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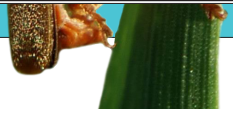

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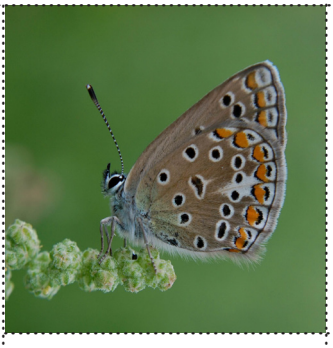
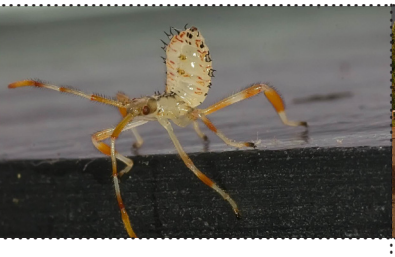
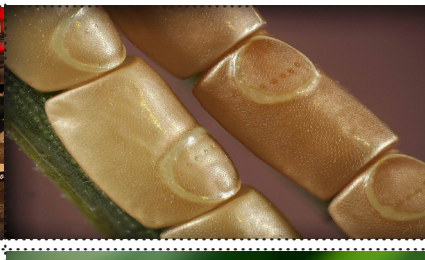






## Images

**Sur le dos:** Une mouche à toison, *Stenopogon inquinatus* Loew (Diptera : Asilidae), photographiée dans la vallée de l'Okanagan en Colombie-Britannique. Un des plus gros asilidés canadiens, sa distribution s'étend sur presque tout l'ouest de la Colombie-Britannique où il est commun dans les forêts sèches et les prairies. Photo : W. Strong

**Sous le titre:** Accouplement de téléphores fauves, *Rhagonycha fulva* (Scopoli) (Coleoptera : Cantharidae), dans un pré près de Delémont, en Suisse. Ce coléoptère prédateur européen a été introduit récemment en Amérique du Nord où il est maintenant répandu. Photo : A. Leroux

**1** Une espèce européenne de *Plebejus* Kluk (Lepidoptera : Lycaenidae), très semblable à l'espèce néarctique *Plebejus melissa* (Edwards). Jerisberghof, Suisse. Photo : A. Leroux

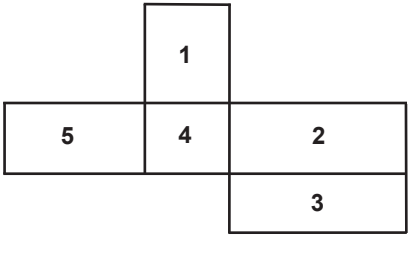
**2** Œufs de *Leptoglossus occidentalis* Heidemann (Hemiptera : Coreidae), un important ravageur des graines de conifères en Amérique du Nord et des pignons de pins comestibles en Europe. Vernon, Colombie-Britannique. Photo : W. Strong

**3** Une nymphe de criquet des pâtures, probablement une espèce de *Chorthippus* Fieber (Orthoptera : Acrididae), dans une pâture de montagne près de Soyhières, en Suisse. Photo: A. Leroux

**4** Lars Andreassen préparant des leurres pour ses pièges à *Aleochara bipustulata* (L.) (Coleoptera : Staphylinidae), un agent potentiel de lutte biologique contre *Delia radicum* (L.) (Diptera : Anthomyiidae). Zurich, Suisse. Photo: A. Leroux

**5** Une nymphe de punaise réduviidée (Heteroptera : Reduviidae), photographiée dans l'ouest du Massachusetts. Photo: B. Roitberg

**Couverture arrière:** Une guêpe platygastroidea, *Gryon pennsylvanicum* (Ashmead) (Hymenoptera : Scelionidae), pondant dans des œufs de la punaise américaine, *Leptoglossus occidentalis* Heidemann (Hemiptera : Coreidae) dans la vallée de l'Okanagan en Colombie-Britannique. Photo: W. Strong



# Up front / Avant-propos

**Michel Cusson, President of ESC / Président de la SEC**

## Choosing optimism

In these times of doom and gloom about the world economy, frustrations about government cut-backs, and mounting cynicism about the ability of our leaders to find sustainable solutions to the various problems we face, the remarkable vitality and health of our Society are both refreshing and a source of optimism for the future.

A good example of this vitality is the recent Joint Annual Meeting, held in Halifax and hosted by the Acadian Entomological Society. The Organizing Committee put together a conference that all participants will remember for the quality of its scientific program, the elegant venue, the smooth operation of all events, and the original entertainment program. I was struck by the variety of areas and sub-disciplines of entomology featured in the plenary and scientific programs, including some stellar presentations by invited speakers as well as by regular and student

## Choisir l'optimisme

En cette période de morosité face à la précarité de l'économie mondiale, de frustrations à propos des coupures budgétaires imposées par nos gouvernements et de cynisme galopant vis-à-vis de la capacité de nos dirigeants à trouver des solutions durables aux problèmes qui nous assaillent, la vitalité et la santé remarquables de notre Société ont quelque chose de rafraîchissant et sont une source d'optimisme à propos de l'avenir.

Un bon exemple de cette vitalité est la récente Réunion conjointe annuelle organisée à Halifax par la Société d'entomologie acadienne. Le Comité Organisateur a concocté une conférence dont tous les participants se souviendront, tant pour la qualité de son programme scientifique que pour l'élégance des lieux, le déroulement sans heurt de tous les événements et l'originalité des activités sociales. J'ai été frappé par la variété des thèmes abordés lors des conférences plénières et des présentations scientifiques, dont certaines étaient de qualité exceptionnelle, tant du côté des conférenciers invités que des membres réguliers et étudiants. Et nous garderons tous un excellent souvenir de l'allocution du patrimoine très amusante que nous a préparée et servie Dan Quiring. Il est donc de mise de féliciter tous ceux et celles qui ont contribué au succès du programme scientifique, incluant les étudiants qui ont participé au Symposium des étudiants gradués et les récipiendaires des Prix du Président. Par-dessous tout, je tiens à remercier chaleureusement tous les membres du Comité organisateur, qui ont travaillé d'arrache pied pour nous offrir un congrès tout à fait mémorable.

Si notre Société doit sa vitalité aux diverses contributions de ses membres, elle la doit aussi au dévouement de son Conseil d'administration, de ses fiduciaires et des présidents et membres de ses différents comités. Au cours de la dernière année, ils ont

members. We will also remember fondly the very entertaining Heritage Lecture delivered by Dan Quiring. Congratulations are in order for those who contributed to the success of the scientific program, including the students who spoke at the Graduate Student Symposium and the recipients of the President's Prize awards. Above all, I wish to extend my warmest thanks to all members of the Organizing Committee for their tireless efforts in making this meeting so memorable.

If our Society owes its vitality to the various contributions made by its members, it also owes it to the dedication of its Governing Board, Trustees and committee members and chairs. During the past year they successfully addressed several important issues. Most significantly, ESC President Peter Mason oversaw two important changes in the management of our journal, *The Canadian Entomologist* (*TCE*), including the recruitment of Chris Buddle as new Scientific Editor and the signing of a contract with our new *TCE* publisher, Cambridge University Press (CUP). Sincere thanks go to all those who, in addition to Peter, contributed to each of these two transitional processes. More specifically, Kevin Floate, Publications Committee Chair, and Scott Brooks, Treasurer, played a pivotal role in negotiating the contract with CUP, and both past and new Scientific Editors, Robb Bennett and Chris Buddle, worked together to ensure a smooth transition from the previous to the new Editorial Board structure and operation. Peter also played a key role in identifying our new Secretary, Alec McClay, who has replaced Annabelle Firlej. Annabelle had announced she would be stepping down after this year's Annual Meeting. I thank her for her dedicated service to the Society and welcome Alec, with whom I look forward to interacting throughout the year, as I step in as President of our Society.

It is both an honor and a pleasure to begin my service as President of the ESC. I am indebted to Peter Mason and the other members of the Governing Board for their support during the past 2 years and their help in ensuring a smooth transition to my new duties. Although collectivement relevé plusieurs défis. De façon remarquable, le Président Peter Mason a mené à bien deux changements important dans la gestion de notre revue, *The Canadian Entomologist* (*TCE*), dont le recrutement de Chris Buddle comme nouveau Rédacteur scientifique et la signature d'un contrat avec la nouvelle maison d'édition de *TCE*, Cambridge University Press (CUP). Je tiens à remercier tous ceux et celles qui, avec Peter, ont contribué au succès de ces deux transitions. Plus spécifiquement, Kevin Floate, Président du Comité des publications, et Scott Brooks, Trésorier, ont joué un rôle clé dans les négociations qui ont mené à la signature du contrat avec CUP. De leur côté, le Rédacteur scientifique sortant, Robb Bennett, et le nouveau Rédacteur scientifique, Chris Buddle, ont travaillé de concert pour assurer une transition harmonieuse des anciennes aux nouvelles structure et opérations du Comité éditorial. Peter a aussi joué un rôle important dans l'identification du nouveau Secrétaire, Alec McClay, qui remplace maintenant Annabelle Firlej. Annabelle avait annoncé qu'elle quitterait son poste au terme de la réunion annuelle 2011. Je la remercie chaleureusement pour son dévouement pour la Société, et je souhaite la bienvenue à Alec McClay, avec qui j'aurai le plaisir de travailler et d'interagir au cours de l'année, alors que j'assumerai les fonctions de Président de notre Société.

C'est pour moi un honneur et c'est avec grand plaisir que j'entame mon mandat comme Président de la SEC. Je suis redevable à Peter Mason et aux autres membres du Conseil d'administration pour leur soutien au cours des deux dernières années et pour leur aide dans la transition vers mes nouvelles fonctions. Bien que notre Société soit présentement en excellente santé et qu'elle soit dans une phase passionnante de son évolution, certains défis restent à relever. L'un d'eux est la nécessité d'accroître le nombre de nos membres et d'en diversifier la composition, ce qui nécessitera des efforts pour attirer des entomologistes de sous-disciplines qui n'ont traditionnellement pas été bien représentées au sein de notre So-

our Society is currently in very good health and in an exciting phase of its evolution, there remain issues to be addressed during my mandate. One of them is the need to increase and broaden our membership, which could involve efforts to attract entomologists from sub-disciplines that traditionally have not been well represented within the Society. With respect to the publication of *TCE*, I look forward to working with the Publications Committee, CUP and our new scientific editor to explore ways of capitalizing on the new editorial process and advantages conferred by our contract with the publisher to increase the number of manuscript submissions, to build upon Robb Bennett's hard work to further improve the quality of the journal, and to increase the number of subscriptions. I also plan on working with the Web Content Committee towards the development of a web-based electronic voting system that the Society could use for the election of Officers and for consulting its membership on various issues.

This is an exciting time to be involved in the ESC. I hope you share my enthusiasm and, like me, choose to look optimistically upon the future of our Society.

ciété. En ce qui a trait à la publication de *TCE*, il me fera plaisir de travailler avec le Comité des publications, CUP et notre nouveau Rédacteur scientifique pour accroître le nombre de manuscrits soumis pour publication, pour continuer le travail de maître entrepris par Robb Bennett visant l'amélioration continue de la qualité de la revue, et pour accroître le nombre d'abonnements. Je compte aussi travailler avec le Comité du contenu internet en vue de développer, sur le site web de la SEC, un système de vote électronique que la Société pourra utiliser pour l'élection ses Officiers et pour la consultation de ses membres sur divers enjeux.

Il est agréable et stimulant de s'impliquer dans la SEC pendant cette période effervescente de son histoire. J'espère que vous partagez mon enthousiasme et que, comme moi, vous choisirez d'adopter une attitude optimiste à l'égard du futur de notre Société.

M. Larrivée

*Analeptura lineola* (Cerambycidae)

## The Dark Exsanguinations of the Night

I have previously commented on the immense role that insects have played in several types of entertainment, namely film (*Bull. E.S.C.* **37**: 183-184) and fictional literature (*Bull. E.S.C.* **42**: 122-124). OK, maybe "immense" is not exactly the right adjective (more like "minuscule", "insignificant" or "non-existent"). With entertainment, it always seems that insects and their brethren are completely type-cast, regardless of the medium. Need a mutated, mindless villain for your film or story? Scuttle right this way. But a leading man or heroine? Or a complex character who develops throughout the story and ends up teaching us all a moral lesson? Don't let the door hit your caudal appendages on the way out...

Since I wrote about insects in film, another entertainment medium has always entered into my thoughts as a possible future topic for a column. I just couldn't figure out the best way to present it. I'm talking, of course, about music. As with film and literature, where on earth are all the references to insects (and relatives) in music? Of course, there are a few, most notably "The Beatles" (although I am at a loss to remember anything in their music that was even remotely coleopterological). With respect to entomology-inspired song titles, there have been a few, ranging from Rimsky-Korsakov's brilliant "Flight of the Bumblebee" to the ever-popular "Itsy-Bitsy Spider" (re-interpreted so "successfully" by The Who in "Boris the Spider"). I know there are others, but the point is, it was kind of difficult to conceive of a complete article discussing the nuances of entomology in music.

I'm not sure when the breakthrough for a topic for this issue came. Karen Needham at UBC suggested the topic (thanks Karen) which made me re-examine it. I think perhaps at some point (likely stuck in traffic), I was humming a tune and accidentally substituted an entomological term for the actual lyrics. And there you have it. Mix in some of my favourite *Moth Balls* themes (i.e., a long list, making fun of Diptera/ Dipterists, etc.) and the rest, as they say, is history. *Moth Balls* now presents a list of lyrics from some of the more popular (?) musical genres/subgenres of the past century or so, entomogrified to describe the fun-filled interaction between humans and one or (usually) more biting flies.

**1) Doo-Wop**

Why must flies bite my ass? Why must they bite my a-ass?

**2) Disco**

Well you can tell by the way I poot those flies,

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I'm a dipterist: no need for DEET.
On my legs and on my arms. I've been bitten there
since I was born.
And now it's all right. It's OK.
And you may run the other way.
And you can try to understand
The things I'll do to catch those flies.
Ow, ow, ow, ow, eaten alive, eaten alive.
Ow, ow, ow, ow, eaten alive, eaten alive.

**3) Funk**

I feel good. I knew that I would now.
So good, so good... Uggh, I got bit!
EEE-YOWWW!!

**4) Reggae**

Black flies, black flies
What you gonna do?
What you gonna do
When I thumb crush you?

**5) Death Metal**

FLIES… BLOOD… DEATH… HATE… (repeat 500 times very loudly with deep, growling vocals).

**6) Musicals**

Slowly… deftly… she inserts her mouthparts.
You can't feel it – subtle anaesthetic.
Blood flow will begin. Will *Plasmodium* creep in?
In this darkness when you know she loves to bite.
The dark exsanguinations of the night.

**7) Pop**

It's… so… irritating.
Could it be a black fly? Could it be a horse fly?
I… can't… tell them apart.
Does it really matter? I just want to kill it.
Kill it, k-k-kill it.
Crush it with a shoe box. Squash it with a coat stand.
Save me, s-s-save me.
Don't want to be a victim – ready for a hero.
Boy… you're a dipterist (your couplets so precise).
But I don't really care – just squash that friggin' fly!

**8) Swedish "Super-Group"**

Tsetse, tsetse… flies are gonna find me, but I won't feel blue.
Muskol sprayed anew…
Instead they will be biting you.

**9) R&B/ Soul**

When a fly bites a woman…
Can't keep its mind on nothing else.
It'd risk its life… for a blood meal.

**10) Country**

You gotta know when to swat 'em,
Know when to pop 'em.
Know when to walk away
And know when to run.
You never scratch your bug bites
When you're sittin' at the table.
There'll be time enough for scratchin'
When the bleedin's done.

**11) Grunge**

Ah-na-na-na. Ah-na-na-na. A mosquito. My libido. Yeah.

**12) New Wave**

Every time I see them hovering,
I get down on my knees and spray.
I'm waiting for that fateful moment
The DEET runs out - they make me pay.

**13) Operetta**

I am the very model of a systematic dipterist.
I've information calyptrate, acalyptrate and apterous.
I know the world's Aschiza and I quote them taxonomical
From Phoridae to Syrphidae in order categorical.
I'm very well acquainted, too, with matters nematocerous.
I understand the black flies and the species of *Phlebotomus*.
I travel all the world to find the Diptera most "Dracula"
From pupae to adults and also larval hibernacula.
So when my wife agreed that we should holiday in Pakistan,
I "accidentally" left the DEET at home in my old khaki van,
Then pooted off her forearm while my colleague gently gripped her wrist…
I am the very model of a systematic dipterist.

I convey my sincerest apologies to those of you who don't follow music. I'm sure the preceding was about as humorous to you as a nice, festering mosquito bite. I offer slightly insincere apologies to those of you who do follow music for butchering music that you may know and love. Finally I offer no apologies whatsoever to those of you who find yourself humming any of my mutilated lyrics in the shower or on your way to work… Serves you right for reading it! Note that if you are curious about the musical inspirations for any of the preceding lyrics, feel free to email me and I will send you a list.

I will be taking a hiatus from writing *Moth Balls* in 2012 while I recover from (among other things) spending too much time trying to find words that rhyme with dipterist! I hope to return with some fresh, new ideas (and by this I don't mean formulating an entire article so as to be able to include the phrase "ripped her list").

# Dear Buggy / Cher Bibitte

Dear Buggy,

*My supervisor tells me I need to get out of the lab and start interacting with other researchers. I don't see why. I keep up on the literature and attend all the talks at the conferences I go to. Shouldn't I be in the lab running experiments or at my desk writing my papers rather than schmoozing at the departmental social?*

*Signed* 'Introverted in Inverness'

You are right, the most important part of your job is your research. However, it's almost as important that during graduate school you begin to cultivate your relationships within the community of scientists. Yes, I mean 'networking'.

Before I begin, allow me a small digression. When you see the word 'networking', you probably think I'm going to start writing about Facebook, Twitter, LinkedIn and the rest, and how these social networking sites are revolutionizing the way we communicate. I'm not! That topic has been discussed to death: you can Google it if you're interested. My opinion is that most entomologists haven't yet started to use social networking sites as tools to communicate and network (although the ESC does have an excellent Facebook group which you should check out). There are a small number of us that do, but the majority still don't. Therefore, if you want to meet and build connections to the larger community of entomologists you will need to master the art of 'analog' networking.

Your questions though, are "Why do I need to network?" and "Is it really that important?". Well, science has long since moved on from the popular image of the lone scientist working feverishly away at the bench late into the night. We still work late, but it is not likely that we're working alone. Today, we are encouraged to work collaboratively both within and across disciplines. In this environment, the ability to communicate and network is a 'soft' skill that every graduate student needs in their toolbox. For young researchers, networking can lead to collaborations that bring funding; for you, networking can be the pathway to your next (or first!) job. But networking also has a less practical and less obvious purpose. Until you publish you are somewhat of a non-entity in the research community. You may be doing excellent work, but unless people know about it, and know who you are the less impact you will have, and the fewer the opportunities that will come your way.

