



# Newsletter of the Michigan Entomological Society

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## Breaking Diapause 15 March 2014 MSU Campus

The next MES Breaking Diapause gathering will take place on 15 March 2014 on the Michigan State University campus in East Lansing in Room 244 Natural Science Building (288 Farm Lane). We will meet from 9 am to late afternoon.

## 2014 MES Annual Meeting, 13-15 June 2014, Saginaw Valley State University

### David Stanton, President-Elect

Department of Biology, Saginaw Valley State University, University Center, MI 48710. Email: [dstanton@svsu.edu](mailto:dstanton@svsu.edu)

The 2014 MES annual meeting will be held on the campus of Saginaw Valley State University during 13-15 June 2014. The official meeting will be held on Saturday, 14 June. Both on-campus and off-campus housing will be available for Friday and Saturday nights. Up to 5 meals will be provided on campus as well, from Friday dinner to Sunday breakfast. More details will be available in the spring MES Newsletter and on the MES webpage.



## Submit Your First State Arthropod Reports

### Ron Priest

Department of Entomology, Michigan State University, East Lansing, MI 48824. Email: [priest@msu.edu](mailto:priest@msu.edu)

IT'S TIME AGAIN TO SET THE RECORD STRAIGHT! Have you recovered an arthropod species not before recorded from your state or province? Perhaps you've recovered one a few years ago which has not yet been reported in print. That information is important to document. Publishing new state records significantly adds to our understanding of a species' range as well as their expansion.

Submit your record(s) for our next newsletter. If you're not sure of the identity of your specimens, then bring them along to our next Breaking Diapause meeting, Saturday, 15 March 2014.

The more information you have regarding your recovery the better. Include as many of the following points as you can: species name, common name (if available), family, collector, collection date, collection location, method of recovery, identifier, habitat, current specimen(s) location, and a photograph. Of course, you will be credited for all your information!

Send your information to Ron Priest, using the above contact information. If you have questions, do contact me by Email, phone: (517) 353-3891, or U.S. mail. I look forward to hearing from you, learning what's new, and seeing your records in print.

## Dwayne Badgero Collection Open House

Saturday, 5 April 2014, 9 AM to 10 PM, 3611 St. Mary's St., Auburn Hills, MI 48326. Email: [noctuids75@aol.com](mailto:noctuids75@aol.com)

Come out for a casual meeting of fellow Lepidopterists. Bring specimens to show or to identify. I'm hoping to make this an all-day adventure with day and night field trips to the nearby Bald Mountain Recreation Area. Save the date. Please RSVP if you plan to attend. <https://www.facebook.com/events/355637047906186/>

### 2013-2014 Officers of MES

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### Current Annual Dues Schedule

<b>Student (through Graduate School)</b> .....	<b>\$12.00</b>
<b>Active</b> .....	<b>\$25.00</b>
<b>Sustaining</b> .....	<b>\$35.00</b>
<b>Life</b> .....	<b>\$500.00</b>
<b>Institutional</b> .....	<b>\$45.00</b>

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## The Living Amongst the Dead

**E. Ted Herig**

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**O**n one of my daily walks on this a cold 17 of October day in 2012, as I always do, I was walking through the Mount Rest Cemetery, which is near my home in St. Johns, Michigan, when I began to notice dark blobs hanging every now and then from some of the grave stones that I passed by, especially the rougher ones. So being inquisitive, I took a closer look, and on inspection found that these so-called blobs were in fact pupae of some sort. My hands-on inspection showed that the pupae were of a butterfly species that was that year's most common species in the St. Johns area – the Buckeye (*Junonia coenia*) (Lepidoptera: Nymphalidae). I started seeing adult Buckeyes around the last of April and through the summer months in 2012 it was more common than the Cabbage White (*Pieris rapae*). I then started to look at every grave stone along the roadway through the cemetery and noticed that many had pupae attached, especially where there was an opening in the tree canopy and sun reached the ground. The next day I returned and brought along my camera to document this enigma. Many of the pupae were either empty, where the adult had already emerged, or were dead, likely from parasitic wasps, but several were still alive with adults soon to emerge. I collected several pupae to rear at home, and photographed many others. I collected only a small fraction of all the pupae that were there. The funny thing that struck me about this event was that most of the live pupae would likely die that fall before they could emerge and like the grave stones they will serve as cold monuments of a time well past. As a side note, before finishing this article on 20 October 2012, I noticed a few Buckeyes flying around my home and at the cemetery in St. Johns. The irony is these will also be dead within a few days!



# Biodiversity of Odonates at Pierce Cedar Creek Institute, Barry County, Michigan

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## Introduction

According to the Michigan Odonata Survey, 164 species of Odonata that represent 49 genera occur in Michigan (O'Brien 2010). Some of these species, especially large species representative of family Aeshnidae (the darners) or Libellulidae (the skimmers), are migratory (Russell et al 1998). These migratory species are sensitive to weather conditions such as ambient temperature, precipitation, and wind speed, especially during the time of migration.

Most odonates breed and lay their eggs in slow-moving freshwater; however, the adults may live and find shelter in sparsely forested areas. Adults often hunt for prey on the forest edges or in grassland/prairie habitats, where smaller insect prey is abundant and exposed. For these reasons, Odonates require access to a variety of different habitats in order to complete their life cycle and be reproductively successful. Pierce Cedar Creek Institute (PCCI), Barry County, MI (latitude 42.6459° and longitude -85.2908°), is a 661-acre nature center that comprises a variety of habitats, including deciduous woodlands with relatively open canopies, prairies, wetlands (including several fens), two spring-fed creeks, a lake, and many vernal ponds, all supplying abundant habitat for both larval and adult odonates (see map). Approximately 41% of the land is forested, 40% is wetland (of which over one-half is fen), about 17% is upland field or prairie, and about 2% is open water (lake, stream, vernal ponds, and retention ponds). Because of the variety of habitats at PCCI, we hypothesized that there would be high diversity of Odonata, despite the relatively small area of land that PCCI covers.



Dot-tailed whiteface basking

Property Map

### About the Trails at Pierce Cedar Creek Institute

**BREWSTER LAKE TRAIL**  
 1.8 MILES  
 This trail crosses and passes by a number of beautiful habitats, including a fen, a mature oak forest with unusually large trees, and a pasture frequented by deer and turkeys. A trail extension provides a scenic view of Brewster Lake.

**LUPINE TRAIL**  
 0.8 MILES  
 The primary features of this trail are retention ponds, panoramic views, a small section of open forest, and a stark cabbage-dominated wetland.

**TALL GRASS PRAIRIE TRAIL**  
 1.4 MILES  
 This is a shortcut to the middle of the Beech Maple Ridge Trail. View the beauty of our constructed wildflower prairie on the west side of the trail.

**BEECH MAPLE RIDGE TRAIL**  
 3.8 MILES  
 The path passes through a second-growth forest, mature oak and beech-maple forests, a section of swamp forest, and a fen. Visitors can retrace to the Visitor Center by taking the boardwalk to the Lupine Trail.

**OLD FARM TRAIL**  
 1.3 MILES  
 This is one of our easiest trails to hike. It provides open and forested views. The prairie loop provides a closer view of the prairie.

**BLACK WALNUT TRAIL**  
 1.2 MILES  
 It provides wonderful views of the Visitor Center and loops back to the Beech Maple Ridge Trail. This prairie trail is somewhat more strenuous than other trails. Blue and white trail markers, along with white markings on the trees, will help guide visitors through the trail.

**CEAR CRK TRAIL**  
 1.9 MILES  
 The trail runs through a sand prairie with a great view of Cedar Creek and loops back to the Beech Maple Ridge Trail. This prairie trail is somewhat more strenuous than other trails. Blue and white trail markers, along with white markings on the trees, will help guide visitors through the trail.

- The trails are open daily from dawn to dusk.
- There is no fee to use the trails.
- Trail markers are indicated by color listed on the map. For example, the Brewster Lake Trail has red markers.
- Pierce Cedar Creek Institute grounds and buildings are alcohol and smoke-free.
- Dogs must remain leashed at all times.
- Please clean up after pets.

A pet waste station is located at the head of the Tall Grass Prairie Trail.

- Motorized vehicles, bicycles, snowmobiles, watercraft and horses are prohibited.
- Fishing, hunting, camping, trapping and plant collecting are prohibited.
- Restroom facilities are available in the Visitor Center after hours. Please enter from the west side. Hours may vary by season.

Listed below are some of the trees and shrubs that are found at Pierce Cedar Creek Institute:

Black Ash	Red Cedar	Red Oak
Green Ash	White Cedar	White Oak
White Ash	Grey Dogwood	Striped Poplar
Basswood	Red Osier Dogwood	Pointed Sycamore
Beech	American Elm	Tamarack
Yellow Birch	Red Maple	Black Walnut
Black Cherry		American Hornbeam

Property map from Pierce Cedar Creek Institute website:

## Methods

Species sampling took place from 7 May to 10 August 2012 during daily walks along each trail at PCCI at different times of day to allow capturing adults during the full range of odonate activity periods (between 9 am and 9 pm). During this three-month period, we performed a qualitative analysis of species diversity, relative abundance, and distribution in each separate habitat/location on the PCCI's property. Odonates were captured using a standard aerial insect net, placed in insect envelopes or collection jars, and taken back to the PCCI laboratory for identification. Specimens were killed using 70% ethyl alcohol, then pinned, dried, and labeled to create a synoptic collection housed at PCCI for educational purposes. Several identification guides, e.g., *Dragonflies of the North Woods* (Mead 2009) and *Damselflies of the North Woods* (Dubois 2009), as well as several internet sources were used to identify specimens. Identified species were then compared with the species recorded in the Michigan Odonata Survey's checklist (O'Brien 2010) and the list of Odonata species known from Michigan (O'Brien 2006). All voucher identifications were verified by Mark O'Brien of the University of Michigan, Museum of Zoology. Voucher specimens can be examined by contacting PCCI. Locations of sightings and captures for each specimen were estimated using a GPS.

