (*Eugonobapta nivosaria*), perched in elegant silence in the chill of a Minnesota night.

In 1980, I joined a small group from the U.S. for a summer of butterfly collecting in the Peruvian Amazon. To me, many of the Neotropical butterflies are unbearably, almost mythologically, beautiful. Two websites, in particular, have been very useful to me: butterfliesofamerica.com and Mississippi State's mothphotographersgroup.msstate.edu. Each of these represents an extraordinary amount of the most careful work, and while clicking through them, the drive to learn more becomes irresistible. I strongly recommend these sites to any young person who may want a hobby which involves great beauty, complexity, and meaningful connections to history.

Equal to my childhood love of Lepidoptera was my appreciation of animals in art, especially the depiction of mammals in graphic art and sculpture. I became convinced that hunters and sculptors (including taxidermists) know the behavior and anatomy of the world's megafauna better than anyone. Because of their knowledge of big game and their conservation-mindedness, my childhood heroes were Carl Akeley and Theodore Roosevelt. Naturally, I gravitated strongly toward the big museums, where the painstakingly-wrought dioramas (habitat groups), created during the 'golden age' of museum expeditioneering, represented, to me, the highest form of scientific and artistic achievement. Akeley, the father of modern taxidermy, was a superb sculptor with a focus on African mammals, and I was determined to visit or work in the studios in Chicago and New York in which he had so masterfully completed his work.

Because of their sheer beauty and the anatomical information they contain, my main practical hobby during adolescence was skull collecting. During the 1960's, I cleaned and reassembled the skeletons of a range of mammalian species. Beginning in 7th grade, my parents allowed me to travel north to the Twin Cities on occasional weekends to serve as an assistant in a big taxidermy studio in St. Paul. No money changed hands: the currency in which I was paid consisted of frozen bodies from which the skins had been taken and tanned for hunters. On weekends at home, unspeakable things were happening in our basement, as I dismantled bodies and boiled the severed heads and removed the eyeballs and tongues and brains of bears, wolves, coyotes, foxes, lynx, moose, and other northern mammals. Girlfriends dropping in could be awkward.

During high-school summers, I sought opportunities to work in each of the two marvelous museums about which I had dreamt every day of my childhood. During 1967 and 1968, I served as a summer curatorial assistant in the mammal division at the Field Museum of Natural History in Chicago. My main assignment was as a preparator of skeletons arriving from museum expeditions. In the exhibits studio, I helped with the completion of the museum's updated diorama depicting Neanderthal man. I worked with sculptor J. B. Krstolich, who had prepared, in 1951, an iconic exhibit at FMNH: the 550-pound gorilla "Bushman".

When I was 17, I had the thrill of moving to New York City for one summer, where I worked as a research assistant in the mammal department at the American Museum of Natural History. My chief assignment was the elaboration of replies to letters of inquiry so frequently to be found in the day's mail of the department. Having been captivated at an early age by the heroic American Museum Congo Expedition of 1909-1915, I was overjoyed to be working in the setting in which it all began, and where its results continue to be so visible.

The summer I spent in Manhattan, 1969, was electrifying: a civil war of values raged across the country, AMNH celebrated its 100th year, Woodstock occurred upstate (I missed it), and our Apollo 11 astronauts returned from history's first moon-walk to a tumultuous welcome and ticker-tape parade in Lower Manhattan (later described as the biggest peace-time celebration in history, involving 4 million people and me).

At both FMNH and AMNH, I had the privilege of working alone among the collections late into the night and on weekends. Frequently, when the exhibit halls were empty and silent, I used an office chair on wheels to creep from exhibit to exhibit in the African halls, studying every detail of the dioramas, imagining the lives not only of the animals but of the artists and adventurers who conceived of such marvelous works. The Akeley Hall of African Mammals in New York, with its 28 magnificent megafaunal dioramas, is truly the 'Sistine Chapel' of zoology.

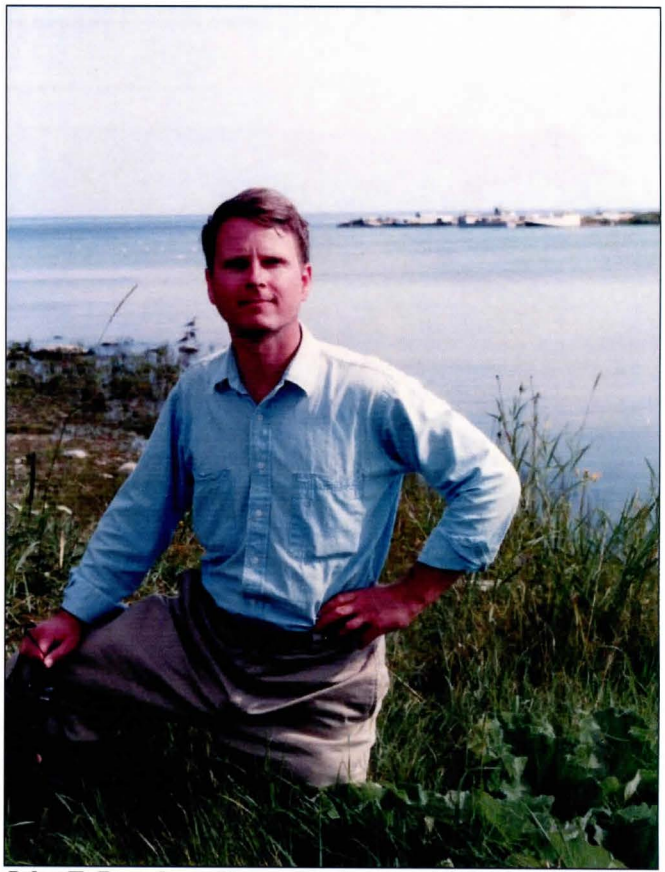
The week after graduating from high school in 1970, I borrowed a car and headed south to begin a month of volunteer work with the Park Naturalists at Everglades National Park. My first stop in Florida was at Manatee Springs: I was shocked by the beauty of it, and I've made the drive to Florida annually ever since. My favorite places in Florida to pursue insects nowadays are along the west coast: wading into the Gulf Hammock's blackwater swamps, it feels as if I am descending into the Eocene.

I applied to Harvard in 1970 and was thrilled to be accepted. Because of its world-class libraries and the MCZ and the fact that E. Mayr and A. S. Romer and other renowned authors of biological books and ideas were still on the faculty, I had no doubt about where I'd go. I didn't know a soul when I arrived in Cambridge, but my roommates were skilled birdwatchers and I felt fortunate to be among them. At every opportunity, we hitchhiked to places up and down the Eastern Seaboard, seeking better looks at birds ranging from loons to longspurs and everything in-between. My mentor in mammalian paleontology at Harvard was Bryan Patterson, son of the British officer who vanquished the man-eating lions of Tsavo in 1898. In our initial meeting at the MCZ, it dawned on me that each of us had held, as our first real job, the exact-same position: mammal preparator at FMNH (he at age 17 in 1926, I at age 15 in 1967). I graduated from Harvard in 1974 after many formative experiences there. I have missed its amazing libraries ever since.

During summers in the 1970's, I enjoyed research and teaching assistantships at Archbold Biological Station (Lake Placid, FL) (reptiles), the University of Michigan Biological Station at Pellston (vertebrate zoology), and the University of Montana Biological Station at Bigfork (mammals). I pursued graduate work in reptile ecology at USF (Tampa) and at Archbold in 1974-1976, and benefited enormously from the guidance of J. N. Layne. I received my Master's degree in Zoology from the University of Michigan (Ann Arbor) in 1979.

During every school year from 1983 to 2010, I taught biology at a fine boys' prep school in Toledo, Ohio: St. John's. I found every single day to be rewarding and fun. With my Science Club, on monthly after-school tours, groups of 9th-graders and I visited laboratories, factories, and farms. We learned about rocket-engine design, ostrich-rearing, condensing of milk, fabricating of glass, brewing of beer, storing of grain, and mixing of cement. My most-stressful experience as a teacher occurred after I asked a girls' school to send students along on one of our trips: Late on a cold winter night, returning from Cleveland on the interstate, our bus broke down, and the kids had to huddle together in the snow to keep warm, well off the road-way, *in the dark*.

A most-exciting period of immersion in tropical butterfly work began for me in 1991. Drs. Lee and Jackie Miller at the Allyn Museum (AME) in Sarasota were interested in expanding the museum's collections of butterflies and skippers from East Zaire, and simultaneously I received permission to collect insects in the Ituri Forest, one of Africa's most species-rich environments, in the northeast of the country (now Democratic Republic of the Congo). The Ituri is one of Equatorial Africa's most superb examples of virgin lowland rainforest, and one of the least-accessible. While based in the central Ituri at the village of Epulu and at outlying camps, I had good luck and good weather, and in a 40-day period I was able to collect butterfly and skipper specimens representing 435 species for the museum.



John F. Douglass, Upper Peninsula of Michigan, August 1993 (northern Lake Michigan in background)

The groups in which I am most interested in the Central African fauna are some of the deep-forest nymphalids (Adoliadini [Euthaliini]), the genera *Bicyclus* and *Acraea*, and the spectacular lycaenid group Lipteninae. Among many memorable encounters for me in Zaire were those with the skipper genera *Ceratrichia* (forest sylphs), *Caenides* (recluse skippers), and *Fresna* (the Acraea-mimics), and the charming liptenine butterflies in the genera *Mimeresia* (harlequins), *Falcuna* (marbles), and *Citrinophila* (yellows). I will never forget seeing, in furiously - combative aerial interaction in a forest glade, the high-speed stroboscopic flickering of two male tiger blues (*Hewitsonia congoensis*), and then

the same behavior by two male barred forest blues (*Powellana cottoni*), like miniature morphos.

