

# The Maine Entomologist

A forum for students, professionals and amateurs  
in the Pine Tree State

The Official Newsletter of the Maine Entomological Society

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## PRESIDENT'S CORNER



BY HILLARY MORIN PETERSON

Dear MES Membership,

It is with great pleasure and honor that I introduce myself as the new president (and eventual webmaster) of the Maine Entomological Society. I was nominated during this past summer, and then voted in during this year's annual meeting on September 26th, along with Mike Parisio as Vice President.

As a brief introduction to myself, I grew up in Brunswick, Maine, and have loved the outdoors since childhood. I have always been fascinated by both vertebrates and invertebrates, and ultimately decided to pursue a Bachelor's degree in biology from the University of Maine.

During my time at UMaine, I worked in the labs of Frank Drummond and Eleanor Groden, both entomologists you may know, and conducted an undergraduate honors thesis study on the potential native natural enemies of the invasive winter moth, *Operophtera brumata*, in Harpswell. It was during this project that two fates were sealed for me - I both fell in love with parasitic Hymenoptera, and met and got to know Charlene, as she served on my committee.

The summer after graduation from UMaine, I attended the MES BioBlitz in Acadia National Park focused on Hymenoptera. This opportunity led to an internship at the Smithsonian, where I identified to morphospecies and species the parasitoids in the families Braconidae and Ichneumonidae, and the superfamily Chalcidoidea, that I'd captured during my project. During this time, I even had the opportunity to describe a new species, *Ormocerus dirigoius*, which I named after the Maine state motto "Dirigo."

I have recently graduated from Penn State University with my Ph.D. in Entomology, where I studied biological

control of the invasive brown marmorated stink bug, *Halyomorpha halys*. I now reside in Lewiston with my husband and my two coonhounds.

Before the annual meeting this year, I spoke with Cathie Murray, who had the wonderful suggestion that I facilitate a conversation with membership about what they love about MES, and what they would like to see change or added moving forward. The discussion was reflective and inspiring - members discussed how field trips add so much enjoyment and enrichment to their lives. For some, the relaxed social aspect to the trips are favored, while for others, it is the open-minded attitude of other members who are quick to offer their expertise.

Members also appreciate how workshops provide professional development and networking opportunities, and how much the newsletter is enjoyed at home. Finally, volunteering at the Maine State Museum (MSM) entomological collection has been an incredible opportunity for many, including myself, to appreciate both the diversity of insects and rich history of collecting in Maine.

Looking forward, many members expressed excellent ideas as well. The previous BioBlitzes sparked discussions of the potential for annual collecting at one location to create a "patch list," and more ideas for education and youth outreach were discussed.

One idea from this conversation has already come to fruition - MES will now be hosting monthly webinars during the "off season" months of October through April, on the first Thursday of every month. Other exciting plans and ideas which have, or will be, implemented this year include the new MES official Facebook group, "Maine Insects" (which at the time of this writing has 1,148 members!), plans in the work for a virtual winter workshop this year (mark your calendars for Saturday, January 23rd), and a new website, including on-line membership applications.

(continued on next page)

### Table of contents

- 📌 Minutes of Annual Meeting (p. 2)
- 📌 Giant Cicada-Killer Wasp in Kennebunk (p. 3)
- 📌 Tick-Borne Disease Risk at Acadia N.P. (p. 4)
- 📌 Can Black-Legged Ticks Survive in Northern Maine? (p. 5)
- 📌 Damselfly Ballet Troupe on Pushaw Lake (p. 6)
- 📌 Elm Zigzag Sawfly New to North America (p. 6)
- 📌 Remembering Dan Jennings (p. 7)
- 📌 Maine Spiders on TV with Charlene and Dana (p. 8)
- 📌 Winter Workshop on Odonates (p. 8)
- 📌 Honeybee Distribution of Labors (p. 8)
- 📌 Bird Feeder "Compost" Beetles (p. 9)
- 📌 Coming M.E.S. Events (p. 10)

*President's Corner (cont.)*

I would be lying if I said taking on the responsibility of MES president does not make me a little nervous. As we all know, Charlene is an amazing, dedicated, witty, and passionate person, and I cannot think of bigger shoes to fill. I am honored to take on this new role, and excited to have this unique ability to, as Charlene wrote in her last President's Corner column, "keep the Society vibrant and moving forward." We wouldn't be as special of a society if it weren't for every member, and I am so grateful to each and every one of you.

Keep being hopeful during these times, and I hope to see you virtually over the winter!

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**Minutes of MES Annual Meeting: Sept. 26, 2020**  
**Submitted by Anna Court, Secretary**

About 16 people attended the 2020 MES Annual Meeting at Bob and Nettie Nelson's home in Clinton on September 26. This was the 23rd annual meeting of the Society.

**Business Meeting:** MES Vice President Kathy Claerr called the annual business meeting to order at 1:30 p.m. Attending were: Nina Beckwith, Kathy Claerr, Anna Court, Peter Darling, Charlene Donahue, Theresa and Elizabeth Mazurkiewicz, Dana Michaud, Ian Miller, Cathie Murray (remotely), Kathy Murray, Bob Nelson, Nettie Nelson, Michael Parisio, Hillary Peterson, and Tom Schmeelk.