## Results

We found 40 species of Anisoptera from 5 different families: 6 Aeshnidae, 6 Corduliidae, 2 Cordulegastridae, 5 Gomphidae, and 21 Libellulidae. We also found 18 species of Zygoptera from 3 different families: 1 Calopterygidae, 5 Lestidae, and 12 Coenagrionidae. A list of the collected species is listed below (an asterisk denotes a new record for Barry County), and a few photos of the PCCI odonates are shown on these pages.

### Suborder Anisoptera:

#### Family Aeshnidae:

*Aeshna interrupta* – Variable Darner\*  
*Aeshna tuberculifera* – Black-tipped Darner\*  
*Aeshna verticalis* – Green-striped Darner\*  
*Basiaeschna janata* – Springtime Darner\*  
*Anax junius* – Common Green Darner  
*Rhionaeschna mutata* – Spatterdock Darner

#### Family Gomphidae:

*Dromogomphus spinosus* – Black-shouldered Spinyleg\*  
*Gomphus exilis* – Lancet Clubtail  
*Gomphus fraternus* – Midland Clubtail\*  
*Gomphus lividus* – Ashy Clubtail\*  
*Gomphus spicatus* – Dusky Clubtail  
*Hagenius brevistylus* – Dragonhunter\*

#### Family Cordulegastridae:

*Cordulegaster bilineata* – Brown Spiketail\*  
*Cordulegaster maculata* – Twin-spotted Spiketail\*

#### Family Corduliidae:

*Dorocordulia libera* – Racket-tailed Emerald  
*Epitheca canis* – Beaverpond Baskettail\*  
*Epitheca cynosura* – Common Baskettail  
*Epitheca spinigera* – Spiny Baskettail  
*Somatochlora williamsoni* – Williamson's Emerald\*

#### Family Libellulidae:

*Celithemis eponina* – Halloween Pennant\*  
*Erythemis simplicicollis* – Common Pondhawk  
*Leucorrhinia intacta* – Dot-tailed Whiteface  
*Leucorrhinia proxima* – Belted Whiteface\*  
*Libellula cyanea* – Spangled Skimmer\*  
*Libellula incesta* – Slaty Skimmer\*  
*Libellula luctuosa* – Widow Skimmer  
*Libellula pulchella* – Twelve-spotted Skimmer  
*Libellula quadrimaculata* – Four-spotted Skimmer\*  
*Nannothemis bella* – Elfin Skimmer  
*Pachydiplax longipennis* – Blue Dasher  
*Pantala flavescens* – Wandering Glider\*  
*Perithemis tenera* – Eastern Amberwing  
*Plathemis lydia* – Common Whitetail\*  
*Sympetrum corruptum* – Variegated Meadowhawk\*  
*Sympetrum costiferum* – Saffron-winged Meadowhawk\*  
*Sympetrum internum* – Cherry-faced Meadowhawk  
*Sympetrum obtrusum* – White-faced Meadowhawk  
*Sympetrum rubicundulum* – Ruby Meadowhawk  
*Sympetrum semicinctum* – Band-winged Meadowhawk

*Sympetrum vicinum* – Autumn Meadowhawk

### Suborder Zygoptera:

#### Family Calopterygidae:

*Calopteryx maculata* – Ebony Jewelwing

#### Family Lestidae:

*Lestes eurinus* – Amber-winged Spreadwing  
*Lestes forcipatus* – Sweetflag Spreadwing  
*Lestes inaequalis* – Elegant Spreadwing\*  
*Lestes rectangularis* – Slender Sreadwing  
*Lestes vigilax* – Swamp Spreadwing

#### Family Coenagrionidae:

*Argia apicalis* – Blue-fronted Dancer\*  
*Argia fumipennis* – Variable Dancer  
*Argia moesta* – Powdered Dancer\*  
*Enallagma annexum* – Northern Bluet\*  
*Enallagma carunculatum* – Tule Bluet  
*Enallagma civile* – Familiar Bluet\*  
*Enallagma ebrium* – Marsh Bluet  
*Enallagma exsulans* – Stream Bluet\*  
*Enallagma hageni* – Hagen's Bluet\*  
*Ischnura posita* – Fragile forktail  
*Ischnura verticalis* – Eastern Forktail  
*Nehalennia irene* – Sedge Sprite\*

## Discussion

As noted above, 40 species of dragonflies from 5 families and 18 species of damselflies from 3 families were identified at Pierce Cedar Creek Institute between 7 May and 10 August 2012. This number of species is greater than what we expected to find, and may be due to several factors: First, PCCI has a large variety of different habitats, including prairies, woods, and wetlands. Second, there is a variety of aquatic environments, including Cedar Creek, Brewster Lake, small ponds and vernal ponds, which provide diverse breeding habitat. In addition, 2012 was unseasonably warm early in the season, allowing



Common whitetail basking



**Ebony jewelwing basking**

migratory species to arrive in Michigan earlier than usual, while also allowing larvae to metamorphose and emerge early in the flight season. For bivoltine species, this unseasonably warm and early summer may have allowed for increased reproduction which would lead to increased density of individuals representative of these species.

The Michigan Odonata Survey online database (<http://insectsdataserver.umz.lsa.umich.edu/mos/home.php>) lists a total of 44 species previously recorded for Barry County, and we were able to add 29 species to the county list, expanding the count to 73 taxa.

Our study indicates that PCCI provides habitat to a large and diverse number of odonates. Landscapes having a wide variety of terrestrial and aquatic habitats are important to maintain Odonata biodiversity, and demonstrates the importance of preserving a wide range of habitats (e.g., woodlands, wetlands, and prairies) within a region. Different Odonata species occupy different environmental niches, and each species requires a variety of environments, both terrestrial and aquatic, to complete its life cycle. Preservation of intact habitats in close proximity to each other likely facilitates Odonata movement, leading to increased species diversity.

#### **Acknowledgments**

We thank Pierce Cedar Creek Institute for use of their facilities and equipment throughout the course of this project, and the Willard and Jessie Pierce Foundation Undergraduate Research Grants for the Environment Program for funding this project. We also thank Mark O'Brien of the University of Michigan, Museum of Zoology for aiding in the identification and verification of voucher specimens collected during the study.

#### **References**

- Dubois R. 2009. Damselflies of the North Woods. Kollath+Stensaas Publishing, Duluth, MN.
- Mead K. 2009. Dragonflies of the North Woods. 2<sup>nd</sup> Edition. Kollath+Stensaas Publishing, Duluth, MN
- O'Brien M.F. 2006. Michigan Odonata checklist. Newsletter Michigan Entomol. Soc. 51(3&4): 6-7.
- O'Brien MF. 2010 Odonata known from Michigan. Michigan Odonata Survey, Ann Arbor, MI (<http://insects.umz.lsa.umich.edu/MICHODO/michodolist.html>).
- Russell RW, ML May, KL Soltesz, JW Fitzpatrick. 1998. Massive swarm migrations of dragonflies (Odonata) in eastern North America. The American Midland Naturalist 140: 325-342.

## **Fall Mowing**

It was a bright, cool Fall day  
and my yard was a mess,  
leaves scattered all around  
so I attacked it with zest.

I was almost done mowing,  
about to cross it off the list,  
when yellow jackets boiled out of  
the ground,  
I'd never seen wasps so pissed.

I bolted like a wild man,  
clenching my fists—  
they stung me on my hands,  
they stung me on my wrists.

I ran even harder,  
shelter my only quest—  
my whole body burned,  
was there a spot that they missed?

I ducked in the garage,  
covered my head with my vest,  
then waited a few minutes,  
*maybe they're gone*, I guessed.

I headed for the house,  
hoping for the best,  
my legs were swelling up  
and my undies were messed.

- Ken Tennesen 2013

### **2014 Dragonfly Society of the Americas Annual Meeting**

The annual meeting of the Dragonfly Society of the Americas will be held in northern Wisconsin, 11-18 June 2014. The main meeting, June 13-15, will be at the Rusk County Community Library (418 Corbett Ave. West, Ladysmith, WI 54848). The business meeting will be Saturday morning, with presentations the rest of that day. A catered banquet is planned for that evening. Field outings will be held on Friday and Sunday. A website will be available soon. Contact Ken Tennesen ([ktennessen@centurytel.net](mailto:ktennessen@centurytel.net)) for updates.

## Appreciation for Honorary Life Membership Award

This year's MES annual meeting was yet another first -- Drummond Island. What a wonderful site, meeting, and field trip conceived and brought together by Martin Andree! After dinner on Saturday, I was completely surprised to be awarded an Honorary MES Membership! Martin and John Douglass made the presentation and, I'm sure, had much to do with making those memorable gifts. Martin presented me with a magnificently framed Honorary Life Member plaque (right)! John presented me with 2 beautiful ceramic leaves, one for a necklace and the other as a lapel pin. My wife, Helen, wears the first and I the other. What a wonderful matching pair! To be surprised even more, Martin, and I'm sure he made it himself, gave me a clear cube box with a representation of me with shears atop a preserved *Cecropia* moth posed in flight (below). Well, I don't collect leaf mining insects exactly in that manner but it sure was a close approximation and would be a great method to collect leafminers atop our largest Michigan moth! That sure did bring back memories!

