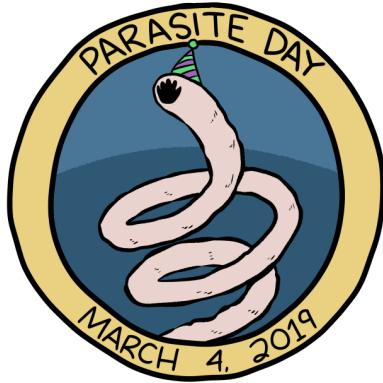


NEWSLETTER



Edited by Kelly Weinersmith & the ASP Public Relations Committee
Layout & Design by Joanna Cielocha



The American Society
of Parasitologists

Parasite Day 2019 By Kelly Weinersmith

Monday, March 4th, 2019 marks the anniversary of the birthday of Dr. Henry Baldwin Ward (ASP's first President). To celebrate, ASP's Public Relations Committee is reviving Parasite Day!

This year, [we put out a call asking ASP Members to volunteer to chat with classrooms over Skype about parasites on Parasite Day](#). Twenty-three parasitologists responded, hailing from the United States, Canada, Spain, England, and Scotland. We have a great diversity of career-stages and research specializations represented. [Teacher sign-ups have begun](#), and we're matching these scientists up with classrooms so they can chat about parasites, careers in science, and more!

There's still time for you to participate in Parasite Day! Reach out to a local school and ask if you can drop by on March 4th (or some other time that week) to talk about parasites with the students! If you set-up a Parasite Day event, please email Kelly Weinersmith at Weinersmith@Rice.edu and let us know about it!

President's Corner By John Hawdon

Hard to believe with the recent frigid air gripping the northern half of the country, but it's time to start thinking about the ASP annual meeting this summer, when it will (thankfully) certainly be considerably warmer in our host city of Rochester, Minnesota, than it is now. I'm really excited about the meeting – the local organizing committee is busy planning an agenda packed with new and classic ASP events. One event I am especially excited about is the student workshop on clinical parasitology that will be presented by our host, Dr. Bobbi Pritt, Director of the Clinical Parasitology Laboratory at the Mayo Clinic. Dr. Pritt will present two separate 2 hour sessions in which students will examine living and preserved specimens, as well as prepare and interpret a clinical specimen from start to finish. Space is limited, so if you are interested please email Dr. Pritt at Pritt.Bobbi@Mayo.edu. [You can find more info here.](#)

Speaking of vortices, don't forget about our definitely non-polar student Vortex, where students and faculty meet and mingle in a "speed meeting" format, with beer of course! This provides students with a chance to break the ice with faculty in an informal atmosphere, and ask about graduate programs, post-doctoral positions, or just general advice about making a career in parasitology. If you are interested in participating, either as faculty or student, please email Sara Brant at sbrant@unm.edu (use ASP Vortex in the subject line).

This will give us an idea of the crowd to expect.

In other Society business, our committees are ramping up their activities. The Awards committee has begun evaluating a strong field of nominees for the Ward Medal, Ashton-Cuckler New Investigator Award, the Mentor Award, and the Distinguished Service Award. The Lectureship Committee is selecting Stoll-Stunkard and R. Barclay McGhee Memorial Lectureships. The Student Awards committee is gearing up to select Travel Awards recipients when the abstracts start rolling in, and the other committees are working hard on their charges. I want to highlight the Education committee's effort to collect educational materials for an online, member's only resource where ASP members can find lectures, lab exercises, syllabi, and other materials to incorporate in their parasitology courses. Keep your eye out for a questionnaire from the Education committee. Finally, I am working with Council to tie up some loose ends in anticipation of our change in tax status, which hopefully will come through soon.



So, it's time to start analyzing your data, crafting your abstracts, and dreaming about balmy summer days in Rochester. Abstracts, including Marc Dresden Student Travel Grant & Student Paper Competition applications, are due March 9, early bird registration ends May 31, and hotel reservations are due by June 18. Meanwhile, stay warm and keep exploring the wonderful world of parasites, and prepare to share your discoveries in Rochester this July. See you there!