Life in Toledo, roughly half-way between East Lansing and Columbus, put me in an enviable position zoologically. Great centers of entomological activity (including OSU, MSU, and the UMMZ) were all within an easy drive, and I attended entomological meetings whenever I could. In my years spent in Ohio and Michigan, I benefited from the superb example set by, and advice from, M. C. Nielsen, E. H. Metzler, E. A. Herig, Jr., J. V. Calhoun, L. C. Koehn, R. J. Priest, O. A. Perkins, G. J. Balogh, M. J. Andree, R. D. Kriegel, and W. P. Westrate. More recently, I am grateful for the kind encouragement I have received from the wonderful people who attend meetings at the McGuire Center in Gainesville.

As my opportunity to study the butterflies of Zaire was developing, I am glad that Drs. Lee and Jackie Miller encouraged me to take an interest in the entire Central African fauna. And this is justification enough, on this bitter-cold night, to settle in by lamplight and pick through my luminous Afrotropical atlases from the old days, and newer monographs, and to become lost, once again, in the continent's black-green interior.

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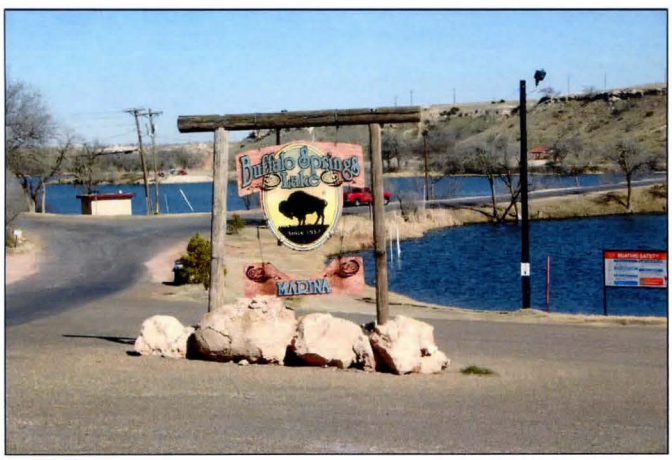

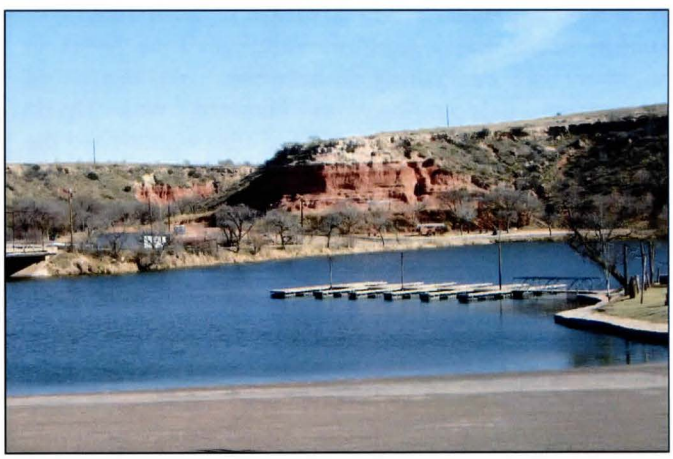

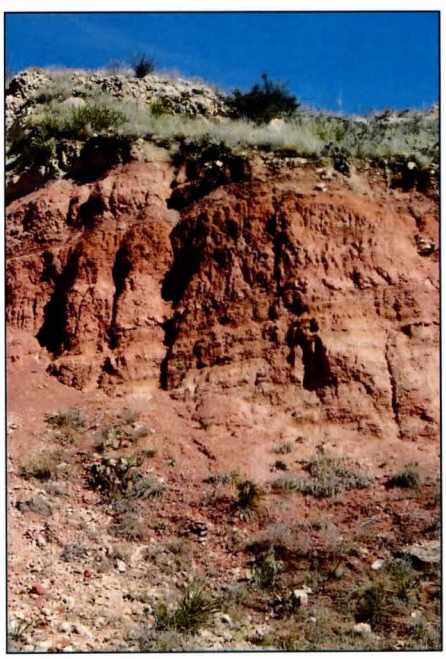

Buffalo springs Lake is 4 miles east of the City of Lubbock, Texas. Typical West Texas lake. Good butterfly collecting area.

MOTH RECORDS FROM TENNESSEE: GEOMETRIDAE

BY

LANCE A. DURDEN

From 1972 through 2015, I recorded moths at various locations in Tennessee. Most records are from the Nashville area and its suburbs (Davidson County) between the years 1972-1987 but recording continued from 1988-2015 and at a few additional localities within the state. Moths were recorded near Hartford (Cocke county) in the mountains of eastern Tennessee from 2012-2015. Most moths were attracted to a 100 W mercury vapor lamp or a 50 W fluorescent blacklight at night. However, a few were reared from larvae or located during daylight hours. Moths were recorded at the following sites with the approximate locations shown in Fig. 1 and designated there by the letters listed below. All Nashville area locations are combined on the map and in the list that follows but are listed separately in corresponding figure captions.

B = Montgomery Bell State Park, Dickson County (36°5'9.4"N, 87°17'12.1"W)
C = near Crossville, Cumberland County (35°57'29.9N, 84°58'43.1"W)
F = Fairview, Williamson County (35°59'23.9N, 87°5'51.1"W)
H = near Hartford, Cocke County (35°49'10.23"N, 83°8'50.76"W)
J = Mount Juliet, Wilson County (36°11'20.5N, 86°30'18.1"W)
M = Monteagle, Grundy County (35°14'37.2"N, 85°51'32.6"W)
N = Nashville, Davidson County, combining the following sites:
Bellevue (36°5'23.1"N, 86°56'13.1"W)
Donelson (36°9'21.1"N, 86°41'17.3"W)
Newsom Station (36°4'57.9N, 87°0'34.4"W)
Warner Parks (Edwin and Percy Warner Parks) (36°3'47.7"N, 86°53'44.4"W)
West Meade (36°7'45.4N, 86°52'49.7"W)
P = Primm Springs, Williamson County (35°51'28.8N, 87°12'18.1"W)
R = Reelfoot Lake, Obion County (36°24'12.9"N, 89°20'10.3"W)

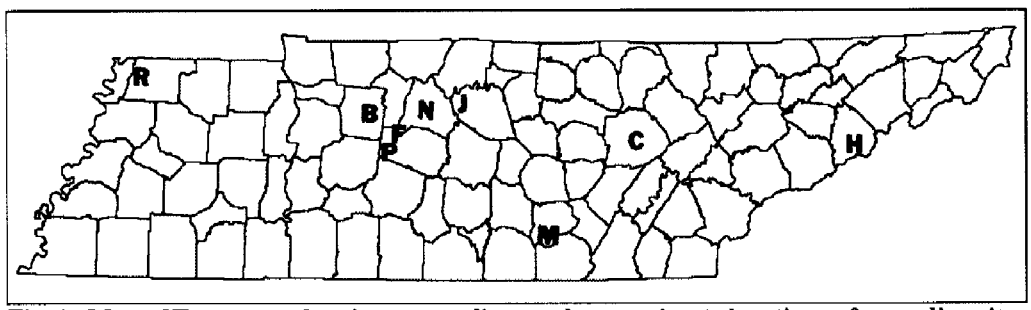

Fig. 1: Map of Tennessee showing county lines and approximate locations of recording sites – see text for precise sites and geographical coordinates.

This note reports on the species of geometrid moths I have recorded in Tennessee. Saturniids, sphingids and various groups of macro-moths were reported in two previous notes on Tennessee moths (Durden, 2014a,b). Voucher specimens are deposited in the Insect Collection at Georgia Southern University and in the collection of the author but most specimens were released alive following identification. In the following species list, MONA numbers are provided for each species, followed by the species name with author, then the recorded localities (abbreviated as upper-case letters corresponding to the sites listed above and shown in Fig. 1) and months of adult occurrence (in Roman numerals). Bold font for an entire species entry indicates that there is no current Tennessee record for that species in the Moth Photographers Group (MPG) maps (<http:mothphotographersgroup.msstate.edu>). Months in bold font (in Roman numerals) indicate adult occurrence months not currently recorded for that species for Tennessee in MPG.