I joined the Michigan Entomological Society in 1969. That was just a year prior to graduating from MSU with a baccalaureate degree in Zoology, with a concentration in what else, Entomology! I have been a MES Governing Board member intermittently, first from 1976-80, then 1991-4, and currently from 2003 to the present assisting Therese Poland with journal articles as copy editor. I also had the privilege of being President twice and organizing 2 annual meetings. The first was in 1982 as President-elect hosting the annual meeting at the Chippewa Nature Center in Midland with Ron Hodges as our keynote speaker. His talk, "Systematic Entomology: Whys and Wherefore" was quite a revelation to those of us not familiar with the knotty problems of taxonomy. As I recall he used examples from the Gelechioidea that he was, and still is, so much involved studying. In 1999, as President-elect for the second time, I hosted our annual meeting at the DNR Ralph A. MacMullan (RAM) Conference Center, with a theme title of "Insect and Ecosystem Diversity in the



Great Lakes Region." All speakers at that meeting were invited, a somewhat different format than most of our meetings. The focal speaker that I wanted to bring to the attention of our entomologists was Dennis Albert, who had developed, with others at the University of Michigan, a detailed ecoregion classification for Michigan, Wisconsin, and Minnesota. It was exciting to see our western Great Lakes region divided into ecoregions based upon abiotic factors. In the past few years I've assisted in assimilating the Perona and Voss collections into the main entomology collection at M.S.U.

Looking back I've had several opportunities to encourage our society along, and all were quite enjoyable times. There are, however, others who have worked longer and/or more creatively than I and who very much deserve recognition. I hope that in the near future they are recognized as well.

**Ron Priest** (priest@msu.edu)



### Websites for selected Michigan Organizations that Deal with Entomology

Michigan Beekeepers Association

<http://michiganbees.org/>

Michigan Mosquito Control Association

<http://www.mimosq.org/>

Michigan Pest Management Association

<http://www.mipca.org/>

SEMBA, the Southeastern Michigan Beekeepers

Association. <http://www.sembabees.org/>

SEMBA, Southeast Michigan Butterfly Association

<http://www.sembabutterfly.com/>

WMBA, West Michigan Butterfly Association

<http://www.glsqa.org/wmba.htm>

### 28th Annual Michigan Mosquito Control Association Meeting. 19-20 February 2014

Radisson Lansing at the Capitol. Additional information can be found at [www.mimosq.org](http://www.mimosq.org) or by contacting the Program Chair Charles Dinsmore: phone 989-832-8677; email: [cdinsmore@co.midland.mi.us](mailto:cdinsmore@co.midland.mi.us)

## MES Honorary Life Member

### Adolph H. Beyer - A Remembrance

#### Ron Priest

Department of Entomology, Michigan State University,  
Natural Science Building, East Lansing, MI 48824

One of our long-time Honorary Life Members, A. H. Beyer, has been a puzzle for the MES Governing Board members for the past several years. We've queried some of our senior MES members such as Mo Nielsen and Dr. Fred Stehr, but neither of them recalled this honorary member. As luck would have it, while recently reviewing some literature given to me by my former work supervisor, Murray

Hanna at the Michigan Department of Agriculture, I came across an article about Mr. Beyer that appeared in "The Record-Eagle" newspaper from Traverse City, Michigan, dated Monday, 26 June 1978, titled: "Entomology Specialist Beyer Dies". Here is the text of that obituary.

"The man responsible for isolating and identifying the cherry fruit fly, Adolph Harvey Beyer, died Thursday in Provincial Home. Mr. Beyer, 96, who lived in Acme



A.H. Beyer (left) and  
John Newman (right)

### Copies of the MES Brochure Are Still Available for Distribution

We developed the MES brochure in 2008 to advertise the Society and increase membership. We had several thousand copies made. Many have been distributed to schools, nature centers, and zoos. But several hundred still remain. If you would like a supply, please request some. Or if you know of a location, like a nature center, which could use a supply, please send us their address. You can contact any of the current MES Governing Board members, but since the brochures are stored in East Lansing, it may be easiest to contact Bob Haack, Therese Poland, or Ron Priest. The brochure was printed as a tri-fold in full-color. Please help distribute this brochure and thereby help MES grow.



[MI] was supervisor at one time for the cherry fruit fly control program for the state of Michigan. He was born June 7, 1882, in Bloomington, Ill. He lived in Bloomington as a child and was educated in Inman, Kan. He received a B.S. from McPherson (Kansas) College and a BA and MS from the University of Kansas. A specialist in entomology, he was with the U.S. Bureau of Entomology from 1913 to 1926. He then was a professor at the University of North Carolina and at the University of Florida. He became supervising inspector in 1929 for the Bureau of Plant Industry of the state of Michigan. He was a long-time summer resident of Long Lake and an active member of Michigan Entomological Society. Burial will be in Battle Creek."

In our current membership directory, Mr. Beyer is listed as residing in Williamsburg, which is near Acme. I am not sure who has been receiving the MES publications since his death in 1978, but quite possibly relatives. As the above overview of his life describes, it is no wonder that A. H. Beyer, became one of our Honorary Life Members!

Note from Robert Haack, MES Newsletter Editor, .

A quick search on Google came up with these publications by A. H. Beyer.

- Beyer AH. 1921. Garden flea-hopper in alfalfa and its control. USDA Bulletin 694. 27 pp.
- Beyer AH. 1922. A brief resume of investigations made in 1913 on *Trogoderma inclusa* Lec. (a Dermestid). University of Kansas Science Bulletin. 14 (15):
- Beyer AH. 1922. The bean leaf-hopper and hopperburn with methods of control. University of Florida, Agricultural Experiment Station. Bulletin 164. 88 pp.
- Beyer AH. 1924. Controlling chinch bugs with calcium cyanide. University of Florida, Agricultural Experiment Stations, Bulletin 362.
- Luginbill P and AH Beyer. 1921. Contribution to the knowledge of *Toxoptera graminum* in the South. Journal of Agricultural Research 14(2): 97-110.
- Luginbill P and AH Beyer. 1921. Corn earworm as an enemy of vetch. USDA Farmers' Bulletin 1206. 19 pp.

### New Book. FAO Forestry Paper 171.

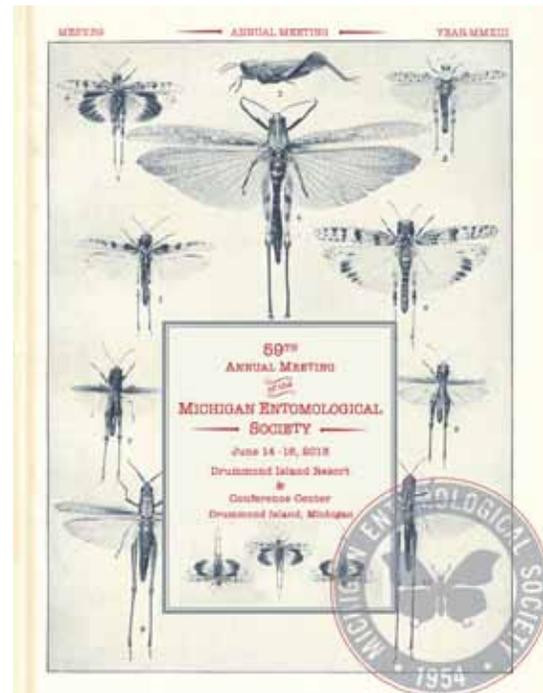
"Edible Insects: Future Prospects for Food and Feed Security." Rome, 2013. Chapter titles include: 1. Introduction. 2. The role of insects. 3. Culture, religion and the history of entomophagy. 4. Edible insects as a natural resource. 5. Environmental opportunities of insect rearing for food and feed. 6. Nutritional value of insects for human consumption. 7. Insects as animal feed. 8. Farming insects. 9. Processing edible insects for food and feed. 10. Food safety and preservation. 11. Edible insects as an engine for improving livelihoods. 12. Economics: cash income, enterprise development, markets and trade. 13. Promoting insects as feed and food. 14. Regulatory frameworks governing the use of insects for food security. 15. The way forward. References. On line at:

<http://www.fao.org/docrep/018/i3253e/i3253e00.htm>

### Michigan Emerald Ash Borer Quarantine Revised.

See: <[www.michigan.gov/eab](http://www.michigan.gov/eab)>. Michigan has modified the quarantine status of several EAB-infested counties in the Upper Peninsula (UP) and has updated the quarantine maps. Travelers and residents are still being asked to *not* move firewood into Michigan's UP.