The reasons for networking are easy to explain. In any endeavour that includes more that two people it is the relationships among those people that predict a good deal of what is accomplished. That includes science. The hard part about networking is 'doing it'; just how do you go about building a network?

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*Chris MacQuarrie is a research scientist with the Canadian Forest Service in Sault Ste. Marie, where he studies the management of native and invasive insects. Currently, he's wondering if the social Hymenoptera could be considered the first social network. Dear Buggy is always looking for suggestions or guest contributors. Have an idea? Send it to* cjkmacquarrie@gmail.com *or find him on Twitter: @cmacquar.*

You should have the beginnings of a network, even if you are not aware of it. You just might not call it a network. Your current lab mates, old classmates that have gone on to graduate school at other universities, previous employers, past professors and your supervisors are all parts of this network. It is from this embryonic network that can you begin to cultivate new connections.

Think back to the last conference you attended. At the coffee break, who did you chat with? Was it your lab mates who you'd come to the conference with? If so, did it not strike you as odd that you had perhaps flown thousands of kilometres and spent hundreds of dollars just to visit with the person who works at the next bench, or sits in the office down the hall? Conferences are where most of us have our first exposure to the world outside our network, and it's during the coffee breaks when you can sharpen your networking skills.

When I was a student, I found it difficult to approach someone I didn't know at a meeting. I think this is something we all find hard, but overcoming our apprehension is important if we want to build a network. One thing I used to do (and in truth, still do) for someone I really wanted to meet was to attend their talk. I'd then find them later at coffee or after the session to follow up on something I found interesting. The problem was that this didn't always work. Sometimes my 'target' would be busy, or sometimes there would be two or three other students with the same idea, or even sometimes I would never see them again at the meeting (one of those hit-and-run speakers). So what do we do then?

Here is where you can use those connections in your embryonic network. The first place to start is your supervisor. It's completely acceptable to ask them to introduce you to someone that they know and that you want to meet. In truth, they probably should be doing this without you asking, but sometimes supervisors need a little prompting. But what if they don't know the person you want to meet, or your supervisor isn't there? A good friend can help you out here.

Conferences are short and time flies when you're having fun. Its alright then, if you're aware of a connection that already exists, to ask for an introduction. Be polite of course, for instance: "Gee Dave, I know you are working in so-and-so's department – can you introduce me next time we see them?" You can even do this in a 'stealthy' way if you like. Pay attention at coffee breaks, if you see someone you know in a group of people that you don't, you can walk up and join the conversation. You will find that most people are quite amenable to a friend of a friend joining their conversation (assuming that they aren't discussing something very personal). Of course, you should use your judgement here. The first thing, though, is to stop spending your conference coffee breaks with your lab mates! They will be there when you get back!

So now that you've made the introduction, how do you add this person to your network? You do that by being someone who is memorable and interesting. The first question anyone is likely to ask you is "What do you work on?" In business, there is something called an 'elevator pitch'. It's a short introduction to yourself and your work that can be delivered in the time it takes to complete an elevator ride. The idea is that you may have only a limited time to make a first impression. You need your own 'elevator pitch' for your research so that you can explain who you are and what you do in a way that other people can understand. You also need to be able to do this in a reasonable amount of time so you don't monopolize the conversation. Being able to talk about your research and why it's important to you demonstrates to others that you can think and talk about your work outside the lab and beyond your conference presentation. In truth, most people you meet will be interested in what you do, but they will be more interested in you if they can see the links between what you do and what they do. It's not egotistical, its just natural curiosity. I get much more out of a conversation with someone who has a new take on a problem I deal with every day than someone who is locked into their own little niche and can't see the bigger picture.

But what if you don't have anything in common with your new conference buddy? It doesn't matter. Instead, use this as an opportunity to broaden your connections to other fields of study. Ask people you meet about their research, and find out about their university, their lab and supervisor, and what it's like to live in and work in their city. Share your experiences and see if you have any common connections. Some of these people will be your colleagues later in your career. Or they may be future lab mates. Or they might be one of those people you only see at meetings. Regardless, starting and maintaining a mental rolodex of people that you've interacted with will be a valuable resource in the future. You will be surprised at how connections you make one day will prove valuable in the future.

So how important is your network? I don't know if anyone has ever tried to quantify the influence of a network on your career, so I can't answer that question with data. But what I can do is to illustrate how important a network can be using my own experiences. I got my first entomology job at Agriculture and Agri-Food Canada (AAFC) with help from classmates I met in the Biology Club at the University of Saskatchewan. I was accepted into my MSc position with AAFC in New Brunswick, in part, because of the experience I gained while working at the lab in Saskatoon. I later worked for the Canadian Forest Service (CFS) in New Brunswick as a technician, which led to a PhD with the lab in Alberta, then a post-doctoral fellowship and finally a job as research scientist in Ontario. The importance of the network comes in when you find out how I got these opportunities. My first summer student job and my most recent position were the only ones that were advertised. I found out about every other opportunity because of networks of entomologists that I was associated with (either in real life or through things such as Entomo-L). When I was starting out, I benefited from the networks among my supervisors and professors that provided recommendations; later, I got jobs as the result of connections I had made on my own. Today, I am writing this column at my desk in the CFS and I have my own network of connections spread across most of this country, into the USA and abroad: a network that was built on the connections I made in the biology lounge at the University of Saskatchewan.

The thing is though, I don't call these people my network, I call them my friends. And that's my real point. Networking is not a self-serving, opportunistic activity; it is getting out there and making friends with people who share a similar passion for science and a drive to discover. And who wouldn't want a group of friends like that.

Buggy.

A. Leroux

Spider on cricket

## Darryl Gwynne – 2011 Ig Nobel Prize Winner

Professor Darryl Gwynne (University of Toronto, Mississauga Campus) received a 2011 Ig Nobel Prize at a ceremony at Harvard University in late September 2011 for his research on sexual selection and copulation patterns in jewel beetles (Buprestidae).

While conducting field work in Western Australia 28 years ago, Darryl and colleague David Rentz (Division of Entomology, CSIRO, Canberra), who also received the accolade, came across male jewel beetles on top of or crawling up the sides of empty stubbies (beer bottles). The beetles were clearly trying to mate with the bottles, which apparently resembled 'super females'. Further studies showed that the males were attracted by the light reflectance pattern created by the bottles' dimpled surface, a pattern that mimicked that produced by the elytra of females. The research was published in 1983 as "Beetles on the bottle: Male buprestids mistake stubbies for females" in the *Journal of the Australian Entomological Society* **22**: 79-80.

Ig Nobel Prizes, which are an American parody of the Scandinavian Nobel awards, are given to researchers whose discoveries will "first make people laugh, and then make them think". The awards are organized by the scientific humor magazine *Annals of Improbable Research* and are presented by Nobel Laureates.

Darryl Gwynne, with David Rentz (inset)

A male jewel beetle (*Julodimorpha bakewellii*) mounting a stubbie

Chandra Moffat

## ESC-AES JAM 2011

This year's Joint Annual Meeting in Halifax was a filled with presentations on diverse entomological research in Canada, and the theme of *Beauty and Impact* could be found throughout the sessions. Personally, I was very impressed with both the scientific content and the professional delivery of the student talks, and saw many students integrating a variety of approaches and tools. The posters were also of high quality; ESC students truly are impressive! Students and non-students alike thoroughly enjoyed the musical talents of the Mahers Bahers, which got several members of the Governing Board dancing around the room!

### Student Mixer

This year we opted for a shorter student mixer to take advantage of the nearby Garrison Brewing Company and their tasty brews. The portion of the mixer held at the hotel provided a great opportunity for socializing. We had delicious appetizers to feed hungry students: the sushi in particular was really great, and I have Vancouver standards! Thanks go to the staff of the Westin Hotel for excellent service, both at the Student Mixer and throughout the meeting, and to the Local Organizing Com-

## SEC-SEA 2011

La réunion conjointe annuelle de cette année à Halifax a été remplie de présentations sur diverses recherches entomologiques au Canada, et le thème *Beauté et Impact* s'est retrouvé dans toutes les sessions. Personnellement, j'ai été très impressionnée autant par le contenu scientifique que par le professionnel des présentations étudiantes, et j'ai vu beaucoup d'étudiants qui intégraient une variété d'approches et d'outils. Les affiches étaient également de grande qualité : les étudiants de la SEC sont vraiment impressionnants ! Les étudiants tout comme les non-étudiants ont grandement apprécié le talent musical des Mahers Bahers, qui ont amené plusieurs membres du conseil d'administration à danser autour de la salle !

### Cocktail étudiant

Cette année, nous avons opté pour un cocktail étudiant plus court afin de profiter de la brasserie du coin, Garrison Brewing Company et leur bonne bière. La partie du cocktail tenue à l'hôtel a fournie une bonne opportunité pour socialiser. Nous avons eu de délicieux hors-d'œuvre pour nourrir les étudiants affamés : les sushis étaient particulièrement bons, et mes points de comparaison sont de Vancouver ! Merci aux employés de l'hôtel Westin pour l'excellent service, autant au cocktail étudiant que tout au long de la réunion, et au comité organisateur local pour avoir fourni de délicieuses bouchées. Notre passage à la brasserie Garrison a été vivant, et plusieurs non-étudiants nous ont accompagnés dans cette dégustation de bière.

### Enchères silencieuses

La qualité des articles a prévalu sur la quantité cette année, et j'ai été vraiment impressionnée par la générosité de ceux qui ont donné les articles autant que de ceux qui ont surenchéri. Nous avons amassé plus de 800$ pour les fonds de prix et bourses étudiants de la

mittee for providing the delicious snacks. Our time at Garrison Brewery was lively, and we were pleased many non-students joined in the fun beer tasting.

### Silent Auction

Quality of items prevailed over quantity this year, and I was very impressed with the generosity of both those who donated items and those who made bids. We raised more than $800 for the ESC Scholarship and Awards Fund which, considering the size of the meeting, was a great result! My personal thanks go to Kevin Reeh for his hard work to make the Silent Auction a success. On behalf of ESC students, we gratefully thank those who donated and bid on items.

### Graduate Student Symposium: Too many aphids, too few butterflies, and the patterns in between

The GSS was a great session this year, as always. I enjoyed the diversity of studies presented, as it offers a good flavour of the entomological research currently being conducted in Canada. The abstracts of the six talks that were selected for inclusion into the GSS are included elsewhere in the Student Wing.

### ESC Job Board and Student Facebook Page

The job board has been quite active lately. At http://www.esc-sec.ca/jobs.html you can find job postings for faculty, research and other positions, as well as postings on graduate research opportunities. This is a great way to find a potential graduate supervisor, as is the Directory of Entomology in Canada, which can be found at http://www.esc-sec.ca/directed.html. The ESC Student Facebook group is also very active, with job and research postings, events, and advice abounding! I highly recommend joining our facebook group and regularly checking the Job Board. Postings for the job board can be sent to jobs@esc-sec.ca.

### Thesis Roundup

As always, we like to know when a student defends their thesis. If you have (or anyone you know of has) defended a thesis recently,

SEC, ce qui, considérant la taille de la réunion, est un grand résultat ! Un merci particulier à Kevin Reeh pour son dur labeur qui a pu faire des enchères silencieuses un succès. Au nom des étudiants de la SEC, nous remercions gracieusement ceux qui ont donné et surenchéri sur des articles.

### Symposium des étudiants gradués: Trop de pucerons, pas assez de papillons, et les patrons intermédiaires

Le symposium des étudiants gradués a été une belle session cette année, comme toujours. J'ai apprécié la diversité des études présentées, puisqu'elle a offert un bon aperçu de la recherche entomologique présentement conduite au Canada. Les résumés des six présentations qui ont été sélectionnées pour le symposium ont été inclut dans l'aile étudiante.

### Page des opportunités d'emploi et page des étudiants sur Facebook

La page des opportunités d'emploi a été très active récemment. Sur http://www.esc-sec.ca/fr/f-jobs.html vous trouverez des annonces d'emplois académiques, en recherche et autres, ainsi que des opportunités de recherche graduée. Jumelé au répertoire des formations entomologiques au Canada, qui se trouve à http://www.esc-sec.ca/directed.html, il s'agit d'une très bonne façon de trouver un directeur potentiel. Le groupe des étudiants de la SEC sur Facebook est aussi très actif, avec des annonces pour de la recherche, des évènements, et des conseils ! Je vous recommande vivement de joindre le groupe sur Facebook et de consulter régulièrement la page des opportunités d'emploi. Les annonces pour la page des opportunités d'emploi peuvent être envoyées à jobs@esc-sec.ca.

### Foisonnement de thèses

Comme toujours, nous aimons savoir quand un étudiant soutient sa thèse. Si vous avez (ou quelqu'un que vous connaissez a) soutenu une thèse récemment, merci de m'envoyer votre/son nom, diplôme, date d'obtention, titre de la thèse, nom du directeur, université et adresse courriel à students@esc-sec.ca

please send me your/their name, degree and date achieved, thesis title, supervisor's name, university and email address to students@esc-sec.ca.

That is all for now. Please feel free to contact me anytime.
~Chandra
students@esc-sec.ca

C'est tout pour le moment. N'hésitez pas à me contacter en tout temps.
~Chandra
students@esc-sec.ca

## Graduate Student Symposium / Symposium des étudiants gradués

### Too many aphids, too few butterflies, and the patterns in between / Trop de pucerons, pas assez de papillons, et les patrons intermédiaires

### Joint Annual Meeting / Réunion conjointe annuelle, 8 November / 8 novembre 2011 Halifax, Nova Scotia / Nouvelle-Écosse

### Chair / Modératrice : Chandra Moffat

Rick West

Graduate Student Symposium speakers: (L-R) Chaminda De Silva, Susan Horton, Christa Rigney, Lauren Pinault, Simon Daoust, Colin Curry and Chandra Moffat (Co-organizer)

### Speakers and Abstracts (in order of presentation) / Participants et résumés (en ordre de présentation)

**Chaminda De Silva Weeraddana** (Nova Scotia Agricultural College)

**Potential use of *Ascophyllum nodosum* (L.) Le Jol. extracts for the management of green peach aphid, *Myzus persicae***

Brown seaweed, *Ascophyllum nodosum*, extracts (ANE) increase plant growth and imparts resistance against biotic and abiotic stresses. *Arabidopsis* plants, which are susceptible to green peach aphids (GPA), were used to determine whether application of ANE can confer protection

against GPA. ANE treatment improved chlorophyll content, biomass and yield while delaying senescence under GPA pressure. This observed improved plant growth was due to ANE imparted tolerance against GPA in *Arabidopsis*.

**Utilisation potentielle d'extraits de *Ascophyllum nodosum* (L.) Le Jol. pour le contrôle du puceron vert du pêcher, *Myzus persicae***

Les extraits de goémon noir (ANE), *Ascophyllum nodosum*, augmentent la croissance des plantes et confèrent une résistance aux stresses biotiques et abiotiques. Les plantes *Arabidopsis*, qui sont susceptibles aux pucerons verts du pêcher (GPA), ont été utilisées afin de déterminer si l'application de ANE peut conférer une protection contre les GPA. Le traitement à l'ANE a amélioré le contenu en chlorophylle, la biomasse et la récolte tout en retardant la sénescence sous la pression des GPA. Cette croissance améliorée de la plante a été permise par la tolérance contre les GPA grâce aux ANE chez *Arabidopsis.*

**Susan Horton** (Saint Mary's University)

**Identifying the locations, movement and habitat of the European fire ant, *Myrmica rubra*: an invasive species in the urban/suburban environment of Halifax, Nova Scotia**

*Myrmica rubra*, the European Fire Ant, is a pestiferous, invasive species in North America. It administers a painful sting, and causes many residents to be unable to use their outdoor property. Locations in Halifax Regional Municipality were mapped, and habitat characteristics were measured and compared to nest densities. No strong correlations were found but comparing urban habitat to other invasive and native environments showed preferences and high adaptability. Public feedback indicates an irruption is occurring.

**Identifier la localisation, le mouvement et l'habitat de la fourmi rouge, *Myrmica rubra :* une espèce envahissante dans l'environnement urbain/suburbain de Halifax, Nouvelle-Écosse**

*Myrmica rubra*, la fourmi rouge européenne, est une espèce envahissante dérangeante en Amérique du Nord. Elle administre une piqûre douloureuse et empêche beaucoup de résidents d'utiliser leur propriété à l'extérieur. Des localités dans la région de la municipalité de Halifax ont été cartographiées et les densités de nids ont été comparées. Aucune corrélation forte n'a été trouvée, mais la comparaison des habitats urbains avec d'autres environnements envahis et natifs ont montré des préférences et une forte adaptabilité. Les commentaires du public indiquent qu'une irruption se produit.

**Christa Rigney** (University of Winnipeg)

**Determination of Dakota skipper (*Hesperia dacotae*) critical habitat in Manitoba: characterization of vegetation**

The Dakota skipper, *Hesperia dacotae*, is a threatened butterfly restricted to fragmented prairies in Manitoba. Currently, there is limited data on the life history and habitat requirements in Canada to implement effective conservation measures. I seek to better understand key biological and physical habitat requirements to develop a preferred site profile. Vegetation and nectar flower surveys were conducted in 2010. Analysis of the vegetation abundance and diversity was used to develop critical habitat profiles to determine optimal Dakota skipper habitat.

**Détermination de l'habitat critique de l'hespérie du Dakota (*Hesperia dacotae)* au Manitoba : caractérisation de la végétation**

L'hespérie du Dakota, *Hesperia dacotae*, est un papillon menacé restreint à des prairies

fragmentées au Manitoba. Présentement, les données sur l'histoire de vie et sur les exigences d'habitats afin d'implémenter des mesures efficaces de conservation au Canada sont limitées. J'essaie de mieux comprendre les exigences-clés de l'habitat biologique et physique afin de développer un profil de site préféré. L'inventaire de la végétation et du nectar floral a été conduit en 2010. L'analyse de l'abondance et de la diversité de la végétation a été utilisée afin de développer des profils d'habitat critique et de déterminer l'habitat optimal de l'hespérie du Dakota.

**Lauren Pinault** (Brock University)

**Distribution and habitat associations of *Anopheles* spp. (Diptera: Culicidae) in highland Ecuador - What does this mean for malaria?**

Malaria has recently occurred in highland Bolivia, suggesting the resurgence of malaria vectors (Culicidae: *Anopheles* spp.) in the Andes. New distribution maps from collections in Ecuador show more widespread occurrence of multiple malaria vectors than historical maps. Habitat associations (abiotic and biotic parameters and human land uses) are summarized. Using habitat association data, a GIS model will predict the impact of climate change on future anopheline distributions in Ecuador.