Announcement: Charlene Donahue announced the publication of *A Checklist of Maine Spiders* by senior author Daniel T. Jennings and herself. She brought copies for members and said that more could be printed if necessary. The *Checklist* was published by the Maine Department of Agriculture, Conservation and Forestry, Maine Forest Service (Forest Health and Monitoring Technical Report No. 47-. Unfortunately, Dan Jennings died just before the *Checklist* was published. Charlene said that he knew about the upcoming publication, however, and was very happy about it.

**Approval of Minutes:** ACTION: Minutes of the October 5, 2019, Annual Meeting were approved without correction.

**Treasurer's Report: General Fund.** Treasurer Dana Michaud presented the Treasurer's Report which showed a balance of \$3,268 in the general account as of August 31, 2020. This is about \$500 more than the balance on August 31, 2019. Additional income came primarily from dues and the Winter Workshop. The Social Media Project consultant was paid \$1,000 out of the general fund in 2020.

**Treasurer's Report: Scholarship Fund.** Michaud reported that the balance in the Scholarship Account was \$4,927 on August 31, 2020 – approximately \$500 more than the fund's balance in 2019. No grants were given for scholarships during the 2020 fiscal year.

ACTION: The Treasurer's Report was audited by Nettie Nelson and approved by the members

**Report on MES Social Media Project:** Hillary Peterson reported on MES's Social Media Project. Over the summer, MES hired Hailey Mealey to create and populate a

social media presence for MES including an Instagram account and a Facebook Group, which is named "Maine Insects." Hailey started work in May, completed her involvement in September and reported on the project.

**Outcome:** Hillary Peterson reported that the Facebook Group now has 900 members and that all age groups are represented. The younger age groups (18-24 and 25-34) are well represented. That was one of the objectives of creating the Facebook Group -- attract younger members. Hillary said that postings are frequent and varied and include pictures of Maine insects, requests for identification, and other questions.

Hillary said that a committee consisting of herself, Cyrene Slegona, and Kathy Murray are the co-administrators of the site. They meet remotely bimonthly. They are creating a task list for administration. Events are posted on both the website and Facebook as well as in the newsletter, and Hillary has posted short, narrated videos of MES Field Days. Hillary reported that these announcements have been productive: at least one new person has attended each Field Day this summer from announcements on the Facebook Group.

Hillary reported that there have been zero negative posts on the site. Inappropriate ads, such as for weed killers, are deleted by the administrators. Hillary also has started organizing the individual postings into taxonomic groups so that they can be searched. She is making a unit for every Order and groups insect photos into these units. She adds family, genus, species and common name to the photos when possible.

The MES Instagram page used the e-mail mainentosociety@gmail.com. The administrators have been populating it, but it is not as popular as the Facebook Group.

**Discussion:** Kathy Claerr asked how we could use the Facebook Group to interest users in becoming members. She reflected that through the Facebook Group users get all the benefits of membership in MES (notice of events, for example) except the quarterly newsletter. She said we should be thinking of attracting younger members. Kathy Murray suggested that if we had more members we could broaden our community relevance which in general is engaging people in the natural world. Anna Court suggested that with more members we could contribute more in advocacy for conservation, education and engagement in nature, as well as financially to causes and groups with our values. Kathy Claerr suggested that we have more winter activities to encourage new members and engage existing members.

**NEW BUSINESS: Election of Officers.**

*Nominated for Executive Committee positions:*

**President:** Hillary Peterson

**Vice President:** Michael Parisio

**Secretary:** Anna Court

**Treasurer:** Dana Michaud

**Members-at-Large:** Cathie Murray and Kathy Murray

**Newsletter Editor:** Bob Nelson

ACTION: This 2021 slate of MES Officers was unanimously approved.

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*Minutes (cont.)*

The group decided to install the 2021 officers immediately after this Annual Meeting. The bylaws do not require waiting until January 1, as we have done in the past.

**Discussion - Leadership Goals.** Nominated individuals and former officers talked about why they wanted to lead MES. Cathie Murray and Hillary Peterson said they wanted to help preserve the traditions of MES and explore new avenues to serve members and the community. Kathy Murray mentioned the opportunities MES provides for professional development. She is always learning something new. She would be interested in furthering tiered levels of learning through workshops, including winter workshops. Tom Schmeelk said that he wanted to play a part in planning MES activities. Kathy Claerr said that the Field Days are relaxed, informal, and serve as opportunities to socialize and make friends. Kathy Claerr also said she valued the opportunity to work at the State Museum annex on the insect collection. Charlene Donahue and Anna Court said the MES Newsletter is a stellar and highly professional entomology journal.

**ACTION:** Starting in January Anna Court will work with Charlene Donahue to develop an index for the MES Newsletter.

**Discussion - New Directions.** Charlene Donahue and others said they hoped we could do more outreach via Zoom, drawing together professional and amateur entomologists. The group suggested we could do a monthly Zoom presentation to be made available on our sites and to our members as well as to colleges and universities in Maine. Participation in Ph.D. dissertation defenses could also be offered. The group also said we should hold more workshops, remotely for the present, but then in-person workshops. Bob Nelson said that he hoped we could sample insects in the same locations over a number of years, such as Viles Arboretum and the Fayette site. Several members said they hoped we could offer curriculum that we could present in schools, along with a cadre of MES members who would do these presentations for both schools and organizations. The group agreed that developing a map of Field Trips by year would be a good tool to make sure we have coverage and to interest new and continuing members.

**ACTION:** A committee was formed to develop Zoom presentations including Thomas Schmeelk, Mike Parisio, Hillary Peterson, Kathy Murray and Cathie Murray.