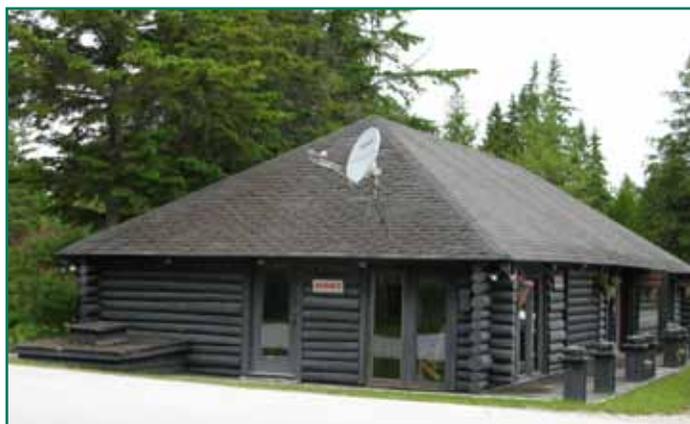
**T**he 59th MES Annual Meeting was held 14-16 June 2013 at the Drummond Island Resort & Conference Center, in Michigan's Upper Peninsula on Drummond Island. The meeting was a success by all measures -- we sold out all reserved rooms, we had excellent meals, and we had interesting and enjoyable talks, posters, and field trips. We thank Martin Andree for all his efforts in organizing this event. On the next several pages are abstracts from the meeting. Our two students (Bridget O'Leary and Travis Washburn) tied for first place (p. 34).



MES Annual Program designed by Martin Andree



Whitefish dinner at Pins Restaurant



The Annex: site for the MES Annual Meeting



Lunch at Bayside Restaurant



Martin Andree calling the MES Annual Meeting to order



Google Earth image of Drummond Island and location of the Maxton Plains and the 2013 MES Annual Meeting site

## Endangered Species Act Update

### Scott Hicks, Field Supervisor

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This year marks the 40th Anniversary of the U.S. Endangered Species Act (ESA). To help save our Nation's natural heritage, in 1973 the US Congress created protections and provisions for the recovery of endangered and threatened species. This new law also marked the first time at the Federal level that insects (excluding pest species) could be listed. Of Michigan's insect species, currently four are federally listed and one is proposed for listing:

Hine's Emerald Dragonfly (*Somatochlora hineana*) – Endangered

Hungerford's Crawling Water Beetle (*Brychius hungerfordi*) – Endangered

Karner Blue Butterfly (*Lycaeides melissa samuelis*) – Endangered

Mitchell's Satyr Butterfly (*Neonympha mitchellii mitchellii*) – Endangered

Poweshiek Skipperling (*Oarisma Poweshiek*) – Proposed Endangered

Michigan has played a key role in several of the ESA successes, such as the recovery of the bald eagle, gray wolf, and Kirtland's warbler. While important progress has been made, we are entering a critical period for conservation. And

entomology in Michigan is one arena where saving species may be won or lost—

Mitchell's satyr butterfly: Michigan is home to 94% of the remaining populations of what appears to be a unique taxonomic entity occurring only in the Midwest. But just six of our Michigan populations are currently considered viable and there are questions concerning how best to restore its rare fen habitat. Even at the secure sites, numbers appeared to be down substantially in 2013.

Powshiek skipperling: Historically Michigan was only a small portion of the species' range (<6%), but of the 14 sites where the species is known to currently occur 10 are in Michigan. Consistent with reports elsewhere in the species' range, monitoring by Michigan Natural Features Inventory staff suggests population declines continued in 2013.

Pitcher's thistle (*Cirsium pitcheri*): This threatened plant is endemic to Great Lakes coastlines and is facing a significant new threat from the Eurasian weevil *Larinus planus*, which is used as a biocontrol agent against some noxious weeds like Canada thistle (*Cirsium arvense*). First reported attacking Michigan Pitcher's thistle populations in 2012, this seed-head predator appears now to be widely distributed throughout the state. Given Pitcher's thistle dynamic habitat, annual seed production is critical and this weevil may present a significant challenge for Pitcher's thistle recovery.

There are many ways entomologists can play a direct role in the conservation of our endangered species. Opportunities are there for a wide range of experience levels and types of work, all of which offer the chance to make a difference on national conservation priorities. Please note that permits are required in order to conduct actions prohibited by the ESA, including some research related activities (see <http://www.fws.gov/endangered/permits> for details). Each year many such research permits are issued for studies on T&E species and they play a critical role in the recovery of listed species. Application



Mitchell's Satyr Butterfly

processing requirements make early planning essential (allow at least three months for application processing).

For each of our listed species there is a team or informal work group that is discussing how best to reach recovery for that species and providing the opportunity for Michigan entomologists to engage. These meetings are also a great way to learn about current research efforts and needs. Please contact our office and let us know what your interests are in helping (e.g., address research needs, assist with existing surveys, evaluate habitat restoration efforts, or offer your entomological expertise for planning efforts).

"The ultimate goal of the Endangered Species Act is the conservation of the ecosystem on which all species, whether endangered or not, depend for survival. For this reason the Endangered Species Act protects all endangered and threatened members of the animal kingdom, not merely the so-called higher forms of life" House Rept. 95-1625 (to accompany H.R. 14104 as reported by the Committee on Merchant Marine and Fisheries), September 25, 1978.



Pitcher's Thistle (*Cirsium pitcheri*)



## High Temperature Tolerance of Two Thermally Distinct Populations of the Embossed Stonefly, *Paragnetina media*

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The critical thermal maxima (CTM) of two populations of the embossed stonefly, *Paragnetina media*, was studied from two sites with differing thermal profiles during late May and early June 2013. Sampling occurred on the Big Sable River in Mason County, in northwestern lower Michigan. CTMs ranged 32.4-38.8°C. Despite only a 1-2°C temperature difference between sites due to cool spring weather, the warm



The warm site population appeared to lose its thermal tolerance advantage when acclimated to the same temperatures over 6 d ( $P = 0.661$ ,  $P = 0.051$ ). At both acclimation temperatures, specimens collected in June had overall higher CTMs than those collected in May regardless of collecting site ( $P =$

site population had a higher CTM when acclimated for 3 d to both 12°C ( $P < 0.001$ ) and 17°C ( $P = 0.018$ ).

0.043,  $P < 0.001$ ), probably due to higher water temperatures in June. Mortality 48 h after trials ranged 8-56%, suggesting that this species is especially intolerant of laboratory conditions and probably should be acclimated for relatively short periods. These results indicate that CTM is influenced by natural environmental factors, even within the same species.



## DNA Fingerprinting of Tiger Swallowtails

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Two recognized species of tiger swallowtail butterflies exist in Michigan, the eastern tiger swallowtail (*Papilio glaucus*) and the Canadian tiger swallowtail (*Papilio canadensis*). The ranges of these two species are primarily determined by climate and vegetation, with the eastern species dominant in southern portion of Michigan's Lower Peninsula and the Canadian species dominant



in Michigan's Upper Peninsula. The two species are known to hybridize in the northern portion of the Lower Peninsula. However, the two species are morphologically similar and it is difficult to distinguish hybrids based on morphology. Genetic markers are needed in order to track the hybrid zone and to determine how it changes over time in response to climate change.

Samples were collected in the summer of 2012 at Oxford swamp in Newaygo County, Michigan. This area is presumably within the hybrid zone. Specimens were frozen at -20°C until DNA extraction was performed on leg tissue using a DNeasy extraction kit. Two types of genetic markers were scored. Mitochondrial haplotype was scored by using PCR to amplify a region of the COI gene. An RFLP polymorphism involving the restriction endonucleases *Sau96I* and *MstII* was scored in order to determine mitochondrial haplotype. DNA fingerprinting was also performed for five loci using PCR with dye labeled primers and capillary electrophoresis.

All samples were determined to have the Canadian mitochondrial haplotype. This indicates that the population is most likely not within the hybrid zone, since the eastern form is typically the maternal parent in hybridization events. DNA fingerprinting revealed 9 to 13 alleles for each locus with an average of 10.6 per locus. Heterozygosity values were generally high, with an average of 0.63 but generally lower than expected (average 0.86).

These results show that there is a large amount of genetic diversity within this population. DNA fingerprinting should provide sufficient resolution for the identification of species specific markers that will allow for more reliable identification of hybrids and a more detailed analysis of gene flow within the hybrid zone. In the future we plan to sample more northern and more southern populations in order to identify such markers.



## The Host Range of the Emerald Ash Borer: A Matter of International Concern

### Robert A Haack

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The genus *Agrilus* is likely the largest genus in the Animal Kingdom, with about 3000 species recognized worldwide. When the Emerald Ash Borer (EAB), *Agrilus planipennis* (Coleoptera: Buprestidae), was first discovered in North America in 2002, little was known about the host range of this Asian insect (Haack et al. 2002). In China, EAB was reported as a pest of ash (*Fraxinus*), but elm (*Ulmus*) was also reported as a host in Korea, while in Japan, walnut (*Juglans*), wingnut (*Pterocarya*), and elm were also listed as hosts (Haack et al. 2002). It was not clear from the Asian literature if these were host records for EAB larvae, adults, or both.

EAB adults, like all *Agrilus* adults so far studied, feed on foliage throughout their adult life. When an *Agrilus* adult is reared from a particular plant species then there is proof that the plant is an actual larval host. However, collecting an *Agrilus*

adult while it is feeding on a leaf is not proof that the plant is a larval host because *Agrilus* adults often feed on more plant species than they use for oviposition. The question of which plant species are actually larval hosts for EAB was raised at a meeting earlier this year in Europe. Below is a brief account of what happened.