**Associations de distribution et d'habitat de *Anopheles* spp. (Diptera: Culicidae) dans les hauts plateaux de l'Équateur – Qu'est-ce que cela signifie pour la malaria?**

La malaria a récemment été observée dans les hauts plateaux de Bolivie, suggérant la résurgence des vecteurs de malaria (Culicidae: *Anopheles* spp.) dans les Andes. Une nouvelle carte de distribution basée sur les collectes en Équateurs montre une occurrence plus répandue des vecteurs de malaria que sur les cartes historiques. Les associations d'habitats (paramètres abiotiques et biotiques et l'utilisation des terres par l'humain) sont résumées. Avec les données d'association d'habitats, un modèle GIS prédira l'impact des changements climatiques sur les futures distributions anophelines en Équateur.

**Simon Daoust** (Université de Montréal)

**Different landscape parameters are perceived at different spatial scales: insights from a tri-trophic system within agricultural lands**

We studied the effects of landscape structure on the trophic interactions between a bird host, its blowfly ectoparasites and their parasitoid wasps. All three organisms revealed scale dependent responses to landscape. These functional scales changed with the landscape parameter modeled. The abundances of birds and insects were lower in highly intensive landscapes, this trend being most pronounced at higher trophic levels.

**Différents paramètres de paysage sont perçus à différentes échelles spatiales : perspectives d'un système tritrophique dans les terres agricoles**

Nous avons étudié les effets de la structure du paysage sur les interactions tritrophiques entre un oiseau, ses mouches ectoparasites et leurs guêpes parasitoïdes. Ces trois organismes ont révélé des réponses au paysage dépendantes de l'échelle. Ces échelles fonctionnelles changent avec le paramètre de paysage modélisé. L'abondance des oiseaux et des insectes sont plus faibles dans des paysages plus intensifs et cette tendance est plus prononcée aux niveaux trophiques supérieurs.

**Colin Curry** (University of New Brunswick)

**Relative patterns of larval biodiversity in Trichoptera and Odonata: the role of dispersal ability in freshwater insect biodiversity assessment**

There is considerable debate over the importance of spatial processes in structuring freshwater

insect communities. Poorly dispersing groups should demonstrate greater spatial autocorrelation independent of environmental variation. To test this hypothesis, we surveyed larval Odonata and Trichoptera diversity in three New Brunswick watersheds. The groups were correlated in their spatial patterns of richness and compositional variation, displayed similar magnitude of compositional variation, and did not demonstrate differing levels of spatial autocorrelation. These results speak to the relative homogeneity of riverine insect assemblages in Atlantic Canada and suggest that dispersal related patterns are not a major issue for regional biodiversity assessment.

**Patrons relatifs de biodiversité larvaire chez les Trichoptères et les Odonates : le rôle de la capacité de dispersion dans l'évaluation de la biodiversité des insectes d'eau douce**

Il y a un important débat concernant l'importance des processus spatiaux dans la structuration des communautés d'insectes d'eau douce. Les groupes à faible dispersion montrent une plus grande auto-corrélation spatiale indépendamment de la variation environnementale. Afin de tester cette hypothèse, nous avons échantillonné la diversité larvaire des Odonates et des Trichoptères dans trois bassins versants du Nouveau-Brunswick. Les groupes étaient corrélés dans leurs patrons spatiaux de la richesse et la variation compositionnelle, montraient une magnitude similaire de variation compositionnelle et ne démontraient aucune différence de niveau d'auto-corrélation spatiale. Ces résultats suggèrent l'homogénéité relative des assemblages d'insectes riverains au Canada Atlantique et suggèrent que les patrons liés à la dispersion ne sont pas majeurs pour l'évaluation de la biodiversité régionale.

## President's Prize Awards at the 2011 ESC-AES JAM

**Oral presentations**

**Forestry Session**

**1st place: Lukas Seehausen** (Université Laval). Influence of partial cutting on parasitism of the spruce budworm and the hemlock looper. (Co-authors: J. Régnière, R. Berthiaume and É. Bauce)

**2nd place: Dorothy Maguire** (McGill University). The effects of landscape composition on the regulation of insect herbivory. (Co-authors: C. Buddle and E.M. Bennett)

**Biodiversity & Physiology Session**

**1st place: Brock Harpur** (York University). Diversity and selection on the honey bee immune system. (Co-author: A. Zayed)

**2nd place: Miles Zhang** (Laurentian University). Total evidence approach reveals cryptic species among Eurytomidae (Hymenoptera: Chalcidoidea) associated with galls of *Diplolepis* (Hymenoptera: Cynipidae) on roses in Canada. (Co-authors: M.W. Gates and J.D. Shorthouse)

**Biocontrol & Ecology Session**

**1st place: Laura Ferguson** (Acadia University). Behavioral modification in *Culex* species caused by blood protozoa of frogs and snakes. (Co-authors: N.K. Hillier and T.G. Smith)

**2nd place: Raphael Royauté** (McGill University). Repeatability of behavioural syndromes across life-stages of the jumping spider *Eris militaris* (Araneae: Salticidae). (Co-authors: C. Buddle and C. Vincent)

**Agriculture & Pollination Session**

**1st place: Boyd Mori** (University of Alberta). Demonstration of pheromone-mediated communication disruption for *Coleophora deauratella* (Lepidoptera: Coleophoridae). (Co-author: M.L. Evenden)

**2nd place: Danielle Stephens** (University of Saskatchewan). Flower visitors as potential pollinators of a population of *Vaccinium myrtilloides* and *V. vitis-idaea* (Ericaceae) in central Saskatchewan. (Co-author: A.R. Davis)

**Poster presentations**

**1st place: Kathrin Sim** (McGill University). Molecular and morphological variation in the Arctic wolf spider *Pardosa glacialis* (Araneae: Lycosidae). (Co-authors: S. Loboda, C.M. Buddle and T.A. Wheeler)

**2nd place: Janie Fauteux** (Université de Moncton). How much is too little? Short term effects of deadwood management strategies on saproxylic beetles in plantations. (Co-author: G. Moreau)

Rick West

President's Prize awardees. Front row (L-R): Dorothy Maguire, Boyd Mori, Laura Ferguson, Kathryn Sim, Janie Fauteux. Back Row (L-R): Brock Harpur, Raphael Royauté, Miles Zhang, Lukas Seehausen, Michel Cusson (ESC President), Danielle Stephens, Christine Noronha (AES President)

## ESC 2011 student award winners / Gagnants des prix étudiants SEC 2011

**Heather Kharouba**, University of British Columbia, was the recipient of the **PhD Scholarship.** Heather is studying how the roles that insects play as herbivores, pollinators, dispersers, predators and decomposers of plants influence how their potential responses to climate and land-use change. In particular, she is investigating to what degree biotic interactions, both mutualistic and antagonistic, limit species' northern range limits and how climate change will influence the strength of these interactions. To investigate these relationships, she is using herbarium and entomological museum specimens to track changes in the phenologies of butterflies and their food plants over time. She is also carrying out a field study of the potential influence of warming conditions on the synchrony of red alder budburst and western tent caterpillar egg hatch, and how this could relate to the cyclic dynamics of this species.

The **MSc Scholarship** went to **Chandra Moffat**, University of British Columbia – Okanagan. Chandra investigates the host plant specificity and habitat selection of the gall wasp *Aulacidea pilosellae* (Hymenoptera: Cynipidae), which is proposed as a classical biological control agent for hawkweeds, a group of plants invasive in North America. She uses a combination of ecological observations, experiments, and molecular methodologies. In particular she is studying the environmental factors that influence the presence of and host plant species selection by two biotypes of the gall wasp to determine if they can be used to predict the most likely establishment sites if the insect is released in North America, and host plant preference among species of hawkweed.

**Boyd Mori**, University of Alberta, received the **John Borden Scholarship**. Boyd is studying the red clover casebearer (RCC), *Coleophora deauratella*, an invasive pest of clover that was discovered in the Peace River Region of Alberta in 2006. The RCC is native to Europe, Eastern Siberia and the Middle East, and was first identified in North America from Ontario and Quebec in 1991. Boyd's thesis research is to determine the most attractive pheromone blend of the recently identified female sex pheromone components and to develop a monitoring program that can detect and predict RCC population levels. In addition he is developing a pheromone-based communication disruption plan that could be implemented to reduce the damage caused by this debilitating pest.

The **Keith Kevan Scholarship** was presented to **Chandra Venables**, University of Calgary. Chandra is studying the phylogeny and phylogeography of predaceous diving beetles in the Nearctic with a focus on the tribe Agabini. The objectives of her doctoral work are to: 1) Establish evolutionary relationships of dytiscids in the Nearctic, and to identify colonization routes for exemplars in the tribe Agabini; 2) Assess genetic diversity of target species and among-population genetic mixing, and compare these data to historical data (where possible) with an aim at assessing latitudinal and historical trends; and 3) Identify areas that currently have high genetic and/or species diversity, which could become desirable targets for conservation/protection efforts. This work will be based on collections made from southern British Columbia and Alberta to areas above 60$^{o}$ N.

The **Research Travel Award** was given to **Crystal Vincent**, University of Toronto. Crystal will use the travel award to go to Australia where she will study immunity in female mormon crickets. This species is of interest because it changes its sex roles repeatedly during adulthood. Current eradication efforts for this species make it impossible for her to study the species in the USA.

This year there were five applicants for the **Becker Conference Travel Award**. Awards were made to the following students: **Boyd Mori**, University of Alberta (Demonstration of pheromone-

mediated communication disruption for *Coleophora deauratella* [Lepidoptera: Coleophoridae]), **Christa Rigney**, University of Winnipeg (Determination of Dakota skipper [*Hesperia dacotae*] critical habitat in Manitoba: characterization of vegetation), **Jessica Orlofsky**, University of New Brunswick (Aquatic insect community trait and taxonomic composition in mesoscale flow habitats), and **Margie Wilkes**, Memorial University (Contribution of native bees to crop pollination in low bush blueberry: managed patches vs. wild patches).

Rick West

Bill Riel receives the Postgraduate Scholarship (PhD) on behalf of Heather Kharouba

Rick West

Julio Rivera receives the Research Travel Award from Michel Cusson on behalf of Crystal Vincent

Rick West

Kevin Floate accepts the Kevan Award from Michel Cusson on behalf of Chandra Venables

Rick West

Michel Cusson presents the Postgraduate Scholarship (MSc) to Chandra Moffat

Rick West

Boyd Mori receives the Borden Award from Michel Cusson

Rick West

Ed Becker Conference Travel Award recipients: (L-R) Boyd Mori, Christa Rigney, Margie Wilkes, Jessica Orlofske with Michel Cusson.

## Student scholarships and awards

In 2012 a competition for the following Entomological Society of Canada scholarships and awards will be held: MSc and PhD Scholarships, the Research Travel Award, the John H. Borden Scholarship in IPM, the Biological Survey of Canada Award, and the Becker Conference Travel Award. Details of the application procedures are available on the Society website http://www.esc-sec.ca/studentawards.html. Students are encouraged to apply for these awards. The deadline for all but the Becker Award is 16 February 2012. For the Becker Award, the deadline will be the same as that for abstract submissions for the 2012 JAM in Edmonton.

## Prix et bourses étudiants

En 2012, une compétition pour les prix et bourses suivants de la Société d'entomologie du Canada se tiendra : la bourse pour études graduées, la bourse de voyage pour la recherche, la bourse John H. Borden en lutte intégrée, la bourse d'études supérieures de la Commission biologique du Canada, et la bourse Ed Becker pour la réunion annuelle. Les détails de la procédure d'application sont disponibles sur le site Internet de la Société http://www.esc-sec.ca/fr/f-studentawards.html. Nous encourageons les étudiants à appliquer sur ces bourses. La date limite pour toutes les bourses, sauf la bourse Ed Becker, est le 16 février 2012. Pour la bourse Ed Becker, la date limite est la même que pour la soumission des résumés pour la réunion conjointe annuelle 2012 à Edmonton.

A grad student, a post-doc, and a professor are walking through a city park and they find an antique oil lamp.

They rub it and a Genie comes out in a puff of smoke.

The Genie says, "I usually only grant three wishes, so I'll give each of you just one."

"Me first! Me first!" says the grad student. "I want to be in a luxurious hotel room in Las Vegas with all-you-can-eat, no-charge room service." Poof!
He's gone.

"Me next! Me next!" says the post-doc. "I want to be in Hawaii, relaxing on the beach with a professional hula dancer on one side and a Mai Tai on the other." Poof!
He's gone.

"You're next," the Genie says to the professor.
The professor says, "I want those guys back in the lab after lunch."

# The Insect Molecular Biology and Pathology Group – Agriculture and Agri-Food Canada Research Centre, Saskatoon

**Martin Erlandson**

Martin Erlandson

**Figure 1.** The Erlandson-Hegedus Lab Group – 2010. Back row: Diana Bekkaoui, Brad Hope, Ivo Nickolov, Doug Baldwin, Dwayne Hegedus, Branimir Gjetvaj. Middle row: Riaza Borhan, Amy Noakes, Cedric Gillott, Sanjaya Gyawali, Keith Moore. Front row: Cathy Coutu, Umut Toprak, Martin Erlandson, Ajaykumar Maghodia, Stephanie Harris, Alison Paton.

Over the past several years our research group (Figure 1) has focused on the digestive biochemistry of insect pests, particularly lepidopteran pests of cole crops and canola. This research has spanned topics as varied as the adaptation to and selection of host plants by insects to detailed molecular characterization of the structure and function of the peritrophic matrix, a chitin-protein sheath that lines the midgut of most insects, and characterization of digestive enzymes. We have employed genomic and proteomic approaches, as well as standard molecular biology techniques, to gain a better understanding of how phytophagous insects digest and utilize food. Over the course of this research we have built substantial genomic and proteomic databases for *Mamestra configurata* (bertha armyworm).

As part of a larger biological control research program in AAFC, our research group has also investigated the potential of insect-specific viruses (mainly baculoviruses) and entomopathogenic fungi and bacteria for development as biologically-based insect control products and biopesticides. Of late, the main focus of our research has been basic and applied research on alphabaculoviruses that infect two important noctuid pests: *M. configurata*, a pest of canola, and *Trichoplusia ni* (cabbage looper), a pest of greenhouse vegetable crops and cole field crops. The scope of our baculovirus project is equally broad, encompassing full genome DNA sequencing of virus isolates and identification of viral genes that determine host range and virulence, to more applied work, including laboratory bioassay selection of promising virus strains for biopesticide development and small scale trials to generate efficacy data for registration and optimization of

application strategies. In addition, our group has collaborated with researchers investigating insect parasitoids as potential classical biological control agents. Our role in these projects has been to develop molecular diagnostic probes, mainly multiplex PCR-based systems, to identify and detect parasitoid species within target hosts. These molecular diagnostic systems have been particularly useful for those biocontrol agents that are difficult to identify based on morphology and for groups where species complexes are present.

One of the more rewarding and enjoyable aspects of research is the opportunity to collaborate with colleagues. Our research has greatly benefited from the involvement of graduate students and most of these students have been co-supervised with Dr Cedric Gillott (Department of Biology, University of Saskatchewan). We also have very active collaborations with Dr David Theilmann (AAFC-Summerland) and Dr Cam Donly (AAFC-London) that are integral to our work on alphabaculovirus-insect interaction studies.

## Principal Investigators (Figure 2)

**Martin Erlandson** (BSc, MSc - University of Saskatchewan; PhD - Queen's University).

My interest in insect pathology and biological control dates back to graduate work on microsporidian pathogens of grasshoppers as an MSc student in Cedric Gillott's lab. I was introduced to molecular virology in the early days of baculovirus genomics and gene mapping studies while doing my PhD research in the Department of Microbiology and Immunology with Eric Carstens at Queen's University. Since then I have continued my interest in insect and pathogen interactions and particularly in studies of the genetics of host range determinants and virulence factors that allow pathogens to infect and kill insect hosts. A fundamental understanding of pathogen genetics and molecular biology is key to maximizing the potential practical use of these micro-organisms as biological control agents. One of my current interests is the exploitation of an alphabaculovirus-BACMID system for the generation of GFP marked virus gene knock-out and repair constructs that allow for the investigation of virus genes essential for oral infection of their insect hosts. We have identified several new "per os infectivity factor" (pif) genes and we are beginning to investigate how these virus *pif* gene products interact with specific molecular targets in the host midgut. We also have an ongoing baculovirus genomics project.


Martin Erlandson

The two scholars! Martin (left) and Dwayne standing in front of the statue of the Two Scholars in Guangzhou, China, site of the International Symposium on Insect Midgut Biology (April 2008).

**Dwayne Hegedus** (BSc, MSc, PhD – University of Saskatchewan).

Dwayne was raised on a farm near Wakaw, Saskatchewan. He obtained a PhD from the University of Saskatchewan in 1995, then was an NSERC Post-doctoral Fellow at the University of British Columbia where he worked on the production of pharmaceutical proteins in insect cells. Since joining AAFC in 1997, he has been involved in research on insect molecular biology, plant molecular pathology and plant bio-products. Dwayne and I have developed genomic, proteomic and bioinformatics resources for several canola pests that have increased our understanding of insect digestion and nutrient acquisition. Dwayne was Chair of the Organizing Committees for

the 1999 and 2007 Entomological Society of Canada Joint Annual Meetings and has served 12 terms as Treasurer of the Entomological Society of Saskatchewan. In 2005 Dwayne was honored to receive the C. Gordon Hewitt Award from the Entomological Society of Canada, presented annually to a researcher under 40 years of age.

### Post-doctoral Fellow

**Ajaykumar Maghodia** (BSc, MSc - Gujarat Agricultural University; PhD - Anand Agricultural University)

Ajay has a background in biological control research involving the use of *Bacillus thuringiensis* and entomopathogenic nematodes for insect pest control. Currently, Ajay is involved in alphabaculovirus genome sequencing projects. He is also undertaking *in vivo* and *in vitro* analysis of *Autographa californica* nucleopolyhedrovirus (AcMNPV) BACMID constructs containing gene-knockout and repairs for five core baculovirus genes. These recombinant viruses are gfp-tagged, allowing for *in situ* tracking of virus infection of specific tissues. Thus, by examining midgut epithelial cells from virus inoculated larvae we are able to determine if specific virus gene products are required for the primary step in gut cell infection.

### Current Graduate Students (Figures 3 and 4)

**Umut Toprak** (BSc, MSc – University of Ankara, Ankara, Turkey; PhD - University of Saskatchewan, 2011).

Umut recently defended his PhD dissertation entitled "The molecular architecture of *Mamestra configurata* peritrophic matrix". Umut's thesis research included identification of a large number of proteins with chitin binding motifs from an extensive cDNA library of transcripts expressed in the bertha armyworm midgut under a variety of dietary regimens. These proteins were characterized as to expression dynamics, localization using western blots, and their potential function as determined by identification of conserved amino acid domains. The proteins constituted both key structural peritrophic matrix proteins and enzymes involved in chitin biosynthesis, turn over and structural modification. Umut's research has contributed very significantly to our current understanding of lepidopteran peritrophic matrix structure and function. For his outstanding research, Umut received the 2011 Mauro Martignoni Student Award from the Society of Invertebrate Pathology. Though Umut has now returned to the Faculty in the Department of Entomology at Ankara University, he is continuing to co-operate with our group on several projects.