SPECIES LIST

OENOCHROMINAE:

MONA 6258 – *Alsophila pometaria* (Harris) – F,N - **I,II,III,XII**

ENNOMINAE:

MONA 6261 – *Heliomata cycladata* Grote & Robinson – M,N,S – IV,V,**VI**
MONA 6263 – *Heliomata infulata* (Grote) – H – V,VI
MONA 6270 – *Protitame virginalis* (Hulst) – P – VII
MONA 6271.1 – *Mellilla xanthometata* (Walker) – F,N – IV,V
MONA 6273 – *Speranza pustularia* (Guenée) – M,N,P – VI,VII
MONA 6326 – *Macaria aemulataria* Walker – F,H,N,P – IV,V,.VII,VIII
MONA 6331 – *Macaria promiscuata* (Ferguson) – F,H,N,P – V,VI,VII
MONA 6335 – *Macaria aequiferaria* Walker – H – **VII,VIII**
MONA 6339 – *Macaria transitaria* (Walker) – H – VII
MONA 6340 – *Macaria minorata* Packard – H – VII
MONA 6341 – *Macaria bicolorata* (Fabricius) – H – VII
MONA 6342 – *Macaria bisignata* Walker – H – VII
MONA 6348 – *Macaria fissinotata* (Walker) – H - VII
MONA 6353 – *Macaria multilineata* Packard – F,N – V,VIII,IX
MONA 6360 – *Trigrammia quadrinotaria* Herrich-Schäffer – H,N – IV,VII
MONA 6362 – *Digrammia continuata* (Walker) – F,N,P,R – IV,V,VI,VIII
MONA 6386 – *Digrammia ocellinata* (Guenée) – F,N,P – IV,VII,VII,IX,**X**
MONA 6405 – *Digrammia gnophosaria* (Guenée) – R – **VIII**,IX
MONA 6419 – *Isturgia dislocaria* (Packard) – N – IV
MONA 6439 – *Hypomecis umbrosaria* (Hübner) – P - VI
MONA 6443 – *Glenoides texanaria* (Hulst) – F,N – VI,VII,VIII,X
MONA 6449 – *Glena cribataria* (Guenée) – N,P – VI,VII
MONA 6452 – *Glena plumosaria* (Packard) – N - VII
MONA 6486 – *Tornos scolopacinaria* (Guenée) – F,N – IV,VIII,IX
MONA 6582 – *Iridopsis vellivolata* (Hulst) – N – VIII
MONA 6584 – *Iridopsis humaria* (Guenée) – N -VI
MONA 6586 – *Iridopsis defectaria* (Guenée) – F,N – V,VI,VII,X
MONA 6588 – *Iridopsis larvaria* (Guenée) - N,P – VII,VIII
MONA 6590 – *Anavitrinella pampinaria* (Guenée) - F,N,P,R – IV,VIII,IX
MONA 6597 – *Ectropis crepuscularia* (Denis & Schiffermüller) – F,N,P – VI,VII,VIII,IX
MONA 6598 – *Protoboarmia porcelaria* (Guenée) – H,N – V,**VII**, VIII
MONA 6599 – *Epimecis hortaria* (Fabricius) – F,H,N – IV,V,VI,VII,VIII
MONA 6620 – *Melanolophia canadaria* (Guenée) – H,J,M,N – VII,VIII
MONA 6621 – *Melanolophia signataria* (Walker) – M,N – III,IV,VI
MONA 6640 – *Biston betularia* (Linnaeus) – H – VII,VIII
MONA 6652 – *Lycia ipsilon* (S. A. Forbes) – N – III,IV
MONA 6654 – *Hypagyrtis unipunctata* (Haworth) – C,H,N – V,VI,VII,VIII,IX
MONA 6655 – *Hypagyrtis esther* (Barnes) – F,M,N,P – V,VI,VII,VIII
MONA 6656 – *Hypagyrtis piniata* (Packard) – H – **VII**
MONA 6658 – *Phigalia titea* (Cramer) – N - II
MONA 6659 – *Phigalia denticulata* Hulst – N – I,II,III
MONA 6660 – *Phigalia strigataria* (Minot) – M,N – III,IV
MONA 6662 – *Paleacrita vernata* (Peck) – N - I,XII
MONA 6665 – *Erannis tiliaria* (Harris) – N – XI,XII
MONA 6667 – *Lomographa vestaliata* (Guenée) – F,N,P – III,IV
MONA 6677 – *Cabera erythemaria* Guenée – H – VII
MONA 6711 – *Ilexia intractata* (Walker) – M,N – V,VI,VII
MONA 6720 – *Lytrosis unitaria* (Herrich-Schäffer) – F,M,N – V,**VI**
MONA 6721 – *Lytrosis sinuosa* Rindge – H - VII
MONA 6726 – *Euchlaena obtusarisa* (Hübner) – N – V,VIII
MONA 6729 – *Euchlaena johnsonaria* (Fitch) – N – VI,**IX**
MONA 6733 – *Euchlaena amoenaria* (Guenée) – F,H,N – V,VII,VIII
MONA 6734 – *Euchlaena marginaria* (Minot) – P – **VII**

Fig. 2: *Heliomata cycladata* (MONA 6261), Donelson, Nashville, Davidson Co., Tennessee, May 1983.

Fig. 3: *Epimecis hortaria* (MONA 6599), Donelson, Nashville, Davidson Co., Tennessee, May 1985.

Fig. 4: *Lycia ipsilon* (MONA 6652), Bellevue, Nashville, Davidson Co., Tennessee, 27 March 2015.

Fig. 5: *Euchlaena amoenaria* (MONA 6733), Donelson, Nashville, Davidson Co., Tennessee, July 1985.

MONA 6735 – *Euchlaena pectinaria* (Denis & Schiffermüller) – N – VII
MONA 6739 – *Euchlaena irraria* (Barnes & McDunnough) – H – V
MONA 6740 – *Xanthotype urticaria* Swett – M,N – V,**VI,IX**
MONA 6743 – *Xanthotype sospeta* (Drury) – N – **V,VI**
MONA 6748 – *Pero ancetaria* (Hübner) – F,N,P – IV,V,VI,VII
MONA 6752 – *Pero zalissaria* (Walker) – R - **IX**
MONA 6753 – *Pero honestaria* (Walker) – F,N – IV,IV,**VII**
MONA 6755 – *Pero morissonaria* (H. Edwards) – N – **IV**,V,VI
MONA 6763 – *Phaeoura quernaria* (J. E. Smith) – F,M,N,P – III,IV,V,VI
MONA 6796 – *Campaea perlata* (Guenée) – C,N – **IV**,IX
MONA 6797 – *Enommos magnaria* Guenée – F,N – **IX**,X
MONA 6798 – *Enommos subsignaria* (Hübner) – N – VI
MONA 6813 – *Homochlodes disconventa* (Walker) – H - **VIII**
MONA 6818 – *Selenia kentaria* (Grote & Robinson) – F,N – IV,VII,**VIII**
MONA 6822 – *Metarranthis duaria* (Guenée) – P - VI
MONA 6823 – *Metarranthis angularia* (Barnes & McDunnough) – N - VII
MONA 6825 – *Metarranthis indeclinata* (Walker) – H - V
MONA 6826 – *Metarranthis hypochraria* (Herrich-Schäffer) – F,N – IV,V,**VII**
MONA 6828 – *Metarranthis homuraria* (Grote & Robinson) – H,N – IV,VII
MONA 6832 – *Metarranthis obfirmaria* (Hübner) – F,N - IV
MONA 6836 – *Plagodis pulveraria* (Linnaeus) – H - VII
MONA 6837 – *Probole alienaria* Herrich-Schäffer – F,N – IV,V,VI
MONA 6838 – *Probole amicaria* (Herrich-Schäffer) – F,N,P – V,VI,VII
MONA 6842 – *Plagodis phlogosaria* (Guenée) – F,N – **V**,VI,VII
MONA 6843 – *Plagodis fervidaria* (Herrich-Schäffer) – N – VI,VII
MONA 6844 – *Plagodis alcoolaria* (Guenée) – F,N – IV,VI.,VII,VIII
MONA 6858 – *Lychnosea intermicata* (Walker) – N – **IX**
MONA 6869 – *Caripeta aretaria* (Walker) – C – IX
MONA 6885 – *Besma quercivoraria* (Guenée) – F,N – V,VI,VII,VIII
MONA 6892 – *Lambdina pellucidaria* (Grote & Robinson) – F,M,N,P – III,IV,VII,VIII
MONA 6894 – *Lambdina fervidaria* (Hübner) – N – IV,V
MONA 6906 – *Nepytia canosaria* (Walker) – H - IX
MONA 6941 – *Eusarca confusaria* Hübner – F,M,N – V,VI,VIII,IX
MONA 6963 – *Tetracis crocallata* Guenée – H,N,P – V,VI,VII
MONA 6964 – *Tetracis cachexiata* Guenée – H – V
MONA 6965 – *Eugonobapta nivosaria* (Guenée) – N – **V**,VI
MONA 6966 – *Eutrapela clemataria* (J. E. Smith) – B,F,N – IV,V,VI
MONA 6974 – *Patalene olyzonaria* (Walker) – F,N,P – V,VI,VII,VIII,X
MONA 6982 – *Prochoerodes lineola* (Goeze) – F,M,N,P – VI,VII,VIII
MONA 6987 – *Antepione thisoaria* (Guenée) – F,N,P – IV,V,VI,VII,VIII
MONA 7010 – *Nematocampa resistaria* (Herrich-Schäffer) – N – **V**,VI,VII

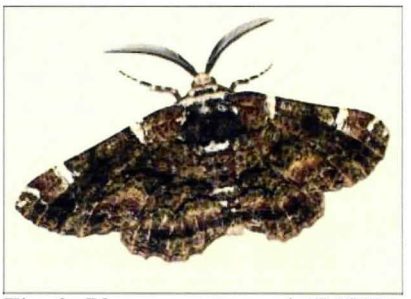

Fig. 6: *Phaeoura quernaria* (MONA 6763), Primm Springs, Williamson Co, Tennessee, 26 March 2015.