In January 2013, the European and Mediterranean Plant Protection Organization (EPPO) convened an Expert Working Group at their headquarters in Paris, France, to conduct a Pest Risk Assessment (PRA) on EAB. The EAB Expert Working Group consisted of 10 individuals, including myself, from 8 countries. The final PRA for EAB was released in late summer 2013 by EPPO at <[http://www.eppo.int/QUARANTINE/Pest\\_Risk\\_Analysis/PRAdocs\\_insects/13-18746\\_PRA\\_Agrilus\\_planipennis.pdf](http://www.eppo.int/QUARANTINE/Pest_Risk_Analysis/PRAdocs_insects/13-18746_PRA_Agrilus_planipennis.pdf)>.

EPPO, which now has 50 member countries, conducted the PRA on EAB not only because there is concern that EAB could enter Europe through trade with Asia (where EAB is native) and North America (where EAB is introduced), but also through trade as well as natural spread from European Russia (where EAB has been introduced). In 2005, EAB was positively identified for the first time in Moscow, Russia, and since then it has spread westward towards Belarus and Ukraine (Baranchikov et al. 2008, Straw et al. 2013).

The EAB Expert Working Group had to deal with the question of EAB's host range, especially in Korea and Japan where elm, walnut, and wingnut have been reported as EAB hosts. The Expert Working Group decided to consider these non-ash trees as potential hosts given the scientific literature and that EAB was considered as the subspecies *Agrilus marcopoli ulmi* Kurosawa prior to being synonymized with EAB (Jendek 1994).

During the preparation of the EAB PRA, *Agrilus* specialists from Japan were consulted over the host range of EAB in Japan. In response, Japan now questioned the previous non-ash host records for EAB, stating that these records were not supported by actual larva-to-adult rearing records (EPPO 2013). Nevertheless, in the final EAB PRA, elm, walnut, and wingnut were still included as potential hosts from Korea and Japan (EPPO 2013).

Although the question of host range may seem minor, the EPPO PRA for EAB is far reaching in that it covers international trade in logs, wood chips, live trees, and trade-associated wood packaging materials (e.g., pallets and crating) for all potential EAB host plants in each country where EAB is found (EPPO 2013). The lesson from this situation is that great care should be taken when publishing host records, and that any host plant identified should state clearly whether it was a larval or adult host.

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## Field Trip to the Maxton Plains Alvars

### Bradford Slaughter, Botanist

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On Saturday afternoon, 15 June 2013, a group of hardy adventurers traveled to the hinterlands of Drummond Island, where they were greeted by the largest, highest quality complex of alvar grassland in Michigan in an area known as the Maxton Plains. Alvar is a grass- and sedge-dominated natural community that occurs on thin mineral soils over limestone or dolomite bedrock. Alvars support a unique suite of plant species adapted to calcareous soils, spring inundation, and summer drought. Here, at the Maxton Plains, prairie species that colonized the area during the warm, dry Hypsithermal Period (ca. 9000 – 5000 YBP) coexist with species typical of Great Lakes shorelines and

wetlands. Vegetation structure and composition varies based on subtle changes in elevation. Little bluestem (*Schizachyrium scoparium*) and poverty grass (*Danthonia spicata*) dominate dry rises; prairie dropseed (*Sporobolus heterolepis*) and sedges adorn mesic sites; and flattened spike-rush (*Eleocharis compressa*) and hair grass (*Deschampsia cespitosa*) occupy wet depressions.

Some of the showy forbs we encountered at the Maxton Plains included balsam ragwort (*Packera paupercula*), harebell (*Campanula rotundifolia*), columbine (*Aquilegia canadensis*), field chickweed (*Cerastium arvense*), Indian paintbrush (*Castilleja coccinea*), and a few late-flowering large yellow lady-slippers (*Cypripedium parviflorum* var. *pubescens*). We also observed four state-listed plant species: the Great Lakes endemic bulrush sedge (*Carex scirpoidea* ssp. *convoluta*), small skullcap (*Scutellaria parvula*), prairie smoke (*Geum triflorum*), and flattened spike-rush (*Eleocharis compressa*). The Maxton Plains are a particularly rich site for rare, threatened, and endangered plants, supporting a total of 12 state-listed taxa.

In addition to botanical bounties, the group enjoyed the fascinating outcroppings of flat, bedded Ordovician dolomite, complete with several unusual nautiloid fossils, some adorning the natural pavement of East Bruce Point Road. The diversity of geological and natural features makes the Maxton Plains an attractive destination for botanists, geologists, entomologists, and off-roadologists alike.



The Great Lakes endemic Bulrush Sedge  
*Carex scirpoidea* ssp. *convoluta*



The Maxton Plains on Drummond Island



Starting the Maxton Plains field trip.



Prairie Smoke (*Geum triflorum*)



Flat outcroppings of Ordovician dolomite at the Maxton Plains Alvars



**The Michigan Butterfly Network: A long-term butterfly monitoring program**

**Ashley Anne Wick**  
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**O**n Drummond Island in June, I presented on the newly established Michigan Butterfly Network (MiBN). The mission of the MiBN is to assess the changing population status of our state's butterfly species, evaluate the quality of our ecosystems, and engage the public in significant citizen science. We are currently building a legion of citizen science volunteers across the state who monitor permanent census routes. The idea of using Lepidoptera as indicator species is not a new one; lepidopterans are often used as indicators of ecosystem health and insect biodiversity.



We are using a citizen science model for our data, a model which has gained popularity in recent years. While conducting research in Canada on the threatened *Apodemia mormo*, I enlisted the help of citizen scientists from around North America who helped me capture nearly 1000 individuals for a mark-recapture study and increased the known locations of this butterfly from 33 to 88. This project was a pivotal moment for me, as a biologist who has buried herself in statistics and theory for enough hundreds of hours to be jaded on anything less than flawless, error-free data lacking in collector bias. However, I found that if a project is designed simply, with clarity in protocol, this model can offer a clear picture of our state's butterfly populations. Citizen science models have produced impressive results, as one can see with the results of long-term projects such as ebird and Monarch Watch.

Citizen science volunteers for the MiBN attend three training sessions, which are held across the state in early spring. In classroom and outdoor field trainings, volunteers learn identification techniques and our monitoring protocol for data collection. We help volunteers choose a site where they walk a census route (1-3 miles) six or more times per year between June 1 and August 7. Census routes are permanent, so ideally located on public land, nature preserves, or conservancies. We are currently in the

stages of collaborating with other states to establish a national database with online submission.

Why should we initiate this project now? Butterflies and other pollinators are in decline facing a trifecta of threats: habitat loss, insecticides and herbicides, and climate change. We can address this problem together by monitoring both common and rare species if we embrace it on several fronts – education, research, and application. With the Michigan Butterfly Network, we are working to educate citizen scientists to become engaged members of the research community, and these people become our ambassadors and educators in their communities as well. Our work will assist land managers to better understand their land and how restoration and management efforts may relate to landscape function. In the coming years we will be expanding the MiBN to other parts of Michigan. We are looking for citizen science volunteers as well as partners from land conservancies, nature centers, or government organizations to become involved in holding trainings and coordinating volunteers. I encourage you to visit our website, [www.michiganbutterfly.org](http://www.michiganbutterfly.org) to learn more, or contact me at [awick@naturecenter.org](mailto:awick@naturecenter.org).



**Skipper identification workshop for members of the Michigan Butterfly Network held at the Kalamazoo Nature Center in May 2013.**

## Case Reconstruction Behavior and Mortality of *Pycnopsyche guttifer* (Trichoptera: Limnephilidae) at Different Temperature and Aeration Treatments

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**P***ycnopsyche guttifer* is an important part of aquatic ecosystems and serves as a biological indicator of habitat disturbance and thermal pollution. These aquatic larvae build protective, tubular shaped cases around their bodies out of woody debris and minerals using silk producing glands. Late-instar larvae of *P. guttifer* were collected from the Little Manistee River, near Luther, MI, May - June 2013. They were exposed for 48 hr to five temperatures (17°, 20°, 23°, 25° and 29°C) either with or without supplemental aeration in

### Historical Notes on Drummond Island

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**J**udge MacDonald, now retired, is a 5th generation native islander and the great-great-grandson of the island's founding Seaman-Bailey families. He is an avid local historian, former member of the Drummond Historical Society Board of Directors and is a co-operator of Drummond Farms, a small family operated orchard and farm market business on the island. His presentation included facts about geography, geology and the demographics of the island

from the British occupation to the present day island residents as well as the community's many facilities and opportunities.



2.5 gal aquaria with substrate from the river. Cases were removed or left intact to observe the effects of both temperature and dissolved oxygen on survivability and case reconstruction ability over the 48-hr period. Case building material from the river was also prepared and provided for case reconstruction. Mortality was near 0% in the 17°C treatments and almost 100% in the 29°C treatments, regardless of aeration. Mortality was higher for the intermediate temperatures of 20°C, 23°C and 25°C for the caddisflies that had their cases removed and when no aeration was provided. Of the specimens that had their cases removed, over 75% rebuilt tubular cases in the 17°C and 20°C treatments; however, only 25% did so in the 23°C treatment, less than 20% in the 25°C and no case reconstruction of any kind was observed in the 29°C treatments. No tubular cases were built in trials of 23°C or higher when aeration was absent. A transition to increased mortality and decreased case



reconstruction success appeared to occur at 23°C, especially when there was no aeration. This temperature is only 2° higher than the maximum recorded at the study site during the previous summer, suggesting that a slight increase in stream temperature may negatively impact this abundant species, especially if dissolved oxygen levels are low. *Pycnopsyche guttifer* usually aestivates during the hot summer months, which may be an adaptive strategy to avoid such negative environmental conditions.