**Amy Noakes** (BSc – University of Victoria, 2009)

Amy is an MSc student in the Department of Biology, University of Saskatchewan. Amy worked in our lab group during her undergraduate program as a co-op student, identifying and characterizing digestive protease sequences from our bertha armyworm midgut cDNA library. She also assisted in developing a qRT-PCR assay to examine the transcription profile of specific digestive protease mRNAs under differing dietary regimens for larval bertha armyworm. Her MSc project involves the construction of AcMNPV bacmid gene knock-out and repair viruses for two virus genes which encode proteins with putative chitin-binding domains. The aim of this work is to determine whether these viral proteins play a role in the interaction between the virus and chitin fibrils in the host-insect peritrophic matrix, thus impacting the oral infectivity of the virus.

### Former Graduate Students (Figures 5-7)

**Tara Gariépy** (BSc - Carleton University, MPM – Simon Fraser University, PhD –University of Saskatchewan, 2007) (currently a Research Scientist, AAFC, London, Ontario).

Tara's thesis was entitled: "Molecular markers for lygus parasitoids to assess host specificity of candidate entomophagous biological control agents." Tara received the Governor General's Gold Medal as the top PhD student at the 2007 University of Saskatchewan Spring Convocation.

**Bryan Ulmer** (BSA, PhD –University of Saskatchewan, 2003) (currently a Senior Research Scientist, Syngenta Crop Science Inc., Basel, Switzerland).

Bryan's thesis was entitled "Crucifer host plant suitability for bertha armyworm (*Mamestra configurata*) and diamondback moth (*Plutella xylostella*)."

**Bryan Sarauer** (BSc, MSc –University of Saskatchewan, 2002) (currently a research technician at the Toxicology Centre, University of Saskatchewan).

Bryan's thesis was entitled "An investigation of the peritrophic matrix proteins from the diamondback moth (*Plutella xylostella*) and the cabbage root maggot (*Delia radicum*)".

## Research Associates (Figures 8-10)

**Doug Baldwin** (BST-SIAST Kelsey Campus, BSc –University of Saskatchewan, 1992).

Doug has been a member of our research group for 17 years. He has been involved in the development of much of our genomic and proteomic resources for both insect molecular biology and insect pathogen projects. Doug's expertise in molecular biology supports many of the projects undertaken by graduate students, post-doctoral fellows and other technical staff that have been part of our research program. Doug contributed to the organizing/event committees for the 1997 Society of Invertebrate Pathology meeting, and the 1999 and 2007 Entomological Society of Canada Joint Annual Meetings. In 2012 Doug will assume the position of Vice-president of the Entomological Society of Saskatchewan.

**Stephanie Harris** (BSc –University of Saskatchewan, 1995)

Stephanie joined our research group over 13 years ago. Her skills in insect tissue dissection and isolation, as well as her expertise in primary tissue culture have been invaluable to many facets of our research program. Stephanie has also worked extensively on our classical biological control projects, undertaking parasitoid identification using standard morphological criteria as well as running various multiplex PCR molecular systems for insect identification.

**Ruwandi Andrahennadi** (BSc- University of Kelaniya, Sri Lanka; MSc, PhD –University of Saskatchewan, 2009)

Ruwandi recently joined our research group to provide support for insect nutrition and insect-host plant interaction studies. In addition, she oversees maintenance of insect colonies and insect rearing for the entomology research programs at the Research Centre. Ruwandi was the 2011 President of the Entomological Society of Saskatchewan.

## Recently Retired Staff

**Keith Moore** (BST-SIAST Kelsey Campus, 1975)

Keith started working in the Entomology Section of AAFC in 1979 and retired in 2010. Keith first worked on insect nutrition with Dr G.R.F. Davis and then in the insect biological control program with Martin. Keith has been and remains very active in the Entomological Society of Saskatchewan.

**Alison Paton** (BAg, University of Manitoba, 1982)

Alison has been involved with entomological research in AAFC since 1982 when she took

up a position with Dr Peter Harris in the Biological Control of Weeds Program at the Regina Research Station. In 1993 she moved to the Insect Biological Control Program at the Saskatoon Research Centre where she was in charge of the insect rearing facility until her retirement in 2010.

For more information on our research, including opportunities to undertake graduate work with us, please contact Martin (martin.erlandson@agr.gc.ca) or Dwayne (dwayne.hegedus@agr.gc.ca).


**Figures 3-10:** 3. Umut Toprak; 4. Amy Noakes receiving the A.R. Brooks Prize, awarded by the Entomological Society of Saskatchewan; 5. Tara Gariépy, with Martin Erlandson (left) and Ulli Kuhlmann doing field work in Switzerland (another advantage of collaborative research!); 6. Bryan Ulmer indulging in one of his passions; 7. Bryan Sarauer; 8. Doug Baldwin; 9. Stephanie Harris; 10. Ruwandi Andrahennadi. (Photos by Martin Erlandson, except where noted).

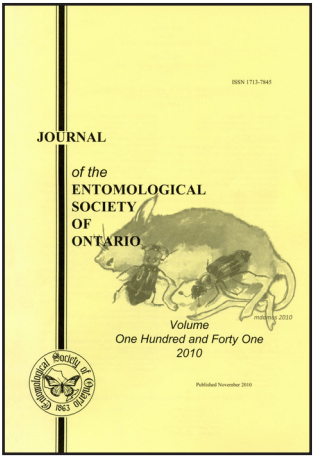
# Canada's Regional Entomological Journals

**Cedric Gillott**

Of Canada's seven regional entomological societies, five publish a peer-reviewed journal. The five are: Entomological Society of British Columbia (ESBC), Entomological Society of Manitoba (ESM), Entomological Society of Ontario (ESO), Société d'entomologie du Québec (SEQ), and Acadian Entomological Society (AES). In some instances, regional societies have a considerable history of publication. Most notably, the ESO began publishing a journal (*The Canadian Entomologist*) in 1868. The ESBC began publishing over a century ago, and publication of the ESM's Proceedings began in 1945. At the other end of the spectrum, the AES (although over 90 years 'young') began publication of its journal only in 2005.

In the following accounts of the regional journals, I have changed as little as possible the information supplied by the editors (in the case of the *JESBC*, by Ward Strong) so as to retain their original flavour.

## Journal of the Entomological Society of Ontario




Canada's oldest regional society, the ESO, has a rich and fascinating history (see Timms 2009). In 1868 while still called the Entomological Society of Canada, it produced on a monthly basis *The Canadian Entomologist* (*TCE*). Despite being renamed the ESO in 1871, the Society continued to produce *TCE* until 1960 when the national society, the Entomological Society of Canada, took over sole responsibility as publisher. As a result, the secondary publication of ESO, published yearly as *The Annual Report of the Entomological Society of Ontario* (Volumes **1–89**), became the primary journal. Its mandate was to provide an annual report "on insects injurious or beneficial to Ontario." So, initially it was relatively limited in entomological scope. In 1959, in an effort to change its image and to boost readership, the ESO changed the name from '*Annual Report*' to '*Proceedings*' *[of the Entomological Society of Ontario*] and published under this title from 1959–2001 (Volumes **90–132**). In 2002 (Volume **133**) it became the *Journal of the Entomological Society of Ontario*, again to try and improve its image, and it continues to publish under that title. Beginning in 2007, the *JESO* began publishing on-line as well as in print.

**Publication schedule**. The *JESO* is published annually towards the end of each calendar year. Illustrations published in *JESO* and hard copy reprints, if purchased by authors, are in black and white. Pdfs for the on-line *JESO* include colour illustrations, if desired. Back issues (to 1999) of *JESO* are now available electronically. The goal is eventually to have all back issues of the

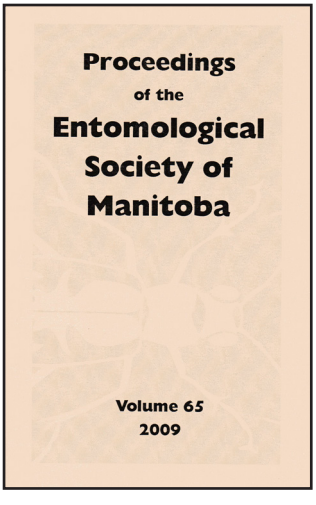
*The suggestion that readers might find an article on Canada's peer-reviewed regional entomological publications of interest came from former editor, Kevin Floate. Preparation of this article would not have been possible without the excellent assistance and encouragement of the following: Ward Strong (Journal of the Entomological Society of British Columbia), Terry Galloway (Proceedings of the Entomological Society of Manitoba), John Huber (Journal of the Entomological Society of Ontario), Christine Jean (Antennae), and Don Ostaff (Journal of the Acadian Entomological Society).*

*Annual Report* or *Proceedings* scanned and made available electronically.

**Scope**. Articles on any aspect of entomology are acceptable and will be considered for publication. Although the focus is on Ontario insects, *JESO* articles do not have to be restricted to this province. Taxonomy papers, for example, may cover all of Canada or the entire Nearctic region. All submitted manuscripts are peer-reviewed. In addition to full length articles, scientific notes, book reviews and occasional compilations or reviews on special entomological topics are published (e.g., *Volume* **116** - white pine symposium, and *Volume* **137** - memorial volume).

**Submission of manuscripts and author instructions**. Authors wishing to publish in the *JESO* will find current instructions for preparing manuscripts on the ESO website (http://www.entsocont.ca). An annual fee of $30 provides membership in the ESO and the right to publish in the *JESO*. Page charges are $35.00 per page. Authors are encouraged to submit their manuscripts, if possible by 1 July, for publication in the same calendar year.

## Proceedings of the Entomological Society of Manitoba




Entomologists must communicate, one way or another, and regional journals in Canada have served this purpose for a long time. In Manitoba, communication among early entomologists took place at meetings of the International Great Plains Crop Pest Committee, attended by entomologists from western Canada (Manitoba, Saskatchewan and Alberta) and the United States (Montana, Wyoming, North Dakota and South Dakota). The group was formed in 1921, with Norman Criddle as permanent President until his death in 1932, and continued until 1967. These meetings were suspended at the start of World War II and entomologists in Manitoba met in 1943 and 1944 with the Manitoba Agrologists and began their first discussions about their own entomological society. On 23 March 1945, the ESM was formally constituted. The Society's first meeting was arranged for Saturday, 30 June 1945, and entomologists from Minnesota and North Dakota were also invited. The special guest at this first meeting was Sir V.B. Wigglesworth, and by the account published in Volume **1** of the *Proceedings of the Entomological Society of Manitoba*, the meeting was a great success.

The first issue of the *Proceedings* was more than a dry account of the first business meeting of the Society. It included 51 mimeographed pages with a description of activities at the meeting with Wigglesworth as well as a number of scientific papers: John McLintock – The insect cuticle – a review; C.H. Goulden – The application of statistics in entomological research; T.H. Williams – Medical entomology; R.R. Lejeune – Large-scale DDT experiments. The *Proceedings* included such review-style papers for several years, apparently edited by whoever happened to be Secretary-Treasurer at the time. The job of editor was shifted to the Society's Librarian, R.J. Heron with Volume **7** (1951) and he implemented a new format. The *Proceedings* became properly bound and formatted rather than simply mimeographed and stapled.

The *Proceedings* passed through the editorial hands of a number of people in the early years and the contents varied considerably. For example, in Volume **5** (1949) there is a detailed account of the joint meeting with the Entomological Society of Ontario in Winnipeg's Fort Garry Hotel, where the ESM was accepted as an affiliate of the ESO. The Entomological Society of Canada was formerly constituted in the following year. In 1962, the first Joint Annual Meeting

of the Entomological Society of Manitoba with the Entomological Society of Canada was held in the same Fort Garry Hotel. The presidential address by A.W.A. Brown and some abstracts from the meeting were published in the *Proceedings*, along with papers from a symposium on Physics in Insect Biology.

As the ESM grew, a journal separate from the *Proceedings* was needed to accommodate publication of papers of regional interest. Volume **1** of the newly formed *Manitoba Entomologist* was published in 1967 under the editorship of C.H. Buckner. During production of the first 13 volumes of the *Manitoba Entomologist*, 6 editors and various editorial board structures directed its publication. Sadly, Volume **13** was an unlucky number. In 1981, the Editor, George Gerber, recommended that the *Manitoba Entomologist* be discontinued. The Director of the Agriculture Canada Research Station in Winnipeg had advised research scientists not to publish in the journal, and the Natural Sciences and Engineering Research Council of Canada informed university faculty that there would be little credit given to publications in regional journals. The immediate response, a decline in the number of submitted manuscripts, meant the *Manitoba Entomologist* was no longer sustainable.

The *Proceedings of the Entomological Society of Manitoba* continues and today provides an avenue for publication of refereed, regionally relevant manuscripts as well as the constituted requirement for ESM business affairs. Abstracts for all submitted papers and posters from annual scientific meetings are published, including abstracts from Joint Annual Meetings held in Manitoba. The *Proceedings* accepts detailed obituaries with bibliographies of published works by deceased Manitoba entomologists. The *Proceedings* are posted on the ESM website at http://home.cc.umanitoba.ca/~fieldspg/proc.html, which also includes a link to the editor for authors interested in publishing here.

With the sophisticated search engines available today, entomologists the world over now have access to information in the ESM's journal. Regional journals have served and continue to serve an important role for the ESM, and the Society looks forward to the *Proceedings* continued success.

## Journal of the Acadian Entomological Society


The Acadian Entomological Society is a registered scientific society whose objectives are to bring about a close association of professional entomologists, amateurs, educators and those interested in entomology in the four Canadian Atlantic Provinces and the neighbouring New England States, and to cooperate with and to support the Entomological Society of Canada.

On 3 August 1915 in the Assembly Hall of The Normal College, Truro, Nova Scotia, a meeting, spearheaded by W.H. Brittain, was held to organize a society to be known as the Nova Scotia Entomological Society to constitute a branch of the Entomological Society of Ontario. The Society took form at a time when concern about an introduced insect, the brown-tail moth, was at its peak. In 1921, the name was changed to the Acadian Entomological Society, and the first meeting outside Nova Scotia was held in Saint John, New Brunswick.

In 2005, the Society published its first scientific article in the newly-formed *Journal of the Acadian Entomological Society*. The *JAES* will consider manuscripts dealing with all facets of the study of arthropods with preference to those where the content is of regional origin, interest, or application. Manuscripts may be in the form of **Standard Papers** (results of original

observations or research), **Notes** (concise, complete description of an investigation limited in scope), **Reviews** (summary of existing knowledge of a specific topic of current interest), **Forum Articles** (for suggesting hypotheses challenging current thinking, for discussing new ideas or ways of interpreting existing information, or responding to forums previously published), and **Inventories and Biodiversity Studies**, **Regional United States, Canadian, State, and Provincial Lists** (species encountered during long-term sampling periods provided that appropriate supporting data were obtained from museums or literature and not reported previously). All submissions are reviewed by at least two peers qualified to evaluate the manuscript. Authors need not be members of the Society, but will incur a charge of $40 per paper compared to $25 for members. Manuscripts can include colour photos, and authors are encouraged to submit multi-media attachments to enhance the on-line versions of published research articles. Following completion of the review process, manuscripts are posted on the Society website at www.acadianes.ca/journal.html. Access to the pages of the *JAES* is unrestricted for non-commercial use. All rights are reserved, including those to reproduce each publication or parts thereof in any form without permission of the Journal Editor. We welcome fair use of all material published in the *Journal* but material may not be posted or in any way mirrored on the WWW or any other part of the internet except at the official publication site at the Acadian Entomological Society. All materials contained in the *Journal* are subject to copyright claims and other proprietary rights.


## Journal of the Entomological Society of British Columbia

The *JESBC* is a peer-reviewed scientific publication issued once per year. Manuscripts dealing with all facets of the study of arthropods are considered for publication, provided the content is of regional origin, interest, or application. Authors need not be members of the Society. It is funded entirely by page charges and membership dues; no advertisements appear in the *Journal*.

The *Proceedings* of the ESBC were first published in 1906 as Quarterly Bulletins. This series ended in June 1908; publication resumed in 1911 with Number 1 of the New Series. The *Proceedings* were published somewhat more than annually at first, becoming annual by Number 30 in 1933. Issues became known as volumes starting with Volume **38**. The publication was rechristened the *Journal* of the ESBC in 1966 by Editor Mac MacCarthy. The 1951 *Proceedings*, Volume **48**, was a 50-year retrospective of the history of the Society and the study of entomology in British Columbia. The 2001 *Journal*, Volume **98**, included a similar retrospective compiled by Editor David Raworth. Currently in preparation is Volume **108** (2011).

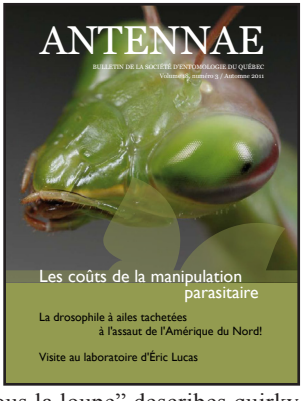
The *JESBC* Editorial Board consists of an Editor-in-Chief and several subject editors. The number of subject editors has increased over the years to diminish the workload of each, and to better utilize ESBC members' fields of expertise. The Editor-in-Chief, currently Dezene Huber at UNBC, is responsible for all aspects of journal production, including choosing the subject editor to handle each submission, and final decisions on revisions and acceptance. Each subject editor reviews the paper himself or herself, and also forwards the paper to two external reviewers, so that each accepted paper has been reviewed by at least three independent peers.

In recent years, the *JESBC* has made changes to keep up with a changing world. Desktop

publishing with in-house typesetting has speeded up and improved the appearance of the publication. Printing on digital printers from electronic files, rather than offset printing from hardcopy, has reduced printing time and maintained quality, all at a lower cost. Colour images can be included in hard-copy publications at an additional cost. Recent issues are freely available in pdf format to anyone with internet access: http://www.sfu.ca/biology/esbc/.

Current issues that the JESBC Editorial Board is wrestling with include the role of the Editor-in-Chief, Assistant Editor, and Subject Editors; whether to maintain hard-copy subscriptions; how to digitize older issues; how institutional subscriptions and subscription trade partners should be dealt with; and how to get abstracted on the Thomson ISI Web of Science. Thomson ISI creates the Journal Impact Factor; journals not abstracted on Web of Science have no impact factor, and citations from *JESBC* papers are too few for inclusion in Web of Science. Of course, lack of exposure through Web of Science contributes to low citations - a frustrating catch-22. This is important because many authors will not publish in a journal with no impact factor.