GEOMETRINAE:

MONA 7033 – *Nemoria lixaria* (Guenée) – F,N,P – **III,IV**,VI,VIII
MONA 7034 – *Nemoria saturiba* Ferguson – N – VI
MONA 7046 – *Nemoria bistriaria* Hübner – N,P – IV,V,VI
MONA 7047 – *Nemoria rubrifrontaria* (Packard) – F,N – V,VI
MONA 7053 – *Dichorda iridaria* (Guenée) – F,J,N – V,VI,VII
MONA 7058 – *Synchlora aerata* (Fabricius) – N,P – VI,VII,IX
MONA 7071 – *Chlorochlamys chloroleucaria* (Guenée) – F,N – V,VIII,IX
MONA 7075 – *Chloropteryx tepperaria* (Hulst) – F,N – V,VI

STERRHINAE:

MONA 7094 – *Lobocleta ossularia* (Geyer) – N,P,R – VI,VII,IX
MONA 7097 – *Lobocleta plemyraria* (Guenée) – F - **IX**
MONA 7105 – *Idaea scintillularia* (Hulst) – N - **V**

MONA 7108 – *Idaea furciferata* (Packard) – F,N.P – VI,VII
MONA 7109 – *Idaea celtima* (Schaus) – N – VIII
MONA 7114 – *Idaea demissaria* (Hübner) – F,N,P – VII,VIII,IX
MONA 7123 – *Idaea obfusaria* (Walker) – N – **IX**
MONA 7132 – *Pleuroprucha insulsaria* (Guenée) – F,N,P,R – VI,VII,VIII,IX,**XI**
MONA 7136 – *Cyclophora packardi* (Prout) – F,N,P – V,VI,VII,VIII
MONA 7140 – *Cyclophora nanaria* (Walker) – N - VII
MONA 7146 – *Haematopis grataria* (Fabricius) – F,N – IV,VII,IX
MONA 7147 – *Timandra amaturaria* (Walker) – N - **VI**
MONA 7159 – *Scopula limboundata* (Haworth) – H,N - V,VI,VII,VII
MONA 7169 – *Scopula inductata* (Guenée) – N – V
MONA 7173 – *Leptostales pannaria* (Guenée) – M - IX
MONA 7179 – *Leptostales rubromarginaria* (Packard) – J,N – IV,**V**,VII
MONA 7181 – *Lophosis labeculata* (Hulst) – N – V,VIII,IX

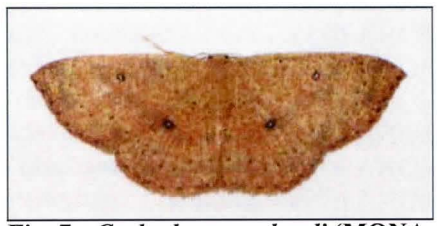

Fig. 7: *Cyclophora packardi* (MONA 7136), Bellevue, Nashville, Davidson Co., Tennessee, 10 July 2015.

LARENTIINAE:

MONA 7196 – *Eulithis diversilineata* (Hübner) – F,M,N – VI,VII,VIII
MONA 7197 – *Eulithis gracilineata* (Guenée) – N – VI,VII
MONA 7214 – *Ecliptopera atricolorata* (Grote & Robinson) – N – VI,VII,VIII
MONA 7235 – *Hydriomena divisaria* (Walker) – H - V
MONA 7237 – *Hydriomena transfigurata* Swett – H –V
MONA 7239 – *Hydriomena pluviata* (Guenée) – N – IV,V
MONA 7290 – *Coryphista meadii* (Packard) – N – **VII,VIII**
MONA 7292 – *Rheumaptera prunivorata* (Ferguson) – F,N – VI,VII
MONA 7293 – *Rheumaptera hastata* (Linnaeus) – H -VII
MONA 7329 – *Anticlea vasiliata* Guenée – H – V
MONA 7330 – *Anticlea multiferata* (Walker) – N – IV
MONA 7368 – *Xanthorhoe labradorensis* (Packard) – H – **VIII**
MONA 7390 – *Xanthorhoe lacustrata* (Guenée) – N - VI
MONA 7399 – *Euphyia intermediata* (Guenée) – H – VII,VIII
MONA 7414 – *Orthonama obstipata* (Fabricius) – F,H,N,P,R – V,VI,VII,X,XII
MONA 7416 – *Costaconvexa centrostrigaria* (Wollaston) – C,F,N,P – V,VI,VII,VIII,IX
MONA 7417 – *Disclisioprocta stellata* (Guenée) – F,H,N,P – VIII,IX,X
MONA 7422 – *Hydrelia inornata* (Hulst) – H,N – V,VI,VII,VIII
MONA 7423 – *Hydrelia albifera* (Walker) – N – VII
MONA 7428 – *Venusia comptaria* (Walker) – N,P – **III**,IV
MONA 7430 – *Trichodezia albovittata* (Guenée) – H – V,VI,VII,VIII
MONA 7440 – *Eubaphe mendica* (Walker) – N,P – VI,VII,VIII
MONA 7445 – *Horisme intestinata* (Guenée) – F,N – V,VI,VII,VIII
MONA 7474 – *Eupithecia miserulata* Grote – C,F,J,M,N,P,R – V,VI,VII,VIII,IX,X
MONA 7639 – *Cladara atroliturata* (Walker) – N – III,IV
MONA 7647 – *Heterophleps triguttaria* (Herrich-Schäffer) – N - VII
MONA 7648 – *Dyspteris abortivaria* (Herrich-Schäffer) – F,N – V,VI,VII

Fig. 8: *Dyspteris abortivaria* (MONA 7648), Bellevue, Nashville, Davidson Co., Tennessee, 13 July 2015.

A total of 147 geometrid species are recorded here from Tennessee: 1 Oenochrominae, 94 Ennominae, 8 Geometrinae, 17 Sterrhinae and 27 Larentiinae. There are no current Tennessee records on MPG (accessed, 3 February 2016) for six species of geometrids recorded here, namely *P. virginalis* (MONA 6270), *L. ipsilon* (MONA 6652), *L. sinuosa* (MONA 6721), *N. rubrifrontaria* (MONA 7047), *C. nanaria* (MONA 7140) and *H. transfigurata* (MONA 7237). However, MPG locality records show that *P. virginalis* and *C. nanaria* are quite widely distributed in the U.S. with records from most of the states that are contiguous with Tennessee. Covell (1984) states that *P. virginalis* is locally common from Nova Scotia to Virginia and west to Manitoba, Mississippi and Louisiana. Similarly, *L. ipsilon* is widespread in the eastern United States (Covell, 1984) and it is a common spring moth in central Tennessee so it is somewhat surprising that there are no MPG records of this moth shown for Tennessee. Both *L. sinuosa* (1 specimen) *and H. transfigurata* (several specimens) were recorded only in the mountains of eastern Tennessee very close to MPG records for adjoining states, especially North Carolina. *Nemoria rubrifrontaria* was only recorded in central Tennessee and, although there are relatively few MPG records for this eastern U.S. species, there are records from

the adjacent states of Georgia, Kentucky and South Carolina. Further, Covell (1984) states that *N. rubrifrontaria* is common and ranges from Nova Scotia south to North Carolina and west to South Dakota and Kansas.

In addition to the six species highlighted above, new months of occurrence (compared to MPG records) in Tennessee are listed for adults of another 33 species of geometrids. Also, records from the mountains of eastern Tennessee (near Hartford, Cocke Co.) highlight that several different species occur in this region relative to species recorded in other parts of the state. As with several other groups of organisms such as fleas, ticks and mammals, many of these eastern Tennessee species represent montane specialists or northern species with ranges that extend southwards along the Appalachians (McCay and Durden, 1996).

Fig. 9.

Fig. 10.

Fig. 9:
TOP: *Protitame virginalis* (MONA 6270), Primm Springs, Williamson Co., Tennessee, 1 July 2000.
MIDDLE: *Timandra amaturaria* (MONA 7147), Newson Station, Nashville, Davidson Co., Tennessee, June 1986.
BOTTOM: *Idaea scintillularia* (MONA 7105) West Meade, Nashville, Davidson Co., Tennessee, 31 May 1982.

Fig. 10:
TOP: *Trigrammia quadrinotaria* (MONA 6360), near Harford, Cocke Co., Tennessee, 24 April 2015.
MIDDLE: *Pero zalissaria* (MONA 6752), Reelfoot Lake, Obion Co., Tennessee, 14 September 1980.
BOTTOM: *Caripeta arenaria* (MONA 6869), near Crossville, Cumberland Co., Tennessee, 3 September 2012.

Fig. 11.

Fig. 12.

Fig. 11:
TOP: *Lytrosis unitaria* (MONA 6720), Fairview, Williamson Co., Tennessee, 30 May 1981.
BOTTOM: *Lytrosis sinuosa* (MONA 6721), near Harford, Cocke Co., Tennessee, 31 July 2015.

Fig. 12:
TOP: *Lychnosea intermicata* (MONA 6858), West Meade, Nashville, Davidson Co., Tennessee, September 1974.
MIDDLE: *Antepione thisoaria*, (MONA 6987) gynandromorph, West Meade, Nashville, Davidson Co., Tennessee, 29 August 1973 – previously documented by Durden (1984).
BOTTOM: *Homochlodes disconventa* (MONA 6813), near Hartford, Cocke Co., Tennessee, 26 August 2012.

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LITERATURE CITED

Covell, C. V., Jr., 1984. *A Field Guide to the Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496 pp.

Durden, L. A., 1984. A bilateral gynandromorph of *Antepione thisoaria* (Geometridae). *J. Lep. Soc.* 38: 323.

Durden, L. A., 2014a. Moth records from Tennessee: Saturniidae and Sphingidae. *S. Lep. News* 36: 9-12.

Durden, L. A., 2014b. Moth records from Tennessee: Thyatiridae, Drepanidae, Mimallonidae, Apatelodidae, Lasiocampidae, Notodontidae, Erebidae (Arctiinae, Lymantriinae), Euteliidae, Nolidae. *S. Lep. News* 36: 172-176.

McCay, T. S., and Durden, L. A., 1996. Ticks and fleas of shrews in Appalachian Georgia and North Carolina. *Journal of Parasitology* 82: 666-667.