**Web Master.** Hillary Peterson volunteered to become the new webmaster (replacing Bob Nelson) and to obtain a domain. Colby College would no longer be the host.

**Non-Profit Status.** The group decided to explore obtaining non-profit status for MES. Hillary Peterson will lead this effort.

**Scholarship Committee.** Dana Michaud is currently on the scholarship committee with Jon Wallace. The scholarship committee receives and approves scholarship applications.

**ACTION:** The group agreed that the opportunity for grants from MES for educational purposes needs to be more widely publicized and that the scholarship application needs to be revised to be more specific as to what kinds of projects

and expenses would qualify. These materials will go on the MES website and Facebook Group.

**MES Field Trips and Activities.** The following events are planned:

**October:** Invite UMaine entomology graduate students to present their ESA talks on Zoom for a trial run. Coordinator to be announced. Mondays: Volunteers are needed to work on the insect collections at the Maine State Museum Annex. Coordinators: Charlene Donahue and Dana Michaud

**December 3rd Webinar:** Jen Lund on bees and bee gardening. Coordinator: Kathy Murray.

**January 23, 2021:** MES Virtual Winter Workshop on dragonflies and damselflies. Coordinators: Michael Parisio and Thomas Schmeelk.

**February or April:** Enhancing gardens for insects. Date and Coordinator to be announced.

**March 27:** Maple Syrup and Insect Collecting at Charlene Donahue's house in Whitefield. Coordinator: Charlene Donahue.

**May:** Aquatic insects, Southern Maine. Date and Coordinator: To be announced.

**June:** Moth Night, Dresden. Date to be announced; coordinator: Tom Schmeelk.

**July:** Viles Arboretum. Coordinator: Dana Michaud. Date to be announced.

**July:** Field's Pond. Coordinator: Pete Darling. Date to be announced.

**August 7:** Hirundo Wildlife Refuge, Old Town. Coordinators: Anna Court and Tina Graham.

**September:** Cherryfield blueberry barrens. Coordinator: Bob Nelson. Date to be announced.

**October:** MES Annual Meeting at Bob Nelson's home in Clinton. Collecting from 10-12, pot luck lunch, business meeting. Coordinator: Bob Nelson.

**Adjourn.** The group voted to adjourn the meeting at approximately 3:30 p.m.

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## ***Sphecius speciosus* in Kennebunk**

**by Monica Russo and Kevin Byron**

*(all photos by Kevin Byron)*

During the second week of August, our friends Jane and Dick called to notify us about their observations of a colony of very large (up to 2" long) fossorial wasps seen on their walks at the open sandy blueberry barrens in Kennebunk. They watched the wasps entering nest holes which were about large enough to stick your thumb into.

Their descriptions indicated that these were Cicada Killers (*Sphecius speciosus*). They collected a dead specimen and gave it to me; I forwarded it on to Charlene Donahue, who said it was the first specimen to be collected in the state. However, it turns out that Brandon Woo had first documented the species photographically in August, 2014 (<https://bugguide.net/node/view/985149>).

On August 15, Kevin visited the site and indeed found a large colony. He took photographs of the wasps digging and flying, and counted 76 open nest entrances. He returned to

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*Sphecius speciosus* (cont.)

the colony on August 18, and took further photographs. Some of these accompany this note.



An adult *Sphecius speciosus* in flight in Kennebunk. Note the fly in the lower right for scale.

Reports of large colonies of Cicada Killers are probably not unusual: I have a note from the late Sam Ristich (from 1995) that in July, 1941, he saw “only 20 holes left in the colony” where he had earlier observed 30 to 40 wasps. This was probably at Cornell, where he earned his Ph.D. in entomology.



An adult female cicada killer at the entrance to her burrow in Kennebunk.

I am grateful to have had the support and enthusiasm of Sam over the years. Many thanks to Jane and Dick for their alert observations of the local Hymenoptera. And much appreciation for Kevin’s photographs and fieldwork of these big wasps, since I am not able to do much in the way of field studies myself. Perhaps other MES members will discover additional colonies of these spectacular insects in other parts of Maine.

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## Tick-borne Disease Risk in Acadia National Park

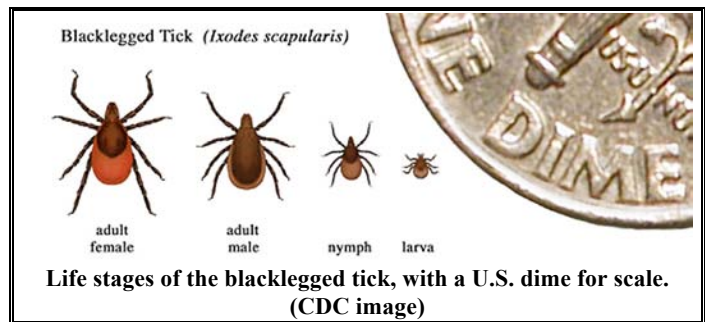
(a 2020 University of Maine M.S. thesis summary)  
by Sara McBride

National parks are regions of great recreational and epidemiological significance with over 300 million annual visitors. While exploring parks, visitors may place themselves at risk of exposure to vector-borne diseases (i.e., pathogens transmitted through the bite of an infected arthropod), including tick-borne diseases such as Lyme disease.

National parks represent unique disease transmission settings compared to other private and public lands, limiting our ability to understand tick-borne disease exposure risk using traditional approaches. These areas are protected under federal laws resulting in ecological differences from neighboring areas outside of park lands.