Addressing these and future challenges will ensure that the *JESBC* remains a vibrant, important and relevant entomological publication for years to come. It would be interesting to read about our current, antiquated activities in the bicentennial retrospective of 2101!




### *Antennae*, the Bulletin of the Entomological Society of Quebec

*Antennae* has been published by the Entomological Society of Quebec (SEQ) since 1994. It informs members of the SEQ on activities related to entomology in Quebec. The bulletin is published in winter, spring and fall. Each issue consists of three sections: a literature review, popular science "Sous la loupe", and the profile of a scientist "Visite au labo".

The literature review section consists mostly of contributions by students for whom the Georges-Maheux prize was setup. After evaluation by senior researchers, good reviews are published in the bulletin and the best one wins a $300 prize. "Sous la loupe" describes quirky or unappreciated aspects of the life of insects in lay terms. "Visite au labo" draws the profile of a researcher: his or her career path, lab members and current research projects. Individuals who in the past have shone in the field of entomology in Quebec are also sometimes presented.

*Antennae* also has the "Babillard" to highlight notable events in different labs such as the addition of new students and postdocs, as well as graduate students submitting or defending their thesis. Conferences held in Quebec and throughout the world are listed in "Antennagenda". *Antennae* informs its members of recent publications in "Publications récentes" and activities from members and other entomological groups (e.g., Insectarium de Montréal, Association des entomologistes amateurs du Québec, Entomofaune du Québec, and Maison des insectes).

The bulletin *Antennae* is distributed to members of the SEQ in paper format, but opting for the PDF version (with full color inside) is highly encouraged to reduce waste. In addition, the winter edition is available freely on the website of the Society at http://www.seq.qc.ca/

**Reference**

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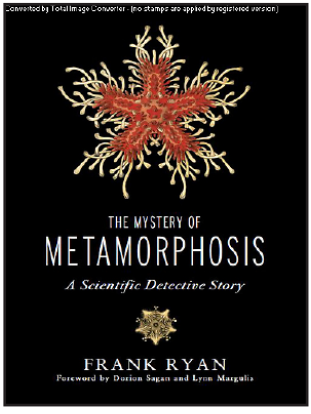
***The Mystery of Metamorphosis. A Scientific Detective Story***. Ryan, F. 2011. Chelsea Green Publishing, White River Junction, Vermont. A Sciencewriters Book. ISBN 1603583411. xxiii + 294 pp. 25 Figs. Can$20.10.




In late November 2009, a paper appeared in *PNAS* (Williamson 2009) that incensed entomologists because its principal thesis seemed so bizarre (how could such hogwash be accepted for publication by such a prestigious journal?). It was written by Donald Williamson, a retired lecturer in Marine Biology at Liverpool University, based on a life investigating the larvae and metamorphoses of diverse marine invertebrates at the university's Port Erin Marine Laboratory on the Isle of Man. His iconoclastic idea that metamorphosis arose through hybridization rather than through linear evolution from a common ancestor via variation and natural selection gradually developed (his first paper on the topic was published after many rejections in 1988) from countless observations showing that similar larval forms occur in representatives of diverse marine invertebrate phyla having very different adults, and that widespread divergence in structure and life style between planktonic larvae and bottom-dwelling adults exists, the adults metamorphosing from 'set-aside cells' within the larval body not unlike the imaginal discs and histoblasts of higher endopterygotes (in the sea star *Luidia sarsi*, the bilaterally symmetric larva continues to live an independent life after the radially symmetric adult leaves!).

Williamson proposed that metamorphosis evolved through 'larval transfer'; that is, reproductively mature 'larvae' of one lineage, and the genes that specify their body plans, have been transferred to non-metamorphosing 'adults' of another lineage by cross-species, cross-generic and even by cross-phylum fertilizations - possible, he suggested, because most marine invertebrates release their sperm and eggs freely into the sea thus increasing the probability of sperm from one species contacting and fertilizing the eggs of another (he ignored the demonstrated presence of species-specific ligands and receptors on the sperm and eggs of investigated marine organisms that prevent this from occurring (see Karr et al. 2009). He tested his ideas over several years by attempting to cross different species of marine invertebrate. For example, under meticulous conditions he fertilized eggs of an ascidian (the sea squirt *Ascidia mentula*) with sperm of a sea urchin (*Echinus esculentus*) and, in one experiment, all the resulting eggs developed into pluteus-like larvae - sea urchin larvae from ascidian eggs - and about 8% of these metamorphosed into sea urchins while the other 92% resorbed their arms and became 'spheroids', each bearing a sucker (larval and adult sea urchins never produce suckers while the tadpole larvae of ascidians do). After analyzing the results of these and other crossing experiments, he proposed that the fused genomes in these hybrids must express themselves sequentially: the pluteus, bipinnaria, tornaria, trochophore, nauplius, tadpole, caterpillar, etc. genes of the larva are expressed first; then, in response to appropriate environmental cues, they are shut off and imaginal gene expression begins - resulting in metamorphosis.

In his 'red flag' paper of 2009, communicated for publication by 'that unruly earth mother' Lynn Margulis (she and and Dorian Sagan provide a spirited Foreword to the book), Williamson proposed that 'caterpillar-like' larvae resembling present-day velvet worms (Onychophora) were transferred by hybridizing with adult, non-metamorphosing, winged insects co-occurring in the Upper Carboniferous to produce descendant 'chimeras' enjoying the best of both worlds: a larval

form specialized for feeding and a flying adult adept at spreading its genes  This scenario could be reconstructed, he suggested, by inserting the spermatophore of a velvet worm into the bursa copulatrix of a female cockroach perhaps, he hoped, to result in viable offspring resembling an early lepidopteran or some other endopterygote having eruciform larvae and having fused, sequentially expressed, onychophoran and cockroach genes as could be evaluated by sequencing their genomes.

As summarized in this book, all elements of this model and most of its examples have been demolished by Hart and Grosberg (2009), Willis and Cox-Foster (2010), and others with copious evidence from many sources - all available at the time Williamson wrote his article.

In this charming but profound little book, Ryan not only describes Williamson's experiments and their results in great detail, but provides a sympathetic summary of his life: his increasing discomfort in teaching current dogma on the origin and evolution of marine invertebrate life histories to undergraduates, his early attempts to come up with an alternate scenario, and his epic struggles to get his ideas published including his two books (Williamson 1992, 2003). Using Williamson as an example, Ryan also exposes the injustice and dangers of not assuring investigators with new ideas a fair hearing by the scientific community.

But this book is not just about Williamson; it is also a complex and intimate history of the study of metamorphosis in animals, particularly insects, of the people intrigued by metamorphosis, of their initially fumbling attempts to explain it philosophically and experimentally beginning with Aristotle and Empedocles and the dissections, descriptions and speculations of William Harvey, Jan Swammerdam and Pierre Lyonet in the 17th and 18th centuries. Ryan includes chapters on the brilliant experimentalists of late 19th and 20th centuries (Jean-Henri Fabre, Vincent Wigglesworth [4 chapters], Carroll Williams, Peter Karlson, Adolf Butenandt, Rudy Raff, etc.), summarizes the work of many other contributors, and ends with a summary of the recent explosion of findings resulting from breakthroughs in molecular endocrinology, developmental genetics and molecular biology by leading students of today including Lynn Riddiford, James Truman and Fred Nijhout and associates and a summary of the game-changing synthetic paper of Truman and Riddiford (1999) on the origin of complete metamorphosis in insects. Concluding chapters briefly summarize recent findings on the roles of *Hox* and other regulatory genes and gene networks on the development of animal form, and on evolutionary (evo-devo) and ecological (eco-devo) developmental biology.

The book is based on a thorough reading of the literature and on countless interviews (3 pages of acknowledgments) with descendants and former students of deceased contributors and with scientists active to-day (including Williamson), and includes work published in late 2010. These interviews enable Ryan to provide intimate portraits of these investigators including their childhoods and family situations, their diverse personalities (Wigglesworth was driven and intense and Williams the opposite though just as brilliant), what got them interested in investigating metamorphosis and the details of some of their experiments (a weakness in the book is that these are described in some detail but with no summary diagrams). Entomologists of all persuasions but particularly endocrinologists will find this book a revelation and a delight.

Ryan, a phenomenal writer, is an Emeritus Consulting Physician at Sheffield University Hospitals and an Honorary Reseach Fellow in Evolutionary Biology in the Department of Animal and Plant Sciences at that University where he attempts to introduce modern concepts of human evolution to Medicine (lots of luck, buddy). He is also the author of *Tuberculosis: The Greatest Story Never Told* (1992), *The Forgotten Plague: How the Battle Against Tuberculosis Was Won - and Lost* (1994), *Virus X: Tracking the New Killer Plagues* (1998), *Darwin's Blind Spot*: *Evolution Beyond Natural Selection* (2002), and *Virolution* (2009) - all best sellers reviewed in the *New York Times Review of Books*.

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Edmonton

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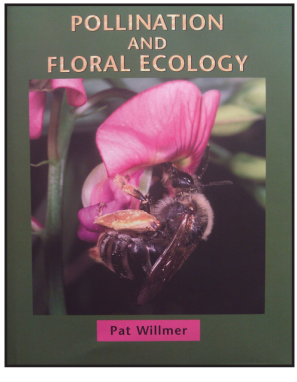
***Pollination and Floral Ecology***. Willmer, P. 2011. Princeton University Press, Princeton, New Jersey. 778 pp. ISBN 9780691128610. US$95.00, hardcover.




Many of the aspects that we consider a part of "pollination" have long been a topic of study for natural historians, dating well back into the early 1700's (Faegri and van der Pijl 1979), and hundreds of books and tens of thousands of scientific articles have been written, covering all aspects of pollination ecology. However, since the publication of *The Forgotten Pollinators* by Buchmann and Nabhan and *The Conservation of Bees* by Matheson et al., both in 1996, and in particular in the last decade, a large warning flag has been flying, stressing not only how important the ecological service of pollination is for terrestrial ecosystem productivity, but also how vital this process is to humanity. As such, this same time frame has witnessed increased research and publication of important scientific research in the realms of plant reproduction, bee/animal pollinators and their conservation, in addition to many popular accounts which fall under the umbrella of "pollination ecology" (though most focus on the decline and conservation of bees and other pollinators). The concern for pollinators has also led to the development of several international initiatives (e.g., Brazilian Pollinators Initiative; North American Pollinator Protection Campaign; African Pollinator Initiative), including in Canada, the development of the research-based Canadian Pollination Initiative (CANPOLIN).

With this growing concern for pollinators and the need for much more research in pollination-related issues globally, new students and researchers could easily be overwhelmed with familiarizing themselves with the vast body of literature, and the daunting task of obtaining much of the

classic and current literature in pollination ecology. However, the pollination crisis is not the only reason to study pollination, and, as pointed out in the new book by Pat Willmer, *Pollination and Floral Ecology*, the study of "*[p]ollination ecology can provide almost unparalleled insights in evolution, ecology, animal learning, and foraging behaviour*". This new book provides a great foundation for all these disciplines and is a great starting point for understanding the varied interactions between some 260,000 flowering plants and the 300,000 animal species which visit them. This handsome volume is the most comprehensive single-volume available for pollination ecologists ever published, and is a fine successor to Faegri and van der Pijl's (1979) classic, incorporating major findings and new ways of studying plant/pollinator interactions developed in the intervening 30 years. This new work also complements other important works that are available (e.g., Barth 1991, Proctor et al. 1996), and those more focused on specific elements of pollination ecology (e.g., Chittka and Thomson 2001; Waser and Ollerton 2006).

The book is logically organized into four parts. Part I introduces and/or reviews for the reader the botanic aspects of pollination biology. The author gives a thorough review of floral structure and function, providing a solid foundation for understanding the morphological adaptations and complexities of plant reproduction, and how these structures and processes evolved. Most flowers are billboards for pollinators, and although most offer some reward, many do not. Part II covers floral advertising and rewards (or why animals visit flowers), and ends with a discussion on the energetics/economics of pollination. Following on the themes of Parts I and II, Part III covers the ecology of plant/pollinator interactions in the context of pollination syndromes, but unlike coverage of these topics elsewhere, which focus mainly on the morphological characteristic of flowers (and pollinators), this volume summarizes many of the ecological factors affecting floral visitation, including flowering phenology and pollinator behaviour and learning (with further discussion in Part IV). Importantly, this section also presents a balanced view of "floral syndromes" and presents the arguments against the classical approach, summarizing the "newer" approaches involving plant/animal community and landscape approaches (whole volumes have been recently published on these themes). These approaches are in turn critiqued, and the pros and cons of each are evaluated. Part IV focuses on the ecological elements of pollination, and unites much of the preceding discussion into a community-based context, including competition among plants for pollinators, cheating by plants and pollinators, and pollination in different habitats. Although covered in detail in many other volumes, this section ends with a summary of the pollination of crops, leading into the last chapter which focuses on the recent global pollination crisis. This volume offers sound advice on the importance of assessment of pollination (or suitable proxies) and pollinator declines, stressing the need for long-term standardized sampling protocols to distinguish natural fluctuations in pollinator communities versus actual declines, and highlighting the taxonomic impediment hampering studies of invertebrate pollinators. The last chapter also summarizes the threats to pollinators, and cites much of the prominent and current work.

*Pollination and Floral Ecology* is amply illustrated with over 300 black and white figures throughout its 828 pages, and includes 93 useful summary tables. In addition, this volume contains 39 colour plates illustrating typical floral syndromes and types, nectar guides and other floral rewards, pollen structure, and a large assemblage of floral visitors, and an extensive glossary. This is a very comprehensive volume, and *Pollination and Floral Ecology* should find a place on the book shelf of ecologists, conservation biologists, botanists, and entomologists alike. It is also highly readable and thus is a great resource for anyone interested in natural history, or other natural pursuits (e.g., horticulture, gardening, and natural history groups). In addition, this book offers a great theoretical foundation for developing courses centered around pollination with its comprehensive review of the botanic and metazoan elements of pollination biology,

and complements the practical approaches offered by Kearns and Inouye (1993) and Dafni et al. (2005). Thus, it will be a great reference and/or main textbook for students and educators alike.

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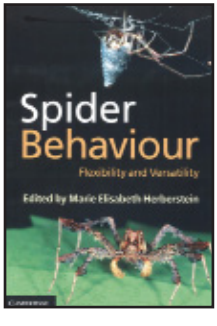
***Spider Behaviour. Flexibility and Versatility***. Herberstein, Marie Elisabeth (ed.). 2011. Cambridge University Press, New York, 391 pp. 978-0-521-76529-9, Can $120 hardcover; 978-0-521-74927-5 Can $55 softcover.




There is something about spiders that stirs up emotions in human beings. For most people, these emotions tend to range from revulsion to outright arachnophobia. For me, spiders have always seemed fascinating, and over the years I have collected just enough knowledge about the positive aspects that I can convert one or two students with my annual arachnid lecture in the Invertebrate Zoology course I teach. Consequently, I jumped at the opportunity to review this book, and it did not disappoint.

The objective of the book is to provide a concise, but not necessarily exhaustive, review of current knowledge of spider behaviour, specifically focusing on the potential of spiders as excellent models for behavioural research. The subtitle of the book "*Flexibility and Versatility*" captures this intent nicely, and several authors emphasise that many spiders employ a remarkable range of behaviours in response to a given stimulus depending on the context. Concepts are

illustrated by case studies and examples, which makes for easy but informative reading. Each chapter also ends with a "Conclusions and Outlook" section, where the authors summarize the chapter and the future potential for behavioural research in the area. An interesting twist (at least in the softcover version I reviewed) was that black and white illustrations were dispersed throughout the text, but the same illustrations were also presented on colour plates grouped in the middle of the book. Presumably, this arrangement was to keep production costs down. While I liked the fact that I didn't have to search for figures, I think I would have preferred a different set of illustrations for the colour plates rather than just a repetition.

Each of the 10 chapters covers a particular aspect of spider behaviour, except Chapter 1, which gives a brief introduction to spider biology and phylogeny. Each chapter is written by one or several authorities. The format works well, except that there is some overlap between chapters. Chapter 2 deals with foraging strategies, Chapter 3 with spider webs, and Chapter 4 with anti-predator defense. Chapters 5 and 6 are about communication, with the latter focusing on deceptive signals. This is the area of expertise of the editor of the book, and I have to admit that I found that chapter particularly fascinating. Chapter 7 covered mating behaviour and reproduction and Chapter 8 social and subsocial spiders, which is another extremely interesting topic. Table 8.1 lists all known species that exhibit social or subsocial behavior, and the discussion of the phylogeny of this group was particularly valuable for an understanding of these organisms. Chapter 9 discussed learning and cognition. Perhaps this chapter suffered somewhat from being relegated to the end of the book, as many of the examples had already been used in earlier chapters. Nevertheless, I found this chapter very informative as well. The final chapter on kleptoparasites was again an extremely interesting chapter, and it was very well chosen as a suitable end to the book.

Technically, the book is well written and very well edited. The final chapter had a few minor typographical errors (in both cases a word entered twice - perhaps the proof readers were getting tired). Factually, the book got off to a rough start for me when on Page 7 the genus *Dolomedes* (fishing spiders) was assigned to the Lycosidae (wolf spiders): they are nursery web spiders (Pisauridae). Who knows how that happened, but as far as I could tell that was the only error.

If I seem enthusiastic about this book it may be because I have been a bit of an arachnophile since childhood, but I truly think that the information in this book can be useful in many ways. It provides a great reference book for examples of intriguing spider behaviour that teachers interested in dispelling the myths about spiders could use, for example. It also summarizes the literature nicely for researchers, and provides ideas for potentially fruitful questions to pursue. I have thought for a long time that spiders are under-represented in ecological research, and this book demonstrates that the same holds for other disciplines as well. I thoroughly enjoyed reading the book, and recommend it for anyone wishing to gain a good understanding of spiders in general, and their behaviours in particular. Although the suggested retail price from Cambridge University Press is $120 and $55 for the hard- and soft-cover editions, respectively, it is also available as Adobe or Mobipocket eBooks for slightly less ($44.00).

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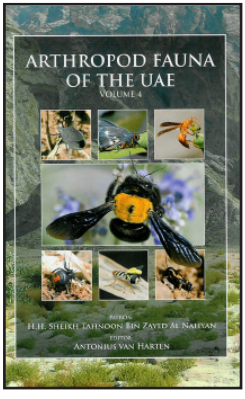
*The above review was published after minor revision with permission from the International Society of Behavioral Ecology Newsletter, Supplement to Behavioral Ecology, Volume 23(2):5.* (*http://www.behavecol.com/pages/society/news/main.html*)




***Arthopod Fauna of the United Arab Emirates, Volume 4*.** Antonius van Harten (ed.). (UAE Insect Project). 2011. Multiply Marketing Consultancy Services. Abu Dhabi (United Arab Emirates). 816 + 16 pp. ISBN 978-9948-16-116-5.