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What kind of bird lives in this nest? Lake Fort Phantom Hill Lake, Abilene, Texas (February 27, 2016).

WHY FLY NOW? PUPA BANKS, APOSEMATISM, AND OTHER FACTORS THAT MAY EXPLAIN OBSERVED MOTH FLIGHT ACTIVITY

BY

JOHN PICKERING

Abstract – This paper addresses factors that affect insect flight activity. It presents a 5-year time series of nightly activity at a site in Clarke County, Georgia for *Epimecis hortaria*, Tulip-tree Beauty (Geometridae: Ennominae); *Nigetia formosalis*, Thin-winged Owlet (Erebidae: Scolecocampinae), and *Dryocampa rubicunda*, Rosy Maple Moth (Saturniidae: Ceratocampinae). These species exemplify three seasonal flight patterns, here defined as *diffuse*, *synchronized*, and *complex*. I propose that *diffuse* flight patterns are typical of many cryptic species and that *synchronized* ones are typical of aposematic species and species restricted by the phenology of their hosts. The *complex* pattern of *D. rubicunda* shows variation in when individuals broke pupal diapause and eclosed. Because some insects have *pupa banks*, similar to seed banks in plants, their observed flights and generations may be decoupled. I caution against using terms such as brood, generation, or voltinism to describe observed seasonal adult activity. Instead, I propose that we use the term *flight* to describe their activity.

Introduction – Many biotic and abiotic factors interact to affect the seasonal flight activity of moths and our ability to sample them accurately (Tauber et al. 1986; Valtonen et al. 2011). They include processes fundamental to each species' natural history and life cycle. By what means do they disperse, avoid natural enemies, find mates, lay eggs on or near hosts, avoid natural enemies, and in the grand scheme of things, survive for millions of years beyond the next mega-drought, warming period, and ice age? Science has barely begun to explore the complexity of these questions. Understanding when moths fly is a frontier that could answer much about how insects will respond to a changing world.

This is the second of a series of articles that presents results from Discover Life's *Mothing* project (www.discoverlife.org/moth). In the last SLN issue I gave an overview of *Mothing* and invited readers to participate (Pickering, 2015). Here I present nightly data on seasonal moth activity at our Blue Heron site in Georgia and focus on two factors that may help to explain these observations – '*pupa banks*' and '*aposematic vs cryptic coloration*'. In future articles I plan to consider how latitude, thermoregulation as a function of body size, moon phase, weather, sampling time, and other factors affect seasonal and nightly flight observations.

Pupa banks – The multitude of species-specific genetic and environmental factors that control metamorphosis, potential diapause, and pupal eclosion are key to understanding adult flight patterns. However, there is too little appreciation in entomology for the factors that induce long-term insect diapause and those that can vary the time at which individuals eclose as adults.

Here I develop the concept of a *pupa bank*, similar in function to a seed bank which are widespread and important in plants (Kalisz and McPeek 1993, Salguero - Gomez et al. 2015, Stott et al. 2010). Prolonged diapause — defined as diapause of over a year — is widespread in insects, particularly in taxa with pupae (Danks 1987). Powell (1986) lists 91 species in 16 families of Lepidoptera in which it is known. He suggests that there are probably many more species that use prolonged diapause to survive drought and unpredictable food resources. Because pupae are difficult to study under natural conditions, most studies of insect populations ignore them. There is no systematic study of the role pupae play in the dynamics of wild populations. Most studies focus only on changes in adult or larval numbers. Many insect species overwinter as diapausing pupae, and hence, could be considered by definition to have a pupa bank. Worth (1979) reports that 24.5% of 94 reared pupae of *Citheronia regalis*, Regal Moth (Saturniidae: Ceratocampinae), remained dormant beyond a year. Thus, the role of pupa banks could be large.

Observed differences in adult numbers across flights could reflect differences in the size of pupa banks and proportion of individuals eclosing from them rather than in changes in population size per se. Because diapausing individuals can skip sequential flights, generations and flights can be decoupled. When we do not know the genetic structure of a population and the magnitude of gene flow across flights, both within and across years, I propose that we use the term *flight* to describe their seasonal activity.

Aposematic vs cryptic coloration – In the results and discussion below, I hypothesize and present some evidence that

diffuse flight patterns are typical of many cryptic species and that s*ynchronized* ones are typical of aposematic species or of species restricted by the phenology of their host stages.

Methods – Since February 2010, a team of 16 individuals has taken 182,000 photographs to document the activity of creatures attracted to lights at my house at 275 Blue Heron Drive, Athens, Georgia (latitude 33.8882°N, longitude 83.2973°W).

Site description – This Clarke County site is within Georgia's Piedmont region. Its landscape contains a mix of pasture, agricultural fields, and forest patches. The house is on a 9 hectare property in a low-density neighborhood. There are no street lights and little light pollution from other sources. In front of the house there is a successional stand of trees dominated by pines (*Pinus*) and sweetgum (*Liquidambar*). Behind the house there is a mature stand of hardwoods dominated by oaks (*Quercus*) and hickories (*Carya*), a grassy area that includes *Andropogon* and *Eupatorium*, and a 1-hectare dammed pond above a forested floodplain including *Acer*, *Betula*, *Carpinus*, *Fraxinus*, *Ulmus*, and invasive *Ligustrum*. On the property there are a total of approximately 50 woody species, numerous wildflowers, including *Hexastylis*, *Podophyllum*, *Tipularia*, *Trillium* and *Sanguinaria*, and a profusion of lichens, including *Cladonia*, *Parmotrema*, and *Usnea*. Since at least 1995 there has been no spraying of pesticides on the property, although some neighbors spray for mosquitoes.

Lights – Each night we run three porch lights (23 watt compact-fluorescent bright white bulbs, 1,650 lumens, Utilitech #0073511), one on the front porch and two on the back. In May 2010 we started running a black light (15 watt 22-inch T8 fluorescent, Utilitech #283498) on the front porch on alternate nights. We switch lights on before dusk. The house walls are white stucco. We photograph moths in a set area around the lights up to a height of approximately 3m.

Photography – We use Nikon D50 cameras with AF Micro Nikkor 105mm 1:2.8 D lens to record all moths and other creatures larger than approximately 3mm in length. We use the camera's built-in flash and typically shoot at a shutter speed of 1/500 second and an aperture of F32. See discoverlife.org/ed/tg/Using_Digital_Camera/nikon_d50.html for other camera settings. In most photographs we include a mm ruler to enable us to measure specimens and help in their identification. In the first half of 2010 and 2011, we typically photographed specimens between 10PM and 2AM; in July of these years we switched to photographing them between 4AM and dawn. Currently, since 2011, we photograph after 4:00AM. Each night, before starting, we photograph the time and date on a cell phone and then the lights and wall. These photographs serve as quality controls to help us manage the images and know whether the moths were on the front or back porch. Since 28 November, 2010, we have sampled every night through February, 2016, with the exception of one night, 22 June, 2012.

Images – Photographers bulk upload images to their personal albums on Discover Life. After automated processing in which the system adds a unique identification number to each image, we tag the associated data records with where and when information. All images and associated data are available through *Mothing's* results page: discoverlife.org/moth/report.html. One can view and link to individual images as explained on Discover Life's help page: discoverlife.org/nh/id/20q/20q_help.html#services_images. For example, discoverlife.org/mp/20p?see=1_JP70255 shows a *Plagodis fervidaria* with ruler and associated data.

Identification – Using Discover Life's local identification guides and annotated checklists (see Pickering 2015), we have developed a rapid workflow to determine specimens within photographs and add their name(s) to each image's *title* field. This field supports multiple names, a count of each species, and additional information such as sex, the number of mites on a specimen, or whether two specimens were mating. Once identified, up to 6,000 images and associated titles can be reviewed simultaneously and '*blessed*' or '*rejected*' by an expert. The system also allows users to link multiple photographs of the same specimen into a group so that they are correctly tabulated as only one specimen. This feature is particularly useful in genera such as *Spilosoma* for which more than just a dorsal view of the forewing is needed for identification.

Depending their taxa, we determine specimens to '*valid species*', '*species group*' (typically groups of 2-4 species that we cannot easily tell apart from photographs), or '*morphospecies*' (typically microlepidopterans, many of which may be undescribed). For species groups we use the convention of separating members with a '--' (double dash), for example, *Hypagyrtis esther--unipunctata*. We use *Gn_* and *sp_* to name morphospecies, for example, *Papaipema sp_new_species_3*. For more details on our naming conventions see discoverlife.org/nh/id/20q/20q_help.html#Scientific_names.

Tabulation – Each night the system tabulates across albums the number of specimens for each taxon by site and date. It tabulates specimens to the date of the night's dusk, even if they were photographed after midnight and technically recorded on the following date. The system makes summary tables and refreshes information used to build maps and produce seasonal graphs for users. discoverlife.org/mp/20m?plot=3&la=33.9&lo=-83.3 presents an interactive graph of the species accumulation since 2010 and allows users to query by date(s) the abundance of species. For a table of the number of each species recorded by month see discoverlife.org/moth/data/table2_33.9_-83.3. html. For each species click '*details*' to see a nightly phenology graph across years, including data from *Mothing's* other 22 sites.

Results & Discussion

As of February, 2016, we have identified (or misidentified!) 143,156 of 144,603 (99.0%) of the Blue Heron site's lepidopteran images. The accumulated number of species is 1,254 (1,240 moths; 14 butterflies), including 65 *morphospecies* (1,602 specimens) and 48 *species groups* (6,054 specimens). Of the 1,254 taxa, 196 are represented by over 150 specimens each.