The 94th Annual Meeting of the American Society of Parasitologists

Mark your calendars! ASP 2019 will be held at the Double Tree by Hilton-Mayo Clinic Area, Rochester, MN July 11-14. Important deadlines are listed below:

- ◇ **March 9, 2019:** Abstracts and Applications for Marc Dresden Student Travel Grant and Student Paper Competition
 - ◇ **April 19, 2019:** Abstracts numbers need to be submitted for ASP Member Symposiums
 - ◆ To organize a symposium, browse the submitted abstracts, and find abstracts on a common theme. Confirm that the presenters of those abstracts are interested in being part of your symposium, and submit the abstract numbers for your symposium to the organizers.
 - ◇ **May 31, 2019:** Early registration deadline for the meeting
 - ◇ **June 18, 2019:** Deadline for hotel room reservations at conference room rate
- For more information about the conference, download the 2019 ASP Call for Papers on [ASP's website](#).

Student Rep's Corner By Christina Anaya

The 94th Annual ASP conference is around the corner and this year promises to be new and innovative for student attendees. We are privileged to have our conference in Rochester, MN, home of the Mayo Clinic. Therefore, our inaugural student workshop will be held at the Mayo Clinic and taught by Dr. Bobbi Pritt, M.D., MSc, DTM&H, author of the Creepy Wonderful Parasites blog. The 3-hour workshop will include making thick and thin blood films using malaria-positive blood followed by some case-based and clinically-relevant human parasites. This hands-on training can be used in your parasitological future and will be available to students at no charge. This is a wonderful opportunity to learn some new skills and receive a behind the scenes look at the Mayo Clinic. More information will be provided in the near future. You can read about Dr. Pritt [here](#) and follow her blog on parasite case studies [here](#).

As a parasitology student, transitioning into the parasitology workforce, I have spent many sleepless nights contemplating my future. Where will I go? What will I be?!? I want to alleviate some of that angst for you and your future! This year's student symposium is titled "Preparing for and Navigating Your Parasitological Future". No matter what field you are going in to, it is never too early to begin planning for that future career. I want to give you some tips on what you can do as a student, whether you are a first-year undergraduate or preparing to defend your Ph.D., to build that curriculum vitae. In addition, I am inviting a variety of parasitologists from a diversity of parasitology jobs who will provide insight into how they got their start, what they had to do to get there, and what they wish they would have done differently. You don't want to miss this!

As this year's student representative, I am making a point to get students mingling. Since my first ASP meeting seven years ago, I have observed students clinging to their friends like nematomorphs in Gordian knots. This year, we will do some activities that promote getting to know your parasitology cohorts. You never know when a new friendship can lead to opportunities now or in the future. These cohorts could potentially be your co-workers, bosses, or proposal reviewers. But more than that, they can be a great resource for something you never considered such as a fellowship in a far-a-way land or advice about graduate school or jobs. So be prepared for some exciting networking opportunities during our annual Steve Upton Social! We will also have our 3rd annual Vortex event where you can get advice from some of the leading parasitologists in the world. If you haven't previously participated in the Vortex, this is an opportunity to "speed meet and ask" some great people about topics from parasites to postdocs.

Please look-out for emails from me in the coming weeks as I try to gather information on student attendees to plan for upcoming events. I look forward to speaking with all of you and our time in Rochester, MN!



Member Spotlight

By Jillian Detwiler



featuring:

Graham Goodman

Pardon the pun, but [Graham Goodman's](#) research on the behavioral defenses of birds against ectoparasites is just “so coo”! In 2018, Graham Goodman (PhD candidate, University of Utah) not only received an ASP Willis Reid Research grant, but also won an ASP meritorious paper award at the annual meeting in Cancún. We thought these achievements should be highlighted to our members, and asked Graham to share the results of his work stemming from the ASP research grant. You can also check out some of his work in a [2016 publication by Villa et al. in Biology Letters](#).



But first, a little about Graham. Graham first “fell in love” (I am quoting here!) with parasites after taking a course with Valerie McKenzie at the University of Colorado. Aspects of their behavior may have subconsciously rubbed off on him, as shortly thereafter, he hitched a ride to the [Southwestern Association of Parasitologists'](#) meeting with Janice Moore's laboratory from Colorado State University. He didn't present at this regional meeting, but enjoyed the welcoming community of parasitologists.

Although he had not yet attended an ASP meeting, Graham perused the abstracts from the annual meetings to help him decide what area of research to pursue for graduate studies. The work presented by the Clayton-Bush lab at the 2012 ASP meetings in Richmond, VA was “so eggs-sighting” to him (pardon the pun again!). He was particularly attracted to the tractability of the pigeon/lice system for experimental work related to host-parasite interactions. Two years later he joined the lab! Since that time, Graham has attended two ASP meetings. In Cancún, he enjoyed practicing his Spanish and will never forget “pulpo”, the Spanish word for octopus, after talking to researchers about their work on the cestode communities of those hosts.