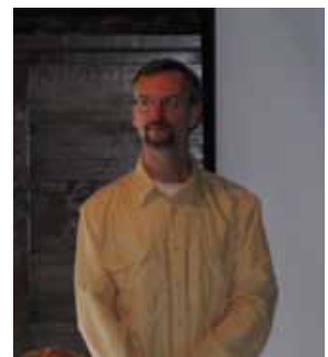
### Updated Checklist of the Michigan Caddisflies (Trichoptera)

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**B**ased on examination of over 100,000 specimens from over 400 collections (including blacklight samples and museum collections dating back to the 1940s) that represented nearly 300 aquatic habitats, I report 287 caddisfly species from Michigan, representing 21 families and 75 genera. Of these, 39 species are reported from the state for the first time and 153 species are new to the state since the previous (1949) Michigan caddisfly checklist. The 10 most abundant species represented >50% of all specimens examined. In contrast, 108 species are known from <10 specimens and 43 are known from a single specimen. Despite an 80-year collecting history, nearly 20% of the Michigan caddisfly fauna has been discovered since 2010, suggesting that new species remain undiscovered.



## Biological Control of Emerald Ash Borer in Michigan and Beyond

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**T**he emerald ash borer (EAB), *Agrilus planipennis* (Coleoptera: Buprestidae), is a phloem-feeding beetle from Asia that attacks ash (*Fraxinus* spp.) trees (Haack et al. 2002). This invasive buprestid was likely introduced to North America from China in EAB-infested solid-wood packaging during the 1990s and became established in the abundant ash resources of southeast Michigan and nearby Ontario. EAB has since spread throughout much of eastern North America (emeraldashborer.info 2013).

Soon after EAB was discovered in North America in 2002, we began surveying field populations for larval and egg parasitoids in southeast Michigan and northeast China (Bauer et al. in press, USDA FS NRS 2013). Although few larval and no egg parasitoids were found in Michigan, several parasitoids were found attacking EAB in China. In the northeastern provinces of China, the most prevalent parasitoids were *Tetrastichus planipennisi* (Eulophidae), a larval endoparasitoid, and *Oobius agrili* (Encyrtidae), an egg parasitoid (Liu et al. 2003, 2007). In Tianjin, the city-province just south of Beijing, the most abundant parasitoid attacking EAB was *Spathius agrili* (Braconidae), a larval ectoparasitoid (Liu et al. 2003).

After completing several years of research and the regulatory requirements to assess the risk-benefit of these parasitoid species for biocontrol of EAB in North America, USDA APHIS issued permits for their release in Michigan (Federal Register 2007). Releases began in Michigan's Lower Peninsula in 2007, Ohio and Indiana in 2008, and Illinois and Maryland in 2009. Two years following release of the parasitoids, establishment was confirmed at several field sites in Michigan. This resulted in the development of USDA's EAB Biological Control Program, and subsequent construction of APHIS' EAB Biocontrol Facility in Brighton, MI where the parasitoids are mass-reared for distribution and release. Information and detailed instructions for cooperators are available in "Emerald Ash Borer Biocontrol Release and Recovery Guidelines" (mapBioControl.org 2013), a website where parasitoid-release and recovery data is stored and mapped. As of fall 2013, parasitoid releases



have expanded to EAB infestations in Connecticut, Kentucky, Massachusetts, Michigan's Upper Peninsula, Minnesota, Missouri, New York, North Carolina, Pennsylvania, Tennessee, Virginia, West Virginia, Wisconsin, and Ontario, Canada.

To evaluate the effects of biological control on EAB population densities, we have been sampling EAB for mortality factors at six study sites in southern Michigan each year since 2008. The parasitoids were released at these sites from 2007 to 2010, and each site is comprised of a release plot and a control plot. EAB-egg parasitism is estimated

by sampling EAB eggs from the bark of ash trees. To date, *Oobius agrili* remains the only EAB egg parasitoid recovered. Egg parasitism increased from <1% in 2008 to ~30% in 2011, when it was found on 44% of the ash trees sampled at two of the release plots (Duan et al. 2012a). EAB-larval parasitism is estimated by felling and debarking EAB-infested ash trees, collecting the larvae and parasitoids, dissecting the EAB larvae, rearing, and identifying parasitoid adults. Larval parasitism by *T. planipennisi* increased from 1% in 2008 to 21% in 2012 at the six release plots, and 92% of the sampled ash trees contained at least one brood of *T. planipennisi* (Duan et al. 2013). *Spathius agrili*, the other species of introduced larval parasitoid from China, may not have successfully established in Michigan or remains too scarce to detect using these sampling methods. Two native *Agrilus* parasitoids, *Atanycolus* spp. (Braconidae), larval ectoparasitoids, and *Phasgonophora sulcata* (Chalcididae), a larval-pupal endoparasitoid, are also increasingly important natural enemies of EAB.

Using a variety of sampling methods, the establishment of *T. planipennisi* has now been confirmed at several sites throughout Lower and Upper Michigan, Ohio, Illinois, Indiana, Maryland, Minnesota, New York, and Wisconsin. The establishment of *O. agrili* has been confirmed in Lower and Upper Michigan, Maryland, Ohio, and Indiana. APHIS plans to continue rearing *S. agrili* for release in southerly regions of the U.S. (below the 40<sup>th</sup> parallel), and a more cold-hardy EAB parasitoid native to the Russian Far East, *Spathius galinae*, may soon be approved for release in the U.S. (Belokobylskij et al. 2012; Duan et al. 2012b).

Classical biological control of an invasive species is a long-term management approach, and it will take several years to determine the impact EAB biocontrol has on North American ash species. Most large ash trees will continue to die off as EAB invades our forests, leaving ash seedlings, saplings, stump sprouts, and a few surviving trees. We are optimistic that in time, a complex of native and introduced natural enemies will suppress EAB densities below a tolerance threshold for the survival, growth, and reproduction of some ash species or genotypes in the aftermath of EAB's invasion.

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## MES 2013 Annual Meeting Minutes – June 14-16, 2013 59<sup>th</sup> Annual Meeting, Drummond Island Resort & Conference Center, Drummond Island, MI

**T**hanks to Martin Andree for his efforts to make this a most enjoyable meeting in an excellent setting. There is so much to see on Drummond Island – go there!

**Present:** The General Membership plus Governing Board Members: Dave Houghton, Tina Ciaramitaro, Toby Petrice, Bob Haack, Mark O’Brien, Ron Priest, Adrienne O’Brien, Martin Andree, and David Cuthrell

### Reports:

**Secretary:** Adrienne O’Brien – membership is currently at 274 individuals and 101 institutional/subscriber members, an increase of 12 and 5, respectively, from 2012. Five new student members with new definition of student – through graduate school

**Treasurer:** Tina Ciaramitaro – current balance - \$25,103. Pay Pal has been used for some memberships and Journal page charges. It is great to be tax-exempt again.

**Newsletter:** Bob Haack – As always, looking for articles.

**Journal:** Therese Poland - Dan Swanson has joined the GLE editorial team, along with Therese, Ron Priest and Anthony Cognato. He and Ron are responsible for copy-editing papers after they are accepted. Anthony helps Therese oversee technical review and deciding on the acceptability of submitted papers. Vol. 46(1,2) published in March, Vol. 46(3,4) almost ready to go.

**Webmaster:** Mark O’Brien – no report

**Old Business:** A ballot was sent with membership renewals about changing the constitution to allow Student Membership to apply to full time students through graduate school and to allow students to vote and hold office. It passed with 127 YES votes and 9 NO votes.

**New Business:** Ron Priest was awarded a long overdue Honorary Membership to the Society – Therese Poland and John Douglass nominated him and the general membership overwhelmingly agreed. Congratulations, Ron!! Martin Andree presented to him a plaque and “trophy” depicting Ron with hedge shears (p. 30).

John Douglass proposed the idea of making the office of President a two-year appointment. There was some discussion, but no decision made. It will be discussed at the Fall Board Meeting.

The discussion continued on the topic of putting the contents of the more recent journals online to increase the availability, visibility and impact of the GLE. It was proposed by Leah Bauer and seconded by Dana Richter to post all journals at the time of publication. Motion passed.

Other journal topics of discussion introduced, but no decisions made: Increasing subscription rate for international subscribers to cover mailing costs; increasing costs for mailing back issues; reducing page charges – ours are one of the higher rates and some journals are free. However, authors with funding have been willingly paying the charges and we currently waive the fee for those who are not sponsored.

**Elections:** Congratulations to our new Member-at-Large, Julie Craves (2013-16) and President Elect, David Stanton from SVSU. Thank you to Kirsten Robinson for agreeing to be on the ballot for Member-at-Large – it was really, really close! And finally, a huge thank-you to Toby Petrice, Immediate Past President, and Harry King, Member-at-Large (2010-13), for their service to the MES.

**Bumble Bee Guides.** The USDA Forest Service along with The Pollinator Partnership has published identification guides for eastern and western bumble bees. They can be downloaded for free. The eastern guide is at: <http://www.fs.fed.us/wildflowers/pollinators/documents/BumbleBeeGuideEast2011.pdf>. These two on-line guides will be published in book form in 2014 as “*Bumble Bees of North America: an Identification Guide*” by Princeton University Press.