Additionally, because national parks have geographically diverse visitor profiles and human cases of tick-borne disease are typically reported based on state of residence rather than presumptive location of exposure, traditional methods of human case surveillance to assess risk prove unreliable in these areas. Finally, national parks practice integrated pest management, which aims to minimize the environmental impact of pest control interventions, thus many typical management strategies for tick-borne disease cannot be easily applied. These challenges may be overcome by using ecological metrics to develop spatial models of tick density and to identify areas of highest tick exposure risk within a park.

The blacklegged tick, *Ixodes scapularis* (also known as the deer tick), and the infectious diseases of humans and wildlife that it transmits, including Lyme disease, anaplasmosis and babesiosis, have been expanding in the eastern United States within recent decades. Likewise, the state of Maine has experienced this expansion moving north and along the coast. Acadia National Park (ANP) located on Mount Desert Island, Maine, is highly visited, with more than 3 million visitors per year, and largely has not been assessed for tick-borne disease exposure risk.



To determine the broad-scale patterns of blacklegged tick densities in ANP, field surveys of blacklegged ticks were conducted at a total of 114 sites across the park between the months of June and August during two consecutive years. Using field-observed tick densities and landscape feature data (i.e., land cover, elevation, forest fragmentation, aspect, and UTM coordinates), a spatial model was created to identify

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**Ticks in Acadia (cont.)**

how tick density varies across Mount Desert Island. We found that tick densities vary significantly across the island and are particularly high in areas characterized by deciduous forest cover, relatively low elevations and northerly and easterly locations of the island.



Sara conducting drag sampling, a standard collection method wherein a 1x2m corduroy cloth is pulled across vegetation or leaf litter and inspected every 10 meters for ticks.

- Photo by Holland Haverkamp, University of Maine



Ticks were removed from cloth with forceps every 10 meters.

To investigate the causal mechanisms driving spatial patterns of tick density, a subset of 19 sites were assessed for microclimate conditions (relative humidity and temperature),

host activity (small mammal trapping and deer scat surveys), and vegetation metrics (percent canopy cover and leaf litter depth). We found that mean temperature and mean humidity are different among landscape features and are significantly correlated to tick densities. Therefore, microclimate may provide a mechanistic link between landscape features and blacklegged tick densities. Areas with deciduous forest, at low elevations in the northern and eastern locations of the island and down the eastern coast generally had more ticks.

This project emphasizes the importance of using ecological metrics to estimate risk of exposure to vector-borne diseases, provides new insight into habitat characteristics that may drive tick-borne disease exposure risk across spatial scales, and demonstrates the design and effort required to operationalize similar vector-borne disease risk assessment protocols in other National Parks.

Sara McBride now works with the CDC in Atlanta, Georgia

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**Can blacklegged ticks survive northern Maine winters?**

by Michelle Volk

(a 2020 University of Maine M.S. thesis summary)

Lyme disease is the most common vector-borne disease in North America and affects thousands of people each year in the United States. Blacklegged ticks (*Ixodes scapularis*) are the primary vector of *Borrelia burgdorferi*, the bacterial agent that causes Lyme disease.

In the past few decades, reported human cases of Lyme disease have increased in number and geographic distribution, both in the northeastern and midwestern United States. Maine has a high incidence of Lyme disease and other tick-borne diseases, and in recent years Lyme disease has been spreading north from southern Maine.



A hungry adult female black-legged tick, *Ixodes scapularis*.

Photo by Scott Bauer, USDA, Bugwood.org

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**Can Black-Legged Ticks Survive Winter (cont.)**

One hypothesis for this trend is that an increase in temperature and precipitation due to climate change is facilitating increased abundance and the regional expansion of blacklegged ticks into areas where tick-borne diseases are rare or emergent, such as northern Maine.

As arthropod vectors, blacklegged ticks are susceptible to cold or dry conditions that can cause freezing or desiccation. Thus, it is possible that regional climate and climate change is a factor that is constraining or facilitating the spread of blacklegged ticks into northern Maine.

Our research explored whether winter climate (in particular, winter temperature and snow fall) facilitates or inhibits the spread of blacklegged ticks and thus the bacteria they can transmit. Twice during their two-year lifecycle, blacklegged ticks overwinter buried under snowpack and leaf litter, which provide insulation and moisture to protect them against cold and dry ambient conditions.

We experimentally tested blacklegged tick overwintering survival during two winters across Maine, in areas where ticks and tick-borne diseases are common (such as Cape Elizabeth) and areas where few or no blacklegged ticks have been detected (such as Presque Isle), to determine if overwintering survival was different across the stated based on climate.

In late November of 2018 and 2019, we placed blacklegged ticks inside 1-gallon plastic buckets that were filled with soil and leaf litter to simulate where ticks would naturally overwinter under snow cover and leaf litter. The following April, we retrieved the overwintering ticks from their buckets and determined the survival of ticks overwintering at different locations across the state.

We found that blacklegged tick overwintering survival was similar across Maine, despite recording low ambient temperatures in northern Maine that have been shown to cause tick mortality due to freezing injury. The successful survival of ticks in northern areas was likely due to sufficient snowpack in northern Maine that insulated ticks and provided protection against cold ambient temperatures.

We determined that snowpack plays an important role in tick survival and that snowpack in northern areas outside of the blacklegged tick's range may allow for successful overwintering survival despite cold temperatures.

Our results suggest that winter climate is not constraining blacklegged tick populations in areas north of their current range and that additional factors (i.e., host distributions, habitat type, summer climate, etc.) may be limiting the expansion of blacklegged ticks into northern Maine thus far.