Seasonal flight patterns – I now consider the moths' seasonal flight activity, using three species to illustrate different patterns. These species are *Epimecis hortaria*, Tulip-tree Beauty (Geometridae: Ennominae) with a *diffuse* pattern; *Nigetia formosalis*, Thin-winged Owlet (Erebidae: Scolecocampinae) with a *synchronized* pattern, and *Dryocampa rubicunda*, Rosy Maple Moth (Saturniidae: Ceratocampinae) with a *complex* pattern. Adults of these species appear in Fig. 1, which contrasts the cryptic coloration of *E. hortaria* in the top two images with the contrasting black and white pattern of *N. formosalis* and pink and yellow of *D. rubicunda.* Brou (2003, 2010) shows multiple morphs of *E. hortaria* and presents a graph of its seasonal flight pattern accumulated across years in Louisiana. Brou (2008) shows a similar graph of flight activity for *D. rubicunda.* The subsequent three figures present five years of nightly abundance for these species at Blue Heron Drive.

Fig. 1. Cryptic and aposematic moths. The top two images are of *Epimecis hortaria.* The one on the left shows it camouflaged on a tree. In contrast, the lower images show *Nigetia formosalis* [left] and *Dryocampa rubicunda,* which clearly are not cryptic.

Diffuse – Fig. 2 presents the season activity of 713 specimens of *E. hortaria*. These specimens did not exhibit tight seasonal peaks but were spread out over their flight seasons, here observed between late February and early November. This *diffuse* pattern is exemplified in other cryptic species, such as some gray geometrids (e. g., *Iridopsis larvaria*, Bentline Gray; *Anavitrinella pampinaria*, Common Gray; *Protoboarmia porcelaria*, Porcelain Gray; *Hypomecis umbrosaria*, Umber Moth); *Hypena scabra*, Green Cloverworm Moth (Eribidae: Hypeninae), and *Pselnophorus belfragei*, Belfrages Plume Moth (Pterophoridae), as graphed in the last issue (Pickering, 2015).

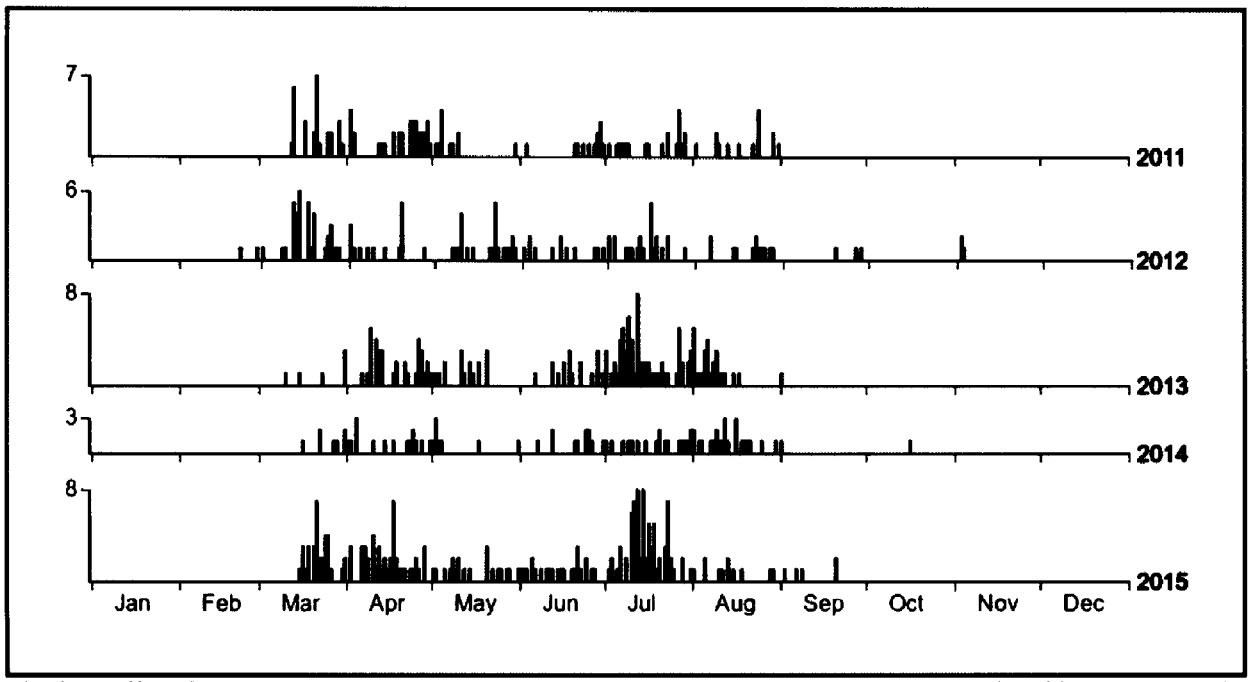

Fig. 2. Diffuse flight pattern. Activity of *Epimecis hortaria*, Clarke County, Georgia, 2011-2015. For details see discoverlife.org/mp/20q?search=Epimecis+hortaria

A possible exception to cryptic species having a *diffuse* flight pattern is *Glenoides texanaria*, Texas Gray (Geometridae: Ennominae), which had two fairly distinct flights in the summer and fall of 2013, 2014, and 2015.

Synchronized – Fig. 3 presents the seasonal activity of *Nigetia formosalis*. The 769 recorded specimens had two distinct flight peaks in each year without any specimens between the peaks. Other examples of this *synchronized* pattern with two flights are *Hypoprepia fucosa*, Painted Lichen Moth (Erebidae: Arctiinae), which is red, yellow, and black, and *Cisthene plumbea*, Lead-colored Lichen Moth (Erebidae: Arctiinae), which is yellow and black. Species such as the orange and black *Cisthene packardii*, Packard's Lichen Moth, displayed three such *synchronized* peaks.

Such *synchronized* flight activity may be typical of aposematic species that cluster together in time and space, warning birds and other visual predators that they may be distasteful. Natural selection may work against temporal outliers and favor ones that cluster together. However, an exception of an aposematic species that does not have *synchronized* flights is *Atteva aurea*, Ailanthus Webworm Moth (Yponomeutoidea: Attevidae), which is orange, black and white. It flies both at day and night. We recorded its *diffuse* flight activity between late March and early December.

Another category of species with *synchronized* flights appears to be species that have larvae that depend on a host stage with a restricted phenology. Two examples of such species that are not aposematic and have one *synchronized* flight per year are *Cissusa spadix*, Black-dotted Brown (Erebidae: Erebinae), the young larvae of which feed on young oak leaves (Coyle et al. 2013), and *Malacosoma americana*, Eastern Tent Caterpillar Moth (Lasiocampidae: Lasiocampinae), the young larvae of which feed on young leaves of *Prunus serotina*, Black Cherry (Abarca & Lill 2015).

Complex – Fig. 4 shows the seasonal activity of 225 specimens of *D. rubicunda*. I term this a *complex* pattern because there appear to be several things driving it. In 2014 and 2015, *D. rubicunda* had short flights in April and May that were too close together to be separate generations. These flights were followed by a longer flight starting in late June. The short April and May flights may show that *D. rubicunda* has a split emergence pattern following winter pupal diapause. Willis et al. (1974) documented that autumn collected cocoons of *Hyalophora cecropia*,

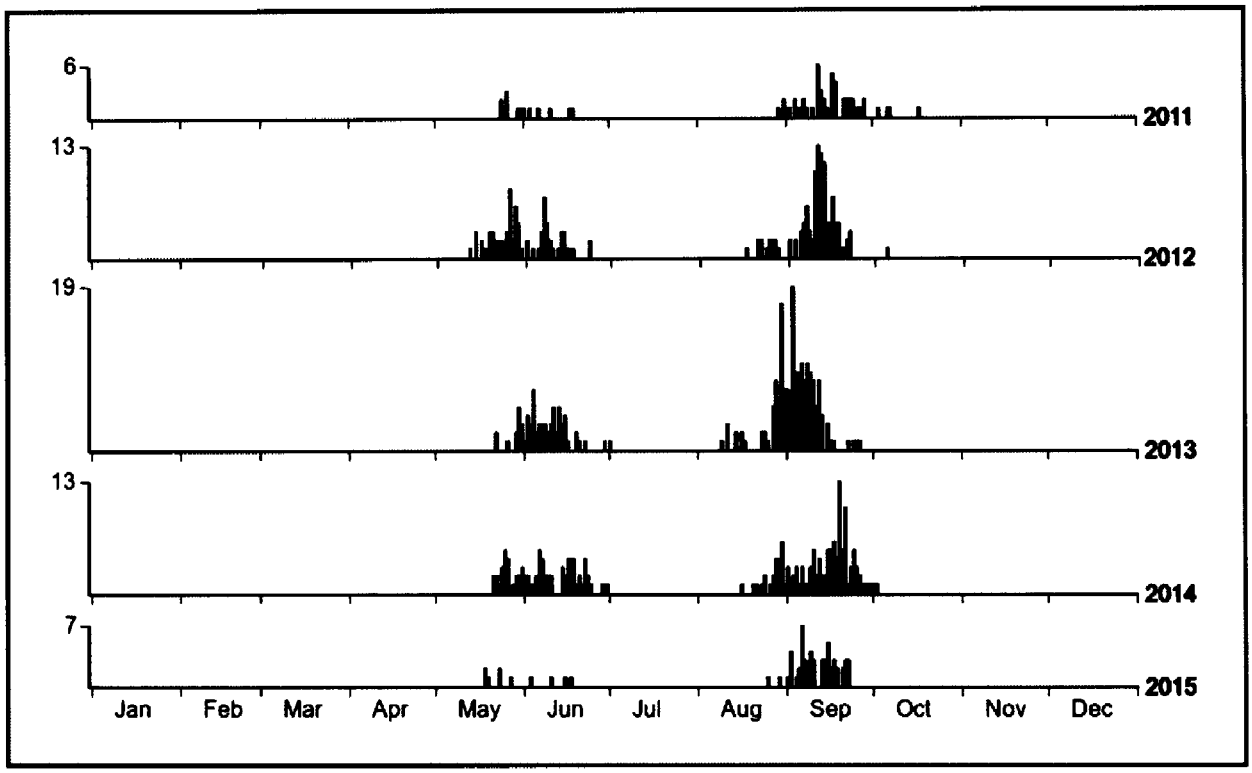

Fig. 3. Synchronized flight pattern. Activity of *Nigetia formosalis,* Clarke County, Georgia, 2011-2015. For details see discoverlife.org/mp/20q?search=Nigetia+formosalis