## Responses of Cerambycids to Prescribed Fire in Hardwood and Conifer Stands in Michigan

Elizabeth E. Graham<sup>1</sup>, Therese M. Poland<sup>2,3</sup>, Deborah G. McCullough<sup>3,4</sup>, Tina M. Ciaramitaro<sup>2</sup>, and Thomas A. Baweja<sup>3</sup>

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**N**ative woodborers, including cerambycid and buprestid beetles, play important roles in nutrient cycling and regulation of productivity in forest ecosystems; however, invasive woodborer species threaten forest health globally (Paine et al. 1995, Nowak et al. 2001, Brockerhoff et al. 2006). At high densities, even native species can damage and kill trees in forests, plantations and urban areas, and degrade lumber (Soloman 1995, Allison et al. 2004). Many woodborers colonize trees injured but not killed outright by fire and other species are attracted to fire-killed trees (Ryan and Frandsen 1991, Flanagan 1996, Scott et al. 1996). Most trees killed or injured by fire become infested with woodborers within 5 years and if native or invasive woodborer populations build to high densities, they can attack nearby uninjured trees. Spillover tree mortality elevates fuel levels which in turn increases fire hazard. Better understanding of the composition of cerambycid communities and their interactions with fire is needed to mitigate potential damage associated with cerambycid outbreaks and invasions. As such, our objective was to characterize the community of woodborers among canopy strata in forest stands at different times after fire damage.

We recently developed improved trapping protocols to maximize captures of cerambycid beetles at different types of

field sites. Our approach uses an array of Fluon-coated intercept panel traps baited with different lure combinations and deployed in the canopy and at ground level to ensure that a wide range of cerambycid species are captured. This work has shown the habitat niches exploited and the responses to different pheromone and host volatile components vary substantially among cerambycid species (Graham et al. 2011). Over 110 different areas had prescribed fires in the Lower Peninsula of Michigan during 2011. We identified 6 forest stands (3 conifer and 3 hardwood) burned in spring 2011 for woodborer sampling. We also selected 6 unburned control stands adjacent to the burned areas that were not affected by the fire, enabling us to address the theory that woodborer populations can build up in fire-stressed sites and then move into healthy stands. Transects were established in each burned and control stand to describe and quantify overstory composition and tree condition (using FIA/FHM inventory plot protocols and damage and crown indicators). Within each stand, an array of 10 traps was installed from May-September 2012 and again in 2013. In both years, trap arrays consisted of Fluon-coated intercept panel traps, with 5 hung in the canopy and 5 hung at ground level. Five different lure combinations were tested and each pair of canopy and ground level traps was baited with the same lure combination. Woodborers were collected from traps every 2-3 weeks, identified to species and tallied. We compared species captured in the canopy versus the ground traps, the attraction of specific species to different lures, and the species composition of woodborers in burned stands and adjacent control stands.

In 2012, we captured a total of 2171 cerambycids representing 69 species. The most commonly captured species were *Xylotrechus colonus* (776), *Monochamus scutellatus* (354), and *Aegomorphus modestus* (147). In general, we captured similar numbers of cerambycid beetles and cerambycid species in burned and control sites. Overall, more beetles per trap were caught in the hardwood sites than the conifer sites but the number of species captured did not differ between hardwood sites and conifer sites. Species composition varied between hardwood and conifer sites and between canopy and ground

traps, as might be expected, but within the hardwood and conifer sites, there was no consistent difference in species composition between burned and unburned sites.

Fire damage from controlled burns may not have been intense enough to severely stress trees and attract species that respond to fire-damaged and dying trees. Population density and community composition may change over time after a fire, thus it may have been too soon to see differences in response to fire. If beetles were attracted to smoke during the burning or to volatiles emitted by injured trees in spring, we may capture their progeny when they emerge in 2013. We will continue to follow woodborer abundance and diversity at these sites over time to assess the woodborer communities associated with specific cover types, the long-term effects of prescribed fire on woodborers, and to determine optimal trap placement and lure composition for detecting, monitoring and assessing cerambycid beetles.

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## Fall 2013 Governing Board Meeting Minutes

November 21, 2013

USDA Forest Service Office, East Lansing, MI – 1-3 PM

**Present:** Martin Andree, Dave Cuthrell, Ron Priest, Julie Craves, Bob Haack, Toby Petrice, Therese Poland and Adrienne O'Brien, recording secretary

**Welcome and Introductions:** welcome to Julie Craves, newest Member-at-Large.

**Minutes from 2013 Annual Meeting:** Dave moved, Toby seconded, approved.

### Reports:

**Treasurer:** Tina Ciaramitaro absent, presented by Therese. Current balance is \$19,250 with \$10, 881 in expenses since June 2013, \$4773 income during same period. Due to a question on some of the figures for the annual meeting, the report will not be approved by the Board until further clarification.

**Secretary:** Adrienne O'Brien – total number of members is slowly increasing, especially students, since the MES extended the student rate to all students, including those seeking any type of graduate degree. Membership is at 282 plus 101 Subscription and Institutional members.

**Newsletter:** Bob Haack – waiting on a few articles before starting the layout of the fall issue. Due to visitors from China coming for most of December, Bob will most-likely have the Fall Newsletter out in January 2014.

**Journal:** Therese Poland – Papers are being submitted, Vol 47(1&2) should be published in March 2014 and more papers are in review so that vol 47 (3&4) should be ready in the Fall. We continue to seek ways to make The Great Lakes Entomologist have more impact. In the near future, all volumes of our journal will be posted on the MES website as they are published. The journal will continue as a printed document, but its distribution can be increased by having it available sooner as a digital copy. This appeals to potential authors because their papers will be cited

more often, thus increasing the h-index rating for the author. An h-index score is determined by the number of publications and how often they are cited and is used as a basis for hiring, tenure, promotion and performance evaluation. In addition, many journals have reduced or done away with page charges. We must take action to compete with other journals.

**Webmaster:** Mark O'Brien absent - will work on getting the current issues of the journal on the website.

**Old Business:** a) At the June MES Annual Meeting, we proposed having a 2 year term for President, but after further discussion, the board decided that it would be difficult to get that kind of commitment.

b) there had been a suggestion that we increase the rates for all international members. Upon looking at the actual numbers, 27 in all, we felt it wasn't as big a problem as perceived.

**New Business:** a) Ron Priest proposed that residual funds (approximately \$500) from an MDA grant to MES that occurred several years ago be used to purchase Cornell drawers for the MSU Insect Collection. A motion by Ron, seconded by Dave, was passed unanimously.

b) Based on Therese's Journal Editor's report, it was suggested that we reduce page charges (currently \$42/page) to \$25/page for members, \$40/page for non-members. In addition, the Society will continue to subsidize authors who have no support from grants or colleges. The motion was made by Therese, seconded by Martin, and passed unanimously.

c) The 2014 Annual Meeting will be held at Saginaw Valley State University and hosted by President-elect Dave Stanton. At this point, no date has been determined, but further information should be available soon (see p. 25).

d) The MES Governing Board put together a potential election slate for 2014 for the offices of President-elect and Member-at-large. If you have any interest in being involved with the Society (and meet with fun people) do not hesitate to contact any board member. You'll be glad you did....

e) Breaking Diapause will be held Saturday, March 15 at MSU. See more details in the newsletter. (see p. 25)

f) There was discussion about the possibility of raising the fees for Active and Sustaining Memberships by \$5 in 2015. Adrienne moved, Bob seconded and the motion was carried unanimously. Save your pennies!

Meeting was adjourned at 3:00 on a motion by Adrienne, seconded by Therese, all approved.

Adrienne O'Brien, MES Secretary

### USDA Forest Service Region 9 Abuzz about new pollinator workshops!

The Eastern Region of the USDA Forest Service recently formalized a partnership with the Pollinator Partnership (<http://www.pollinator.org/>) through a challenge cost-share agreement to develop and execute two pilot pollinator training workshops in Spring/Summer 2014. The workshops will be offered to non-government organizations, partners, citizen scientists, as well as Forest Service personnel. The Mark Twain National Forest (Missouri) and the Ottawa National Forest (Upper Michigan) will serve as pilots for this endeavor. The Eastern Region is committed to building partnerships and encouraging citizen science to share the importance of native pollinators and the threats they currently face. We feel that these workshops are a huge step toward that, and are very excited about this opportunity. The Eastern Region has many resources and links related to pollination at: <<http://www.fs.usda.gov/detail/r9/plants-animals/plants/?cid=stelprdb5291476>>.

#### Contacts for Pollinator Workshops

**Jan Schultz**, Regional Botanist, Milwaukee, WI. (414) 297-1189 or [jschultz@fs.fed.us](mailto:jschultz@fs.fed.us)

**Daniel Jordan**, Wildlife Biologist, Mark Twain National Forest, (573) 438-5427 ext. 5112 or [ddjordan@fs.fed.us](mailto:ddjordan@fs.fed.us)

**Sue Trull**, Botanist, Ottawa National Forest, 906-932-1330 ext. 312 or [stroll@fs.fed.us](mailto:stroll@fs.fed.us)

**That's My Story and I'm Sticking to It****Martin J. Andree**3990 Four Mile Road NE, Grand Rapids, MI 49525. Email: [mjandree@koeze.com](mailto:mjandree@koeze.com)

In the entomologists' bag of tricks there are dark arts, cloaked in deep secrecy. Even in the rarified inner sanctum of the hallowed annual meeting's "Evening Mixer," or in quiet, less visited halls after the much-vaulted Breaking Diapause spring meeting, do we utter of our questionable deeds? To the un-washed, we are pure, forthright, bona fide and what you see is what we caught, a true and honest presentation of nature, perfectly pinned, labeled, displayed, and preserved, a mirror of honest entomological piety.