Without “feather ado”, Graham tells us a bit about his award-winning research.

1) What did you propose in your Willis Reid Student Research grant?

I study behavioral defenses against ectoparasites. One of the behaviors I am most interested in is allopreening which is when one bird preens another. In addition to helping control ectoparasites on regions that birds cannot self-preen, allopreening is thought to



serve important social functions. Several studies show correlations between allopreening rates and ectoparasite loads, but it is unclear whether these correlations were being driven by the parasites or the behavior. For example, birds with lots of parasites might not be able to find a partner to allopreen them. I proposed to determine whether parasite load affected allopreening rates by collecting behavioral data on allopreening pairs of birds before and after infesting them with lice.

2) Is everything going to plan so far? Any surprises?

There were definitely some surprises, and I am writing the results up for publication. Before submitting my proposal, I conducted a small pilot with only a few pairs of birds. The preliminary results suggested that parasite load heavily influenced allopreening rates. However, when I scaled up the project, I got very different results. I found that parasite load did not have an immediate direct effect on allopreening rates. This project hammered home the importance of sample size.

3) Any tips for grant writing to ASP student members?

I would say persistence is important. Not receiving an award does not necessarily reflect poor quality research; it is important to keep trying. Continuing to apply can be hard, especially when there are other things that feel more pressing in the moment. But it is worth it. I did not receive this grant until my second or third attempt.

4) How does this grant fit into the overall goals of your PhD work?

My thesis focuses on two anti-parasite behaviors: allopreening and scratching. This grant allowed me to dive deeper into the possible role of allopreening for controlling parasites in a way I would not have been able to otherwise. Allopreening is one of the few parasite control behaviors that birds cannot perform on their own. This, in turn, is interesting because it is possible that parasite control may have been a stepping-stone in the evolution of cooperation in birds and other animals.

5) Are you coming to the 2019 meeting in Rochester, MN? If so, what are you most looking forward to?

I will definitely attend the 2019 meeting in Rochester, MN. Janine promised lasers. In all seriousness, I am looking forward to hearing what all the other members have been up to since Cancún. There were a lot of great presentations and I look forward to seeing the new research.

Field Notes By Matthew Bolek

Attempting to Solve the Life Cycle of *Distoichometra bufonis* Dickey 1921, (Cestoda: Nematotaeniidae) while Teaching a Field Course!

I just defended my PhD, and I was driving to my favorite place in the world, Cedar Point Biological Station (CPBS) in Western Nebraska, to teach a three week course on the Natural History of the Invertebrates. Field courses at CPBS are rather demanding, and attempt to expose students to as much biological diversity as humanly possible during a three-week time frame. In a typical CPBS field course, students attend class from 8:00 am to 9:00 pm or later, five days a week. In addition to the field work and class work, students work in groups, and develop an independent project on a specific topic of their choice. At the end of the three-week session, each group of students presents a 15 min scientific presentation and turns in a manuscript on their specific project formatted to be submitted to a journal.

During the five-hour drive from Lincoln Nebraska to CPBS, I remembered some words of advice from John Janovy Jr., my PhD adviser, indicating that the most educationally rewarding class projects are ones that are extremely challenging, and difficult for students to solve. As I brainstormed for a challenging project to engage the seven students, that were registered for my course, on the wonders of invertebrate zoology and field biology, I

thought we should attempt to solve the life cycle of one of the most notorious tapeworms at CPBS and that was *Distoichometra bufonis*!

Distoichometra bufonis is a nematotaeniid cestode, and currently no life cycles are known for any member of this group of tapeworms. Nematotaeniid cestodes infect frogs, toads, salamanders and lizards across the world, and *D. bufonis* is one of the most common parasites of Woodhouse's toads at CPBS. Although the life cycle of *D. bufonis* is not known, previous work by one of John Janovy's graduate students, Lee Hardin suggested that *D. bufonis* has a terrestrial life cycle and newly metamorphosed toads become infected when toads ingest some terrestrial invertebrate that is small enough for a 15 mm toad to eat! It seemed like the perfect invertebrate zoology project. My idea was, that over the three-week period, we would examine (1) the development of the tapeworm in toads, (2) the behavior of gravid proglottids, (3) evaluate the stomach content of toads for potential intermediate hosts, and (4) observe what terrestrial invertebrates visited toad feces containing gravid proglottids of *D. bufonis*!