*Michelle Volk is now undertaking studies towards her Ph.D. at Michigan State University*

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**Odonate Ballet on Pushaw Lake**

Ron Logan of Orono has agreed to share with us some photos he took of a swarm of bluet butterflies on Pushaw Lake this past summer. He had just started to paddle his kayak home after watching loons feeding their chick, fledgling eagles "hanging out" on rocks, and a fishing osprey

"doing kamikaze dives" into the water. The calm water reflected the sky like a thick liquid mirror.

He described the setting: "As I paddled, I notice a bluet damselfly pair flying with me. Then another. Then another. As the numbers grew, I realized I was the only audience to a flash mob performance, by the famed **Bluet Damselfly Precision Aerial Acrobats**. I can't even attempt to describe the show and can only say... you gotta see this! I was spellbound for 40 minutes. At one point the dazzling Damsels even treated me a lap dance."



Some clarifying notes.

- \*\* The Bluet Damselflies are tiny, just 1.4" long.
- \*\* The flower head that's sticking out of the water, a staminate cone from a conifer, is a little bigger than the eraser end of a pencil.
- \*\* All the images below the flower are reflections of the damselflies above.



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**Zigzag Elm Sawfly Found in Montreal**

For those lucky enough to have healthy elm trees, there's a new exotic pest to watch for.

In August of this year, larvae of the zigzag sawfly, *Aproceros leucopoda* (Hymenoptera: Argidae), were detected on *Ulmus* (elm) trees in Canada. This is the first detection of *A. leucopoda* in North America.

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**Zig-zag elm sawfly (cont.)**

As the larvae of *Aproceros leucopoda* feed on leaves of elms, they create zigzag feeding patterns, resulting in defoliation and dieback. The species is native to eastern Asia and has been reported from parts of Europe. It is not yet known to occur in the United States, but due to the proximity of Montreal to Maine, and the commonly western winds we get, it's not out of the question that this species could show up in Maine in the near future.

Anyone finding any evidence of such feeding on elms in Maine should photograph the damage and, if possible, capture a specimen in alcohol, and report the finding to Tom Schmeelk by e-mail at [Thomas.schmeelk@maine.gov](mailto:Thomas.schmeelk@maine.gov) or by phone at 207-287-3244.



**Remembering Dan Jennings**  
by Charlene Donahue

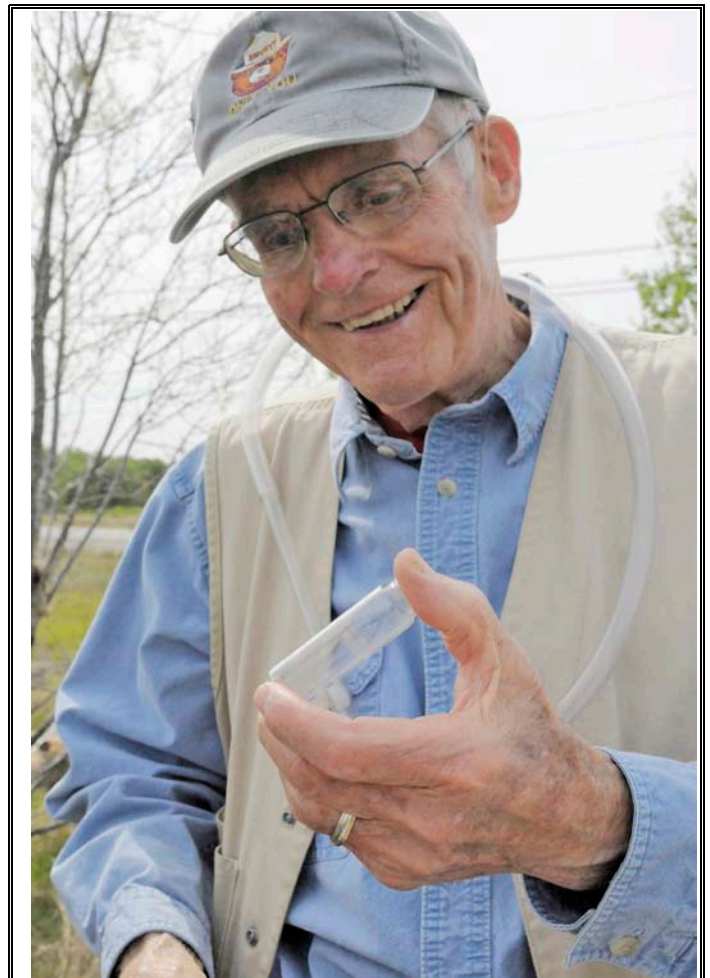
It is with sadness that we note the passing of arachnologist Dr. Daniel T. Jennings.

Daniel Thomas Jennings passed peacefully on September 14, 2020. He is blessed to once again be with his beloved wife of nearly 65 years, Nancy Barbara Kern Jennings, who passed away on March 17, 2020. He was the son of D. Thomas Jennings and Jane Elizabeth Winter Jennings, both of Parsons, Tennessee.

Dan and Nancy had two daughters, Cynthia A. Jennings and Diane L. Rowland. They were blessed with four grandchildren, Erin Bridges Padham, Hannah Elizabeth Jennings Priest, Eve Nancy Rowland, and Noah Frances Jennings Priest.