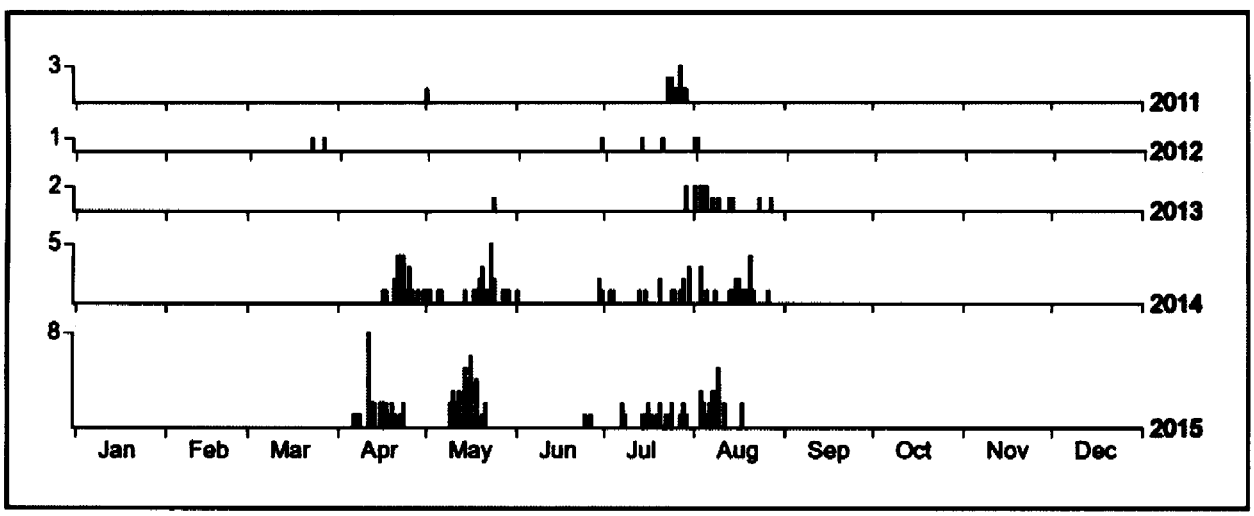

Fig. 4. Complex flight pattern. Activity of *Dryocampa rubicunda,* Clarke County, Georgia, 2011-2015. For details see discoverlife.org/mp/20q?search=Dryocampa+rubicunda

Cecropia Moth (Saturniidae: Saturniinae), in Illinois broke diapause in two distinct morphs, 8% eclosing mostly in late May and the remainder in late June.

The two *D. rubicunda* specimens recorded in March, 2012, probably reflect an early emergence that year after a warmer winter than in the other four years.

Conclusions

A multitude of factors affect the flight activity of insects. Here I have proposed the concept of a *pupa bank,* the importance of which is unknown for most species. If pupa banks are found to play a major role, they will profoundly change our understanding of the population dynamics and long-term survival of insects. Until we know more about the genetical structure of populations, as affected by long-term pupal diapause, I recommend that we use the term *flight* to describe adult seasonal activity and refrain from using brood, generation, and voltinism.

The contrast between the *diffuse* flight pattern presented for *E. hortaria* and the *synchronized* flight pattern of *Nigetia formosalis* may suggest that aposematic species are favored to cluster together temporally and that cryptic species are favored to avoid each other. More data and analyses are clearly needed to test this hypothesis.

References

Abarca, M. & J. Lill, 2015. Warming affects hatching time and early seasonal survival of eastern tent caterpillars. *Oecologia* **169**:901-912.

Brou, V.A., 2003. The many faces of the tulip tree moth *Epimecis hortaria* Fabricius. *S. Lep. News* **25** (1):6.

Brou, V.A., 2008. *Dryocampa rubicunda* (F.) in Louisiana. *S. Lep. News* **30** (2):51.

Brou, V.A., 2010. Adult phenotypes of *Epimecis hortaria* (Fabricius, 1794) (Lepidoptera: Geometridae) from St. Tammany Parish, Louisiana . *S. Lep. News* **32** (2):56-57.

Coyle, D.R., J. Pickering, K. A. Dyer, F. R. Lehman, J. E. Mohan and K.J. K. Gandhi, 2013. Dynamics of an unprecedented outbreak of two native moth species, *Cissusa spadix* and *Phoberia atomaris* (Lepidoptera: Noctuidae), on oak trees (*Quercus* spp.) in southeastern U.S.A. *American Entomologist* **59**:78-90.

Danks, H.V., 1987. *Insect dormancy: an ecological perspective.* Entomological Society of Canada.

Kalisz, S. and M.A. McPeek, 1993. Extinction dynamics, population growth and seed banks: An example using an age-structured annual. *Oecologia* **95**:314-320.

Pickering, J., 2015. Find your dark side: Invitation to join Discover Life's *Mothing* project. *S. Lep. News* **37** (4):205-208.

Powell, J.A., 1986. Records of a prolonged diapause in Lepidoptera. *Journal of Research on the Lepidoptera* **25**:83-109.

Salguero-Gomez et al., 2015. The compadre Plant Matrix Database: an open online repository for plant demography. *J. Ecol.* **103**:202-218.

Stott, I., M. Franco, D. Carslake, S. Townley, and D. Hodgson, 2010. Boom or bust? A comparative analysis of transient population dynamics in plants. *J. Ecol.* **98**:302-311.

Tauber, M.J., C.A. Tauber, and S. Masaki, 1986. *Seasonal Adaptations of Insects.* Oxford University Press, New York.

Valtonen, A. and M.P. Ayre, 2011. Environmental controls on the phenology of moths: predicting plasticity and constraint under climate change. *Oecologia* **165**:237-248.

Willis, J.H., G.P. Waldbauer, and J.G. Sternburg, 1974. The initiation of development by the early and late emerging morphs of *Hyalophora cecropia. Entomologia Experimentalis et Applicata* **17**:219-222.

Worth, C.B., 1979. Doubly overwintering *Citheronia regalis* Fabricius (Lepidoptera, Saturniidae). *J. Lepid. Soc.* **33**:166.

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Charlie sends in the following report:

Lignumvitae Key, Monroe Co., annual Florida Purplewing count 12/28/2015 by Sara and Kay Eoff (with Barbara Woodmansee). All species known in the previous 4 years are listed, but only 7 species were seen on this

occasion. Thanks to Sara for providing this information.

Giant Swallowtail	1	Julia	0
Great Southern White	0	Zebra Longwing	4
Barred Yellow	0	Mangrove Buckeye	1
Large Orange	0	Florida Purplewing	3
Orange Barred	0	Soldier	0
Red Banded Hairstreak	2	Mangrove Skipper	4
Silver Banded Hairstreak	0	Hammock Skipper	11
Eastern Pygmy Blue	0	Long Tailed Skipper	0
Gulf Fritillary	0	Obscure Skipper	0

Akers Pence of Gainesville reported on an unusual emergence of a Polyphemus Moth last year: January 15, 2015, on the night of the first freeze. The moth flew away after eclosing, so Akers did not know its fate.

Charlie's backyard "first sighting" list for 2015 follows:

Butterflies in our yard at 207 NE 9th Ave., Gainesville, FL, 2015 with first dates of sighting (compared with 26 in 2014)

1. *Agraulis vanillae*	Jan. 1, basking on back lawn
2. *Phoebis sennae*	Jan. 4, nectaring on *Pentas* in back yard
3. *Junonia coenia*	March 20, resting in back yard
4. *Vanessa virginiensis*	March 21, in Viburnum tree
5. *Libythaea carinenta*	March 22, in holly tree
6. *Atlides halesus*	March 25, nectaring on viburnum tree
7. *Parhassius m-album*	March 25, nectaring on viburnum tree
8. *Papilio glaucus*	March 25, flying in back yard
9. *Heliconius charithonia*	March 26, flying in back yard
10. *Erynnis horatius*	May 2, on Lantana blossom
11. *Urbanus proteus*	May 2, flying and resting in back yard
12. *Papilio troilus*	May 3, flying in front yard
13. *Leptotes cassius*	May 24, flying near garbage cans
14. *Danaus plexippus*	May 31, flying over back yard
15. *Heraclides cresphontes*	May 31, flying over our driveway
16. *Battus polydamas*	June 19, nectaring on Lantana
17. *Panoquina ocola*	Sept. 11, nectaring on Bidens
18. *Abaeis nicippe*	Oct. 31 in back yard
19. *Phoebis philea*	Nov. 6, in back yard
20. *Lerema accius*	Nov. 7, nectaring on *Pentas*