That summer, we made some remarkable observations on the biology of *D. bufonis*. First, we discovered that as the proglottids of *D. bufonis* matured, they develop dense areas on the lateral sides and below the tegument, which appeared as dark spots under a microscope. More importantly, those dense areas were more pronounced in gravid proglottids but absent in immature proglottids (Fig. 1). Additionally, mature and gravid proglottids contained paruterine capsules, located medially but with no opening

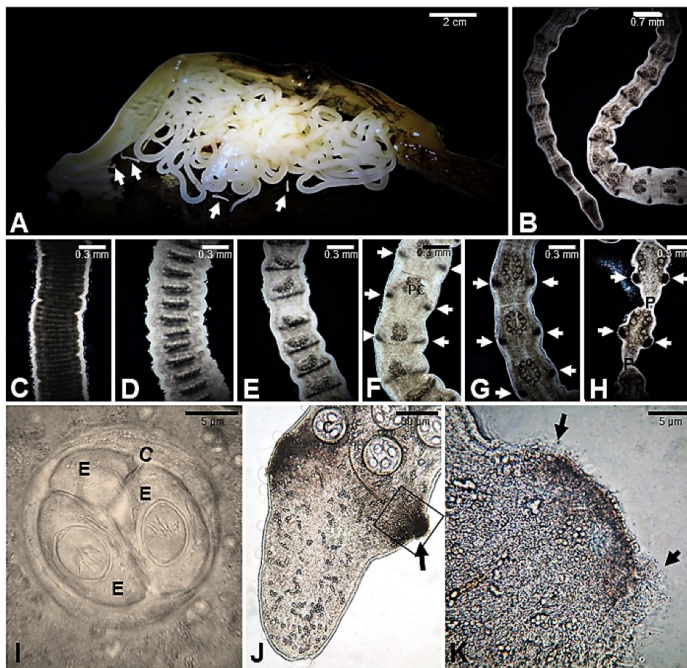


Figure 1. A. Adult *Distoichometra bufonis* in the small intestine of a toad. Note the shed gravid proglottids (arrows). B-H. Strobila of *D. bufonis* showing immature, mature and gravid proglottids. Note the dense dark spots (arrows) in mature and gravid proglottids containing paruterine capsules (PC) and tapering posterior end (P). I. Capsule (C) with eggs (E). J-K. Gravid proglottid showing the disintegrated tegument above the dense dark spots.

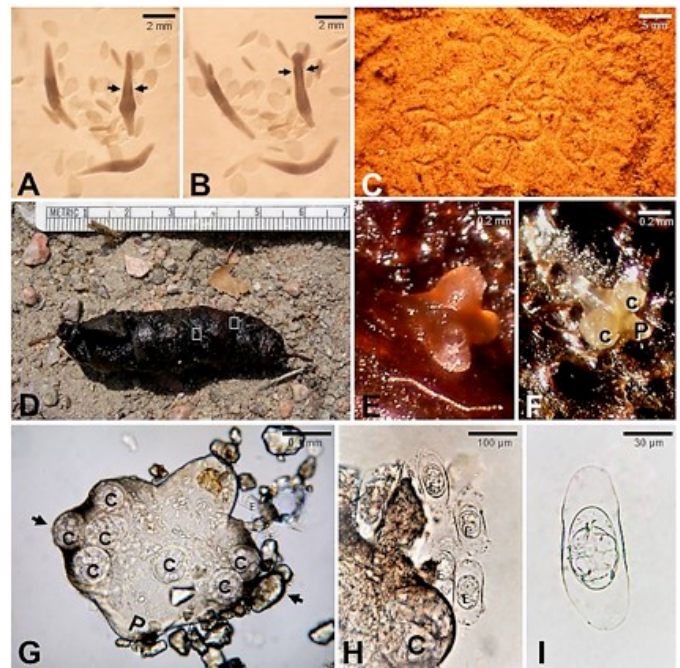


Figure 2. A-B. Actively moving gravid proglottids of *Distoichometra bufonis* in water. Arrows indicate the position of the dense dark spots. C. Track marks in sand, of gravid proglottids showing circular movement. D-F. Toad feces and the location and morphology of gravid proglottids. Note the shape of the compressed proglottids and the location of the capsules (C) in relationship to the proglottid posterior end (P). G-I. The location of the capsules (C) and eggs (E) in a compressed gravid proglottid removed from the surface of toad feces.

Field Note, continued

for the eggs to be released. However, under cover slip pressure, the tegument above the dense areas of gravid proglottids disintegrated (Fig. 1), suggesting a mechanism for how the eggs of *D. bufonis* were released.