Approximate prices: 100 EA Dirhams, US$65, €45, £38. (Available from Dar Al Ummah Printing, Publishing, Distribution & Advertising; P.P. Box 39975. Abu Dabi, United Arab Emirates; info@daralummah.ae).

*Volume 4* of the *Arthropod Fauna of the United Arab Emirates* was published in May 2011 under the coordination of Dr Antonius van Harten with the munificent patronage of H.H. Sheik Tahnoon Bin Zayed Al Nahyan. Volumes 1, 2 and 3 were published in 2007, 2009 and 2010 (see *Bulletin* **40**:76-77, **41**: 123-124 and **42**: 221-222, respectively). As a result, the entomofauna of the United Arab Emirates is possibly the best inventoried of the Middle East countries.

As in previous volumes, each chapter, which deals with one family or several families very closely related to each other, is accurately and scientifically written. However, the length of the chapters varies considerably because the number of species in each one is different. Fifty-seven authors from eighteen countries have contributed to this volume.

The volume consists of 4 parts: (1) General, with the Patron's *Preface* and the Editor's *Introduction*; (2) Arachnids of the United Arab Emirates, with 3 chapters devoted to Zoodaridae, Salticidae (Araneae) and Trachyuropodidae (Mesostigmata); (3) Land Crustaceans of the United Arab Emirates, with 1 chapter on the Suborder Oniscidea (Malacostraca: Isopoda); and (4) Insects of the United Arab Emirates, with 33 chapters. There are three separate indexes: Coordinates of localities, List of taxonomic novelties in this volume, and Zoological index.

The editorial features of the volume are similar to those of the previous ones, the pictures and figures having the same quality of printing. The only negative point is that the 16 pages containing the indexes are not numbered.

The material studied was collected directly or using different types of traps (see pages 14-32 of *Volume 1*) during 2005-2007 and 2009-2010 by the authors or other entomologists. There are also records from other countries in the region: Saudi Arabia, Oman, Yemen, and several African countries as far as Mauritania in the west and Congo in the south, particularly in the description of new species and in some chapters, for example, in the chapter written by Bílý et al. on the family Buprestidae.

The contribution to faunistic knowledge of 57 families (see complete list below) is of great importance. From the taxonomic perspective, it is noteworthy that (1) 3 new genera have been established: *Buschingomyia* Jaschhof & Jaschhof and *Tropaprionus* Jaschhof & Jaschhof (Diptera: Cecidomyiidae), and *Wadipogon* Bosák & Hradský (Diptera: Asilidae); (2) 103 new species have been established, distributed among the families Zodariidae and Salticidae (Araneae), Trachyuropodidae (Mesostigmata), Agnaridae and Eubelidae (Isopoda), Issidae (Homoptera), Dytiscidae, Carabidae, Staphylinidae, Buprestidae, Silvanidae, Latridiidae and Chrysomelidae (Coleoptera), Braconidae, Megaspilidae, Bethylidae, Formicidae, Ampulicidae and Crabronidae (Hymenoptera), and Ceratopogonidae, Cecidomyiidae, Limoniidae, Asilidae, Empidae, Tephritidae and Chloropidae (Diptera); (3) a replacement name has been given: *Allarete hindica* Jaschhof & Jaschhof for *Allarete indica* (Grover, 1964); (4) 2 generic synonymies have been established: *Ctenisoschema* Jeannel, 1956 (junior synonym of *Ctenisomorphus* Raffray, 1890)

and *Baeognatha* Kokujev, 1903 (junior synonym of *Agathis* Latreille, 1804); (5) 7 specific synonymies have also been established; (6) changed status has been proposed for 6 species; and (7) 26 new combinations have been formed (for species classified in Trachyuropodidae, Braconidae, Cecidomyiidae, Asilidae and Chloropidae).

The families studied are as follows, in the sequence used in the book, grouped by order:

**Order Araneae** - (1) Zodariidae, with color pictures, scanning electron micrographs, and ink figures. (2) Salticidae, with color pictures and ink figures.

**Order Mesostigmata** - (1) Trachyuropidae, with ink figures.

**Order Isopoda, suborder Oniscidea** - (1) Ligiidae, Tylidae, Halophilosciidae, Platyarthridae, Agnaridae, Porcellionidae, and Eubelidae, with color pictures and ink figures.

**Order Neuroptera** - (1) Ascalaphidae, with color pictures, color ink figures, and ink figures. (2) Nemopteridae, with color pictures, and ink figures and pictures.

**Order Hemiptera, suborder Heteroptera** - (1) Nepidae, Belostomatidae, Ochteridae, Micronectidae, Corixidae, Naucoridae, Notonectidae, Mesoveliidae, Hebridae, Hydrometridae, Veliidae, Gerridae, Saldidae, with habitat photographs and color pictures.

**Order Homoptera** [*sic*] - (1) Issidae, with color pictures, ink figures; (2) Caliscelidae, with habitat photographs, color pictures, ink figures.

**Order Coleoptera** - (1) Gyrinidae, with color pictures; (2) Dytiscidae, with habitat photographs, color pictures and ink figures; (3) Carabidae, with color pictures; (4) Staphylinidae, with color pictures and ink figures; (5) Buprestidae, with color, micrograph pictures, and ink figures; (6) Nitidulidae, with color pictures; (7) Silvanidae, with color pictures and ink figures; (8) Latridiidae, with color and ink figures; (9) Chrysomelidae (two chapters), with color pictures and ink figures.

**Order Hymenoptera** - (1) Braconidae Agathidinae, with an illustrated key of the Arabian genera and species of the subfamily plus color pictures and ink figures. This chapter is one of the longest chapters of the volume at 66 pages; (2) Megaspilidae, genus *Dendrocerus*, with color pictures and microphotographs; (3) Bethylidae Mesitiinae, with color pictures, micrographs and ink figures; (4) Formicidae, with illustrated keys of subfamilies and genera of the United Arab Emirates and a complete collection of color pictures of species; another long chapter of 69 pages; (5) Ampulicidae, with color pictures; (6) Crabronidae and Sphecidae, with color pictures and ink figures. This chapter is the longest one of the book, 121 pages, and includes several keys; (7) Apidae, genus *Braunsapis*, with color pictures and habitat photographs.

**Order Diptera** - (1) Ceratopogonidae, with color micrographs and ink figures; (2) Cecidomyiidae, subfamilies Lestremiinae and Micromyinae, with ink figures; (3) Lomoniidae, with color pictures; (4) Asilidae, with color pictures and ink figures; (5) Empididae, with color pictures; (6) Diopsidae, with color pictures; (7) Tephritidae (additional material – see also *Volume 1*), with color pictures; (8) Odiniidae, with color pictures; (9) Chloropidae, with color pictures and ink figures; (10) Muscomorpha associated with vertebrates: Calliphoridae, Sarcophagidae, Oestridae, Gastrophilidae and Hippoboscidae, with color pictures.

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## Books available for review

The ESC frequently receives unsolicited books for review. A list of these books is available online (http://www.esc-sec.ca/bulletinbooks.html) and is updated as new books are received.

If you wish to review one of these books, please send an email to the Chair of the Publications Committee

(Kevin Floate, Kevin.Floate@agr.gc.ca).

You should briefly indicate your qualifications to review the topic of the book, and be able to complete your review within 8 weeks.

Preference will be given to ESC members.

**Guidelines**

Book reviews should be approximately 800-1200 words in length. They should clearly identify the topic of the book and how well the book meets its stated objective. Weaknesses and strengths of the book should be described.

Formatting of the review should follow that of reviews in recent issues of the Bulletin. A scan of the book cover (jpeg or tiff format, about 500 kb) should be submitted with the review.

## Livres disponibles pour critique

La SEC reçoit fréquemment des livres non demandés pour des critiques. Une liste de ces livres est disponible en ligne (http://www.esc-sec.ca/fr/f-bulletinbooks.html) et est mise à jour lorsque de nouveaux livres sont reçus.

Si vous souhaitez critiquer un de ces livres, veuillez envoyer un message au président du comité des publications

(Kevin Floate, Kevin.Floate@agr.gc.ca).

Vous devez brièvement indiquer vos qualifications pour critiquer le sujet du livre, et être en mesure de terminer votre critique en 8 semaines.

La préférence est donnée aux membres de la SEC.

**Lignes directrices**

Les critiques de livre doivent compter entre 800 et 1200 mots. Elles doivent clairement identifier le sujet du livre et si le livre rencontre bien les objectifs énoncés. Les forces et faiblesses du livre devraient être décrites.

Le format des textes doit suivre celui des critiques des récents numéros du Bulletin. Une version numérisée de la couverture du livre (en format jpeg ou tiff, environ 500 kb) devra être soumise avec la critique.

## Book available for review

**Strausfeld, N.J. 2012. Arthropod Brains: Evolution, Functional Elegance, and Historical Significance.** Harvard University Press, 848 pp.

**45th Annual Meeting of the Society for Invertebrate Pathology**
Buenos Aires, Argentina, 5-10 August (tentative) 2012

**International Congress of Entomology**
Daegu, South Korea, 19-25 August 2012
http://www.ice2012.org/

**Joint Annual Meeting of the Entomological Societies of Canada and Alberta**
Edmonton, Alberta, 4-7 November 2012

**Annual Meeting of the Entomological Society of America**
Knoxville, Tennessee, 11-14 November 2012
Entomology 2012

**ECE X (Tenth European Congress of Entomology)**
York, UK, 3-8 August 2014
www.ece2014.com

*Readers are invited to send the Editor notices of entomological meetings of international, national or Canadian regional interest for inclusion in this list.*
*Les lecteurs sont invités à envoyer au rédacteur en chef des annonces de réunions entomologiques internationales, nationales ou régionales intéressantes afin de les inclure dans cette liste.*


**Dr Vernon Randolph Vickery**

**(1921 – 2011)**

Vernon Vickery, retired orthopterist and apiarist, passed away 30 August 2011 in the Valley Regional Hospital, Kentville, Nova Scotia. He is survived by his wife of 64 years, Muriel, his sons William and Edwin, his daughter Susan, and his five granddaughters, Karen, Allison, Margot, Laura and Lexington.

Vernon, 'Vic' to most, was born 6 June 1921 in South Ohio, Yarmouth County, Nova Scotia. He would be the first to tell you that working hard as a youth on his family's farm provided him with a solid foundation for later life. In his youth, he met a local lady naturalist who taught him about insects, how to collect them and how to pin and label them. She also showed him how to care for his collection.

After World War II started, he volunteered for the RCAF. In April 1941 he became an AC2 trained in the new ultra-secret radio direction finding equipment that became known as RADAR. He took further training in radio and electrical theory and the Mark IV AI airborne radar equipment. He graduated second in his class and was offered a commission of lieutenant and a position in Texas to teach the United States Forces about British RADAR. He turned it down in order to go to the front lines in Europe with his buddies as his father had done before him. He was transferred to England at the end of 1941. There he became an experienced radar technician, serving with the RAF in the United Kingdom, North Africa and Italy. He flew mainly with night bomber missions. When his service was finished in Europe, he returned to Nova Scotia and volunteered to serve in the Pacific theatre but the war ended there and he was discharged from the RCAF in August 1945. He was quite proud of his 4 year, 4 month and 4 days of service to his country.

After his service, he enrolled in the Diploma of Agriculture course in the Nova Scotia Agricultural College (NSAC), Truro, Nova Scotia in 1945. He graduated in 1947 and started his career in entomology working for Malcolm Neary, collecting insects for NSAC and also for a forest insect survey. In the fall of 1947, he began his studies for 2 years at Macdonald College of McGill University, Ste. Anne de Bellevue, Quebec, and received his BSc in Agriculture in 1949 and the Lochhead Memorial prize for the highest marks and average in entomology. During the summers of 1948 and 1949, he continued his work with Malcolm Neary and spent most of his time in Annapolis Valley orchards. In 1949 he was hired by NSAC to teach entomology and to work on insect pest problems in crops and orchards. It was at this time that he became involved in bee counts and pollination in apple orchards. There was some major concern at the time that heavy pesticide use had decimated the natural pollinators. He also met Endel Karmo, an apiculture specialist, who became his mentor and friend. In the fall of 1950 he started his MSc degree at Macdonald College. In 1952 he became a beekeeper of his own for the first time and with the help of Endel, became quite proficient at it. During the next several years, he continued studies on using honey bees for pollination, his study of honey bee behaviour and becoming more proficient at orchard insect work. It was at this time that he, Endel, and others introduced the practice of transporting bees to orchards during bloom. With the publication of "Bees to the Rescue" in the *American Bee Journal*, Vernon and Endel brought together their findings on bee behaviour, pollen transfer and fruit production. Soon after, the practice of moving honey bees to

berry fields, such as blueberries, for pollination began in Nova Scotia, New Brunswick, Maine and Quebec and was quickly adopted worldwide for fruit and nut production.

In 1957 he completed his MSc degree, his thesis being on the Orthoptera of Nova Scotia. After field work in Nova Scotia in 1960, he was advised to pursue his PhD degree so he returned with his family to Macdonald College. In 1961 he was offered the position of Assistant Professor. He was instrumental in bringing together several insect collections and, through the endowment of H.H. Lyman, formed the Lyman Entomological Museum and Research Laboratory. On his birthday in 1964, he was awarded his PhD, his thesis being on the orthopteran genus *Chorthippus*. By the time of his retirement in 1981, the Lyman Museum held nearly two million insects, mostly identified. On receiving emeritus status, he continued to work for the next 13 years on his studies of Orthoptera. During his career as an entomologist, he published 7 books and more than 400 scientific papers and articles mostly on Orthoptera systematics, zoogeography, and genetics, but also some on honey bees, his other love in the insect world.

In 1991, with help of his son Edwin, he published *The Honey Bee - A Guide for Beekeepers* in which he shared his 40 years of knowledge on bee behaviour and pollination. From work with Endel Karmo in Nova Scotia to the observation hive in the window of his office in the Lyman Museum and the bee yard he kept at Macdonald College, he cultured a major interest on the industrious honey bees and their major significance to agriculture in Canada, the USA, and around the world. His undergraduate and extension courses in beekeeping were immensely popular with students young and old.

Vernon's family was very important to him and he took them with him on many a collecting trip by car throughout Canada and the USA where they would stop many times a day to collect Orthoptera and other insects of interest. His expertise in grasshoppers also took him to five continents. In 1976 he was invited to attend a meeting of specialists in Orthoptera in Argentina. From this meeting, the Pan-American Acridological Society, an organization for grasshopper and locust research was formed. In 1985, at the beginning of his 4-year term as President, the organization was expanded worldwide and became known as the Orthopterists' Society. During his career, he earned two Fellowships, those of the Entomological Society of Canada and the Royal Entomological Society and several honorary memberships and teaching awards.

In 1999, Vernon and Muriel moved back to Kentville. He spent his free time growing flowers in the gardens he kept on his property. He loved to write. Although it took him many years, he completed the genealogy of his family that had been started by his brother, George, who passed away in 1984. He also wrote several travelogues, complete with pictures, of his visits to places in foreign countries such as Peru and Spain. He was a philatelist and had collected a significant number of the known insect stamps from around the world. In his later life, he once again showed an acute interest in the two World Wars and the contribution he and his family had in them. This led him eventually to join the local branch of the Legion.

Vernon's undergraduate and graduate students were well served by his knowledge, his wit and the unlimited support he gave to them. He will be missed not only for his academic accomplishments but as a husband, father, grandfather, educator, historian and gentle, generous man.

Peter Arntfield, Winnipeg

## Action items from the Governing Board Meetings held in Halifax, Nova Scotia

**Alec McClay, Secretary**

### Governing Board Meeting on 5 November 2011

#### Fund-raising Committee

Two people have volunteered to serve on this committee but a Chair has not yet been designated [Lisa Lumley has since agreed to chair this committee].

#### Treasurer

A deficit is expected in 2011-2012 but the change to Cambridge University Press as publisher will change the Society's financial situation. The C.P. Alexander Fund was previously used to pay page charges for review articles in *The Canadian Entomologist*. Now that there will be no page charges, S. Brooks was asked to make recommendations on how to use the Fund in keeping with the terms under which it was created. The Treasurer was also asked to find out the cost of providing free hard copies of the three Diptera Festschrift volumes of *TCE* to authors.

#### Office Manager

The auditors (Bouris Wilson) have advised the Society of the need to issue T4 slips to recipients of ESC scholarships and Trustees. There were some problems with the Paypal system for the 2011 JAM registration but these will be fixed for next year. Committee Guidelines for the JAM should be amended to indicate that registration cheques should be sent to ESC Headquarters.

#### Headquarters

The Headquarters Committee was asked to make a prioritized list of repairs needed to the HQ building. In particular, the leak in the back porch roof urgently needs to be repaired. The Office Manager was asked to arrange for a review of the insurance coverage for the building.

#### Ad Hoc Business Plan Committee

This committee has not been active for several years and it was agreed to dissolve it.

#### Scientific Editor

There are many changes to the publication process for *TCE* with the change to Cambridge University Press as the publisher. There will be a two-tier reviewing system with a team of about 20 Subject Editors under the Scientific Editor. Many paragraphs of the Standing Rules and one paragraph of the Bylaws will require to be amended in consequence. Dr Andrew Smith was hired as a part-time Editorial Assistant.

#### *Bulletin* Editor

After switching to St. Joseph Printing for the June 2011 issue, it was decided that future issues will again be printed by LMG. The "Moth Balls" column will in future appear on an occasional basis.

#### Website

Rick West, the current webmaster, will step down after the 2013 JAM. It may be necessary to hire a new webmaster on a contract basis, given the time commitment and skills necessary to manage the Society's website.

### Web Content Committee

Since the Bylaws have been changed to permit electronic balloting, the committee is investigating the mechanisms needed to put this into effect. The Conditions of Use of the website have been revised and are being reviewed by the Society's legal advisors.

### Publications Committee

Cambridge University Press will be the publisher of *TCE* from January 2012. There will be no page charges; page charges will also be waived for the last issue of 2011. The *Canadian Journal of Arthropod Identification* (*CJAI*) became one of the Society's core publications through a Memorandum of Understanding between ESC and the Biological Survey of Canada. Although *CJAI* will not be published by the ESC, the ESC will facilitate printing of a limited number of hard copies.

### Bylaws, Rules and Regulations Committee

Numerous changes to the Bylaws, Rules and Regulations were required as a consequence of the change to Cambridge University Press as publisher of *TCE*. These will be presented at the AGM. It was also proposed to change the Standing Rules regarding the number of members on the Student Affairs Committee.

### Heritage Committee

Preparation of the Second Appendix to the Index to Biography of Entomologists in Canadian Publications, covering the period 2006-2010, is well in hand, and publication is expected in the December 2011 issue of the Bulletin.

### Insect Common Names Committee

The Committee will consider the possibility of including Inuit names of insects on the list.

### Membership Committee

The Committee will review the document on benefits of membership to take account of changes in the Society's operations in recent years.