Here are Charlie's Nov. - Dec. 2015 records for Gainesville, Alachua County:

Urbanus dorantes: Nov. 1, 17, 24, Dec. 9, 14, 23, 29
Urbanus proteus: Nov. 1, 11, 17, 25, 30, Dec. 1, 2, 23, 26, 29, 30
Ancyloxipha numitor: Nov. 1
Hylephila phyleus: Nov. 1
Panoquina ocola: Nov. 1, Dec. 2, 23, 29
Phoebis sennae: Nov. 1, 11, 18, 20, 25, Dec. 2, 9, 14, 17, 22, 25, 26, 28, 29, 30
Phoebis philea: Nov. 1, 7, 11, 18, 20, 25, Dec. 30
Pyrisitia lisa: Nov. 1, 11, 18
Junonia coenia: Nov. 1, 11, 18, 20, Dec. 30
Agraulis vanillae: Nov. 1, 5, 6, 7, 17, 18, 20, 24, 25, 27, Dec. 1, 9, 7, 17, 29
Heliconius charithonia: Nov. 1, 5, 6, 7, 11, 17, 18, 20, 24, Dec. 1, 2, 5, 9, 11, 14, 17, 22, 23, 25, 26, 28, 29, 31
Battus polydamas: Nov. 5, 15, Dec. 30, 31
Limenitis archippus: Nov. 6

Lerema accius: Nov. 7
Eurema daira: Nov. 11
Leptotes cassius: Nov. 16, 29, Dec. 6, 14, 24
Heraclides cresphontes: Nov. 17
Danaus plexippus: Nov. 17, 18, 20, 25, 27, 30, Dec. 29
Abaeis nicippe: Nov. 18
Atlides halesus: Nov. 20 (nectaring on bottlebrush blossoms)
Vanessa atalanta: Dec. 2, 9
Pyrgus oileus: Dec. 9
Euphyes vestris: Dec. 9

Moths: *Leptostales pannaria*, Geometridae (Sterrhinae), Dec. 18

Tom Neal sends in the following winter report from Florida. He states that he has been running bait traps in his yard at 1705 NW 23rd Street during December 2015, January and February 2016. Most of the specimens were of the genus *Mocis*. All were taken at fruit bait unless otherwise indicated.

Hesperiidae:

4115	*Calpodes ethlius* (Stoll	18 December

Geometridae:

6336	*Macaria distribuaria* (Hubner)	1 January, 27 January mercury vapor lamp
6339	*Macaria transitaria* (Walker)	9 January, 3 February mercury vapor lamp
6450	*Glena cognataria* (Hubner)	8 January mercury vapor lamp
7029	*Nemouria elfa* Ferguson	1 January

Epiplemidae:

7657.2	*Trotorhombia metachromata* (Walker)	8 January mercury vapor lamp

Erebidae:

8390.2	*Physula albipunctilla* Schaus	1 January
8599	*Melipotis fasciolaris* (Hubner)	8 January
8579	*Antiblemma concinnula* (Walker)	29 December, 22 January
8687	*Zale fictilis* Guenee	4 specimens 29 December- 8 January
8884	*Mouralia tinctoides* (Guenee)	2 January

Noctuidae:

9675	*Elaphria fuscimacula* (Grote)	3 February
9678	*Elaphria versicolor* (Grote)	23 January
9679	*Elaphria chalcedonia* (Hubner)	29 January
9682	*Elaphria excesa* (Guenee)	29 January
9693	*Condica mobilis* (Walker	27 January
9698	*Condica concisa* (Walker)	9 January
9699	*Condica sutor* (Guenee)	8 January
9886	*Lithophane patefacta* (Walker)	6 January
9942	*Xystopeplus rufago* (Hubner)	22 January
10013	*Psaphida grandis* Smith	27 January
10585	*Orthodes majuscula* Herrich-Schaeffer	9 January

Georgia: James K. Adams, 346 Sunset Drive SE, Calhoun, GA 30701, E-Mail: jadams@daltonstate.edu (Please check out the GA leps website at: http://www.daltonstate.edu/galeps/).

James sends in the following report:

The contributors include James Adams (JKA or no notation), Brian Scholtens (BS), John Hyatt (JH) and Lance Durden (LD). Others are indicated with their records. Most records presented here represent new or interesting records (range extensions, unusual dates, uncommon species, county records, *etc.*), or more complete lists for new locations/new times of year. All known new STATE and COUNTY records are indicated, and all dates listed below are 2015 unless otherwise specified.

Carbondale, I-75 exit 326, Whitfield Co.:
EREBIDAE: **NOCTUIDAE**: *Feralia major,* Dec. 24, 2015 (earliest record to date for N GA), Jan. 4, 5 & 9.

Dalton, Whitfield Co.:
NOCTUIDAE: *Feralia major*, Dec. 29, Flower White.

Calhoun, (James Adams residence), Gordon Co.:
NOCTUIDAE: *Lithophane viridipallens*, Jan. 27; *Psaphida styracis*, Feb. 21.

Lake Juliette, Monroe Co., Terry Johnson:
PAPILIONIDAE: *Papilio glaucus*, Dec. 29 (LATE, [or perhaps really EARLY]).

North of Dublin, along Hwy. 441, Laurens Co., John Jensen, Bob Sargent and Mal Hodges:
PAPILIONIDAE: *Papilio glaucus*, Dec. 28 (LATE, [or perhaps really EARLY]; seen during the Christmas bird count).

Sapelo Island, McIntosh Co.:
April 12, 2013, LD:
GEOMETRIDAE: *Lobocleta plemyraria* (new to island, few in STATE).
Aug. 22, 2014, LD:
GEOMETRIDAE: *Idaea retractaria* (only place in GA so far).
Sept. 19, 2015, LD:
EREBIDAE: *Simplicia cornicalis*. **NOLIDAE**: *Afrida ydatodes*. **NOCTUIDAE**: *Argyrogramma verruca* (new to island).
Nov. 7, 2015, LD:
EREBIDAE: *Dahana atripennis*. **NOCTUIDAE**: *Meropleon cosmion, Papaipema duovata, Condica cupentia, Euxoa detersa.*

Glynn co., Feb. 13, Mike Chapman:
NOCTUIDAE: *Lithophane patefacta.*

Louisiana: Michael Lockwood, 215 Hialeah Avenue, Houma, LA 70363, E-Mail: mikelock34@hotmail.com

Mississippi: Ricky Patterson, 400 Winona Rd., Vicksburg, MS 39180, E-Mail: rpatte42@aol.com

North Carolina: Steve Hall, North Carolina Natural Heritage Program, Div. of Parks & Recreation, 1615 MSC, Raleigh, NC 27699-1615, E-Mail: Stephen.Hall@ncmail.net

Steve send in the following report for North Carolina:

Butterfly Records:

The following record was submitted by Harry LeGrand.

NYMPHALIDAE:
Vanessa cardui, a very rare midwinter record was one seen by Tom Krakauer at Pea Island National Wildlife Refuge in Dare County on January 16.

Moth Records:

The following records were submitted by Kevin Bischof (KB) Steve Hall (SH), Brian Bockhahn (BB), Paul Scharf (PS), and Kyle Kittelberger (KK).

GEOMETRIDAE:
Alsophila pometaria, DEC 10, McDowell Co., KB; JAN 17, Gaston Co., KB
Phigalia denticulata, DEC 2, Warren Co., PS; JAN 17, Gaston Co., KB; FEB 1, Orange Co., SH; FEB 9, Stanly Co., KB; FEB 16, Durham Co., KB
Phigalia strigataria, FEB 29, Orange Co., SH
Costaconvexa centrostrigaria, FEB 21, 28 Orange Co., SH

NOTODONTIDAE:
Heterocampa biundata, DEC 16, McDowell Co., KB

EREBIDAE:
Hypena scabra, FEB 21, McDowell Co. & Burke Co., KB; FEB 29, Orange Co., SH
Caenurgia chloropha, FEB 22, Burke Co., KB
Caenurgina erechtea, FEB 21, Burke Co., KB

NOCTUIDAE:
Lithophane laticinerea, DEC 7, McDowell Co., KB
Pyreferra pettiti, FEB 28, Orange Co., SH
Metaxaglaea violacea, DEC 23, Orange Co., SH
Sunira bicolorago, DEC 11, McDowell Co., KB
Feralia jocosa, FEB 21, Burke Co., KB
Anicla infecta, DEC 9, Dare Co., BB/PS/KK

South Carolina: Brian Scholtens, College of Charleston, Charleston, SC 29424, E-Mail: scholtensb@cofc.edu

Tennessee: John Hyatt, 233 Park Ridge Court, Kingsport, TN 37664, E-Mail: jkshyatt@centurylink.net

Texas: Ed Knudson, 8517 Burkhart Road, Houston, TX 77055, E-Mail: eknudson@earthlink.net

Virginia: Harry Pavulaan, P.O. Box 1124, Herndon VA 20172, E-Mail: pavulaan@aol.com

Everes comyntas - Fairfax County: (Occoquan Regional Park) 12/15/2015 (1 photographed by Gary Myers). Very unusual late date for this region.

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The Southern Lepidopterists' News is published four times annually. Membership dues are $25.00 annually. The organization is open to anyone, especially those with an interest in the Lepidoptera of the southern United States. Information about the Society may be obtained from Marc Minno, Membership Coordinator, 600 NW 34 Terrace, Gainesville, FL 32607, E-Mail: mminno@bellsouth.net, and dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 69th Lane, Gainesville, FL 32653.

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