Spiders were a lifelong interest for Dan from the age of five, and they were a life's work and passion. For decades the Jennings' lived in a log cabin in the woods of Garland, Maine, where Dan had a lab and stored tens of thousands of spiders before depositing them at various institutions. He spent his professional career as a research scientist for the U.S. Forest Service, first in New Mexico and then moving to Maine in the 1970s. Spruce budworm was the major issue in Maine forests when Dan arrived. His research covered many aspects of natural and introduced parasites and predators – including spiders.

Although his work for the U.S. Forest Service centered on forests, he was happy to help on projects in other habitats as well. He assisted with projects in the blueberry barrens in Downeast Maine, the pine barrens in southwestern Maine and he surveyed the spiders on Katahdin. He peered into pitcher plants to discover the spider specialists living inside them. He collaborated with many researchers and students at the University of Maine. His work led to dozens of scientific articles that he authored or co-authored. Dan was always one to give credit to the work of others, sharing authorship with colleagues, tenured professors and students alike.



**Dan Jennings with a particularly exciting specimen at Kennebunk Plains in 1996. - Kevin Byron photo**

Dan was known across the world of arachnology as an expert on spiders in the Northeast. He taught courses on spiders for a number of years in Steuben, Maine, at the Eagle Hill Institute. One of his students, Frank Graham from Milbridge, Maine, decided to survey the spiders living in his town. The two worked together for 15 years using multiple sampling methods in different habitats to collect over 10,000 spiders of 302 different species. Dan was one of the lead scientists at the 2005 Acadia National Park Spider Bioblitz at Schoodic Point, where he worked with Maine Entomological Society members and others to take a first sampling of those spiders residing in that portion of the park.

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**Remembering Dan Jennings (cont.)**

One overarching project encompassed all of this work – developing a Spider Checklist for the State of Maine. Dan asked everyone – his family, friends, neighbors, colleagues, students, faculty, collaborators – to collect spiders for him. And they did. For over 40 years Dan collected, identified and catalogued tens of thousands of spiders. The database for the Spiders of Maine has over 71,000 specimens in it, but this does not include all the immature or damaged specimens he had to sort through. Also, there are studies on which he worked that did not end up in the database.

Dan worked on this project on his own for years and almost gave up on it after he retired. But in 2006, representatives of the Maine Forest Service and the Maine Department of Inland Fisheries & Wildlife met with him to devise a plan that would allow him to continue his work on identifying Maine spiders. The ultimate goal was to have a better understanding of what lives in Maine, and to publish a checklist of Maine spiders so that this baseline information could then be used by others. With this support, Jennings identified another 91 species, bringing the total to 677 different kinds of spiders known to be found in Maine!

Dan’s dream of a spider checklist was finally realized in 2020. He saw the final copy and knew it had been accepted for publication in March. Unfortunately, the Covid-19 pandemic interrupted the publication of this work and it did not come out until the week after he passed away.

Daniel T. Jennings was a founding and Lifetime member of the Maine Entomological Society. He attended field trips and shared his passion for spiders. He will be deeply missed by all who knew him.

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**Maine Spiders Make TV Debut  
with Charlene Donahue and Dana Wilde**

For those who may not be regular TV viewers of "207", a Maine-based newsmagazine on WCSH-Channel 6 out of Portland, Charlene Donahue and Dana Wilde were featured on Thursday, November 12th. The segment was a celebration of Maine's rich and beautiful spider fauna, now documented in the Maine Spider checklist which Charlene and Dan Jennings completed, and Dana's recent book on Maine spiders.

You can catch the entire segment at <https://tinyurl.com/y6sw6b32>.

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**Winter Workshop, January 23rd,  
to Focus on Dragonflies and Damselies**

The theme of this year’s winter workshop will be **dragonflies and damselies** and will be held virtually via Zoom on Saturday January 23rd.

Speakers this year include Emily Sandall from Penn State University, Phillip deMaynadier with the Maine Department of Inland Fisheries and Wildlife, and Michael Blust, from Green Mountain College (Emeritus). As this format is a change from previous years many details are still being worked out and updates will be posted on the webpage and the Facebook page.

Our hope is that this year the winter workshop will be able to reach a broader audience than before, due to the ease of accessibility to those who are farther afield.

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**Honey Bee Division of Labor  
by Charlene Donahue**

Honey bees (*Apis mellifera*) are social insects, and there are many tasks that must be performed in order to have a well-functioning colony. The best way to accomplish all the work is to have a division of labor among the members.

Work is divided by the three castes: queen, worker and drones. The queen lays all the eggs and performs no other physical tasks. She is fed, groomed and protected by her subjects. But she also influences the colony with her pheromones as to when the colony should swarm, produce a new queen, build comb, and collect food.

The next caste is the drones. These are males whose sole purpose is to mate with queens, spreading the genetics of their hive to other hives. They do no work and since they are male and have no ovipositors, do not have stingers. When young, they literally sit around the hive and are fed by the female workers. As they age, they feed directly from honey cells.

During the summer a hive is home to a couple of hundred drones. In the fall, the workers kick the drones out of the hive to freeze to death, so they do not use up precious stores over the winter. Queens will mate with multiple drones; the progeny of these different fathers differ in their tendency to perform particular tasks and the age at which the begin performing them. This aids in providing resiliency to the colony.

The third caste is the female workers, who are not fertile. The vast majority of honey bees (10,000+) are female and they do all the work in a colony. (This why beekeepers often refer to their charges as “The Girls.”) Division of labor within a colony is based primarily on age, although this is plastic and can change if a colony does not have enough workers performing a particular task.