That's really a load of dung beetles and it's time we got this practice out in the open, as I know that there isn't one among us who has not participated in this craft. Some brazenly and more openly than others, some have just dabbled, yet others are in denial. Me? I bumble crudely and disastrously along.

Let's start with the basic tenant that entomological specimens are fragile, hopelessly, horribly fragile. Stir in all of the time it took to collect, curate, identify and label our specimens, factor in all of the memories of the trip, the good souls who accompanied you, the weather you had to contend with, the sport of the chase and the thrill of the capture. Years later, while admiring your specimens from that trip, with rapturous nostalgia, your dog (named Mothra), bounds into your study, knocks over your butterfly nets in the corner, which fall towards your bugs. You dive out of your chair to successfully intercept. Too bad you didn't see that avalanche of slippery Great Lakes Entomologist journals slide off the shelf above your desk and lay waste to your precious specimens below.

"For the love of Lepidoptera!" you scream, "Holy mother of lady bugs, my glorious solitary wasp specimens have been turned into squash bugs!" As Mothra bounds happily out of the room, the diatribe continues, "My bugs, my bugs, my precious bugs! All ruined! Smashed to smithereens! Now what?"

You know perfectly well "Now what?"

There, in the dark cubby at the back of your desk, it's thinly hidden, but you know it's there. Behind the ancient brown glass bottles of Specimen Clearing Fluid, Euparal Mounting Medium, Double Stain, and Barber's Relaxing Elixir it patiently rests, shining as bright as the clear glass bottle that holds

it... BioQuip's #1157, Insect Repair Adhesive. A svelte bottle of four drams of liquid miracle.

"Who cares? No one will find me out." you warble, suddenly remembering the opening lines from, "The Six Million Dollar Man," you croak out in your best Oscar Goldman imitation, "Gentlemen, we can rebuild them. We have the technology, we have BioQuip's #1157 Insect Repair Adhesive, we have the capability to build the world's first bionic insect specimens. These smashed wasps will be those bugs. Better than they were before. Better, stronger, faster."

Just to be sure, you re-read the label, "Cellulose based liquid adhesive specially formulated to facilitate repair of insect wings, tarsi, antennae and other body parts." "Jumping spider jigsaw puzzles!" you yodel out, "Thank goodness! That about covers all the parts I need AND it's specially formulated!" Then you look at the wake of destruction that was once seven different species of wasps. They were all the same black, they were all the same size, now they are all a disarticulated, mixed up heap of iridescent purple wings, tarsi, antennae and other body parts. A jigsaw puzzle indeed, the kind where all of the pieces are black (both sides) and there is no picture on the front of the box, just the mocking phrase, "Cellulose based liquid adhesive specially formulated to facilitate repair of insect wings, tarsi, antennae and other body parts."

Undaunted, you wade in. You unscrew the black cap off the adhesive and slowly pull the attached glass applicator free from the bottle. Immediately out wafts the smell of your youth, recalling hours of botched model airplane assembly and that 1968 jet powered dragster kit you labored on for weeks. Your courage is now buoyed by the intoxicating aromas of Camphor, 1-Methoxy-2-Propylolacetate, Isopropanol, Acetone and Amyl Acetate. "What can possible go wrong?" You happily pearl on, drinking in the smell of certain success.

After sorting the parts to the best of your ability, you try your hand at the first Franken-wasp. You sadly remember that the applicator cap is not the most precise of instruments. It is basically a glass rod attached to the bottle top. As you pull it from the bottle, the adhesive slinks down the glass rod and forms a drop at the end about the size of the average watermelon. Using your finest forceps, you delicately position a wing next to a thorax and shakily move the giant dollop of adhesive towards the two parts. The giant drop falls from the rod, onto the wing, onto the thorax, and then flows down onto the pile of carefully sorted legs below. Next the adhesive is covering your forceps, now decorated with several

wasp heads, part of an abdomen, a good-sized wad of pocket lint, and that large Petoskey stone paperweight you were so proud of. They are all stuck together in an anatomical, natural history jumble. You are not dissuaded.

You move to the next pile of bones and start afresh. You think about Ezekiel and mindlessly sing that song, "The Tarsomeres connected to the Tibia, the Tibia connected to the Trochanter, the Trochanter...wait a minute...the Tibia connected to the Coxa, no, that's not right, the Femur connected to the Tarsi..." "No matter," you sing out, "This is all going along swimmingly!" That's when you notice that one wasp has very short hind legs and five wings, one sprouting from the head like a unicorn. Another has a head on each end and two legs, yet another appears as a Petoskey stone with wings and a stinger. Things have gone amuck. The dry bones song slips from your head and is replaced with the Johnny Cash song about the Cadillac that he stole from the factory, one part at a time over the course of several years. In particular, you sing the lines, "Now up to now my plan went alright, 'till we tried to put it together one night, and we noticed that something was definitely wrong...Now the headlight was another sight, we had two on the left and one on the right, but when we pulled out the switch all three of 'em come on." Somehow, you are consoled by the Man in Black and know everything will be just fine.

You're about to quit for the day; there is insect adhesive everywhere but where you want it. Then the doorbell rings. Aghast you look out the window and see several entomological buddies have dropped by for an impromptu visit. You think your game is up, they've found you out and were sent by the MES Ethics on Sound Specimens Committee. You muster your courage and move to the door, checking your look in the hallway mirror as you glide by and reach for the door handle. Too late, you open the door just as you notice the face looking back at you in the mirror has a wasp leg glued to the middle of its forehead. The door swings open as you face your old friend Mo Nielsen and notice that there is a half of a bright orange and black *Catocala* hind wing stuck to his left ear, there is John Douglass, smiling away, oblivious to the odonate head glued to his jaw. Lastly, there stands Mark F. O'Brien with what's left of a once immaculate sphecid wasp, adhered to his left elbow.

The Man in Black was right, everything will be just fine. You smile silently to yourself and greet your friends heartily saying with the utmost honesty, "Gentlemen we need to stick together on this," as you put a knowingly silent, bug leg decoupage, finger to your lips, as if there were any doubt.



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## MES Historical Notes

**Robert A. Haack**, Newsletter Editor

**1988 – 25 years ago.** In early 1988, Ken Kraft was President; Phil Watson was President-Elect; Mark O'Brien was immediate Past-President; Mo Nielsen was Executive Secretary; Dick Fleming, Robert Husband, and Gary Dunn were the three Members-at-Large; Dave Gosling was Journal Editor; and Lou Wilson and George Heaton were the Newsletter Editors. Robert Haack took over as Newsletter Editor at the end of 1988. The 34<sup>th</sup> MES Annual Meeting was held on 10 June 1988 at Ferris State University in Big Rapids, MI. Peggy Spofford, from SUNY (Syracuse, NY) presented the keynote address on cleptoparasitic flies that lay eggs or live maggots on the prey of pompilid wasps. The flies do this by searching the burrows that were still be provisioned by wasps, or by landing on the prey while the wasp was flying to its burrow. Wasps have developed strategies to reduce parasitism too. There were 11 other talks presented

at the annual meeting, including talks on bark beetles in the Dominican Republic, use of Bt for gypsy moth control, parasitism of gypsy moth egg masses, IPM in Michigan public schools, tips for preparing multi-authored books, oleander aphids, interactions of *Formica* ants and defoliating caterpillars, use of Bt for control of cottonwood leaf beetle, sense organs on grasshopper antennae, impact of scavengers on gypsy moth trap catch, and the anatomy of the digestive system of a non-feeding *Ennomos* moth (see the online abstracts for MES Newsletter vol 33, No 3-4). Ted Hubbell wrote an article on several of the early amateur entomologists that worked at the UM Museum of Zoology, such as Arthur Andrews, Robert Driesbach, Wilbur McAlpine, Sherman Moore, John Newman, George Steyskal, and E.B. Williamson. Annual dues were \$8 per year for active members, and \$15 per year for libraries. Journal page charges were \$30/page. There were 433 members in good standing and 172 library subscriptions at the close of 1988.

**1963 – 50 years ago.** In early 1963, Robert Dreisbach was President, Stanley Gangwere was President-Elect, David Cook was immediate Past-President, and Theodore Cohn was the Executive-Secretary. The 9<sup>th</sup> annual meeting was held at Western Michigan University in Kalamazoo on 23 March 1963. The annual meeting was held on the last day of the Michigan Academy of Sciences annual meeting. Roland Fisher organized the meeting, which included 13 talks. Some of the topics covered in these talks included bird lice, fern sawflies, Collembola, rearing houseflies, butterflies of India, mimicry, *Dendroctonus* bark beetles, revision of the *Limnia* flies, Central American Orthoptera, myiasis, nesting habits of Megachilidae, and ichneumonid development. In addition, several members reported on collecting trips they had done during the past year, such as David Cook in India, Roland Fisher in Oregon, Theodore Hubbell in Ecuador, Mo Nielsen in the U.P. of Michigan, and Henry and Marjorie Townes in Mexico. In 1963, MES membership dues were \$2 per year, \$1 for students.