The second intriguing observation we made, was on the behavior of gravid proglottids. In petri dishes of water or sand, gravid proglottids actively crawled around but appeared to make no progress, commonly circling back to where they started (Fig. 2). However, when we observed the behavior of gravid proglottids released in toad feces, of toad feces, quickly compressed, became inactive and eventually dried (Fig. 2). Observations under a microscope, revealed that as the proglottids compressed the paruterin capsules containing the eggs were displaced laterally, and in the process eggs were released through the disintegrated tegument above the dark dense areas of each proglottid (Fig. 2)!

Finally, our field observations indicated that the only invertebrates visiting fresh toad feces were ants. Ants were observed removing insect remains out of toad feces and taking them back to their colonies. Importantly, our toad stomach analyses indicated that the same species of ants comprised up to 50% of Woodhouse's toad's diets! As you can imagine, we all wondered if ants could be the intermediate host for *D. bufonis*? Previous work by Lee Hardin indicated that young of the year toads recruited one to two tapeworms per week and in the process, toads consumed over 4000 invertebrates. So to find out we needed to dissect thousands of ants and find an unknown larval stage of *D. bufonis*. However, we had two problems, first, student projects were due in two days, and second, dissecting 3-5 mm ants proved to be extremely difficult. As a result, we decided to do one more experiment, and that was to find out if ants actually have an interest in *D. bufonis* proglottids. We collected freshly released gravid proglottids from

infected toads, and carefully place them on coverslips, allowing the proglottids to compress and dry. We then marked the location of each proglottid on coverslips, placed the coverslips next to ant colonies and watched. And to our amazement, ants removed each proglottid one by one and took them back to their colony, suggesting ants might be ingesting the eggs of *D. bufonis*.

As a class, we never solved the life cycle of *D. bufonis*, but that summer was one of the most rewarding and educational teaching experiences in my academic career. A few years later, I attempted another try at solving the life cycle of *D. bufonis* at CPBS. I collected 45 newly metamorphosed toads from a location where I thought *D. bufonis* did not occur. I dissected 15 of those toads and all were negative for tapeworms. I then divided the remaining 30 toads into two equal groups of experimental and time T control toads and placed them into two separate tanks. Everyday for three weeks, I aspirated hundreds of ants from a location where I knew toads were infected with *D. bufonis* and fed those ants to the experimental toad group; whereas the time T control toads were fed hundreds of aspirated midges. At the end of the three-week session, I anxiously dissected my ant fed toads. Of the 15 toads I dissected, the last toad had a 5 mm *D. bufonis* in his small intestine! I was ecstatic!!!! However, my excitement quickly disappeared, when I discovered that one of my time T control toads contained one mature *D. bufonis*. And once again the life cycle of the notorious tapeworms at CPBS eluded me. That was my last summer teaching at CPBS. After all I was now an Assistant Professor at OSU, I needed to get tenure, and there was little time for solving the life cycle of a notorious tapeworm that resided in the small intestine of toads out in western Nebraska. If you are interested in more details about this project, you can find them [here](#).

Regional Society News

Southwestern Association of Parasitologists

SWAP's 52nd Annual Meeting will be held at the University of Oklahoma Biological Station **April 25–27, 2019**. Abstracts can be submitted to Dr. [Heather Stigge](#), President-Elect, before March 22, 2019. Meeting registration is due by **Monday, April 1, 2019**. Instructions for abstract preparation and registration forms are available for download on the [SWAP website](#).

Southeastern Society of Parasitologists

The SSP's 2019 Annual Meeting will be held at the University of Georgia from April 11-13, 2019. More information is available [here](#).

Award Announcements: **Dr. Renee Carleton**, SSP's Secretary-Treasurer, was awarded the Alumni Distinguished Service Award for 2018 by the University of Florida College of Vet Medicine. Dr. Carleton is a DVM, Ph.D., and Associate Professor of Biology in the School of Mathematical and Natural Sciences at Berry College in Mount Berry, GA. **Dr. Gabriel Langford**, SSP's President-Elect, was named the George W. Truitt Endowed Chair in the Sciences at Florida Southern College, where he is an Associate Professor in the Department of Biology. Congratulations Drs. Carleton and Langford!

Regional Society News, continued

Northern California Parasitologists

NCP held their annual meeting on February 2, 2019. Adena Why gave one presentation on her vector control work, and another on her work showing that mosquitofish (*Gambusia*) chemical byproducts change the laying behavior of *Culex tarsal* (a mosquito). She found that when a mosquitofish is in the water, mosquitoes don't lay their eggs in it.