Shortly after emerging as an adult, the worker bee's first job is to clean cells. They do this for a couple days. During this time, they finish maturing and their mandibular and hypopharyngeal glands complete development. These glands are important because they convert pollen into a protein source for the rest of the colony. They now transition to “nurse” bees for the developing larvae, the queen, the drones and the foragers.

The “middle-aged” bees are 12 to 20 days old; they store and process food, maintain the hive and construct new comb as needed. These bees receive nectar and pollen from forager bees, move it around the colony as needed and process the nectar into honey. The middle-ages bees keep the hive clean and cap brood cells where the larvae are ready to pupate. It is this age group whose wax glands produce wax to build new comb, cap brood cells and repair damaged comb.

A few of these bees become “undertakers,” carrying the dead out and dropping them away from the hive. A few others are guard bees who patrol the entrance. Although they

*(continued on next page)*



*Honeybee Distribution of Labor (cont.)*

keep out most bees that do not belong to the colony, they will sometimes make exceptions for foreign bees carrying food (Nouvian et al., 2016). (I also sometimes let strangers in my house if they bring food!!)

Bees that are over 18 days old become foragers. These foragers collect nectar, pollen, propolis (a mixture of plant resin and wax used to seal the hive and provide antimicrobial protection) and water. Usually there are particular bees that specialize in each of these products. Some of these older bees stay in the hive and take on soldier duties, defending the hive from predators, particularly mammals – like us, bears and bees from other colonies that have come to rob the hive of its resources. All threats are met with resistance and are attacked by these soldier bees.

The majority of this information comes from *The Hive and the Honey Bee*, a comprehensive work based on L. L. Langstroth’s 1853 beekeeper’s manual and updated periodically up to the present. It has 44 co-authors, extensive references, diagrams and photos.

References:

Graham, J. M., editor. 2015. *The hive and the honey bee*. Dadant & Sons, Inc. Hamilton, Illinois; 1,057 pages. Pages 78-89, 183-195.

Nouvian, M., J. Reinhard, and M. Giurfa. 2016. The defensive response of the honeybee *Apis mellifera*. *Journal of Experimental Biology*, vol. 219, pp. 3505-3517; doi: 10.1242/jeb.143016



Seems everyone was being COVID-conscious this past summer. Charlene Donahue took this photo in August showing some of her honeybees "social distancing" around the rim of her birdbath as they got a drink of fresh water!



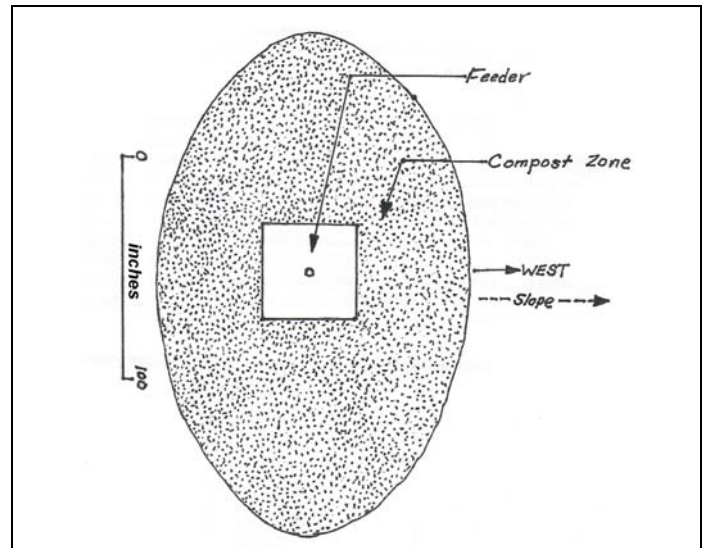
**Some Natural History of a Bird Feeder  
"Compost Zone"**

by Richard Hildreth

When a serious bird feeder is operated at the same site for a significant amount of time, a deposit of debris accumulates around it. The chief component of this debris is the hulls of sunflower seeds, since the birds that come for the sunflower seeds usually remove and discard the hulls and eat the kernels. The debris will also include inedible plant stem fragments and other material.

Plus, not all the seed that's put out will be eaten. Some nyger seed (a.k.a. thistle seed) may be rejected by birds, possibly because the oil content is missing. Some cheap seed mixes may also contain an abundance of seed that is not eaten by most Maine birds, so this often gets left as well.

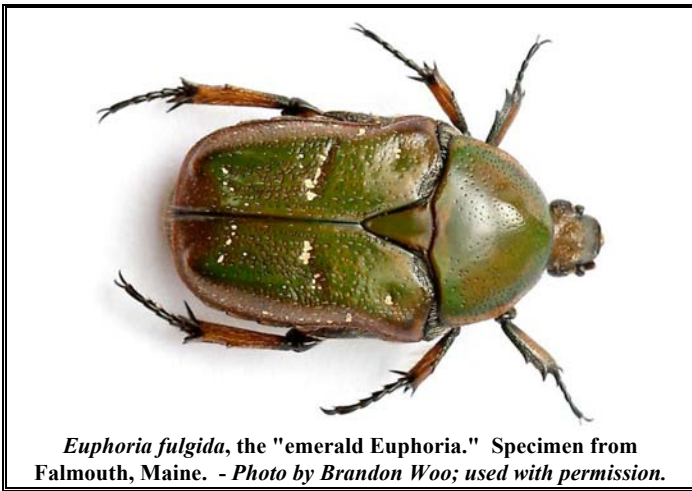
Another component of the debris load is bird feathers. With so many birds visiting, many feathers are shed during molting and can accumulate. Some of these may be hauled away for nest materials, e.g., by house sparrows, but the rest remain as part of the debris. And of course bird poop adds to the accumulating mass.