### Student Awards Committee

It was suggested that Regional Directors be delegated to receive student awards at the JAM on behalf of any students who are not able to attend. The Committee Guidelines will be amended accordingly.

### Student Affairs Committee

The electronic abstract submission system for the Graduate Student Symposium has worked well and should continue to be used in the future. Chandra Moffat will discuss ways of revitalizing the Symposium with Board members. It was agreed that the President's Prizes in future should be funded exclusively by ESC and that their value should be $150. Undergraduate students will be eligible for these prizes.

### Annual Meeting Committee

The rotation of meetings is planned until 2016. The Local Organizing Committees for the JAM with Quebec (2015) and Manitoba (2016) are not yet in place.

### Biological Survey of Canada

The relationship between the Biological Survey of Canada (BSC) and the Canadian Museum of Nature (CMN) is currently under review, and the BSC will meet the CMN President to determine opportunities for a continuing strategic partnership. The 2-year term of the current Directors is up, and election of a new slate of Directors will take place at the 2011 AGM in Halifax. Volume

2 of the Arthropods of Canadian Grasslands was published in 2011 and is freely available on the BSC website (Title: "Inhabitants of a Changing Landscape"). Volume 3 is in preparation and the Newsletter and *CJAI* are published regularly.

### Certified Entomologist Designation

ESC was approached about the possibility of offering a certification similar to that offered by the Entomological Society of America. Michel Cusson will respond to the individual concerned to find out more about the needs of entomologists working in industry.

### International Congress of Entomology

The Board agreed to provide a letter of support for the Entomological Society of America's bid to hold the 2016 ICE in Orlando, Florida.

### Governing Board Meeting on 9 November 2011

### Committee Appointments

The list of Committees and Representatives for 2011-2012 as prepared by the President and the President's appointees to remaining positions to be filled were approved by the Board.

### 2011 Budget

The 2011 budget, once finalized, will be sent to the Board for approval by e-mail ballot.

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## Minutes of the 61st Annual General Meeting

### Westin Nova Scotian Hotel, Halifax, Nova Scotia

### 8 November 2011

President Peter Mason called the meeting to order at 17:05. Forty-eight members were present.

1. **Notice of Meeting.** Notices of the meeting were published in the March and June 2011 issues of the *Bulletin* (Vol. 42) and on the ESC website.

2. **Proxies.** No proxies.

3. **Additions to the Agenda and Approval of the Agenda**. Bob Lamb moved and Neil Holliday seconded that the agenda be accepted. **Carried.**

4. **Deceased Members of the Entomological Community**. A minute of silence was observed in memory of the following members of the entomological community who passed away during the past year: Mushtaq Khan, Ronald Hooper, Gary Grant, Ruby Larson, Doug Eidt, Ken Neil, and Vernon Vickery.

5. **Minutes of the 60th Annual General Meeting**. Minutes of the 60th Annual General Meeting were posted on the web site and published in the December 2010 issue of the *Bulletin* (Vol. 42). Kenna MacKenzie moved and Bob Lamb seconded that the minutes be accepted. **Carried.**

6. **Business Arising from the Minutes**. There was no business arising from the minutes.

7. **Report from the Governing Board**. President Peter Mason presented a report on behalf of the Governing Board and gave an update on progress during the past year and plans for the coming year. The report from the Governing Board and regular updates are published in the *Bulletin*.

7.1. Undergraduate eligibility to President's Prize Competition - Change to Standing Rules.

W. Riel, Chair of the Bylaws Rules and Regulation Committee presented changes to Stand-

ing Rules to membership. John Sweeney moved and Kenna MacKenzie seconded that Standing Rules IX (meetings) be changed

From:

6. (i) The student must be enrolled in a ***graduate degree program*** or have graduated from the program less than six (6) months previously;

to:

6. (i) The student must be enrolled in a ***degree program*** or have graduated from the program less than six (6) months previously;

**Carried. Action: W. Riel**

7.2. **Member composition of the Student Affairs Committee - Change to Standing Rules**

Kenna MacKenzie moved and Bob Lamb seconded that Standing Rules VIII (Committees and Representatives) be changed:

From:

4. (l) The Student Affairs Committee shall consist of ***four Members*** plus Chair of the Student Awards Committee *ex officio*. One member shall be designated Chair. The President shall ensure that the Committee has good regional representation and contains at least two Student Members.

To:

4. (l) The Student Affairs Committee shall consist of ***at least four Members*** plus Chair of the Student Awards Committee *ex officio*. One member shall be designated Chair. The President shall ensure that the Committee has good regional representation and contains at least two Student Members.

**Carried. Action: W. Riel**

7.3. **Secretary as *ex officio* of the Bylaws, Rules and Regulations Committee – Change to Standing Rules**

Neil Holliday moved and Bob Lamb seconded that that Standing Rules VIII (Committees and Representatives) be changed:

From:

4. (c) The Committee shall consist of three Members. The Chair shall normally be a member of the Board. Members of the Committee shall serve a maximum of three consecutive terms.

To:

4. (c) The Committee shall consist of three Members. The Chair shall normally be a member of the Board. ***The Secretary shall serve ex officio on the Committee***. Members of the Committee shall serve a maximum of three consecutive terms.

**Carried. Action: W. Riel**

7.4. **Change in Editorial Board composition – Change to Standing Rules**

M. Isman moved and R. Bennett seconded that Standing Rules VI (Trustees) be changed:

From:

5. **Scientific Editor and Division Editors**

(a) The Scientific Editor of the ENTOMOLOGICAL SOCETY OF CANADA has the overall responsibility for the scientific and editorial integrity of The Canadian Entomologist and of the Memoirs of the Entomological Society of Canada and for the publication of these two scientific journals.

(b) Although responsible to the Governing Board (By-Laws X, 2), the Scientific Editor will normally consult with the Publications Committee, on publication policies, and with the Finance Committee on matters relating to expenditures and financing.

(c) The Scientific Editor shall have a ***maximum of 5 Division Editors and at least 4 Associate Editors.***

(d) The Division Editors shall maintain a close liaison with the Scientific Editor and, under authorization of the Editor, may serve in place of the Editor when the Editor is absent from duty.

(e) The Associate Editors shall maintain a close liaison with Division Editors and, under authorization of the Editor, may serve in place of a Division Editor when a Division Editor is absent from duty.

(f) The Scientific Editor ***and Division Editors*** shall be responsible for the Memoirs of the Entomological Society of Canada and The Canadian Entomologist:

(g) Division Editors are responsible for the approval of the manuscripts that will be published in their assigned division(s).

**(h)** ***Associate Editors are responsible for the evaluation of manuscripts assigned by Division Editors.***

To:

5. ***Scientific Editor***

(a) The Scientific Editor of the ENTOMOLOGICAL SOCIETY OF CANADA has the overall responsibility for the scientific and editorial integrity of *The Canadian Entomologist* and of the *Memoirs of the Entomological Society of Canada* and for the publication of these two scientific journals.

(b) Although responsible to the Governing Board (By-Laws X, 2), the Scientific Editor will normally consult with the Publications Committee, on publication policies, and with the Finance Committee on matters relating to expenditures and financing.

(c) The Scientific Editor shall have ***a minimum of 10 Subject Editors.***

(d) The Scientific Editor shall be responsible for the *Memoirs of the Entomological Society of Canada* and *The Canadian Entomologist*:

**Carried. Action: W. Riel**

Peggy Dixon moved and Rob Bennett seconded that Standing Rules VIII (Committees and Representatives) be changed:

From:

3. (j) (Paragraph 4) ***Associate*** Editors shall be appointed by the Scientific Editor with the approval of the President. At least four ***Associate*** Editors will be appointed from among the membership of the Society. ***Associate*** Editors shall be appointed to three-year terms with the possibility of reappointment.

3. (j) (Paragraph 5) ***Associate*** Editors shall advise the Scientific Editors, in their areas of competence, on the acceptance and rejection of papers referred to them by the Editor. All manuscripts shall be referred to at least two appropriate reviewers, one of whom may be an ***Associate*** Editor. ***Associate*** Editors may correspond with authors on reviewer's comments and revision of manuscripts; however, the ultimate responsibility of publication rests with the Scientific Editor ***or the Assistant Scientific Editor(s).***

To:

3. (j) (Paragraph 4) ***Subject*** Editors shall be appointed by the Scientific Editor with the approval of the President. At least four ***Subject*** Editors will be appointed from among the membership of the Society. ***Subject*** Editors shall be appointed to three-year terms with the possibility of reappointment.

3. (j) (Paragraph 5) ***Subject*** Editors shall advise the Scientific Editors, in their areas of competence, on the acceptance and rejection of papers referred to them by the Editor. All manuscripts shall be referred to at least two appropriate reviewers, one of whom may be a ***Subject*** Editor. ***Subject*** Editors may correspond with authors on reviewers' comments and revision of manuscripts; however, the ultimate responsibility of publication rests with the Scientific Editor.

Carried. Action: W. Riel

7.5. ***The Canadian Entomologist*** cost of subscription and publication - Change to Standing Rules

B. Riel moved and K. MacKenzie seconded that Standing Rules XII (Publications) be changed:

From:

1. The Society shall publish *The Canadian Entomologist*, the *Bulletin of the Entomological Society of Canada*, and miscellaneous irregular publications.

2. Contributions to the ***Society publications*** are equally acceptable in English or French.

The Society shall publish abstracts in French and English for all papers published in *The Canadian Entomologist*, and may publish abstracts in a third language if it be the language of a principal author or country in which the work was done.

***The*** authors ***shall submit a translation of the abstract*** *for all papers published in The Canadian Entomologist****. If a translation of the abstract is not submitted, or if the translation of the abstract is of poor quality, the charge for obtaining a translation of the abstract or for obtaining a good translation of the abstract shall be fifty dollars ($50.00), effective for all manuscripts received after 1 January 1997.***

3. The annual subscription rate for *The Canadian Entomologist* ***shall be recommended by the Treasurer in consultation with the Finance Committee and approved by the Board before it comes into effect. Any annual increase greater than 20% (twenty percent) of the current rate must be approved by members. An online subscription represents a contiguous campus located within the same city and reporting to the same administrative body.***

***4. The charge for publication in The Canadian Entomologist shall be thirty-five dollars ($35.00) for each page for Members and for non-members sharing authorship with Members, effective for all manuscripts received after 1 March 1993.***

***5. The charge for publication in The Canadian Entomologist shall be forty-five dollars ($45.00) for each page for non-members when they do not share authorship with Members, effective for all manuscripts received after 1 January 1997.***

6. The cost of reprints from *The Canadian Entomologist* ***and from the Bulletin shall be recommended by the Treasurer*** in consultation with the Finance Committee and approved by the Board.

***7. No more than 20% of a volume of The Canadian Entomologist may be allocated to papers with page charges waived.***

8. Authors who are delinquent in paying page or reprint charges shall be re-billed and if payment is not made within two months they shall lose publication privileges in The Canadian Entomologist until past debts are settled.

9. The price of back issues of *The Canadian Entomologist* shall be determined by the Treasurer.

10. Paid advertising may be accepted in the *Bulletin* providing it does not conflict with the objects of the Society. Rates shall be ***determined periodically*** by the Finance Committee.

***11. The charge when the final, accepted draft of a manuscript is not submitted on a computer disk is five dollars ($5.00) for each printed page, effective for all manuscripts received after 1 January 1997.***

To:

1. The Society shall publish *The Canadian Entomologist*, the *Bulletin of the Entomological Society of Canada*, ***the Canadian Journal of Arthropod Identification,*** and miscellaneous irregular publications. ***Publication may be done directly by the Society or by a designated third party***.

2. Contributions to the ***Bulletin and The Canadian Entomologist*** are equally acceptable in English or French.

The Society shall publish abstracts in French and English for all papers published in *The*

*Canadian Entomologist*, and may publish abstracts in a third language if it be the language of a principal author or country in which the work was done.

Authors ***are encouraged to submit abstracts in French and English*** for all papers published in *The Canadian Entomologist*.

3. The annual subscription rate for *The Canadian Entomologist* ***will be set by the Publisher (Cambridge University Press until Dec. 31, 2019) at its sole discretion, but following reasonable consultation with the Society.***

4. The cost of reprints from *The Canadian Entomologist* ***will be set by the Publisher. The cost of reprints from the Bulletin shall be recommended by the Treasurer*** in consultation with the Finance Committee and approved by the Board.

5. The price of back issues of *The Canadian Entomologist* shall be determined by the Treasurer.

***6. Paid advertising shall be accepted in The Canadian Entomologist providing that it does not conflict with the objectives of the Society. Rates shall be set by the Publisher.***

7. Paid advertising may be accepted in the *Bulletin* providing that it does not conflict with the objectives of the Society. Rates shall be ***set*** by the Finance Committee.

**Carried. Action: W. Riel**

7.6. **Change in Trustees composition – Notification of change to Bylaws**

W. Riel notified the membership that Bylaws (X) – Trustees should be changed:

From:

1. The Trustees of the Society shall be the Secretary, the Treasurer, the Bulletin Editor, the Assistant Bulletin Editor, the Scientific Editor, ***the Division Editors***, and the Webmaster.

To:

1. The Trustees of the Society shall be the Secretary, the Treasurer, the Bulletin Editor, the Assistant Bulletin Editor, the Scientific Editor, and the Webmaster.

Another notification will be sent by email or published in the *Bulletin* at least 1 month after this meeting. **Action: W. Riel**

8. **Auditor's Report.** S. Brooks presented the Auditor's Report for 2010. The report was posted on the web site and summarized in the September 2011 issue of the *Bulletin*. W. Riel moved and B. Lamb seconded that the Auditor's report be accepted. **Carried. No action required.**

9. **Elections Committee Report.** Secretary Annabelle Firlej read the Elections Committee report. Those elected were: Rebecca Hallett, Second Vice-President; and Chris MacQuarrie, Director-at-Large.

10. **Installation of Officers.** Rebecca Hallett, Second Vice-President, was escorted to the table by Maya Evenden. Peter Mason (outgoing President) then congratulated Michel Cusson as incoming President of the Entomological Society of Canada. The new President assumed office and thanked the members for the honour of being elected President.

11. **Presentation of Service Awards.** President Michel Cusson thanked Peter Mason for his service to the Society and presented him with a Service Award. A Service Award was presented to the outgoing Secretary, Annabelle Firlej, to the outgoing *TCE* Editor, Robb Bennett, and to the outgoing assistant *Bulletin* Editor, Fred Beaulieu (Cedric Gillott received the service award on behalf of Fred Beaulieu). Alec McClay was welcomed as the new Secretary and Chris Buddle as new *TCE* Editor.

12. **Appointment of Auditor.** Pat Mackay moved and Peggy Dixon seconded that Bouris, Wilson LLP be appointed as Auditor for 2011. **Carried**. **Action: S. Brooks**.

13. **Resolutions on behalf of the Entomological Society of Canada**

13.1. **Thanks to the Organizing Committee**

The following resolution was read by Geneviève Labrie and accepted with a round of applause:

Whereas the Entomological Society of Canada has met jointly with the Acadian Entomological Society at the Westin Nova Scotian Hotel, Halifax, Nova Scotia; and

Whereas there has been a full and interesting meeting of lectures, symposia, and papers; and
Whereas the meeting has been planned with care and concern for those attending; and
Whereas there has been ample opportunity for social interaction and visits to Halifax and surrounding areas;
Be it resolved that the Entomological Society of Canada express its sincere thanks to the Organizing Committee for their hard work and skill in arranging a worthwhile and entertaining program; and
Be it further resolved that the Society thank the Organizing Committee and meeting contributors for their generous assistance; and
Be it further resolved that the Society express its thanks to the Management and Staff of the Westin Nova Scotian Hotel for their courteous assistance during the Meeting.
**Action: A. McClay**

14. **New Business.** There is no new business.

15. **Notice of 62nd Annual General Meeting.** The 62nd Annual General Meeting will be held on 6 November 2012, with the Entomological Society of Alberta, at the Coast Edmonton Plaza Hotel in Edmonton, Alberta. Further notices for the meeting will be published in the March and June 2012 issues of the *Bulletin* (Vol. 44) and on the ESC website.

16. **Adjournment.** Michel Cusson adjourned the 61st Annual General Meeting at 17:45 following a motion by Robb Bennett.

## Change in the Bylaws – Second Announcement

It is proposed to change **Bylaw (X) – Trustees** as follows:

From:
The Trustees of the Society shall be the Secretary, the Treasurer, the Bulletin Editor, the Assistant Bulletin Editor, the Scientific Editor, ***the Division Editors***, and the Webmaster.

To:
The Trustees of the Society shall be the Secretary, the Treasurer, the Bulletin Editor, the Assistant Bulletin Editor, the Scientific Editor, and the Webmaster.

## Executive Meeting - Call for Agenda Items

The next Interim Meeting of the ESC Executive will take place by conference call at a date to be scheduled in February 2012. If members have any items they wish to be discussed by the Executive, please send them to the Secretary, Alec McClay, (secretary@esc-sec.ca), by 1 February 2012.

## Réunion du conseil exécutif – Points à l'ordre du jour

La prochaine réunion intérim du conseil exécutif de la SEC se tiendra par appel conférence à une date à déterminer en février 2012. Si des membres aimeraient ajouter des points à l'ordre du jour pour discussion par le conseil exécutif, merci de les envoyer au secrétaire, Alec McClay (secretary@esc-sec.ca), au plus-tard le 1er février 2012.

## Call for Nominees: ESC Achievement Awards

Do you know a well-respected entomologist who deserves recognition because of their outstanding contributions to their science in Canada? Is this person a leader in their field due to successes in publishing, patenting, editorial work and/or grantsmanship, in the teaching and mentoring of students, or through active volunteer involvement in the ESC and other societies/organizations? If yes, consider nominating them for one of our Society's Achievement Awards. Do not hesitate to contact the Chair of the Achievement Awards Committee, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca) if you have any eligibility or nomination process questions.

### Gold Medal and C. Gordon Hewitt Award

***Both awards are for outstanding entomological contributions in Canada by an individual, but the nominees for the C. Gordon Hewitt Award must be less than 40 years of age throughout the calendar year in which the award is both announced and awarded.***

Nominations can only be made by members of the ESC, and signed by the nominator and by at least one seconder (also to be a member of the ESC).

Nominators should include the following information for both awards: 1. The name and address of the nominee(s); 2. A statement of relevant achievements (3-5 pages) which may include, but is not limited to, the following: outline of research areas, particularly major contributions; number of articles in refereed journals, books, book chapters, patents; editorial activities; teaching history, numbers of graduate students, teaching awards; value of grants; involvement in ESC; active involvement and/or memberships in other Societies; entomological extension/community involvement; organizing of symposia, meetings; 3. A

## Appel à candidature : Prix d'excellence de la SEC

Connaissez-vous un entomologiste respecté qui mérite une reconnaissance pour ses contributions remarquables dans son domaine au Canada? Cette personne est-elle un leader dans son domaine par son succès en publications, brevets, travail éditorial et/ou subventions, enseignement et mentorat d'étudiants, ou même par du bénévolat actif dans la SEC et d'autres sociétés/organisations? Si oui, considérez de la nominer pour un de nos prix d'excellence de la Société. N'hésitez pas à contacter la présidente du comité des prix d'excellence, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca) si vous avez des questions concernant l'éligibilité ou le processus de nomination.