Award Announcements: NCP would like to congratulate Samantha Sambado, who won the Best Paper Award, and Paula Rodrigues Cruz who won second place. Congratula-



Samantha Sambado, Best Paper Award at NCP Spring 2019.



Paula Rodrigues Cruz, 2nd place presentation at NCP Spring 2019.

Southern California Society of Parasitologists

The fall meeting of SCSP was hosted by the lab of Dr. Douglas Pace at California State University at Long Beach (CSULB) on November 16, 2018. The meeting included a presentation on parasite physiology research being carried out in the Pace lab and a lab demonstration measuring the respiration of larval parasites taken from local marine macroinvertebrates. Attendees included students, scientists and professors from the following institutions: CSULB, CSU Fullerton, Scripps Institution of Oceanography, University of Southern California at Los Angeles, Saddleback Community College and Cabrillo Marine Aquarium. A special thanks to Dr. Pace for hosting the meeting. [Click here](#) for a description of the research being carried out in the Pace lab.

The Spring Meeting of SCSP will be held on May 3, 2019 at California State University, Northridge. The Spring Meeting is held in conjunction with the Annual Meeting of the Southern California Academy of Sciences. Abstracts for this year's contributed paper session on Parasitology are due no later than **March 8**. Please visit the [SCAS web site](#) to register and submit abstracts.



Helminthological Society of Washington

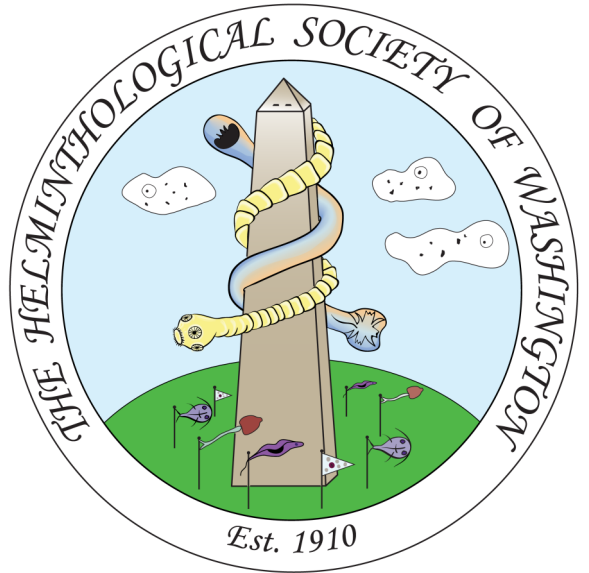
—By Sherman S. Hendrix, Immediate Past-President, Representative to the ASP

I would like to report on several recent items at HelmSoc that may be of interest to ASP members. The 720th meeting of the society, the Anniversary Dinner Meeting, was held on Saturday November 3rd in Columbia, MD. A social with drinks and appetizers prior to the meeting was accompanied by several "lightening talks" of seven minutes each given by members and students attending. This is the second year of these talks, and they will become a tradition at future Anniversary Dinner meetings.

Our brand new HelmSoc logo depicting the Washington Monument, with a hookworm and tapeworm (can you identify them?) wrapped around it along with Entamoeba clouds floating in the background and with parasite-themed flags around the base, was unveiled at the business meeting by its creator, John Hawdon. The whimsical logo highlights our motto that HelmSoc is "not just for worms anymore!"

After dinner, the 2018 Anniversary Award was presented to Vincent Connors, University of South Carolina Upstate, Spartanburg, SC, for his outstanding contributions to the society as a member of the Executive Committee and as Editor of Comparative Parasitology for the past 5 years. Taking on the responsibilities of Editor we welcome Autumn J. Smith-Herron of Sam Houston State University, Huntsville, TX, who begins her term with the January issue of volume 86 (2019). As a reminder, for those who cannot afford page charges in CP beyond the 3 free pages for members, the Brayton H. Ransom Memorial Trust Fund, Ralph P. Eckerlin President, has limited funds available. His contact information can be found on the HelmSoc web site under the Awards tab.

Save the date: the 721st meeting of the Helminthological Society of Washington, our Spring meeting, will be held at Shenandoah University, Winchester, VA on Saturday, **April 6th, 2019**, hosted by Dr. Michael Zimmermann. Stay tuned for registration details to be posted on the HelmSoc web page. ASP members and others always are welcome to attend and participate in HelmSoc meetings.



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We hope to see you in Rochester!