Given a few years, this debris layer can grow to two or three inches deep, and over time it slowly decays to become compost. This is why I call the area where it accumulates the compost zone. I never thought this compost zone was unusual in any way or particularly interesting until I learned that it contained an extraordinary abundance of earthworms. I learned this by watching the earthworm hunting of American robins, who hunted *only* in the compost zone, not in the lawn around it.

During July, 2018, I was watching one of the feeders at my cabin in Steuben, Maine, when I saw a large beetle come flying in. It circled around a few times, landed on the surface of the compost pile, and then dug itself down out of sight. I saw several more beetles come in and repeat this behavior. On 20 July, I captured a specimen of this beetle. It was big, 20-22 mm long, and bright green. In July, 2019, I saw more beetles doing the same thing, and I captured another specimen.

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*Euphoria fulgida*, the "emerald Euphoria." Specimen from Falmouth, Maine. - Photo by Brandon Woo; used with permission.

In July, 2020, I saw the first beetle come in and bury itself, and decided to count all the beetles I saw. But I was not the only observer who noticed the beetles. When one of the beetles flew in, a blue jay that had been eating corn saw it and flew right to it before it could burrow in, then carried it off to eat. In total, I saw jays catch a total of four of the beetles. In July, 2020, I counted a total of 47 of these beetles, which Charlene Donahue kindly identified for me as the scarab *Euphoria fulgida*:

5 July, 2020	1 specimen seen
8 July, 2020	4 specimens seen
9 July, 2020	2 specimens seen
10 July, 2020	14 specimens seen
11 July, 2020	1 specimen seen
12 July, 2020	2 specimens seen
13 July, 2020	1 specimen seen
14 July, 2020	1 specimen seen
15 July, 2020	6 specimens seen
16 July, 2020	4 specimens seen
18 July, 2020	4 specimens seen
19 July, 2020	1 specimen seen
20 July, 2020	1 specimen seen
25 July, 2020	2 specimens seen
26 July, 2020	1 specimen seen
27 July, 2020	1 specimen seen
28 July, 2020	1 specimen seen

**DUES REMINDER!**

M.E.S. dues are payable on a calendar-year basis. If you haven't already done so, please renew now for 2021 to guarantee uninterrupted receipt of the Newsletter; you'll find an insert inside (or as a separate e-mail attachment). Treasurer Dana Michaud's name and mailing address are also at the bottom of this page for your convenience. **Dues are \$15 per year**, and may be paid up to two years in advance. If you get this via snail mail and the year on your mailing label is "2020" or earlier, please contact Dana to renew for 2021 or correct the record.



**Don't forget to check out the M.E.S. Facebook page (under "Maine Insects") - and watch for the new, improved Web page to come soon!**



Those who attended the annual meeting at Nettie and Bob Nelson's place may have seen the several large European paperwasp nests (*Polistes diminula*) under the eaves of the house, against the vinyl siding. In October, we were having morning coffee on the front porch, when a loud pounding was heard. Investigation showed that a female hairy woodpecker was making quite a meal from the contents of all the filled cells in this multi-year composite nest mass.

(Note that the photo is rotated - she was hanging upside-down!)

**COMING M.E.S. EVENTS in 2020-21**

(See the Colby web site at [www.colby.edu/MES](http://www.colby.edu/MES) for additional information on any event, which will be posted as soon as it's received.)

- December 3, 2020, Webinar:** Jen Lund on bees and bee gardening. Coordinator: Kathy Murray. (check your e-mail for information on how to sign up!)
- January 23, 2021:** MES Virtual Winter Workshop on dragonflies and damselflies. Coordinators: Michael Parisio and Thomas Schmeelk.
- February or April:** Enhancing gardens for insects. Date and Coordinator to be announced.
- March 27:** Maple Syrup and Insect Collecting at Charlene Donahue's house in Whitefield (Lincoln County). Coordinator: Charlene Donahue.
- April Symposium - Working Title:** Bridges: The spectrum of entomologically related interests in Maine and the region. **Coordinator: Kathy Claerr.**
- May:** Aquatic insects, Southern Maine. Date and Coordinator: To be announced.
- June:** Moth Night, Dresden (Lincoln County). Date and Coordinator: To be announced.
- July:** Viles Arboretum, Augusta (Kennebec County). Coordinator: Dana Michaud. Date to be announced.
- July:** Field's Pond. Coordinator: Pete Darling. Date to be announced.
- August 7:** Hirundo Wildlife Refuge, Old Town (Penobscot County). Coordinators: Anna Court and Tina Graham.
- September 11:** Cherryfield - blueberry barrens (Washington County). Coordinator: Bob Nelson.
- October 2:** MES Annual Meeting at Bob & Nettie Nelson's home in Clinton. Collecting from 10 - 12, pot luck lunch, business meeting. Coordinator: Bob Nelson.

*The Maine Entomologist* is the quarterly newsletter of the Maine Entomological Society. Dues are \$15 per year. Checks should be made payable to the M.E.S. and sent to Mr. Dana Michaud, M.E.S. Treasurer, at 3 Halde Street, Waterville, ME 04901-6317. Individual articles reflect the opinions of the authors and mention of any specific commercial products or businesses should not be construed as formal endorsement by the M.E.S. of any such product or business.