### Médaille d'or et prix C. Gordon Hewitt

***Ces deux prix vont pour les contributions remarquables en entomologie au Canada par un individu, mais les nominés pour le prix C. Gordon Hewitt doivent avoir moins de 40 ans tout au long de l'année durant laquelle le prix est annoncé et remis.***

Les nominations ne peuvent être faites que par des membres de la SEC, et doivent être signées par la personne qui soumet la nomination et par au moins un personne qui appui la nomination (qui doit aussi être membre de la SEC).

Les personnes qui soumettent la nomination doivent inclure les informations suivantes pour les deux prix : 1. Le nom et l'adresse du nominé ; 2. Un énoncé sur les accomplissements pertinents (3-5 pages) qui peut inclure, mais ne se limite pas à : domaine de recherche, contributions majeures particulières, nombre d'articles dans des revues avec évaluation, livres, chapitres de livres, brevets, activités éditoriales, histoire d'enseignement, nombre d'étudiants gradués, prix d'enseignement, valeur des subventions, implication dans la SEC, implication active et/ou adhésion à d'autres

current curriculum vitae; and 4. The name of the nominator and at least one seconder.

The documentation should stress the particular achievement or achievements to be considered and not merely the general competences of the nominee. Other seconders may merely state their support, without documentation, in a letter of endorsement of the nomination. The Committee shall not prepare the documentation nor conduct research connected with it.

Please send nominations either by e-mail to the Chair of the Achievement Awards Committee, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), or to the ESC office in an envelope marked "Confidential" postmarked no later than **27 February 2012.**

## Honorary Members of the Entomological Society of Canada

***An Honorary Member is deemed to have made an outstanding contribution to the advancement of entomology, and may be an Active Member or former Active Member of the Society at the time of nomination.*** Collectively, Honorary Members are not to comprise more than 10 members or 1% of the active membership of the Society. Nominations should be supported by at least five Active or Special Members of the Society, and are to be sent either by e-mail to the Chair of the Achievement Awards Committee, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), or to the ESC office in an envelope marked "Confidential" postmarked no later than **27 February 2012.**

## Fellows of the Entomological Society of Canada

***Fellows are deemed to have made a major contribution to entomology, and are to be***

sociétés, implication dans la communauté entomologique, organisation de symposiums et réunions ; 3. Un curriculum vitae à jour ; et 4. Le nom de la personne qui soumet la nomination et au moins une personne qui l'appuie.

La documentation devrait mettre en évidence le ou les accomplissements particuliers à considérer et pas seulement les compétences générales du nominé. D'autres personnes peuvent aussi manifester leur appui, sans documentation, dans une lettre de soutien de la nomination. Le comité ne préparera aucune documentation et ne fera aucune recherche en lien avec la nomination.

Merci d'envoyer vos nominations par courriel à la présidente des prix d'excellence, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), ou au bureau de la SEC dans une enveloppe marquée « Confidentiel » au plus tard le **27 février 2012**, le cachet de la poste faisant foi.

## Membres honoraires de la Société d'entomologie du Canada

***Un membre honoraire est considéré comme ayant apporté des contributions remarquables à l'avancement de l'entomologie et peut être un membre actif ou un ancien membre actif de la Société au moment de la nomination.***

Collectivement, les membres honoraires ne peuvent pas totaliser plus de 10 membres ou 1% des membres actifs de la Société. Les nominations doivent être supportées par au moins cinq membres actifs ou spéciaux de la Société, et doivent être envoyées par courriel à la présidente des prix d'excellence, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), ou au bureau de la SEC dans une enveloppe marquée « Confidentiel » au plus tard le **27 février 2012**, le cachet de la poste faisant foi.

## Fiduciaires de la Société d'entomologie du Canada

***Les fiduciaires sont considérés comme ayant apporté une contribution majeure à***

***Active Members of the Society at the time of nomination. Their contribution may be in any area (e.g., research, teaching, application or administration), and may be judged on the basis of contribution to and stimulation of the work of others, as well as by direct personal effort.*** Collectively, Fellows may not comprise more than 10% of the active membership of the Society. Nominations should be supported by at least four Active or Special Members of the Society, and are to be sent either by e-mail to the Chair of the Achievement Awards Committee, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), or to the ESC office in an envelope marked "Confidential" postmarked no later than **27 February 2012.**

## Wanted: Applicants for the Bert & John Carr Award

The Bert and John Carr Award was created in 2010 (see ESC Bulletin, June 2010 [p. 102] or September 2010 [p. 170]) to support research activities by individuals who study insect faunistics, or the natural history and taxonomy of Canada's insect fauna. Preference is given to applications by amateurs, but those by students and others will be considered. Applications should consist of: 1.The name and address of the applicant; 2. A statement of the research activity to be undertaken, including a cost estimate of up to $500; and 3. A current curriculum vitae.

Applications are to be sent either by e-mail to the Chair of the Achievement Awards Committee, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), or to the ESC office in an envelope marked "Confidential" postmarked no later than **27 February 2012.**

***l'entomologie et doivent être des membres actifs de la Société au moment de la nomination. Leur contribution peut se situer dans n'importe quel domaine (e.g. recherche, enseignement, application ou administration), et ils seront jugés selon leur contribution et la stimulation au travail des autres, ainsi que par leurs efforts personnels.***

Collectivement, les fiduciaires ne peuvent pas totaliser plus de 10% des membres actifs de la Société. Les nominations doivent être supportées par au moins quatre membres actifs ou spéciaux de la Société et doivent être envoyées par courriel à la présidente des prix d'excellence, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), ou au bureau de la SEC dans une enveloppe marquée « Confidentiel » au plus tard le **27 février 2012**, le cachet de la poste faisant foi.

## Recherchés : Candidats pour le prix Bert & John Carr

Le prix Bert et John Carr a été créé en 2010 (voir le Bulletin de la SEC, juin 2010 p.102, ou septembre 2010 p. 170) afin de soutenir des activités de recherche par des individus qui étudient la faunistique des insectes, ou l'histoire naturelle et la taxonomie de la faune entomologique du Canada. La préférence sera donnée aux candidatures provenant d'amateurs, mais les candidatures d'étudiants ou d'autres individus seront considérées. Les candidatures devront inclure : 1. Le nom et l'adresse du candidat ; 2. Un énoncé sur les activités de recherche devant être entreprises par le candidat, de la SEC dans une enveloppe marquée « Confidentiel » au plus tard le **27 février 2012**, le cachet de la poste faisant foi. dont une estimation des coûts jusqu'à concurrence de 500$ ; et 3. Un curriculum vitae à jour.

Les candidatures doivent être envoyées soit par courriel à la présidente du comité des prix d'excellence, Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), soit au bureau bureau de la SEC dans une enveloppe marquée « Confidentiel » au plus tard le 27 février 2012, le cachet de la poste faisant foi.

## Honours and Awards at JAM 2011

Rick West

Murray Isman, the 2011 Gold Medal recipient, with Michel Cusson

Rick West

Zoë Lindo receives the Bert and John Carr Award from Michel Cusson

Rick West

Michel Cusson presents the C. Gordon Hewitt Award to Kirk Hillier

Rick West

Linda and Peter Payzant, recipients of the Criddle Award, with Christine Noronha (AES President)


Rick West

Jeremy McNeil (left) with Dan Quiring, who presented the Heritage Lecture


Rick West

Peter Mason (Past President) receives a Service Award from Michel Cusson


Rick West

Cedric Gillott accepts a Service Award on behalf of Fred Beaulieu (former Assistant Bulletin Editor)


Rick West

Michel Cusson presents Annabelle Firlej (Past Secretary) with a Service Award

## Plaudits and pleas

**(continued from page 228)**

and the politics seen at JAMs will appear in future issues.

What will not be appearing in future issues, at least on a regular basis, is Moth Balls. After 32 instalments, Andy Bennett has decided, well, to put the column in moth balls! For 8 years, we have enjoyed his wit and ability to put an entomological bent on the strangest of topics. When I read his final column (in which items 10 and 13 were my personal favorites), my mind was a buzz with Kenny Rogers singing and Gilbert and Sullivan composing these Bennettian lyrics. We shall miss your musings, Andy! However, the opportunity is now there for anyone with a whim for writing a regular *Bulletin* column to step forward. Please get in touch!

## Applaudissements et plaidoyer

**(suite de la page 228)**

ans, nous avons apprécié son esprit et sa capacité à donner une approche entomologique aux sujets les plus étranges. Quand j'ai lu sa dernière rubrique (dans laquelle les items 10 et 13 étaient mes favoris), mon esprit grouillait de Kenny Rogers chantant et Gilbert et Sullivan composant ces paroles Bennettiennes. Tes rêveries nous manqueront, Andy! Cependant, l'opportunité est maintenant présente pour quiconque avec un peu d'inspiration pour écrire une rubrique régulière dans le *Bulletin* de se présenter. Contactez-moi!

## Positions Available

### PhD or MSc Position in Forest Landscape Genetics

The James lab in spatial ecology at the Université de Montréal is now accepting applications for graduate students at both the Masters and PhD level who are interested in the spatial and temporal dynamics of boreal forest ecosystems. In general, research in the lab focuses on the landscape-scale interactions among forest patterns and forest disturbance processes such as fire, insect outbreaks, and forest management. Specifically, I am looking for graduate students to study the landscape genetics of the spruce budworm (SBW), an important insect pest in eastern Canada. This work will examine SBW moth dispersal dynamics using genetic markers to better predict budworm outbreak risk. The research will involve field collection of insect samples and spatial analysis of genetic variation as a function of forest structure. There will also be flexibility in designing a specific research programme that fits with the applicant's interests. Experience in field work, GIS analysis, molecular techniques, statistics, and forest ecology are all beneficial. Expected start date is January or May 2012.

Applicants must meet the entrance requirements for the Université de Montréal, Département des sciences biologiques, which can be viewed at: http://www.bio.umontreal.ca/programmes-etudes/cycles_2_3/admission.html. More information on the lab can found at: https://sites.google.com/site/patrickmajames.

If you are interested in joining the lab, please send your CV, a copy of unofficial transcripts, and a brief statement of research interests to Dr Patrick James: patrick.ma.james@umontreal.ca.

### PhD ou MSc en génétique du paysage forestier

Le laboratoire d'écologie spatiale (ES-James) du professeur Patrick James à l'Université de Montréal accepte maintenant des demandes pour les étudiants de cycles supérieurs qui sont intéressés à la dynamique spatiale des écosystèmes forestiers boréaux. Le thème principal de recherche dans le laboratoire porte sur l'étude des interactions aux niveaux de la structure spatiale des écosystèmes forestiers et les perturbations naturelles (les incendies, les épidémies d'insectes) afin de mieux gérer l'aménagement forestier. La recherche d'étudiants de maîtrise et de doctorat porte spécifiquement sur l'étude de la génétique du paysage (« landscape genetics ») de la tordeuse des bourgeons de l'épinette (TBE), un insecte ravageur important dans l'est du Canada. La recherche consistera à examiner les dynamiques de dispersion de la tordeuse d'épinette en utilisant des marqueurs génétiques afin de mieux prédire le risque épidémie de tordeuses des bourgeons. Cette recherche comprendra la collecte d'échantillons d'insectes sur le terrain ainsi que l'analyse spatiale de la variation génétique en fonction de la structure des forêts. Il y aura aussi la flexibilité dans la conception d'un programme de recherche spécifique qui correspond aux intérêts de l'étudiant(e). Expériences de terrain, d'analyse à l'aide de SIG, de techniques moléculaires, d'analyses statistiques ainsi que des notions d'écologie forestière sont des atouts. Projets peuvent débuter en janvier ou mai 2012.

Les candidats doivent satisfaire aux exigences d'entrée du Département des sciences biologiques de l'Université de Montréal comme stipulées à l'adresse : http://www.bio.umontreal.ca/programmes-etudes/cycles_2_3/admission.html. Pour plus d'informations sur le laboratoire du professeur Patrick James peuvent être trouvé sur le site web : https://sites.google.com/site/patrickmajames.

Si vous êtes intéressé à joindre le laboratoire, s'il-vous-plaît envoyer votre CV, une copie non-officielle de votre relevé de note, et un exposé sommaire de vos intérêts de recherche à : Dr Patrick James : patrick.ma.james@umontreal.ca.

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*Editor's note: Society Directors and Officers are reminded to check these lists, and submit corrections, including the names and positions of new officers.*

## *Bulletin of the Entomological Society of Canada*

Editor: Cedric Gillott
Assistant Editor: Julia Mlynarek

The *Bulletin of the Entomological Society of Canada*, published since 1969, presents quarterly entomological news, opportunities and information, details of Society business, matters of wider scientific importance and book reviews.

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The Entomological Society of Canada was founded in 1863 primarily to study, advance and promote entomology. It supports entomology through publications, meetings, advocacy and other activities.

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## *Bulletin de la Société d'entomologie du Canada*

Rédacteur: Cedric Gillott
Rédactrice adjointe: Julia Mlynarek

Le *Bulletin de la Société d'entomologie du Canada*, publié depuis 1969, présente trimestriellement des informations entomologiques, des occasions, des renseignements sur les opérations de la Société, des dossiers scientifiques d'importance et des analyses d'ouvrages.

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La Société d'entomologie du Canada a été établie en 1863 principalement pour promouvoir l'étude et l'avancement de l'entomologie. Elle soutient l'entomologie par l'entremise de publications, de réunions et d'autres activités.

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# The last word / Le dernier mot

**Cedric Gillott, Editor / Rédacteur**

## Plaudits and pleas

At risk of sounding like a broken record, I will echo what has been said by our President and our Student Representative: The 2011 JAM was excellent! The quality, number and proximity of restaurants, cafes and taverns embellished an excellent scientific program, and the Local Organizing Committee is to be congratulated on its choice of venue. The Acadian Entomological Society, the smallest of our regional societies, fully deserves the plaudits it has received. Well done!

From my editorial perspective, JAMs provide a great opportunity to 'arm twist' the presenters of particularly interesting material into agreeing to write something for the Special Features section of the *Bulletin*. What may surprise readers, though, is that I'm referring here not only to scientific presentations, but also to the business of the Society, which is dealt with almost entirely by the Governing Board, with only nodding (should that be 'hand-raising?) acceptance of the Board's decisions by ESC members at the Annual General Meeting. Not for one moment am I saying that this arrangement is improper; however, Society members may benefit by learning the 'Hows' and 'Whys' of particular Board actions, for example, the decision to use Cambridge University Press as the publisher of *The Canadian Entomologist*. With luck, examples of both the science

**(continued on page 224)**

## Applaudissements et plaidoyer

Au risque de sonner comme un disque qui saute, je vais répéter ce qui a été dit par notre président et notre représentante étudiante : la réunion conjointe annuelle 2011 a été excellente! La qualité, le nombre et la proximité des restaurants, cafés et bars a embelli un excellent programme scientifique et le comité organisateur local a été félicité pour son choix sur le lieu de la réunion. La Société d'entomologie acadienne, la plus petite de nos sociétés régionales, a pleinement mérité les applaudissements qu'elle a reçus. Bien joué!

De ma perspective éditoriale, les réunions conjointes annuelles fournissent une excellente opportunité de « tordre un bras » aux présentateurs de sujets particulièrement intéressants afin qu'ils consentent à écrire quelque chose pour la section *Article spécial* du *Bulletin*. Ce qui pourrait surprendre les lecteurs, cependant, est que je réfère non pas seulement aux présentations scientifiques, mais aussi aux affaires de la Société qui sont gérées presque entièrement par le conseil d'administration à l'assemblée générale annuelle, avec seulement des hochements de tête (est-ce que ça devrait être des mains levées?) des membres de la SEC pour accepter les décisions du conseil. Je ne dis pas une seule seconde que cet arrangement n'est pas correct. Cependant, les membres de la Société pourraient bénéficier à apprendre le pourquoi du comment des actions particulières du conseil, par exemple la décision d'utiliser les presses de l'Université Cambridge comme maison d'édition de *The Canadian Entomologist*. Avec un peu de chance, des exemples de la science comme de la politique abordés dans les réunions conjointes annuelles apparaîtront dans de prochains numéros.

Ce qui n'apparaîtra pas dans de prochains numéros, du moins pas sur une base régulière, est la rubrique *Boules à mites*. Après 32 textes, Andy Bennett a décidé, et bien, de mettre la rubrique dans les boules à mites! Pendant 8

**(suite à la page 224)**

# Entomological Society of Canada, 2010-2011
# Société d'entomologie du Canada, 2010-2011

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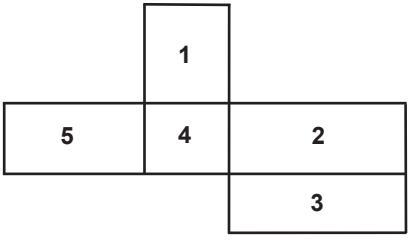


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## Images

**On the spine:** A robber fly, *Stenopogon inquinatus* Loew (Diptera: Asilidae), photographed in the Okanagan Valley of British Columbia. One of the largest Canadian asilids, it ranges over much of western North America where it is common in dry forests and grasslands. Photo: W. Strong

**Beneath the title:** Mating soldier beetles, *Rhagonycha fulva* (Scopoli) (Coleoptera: Cantharidae), in a meadow near Delémont, Switzerland. This predatory European beetle was recently introduced to North America where it is now widespread. Photo: A. Leroux

**1** A European species of *Plebejus* Kluk (Lepidoptera: Lycaenidae), very similar to the Nearctic species *Plebejus melissa* (Edwards). Jerisberghof, Switzerland. Photo: A. Leroux

**2** Eggs of *Leptoglossus occidentalis* Heidemann (Hemiptera: Coreidae), an important pest of North American conifer seeds and European edible pine nuts. Vernon, British Columbia. Photo: W. Strong

**3** A meadow grasshopper nymph, probably a species of *Chorthippus* Fieber (Orthoptera: Acrididae), in a mountain pasture near Soyhières, Switzerland. Photo: A. Leroux

**4** Lars Andreassen preparing trap lures for *Aleochara bipustulata* (L.) (Coleoptera: Staphylinidae), a potential biological control agent for *Delia radicum* (L.) (Diptera: Anthomyiidae). Zurich, Switzerland. Photo: A. Leroux

**5** An assassin bug nymph (Heteroptera: Reduviidae), photographed in western Massachusetts. Photo: B. Roitberg

**Back cover:** A platygastroid wasp, *Gryon pennsylvanicum* (Ashmead) (Hymenoptera: Scelionidae), ovipositing in eggs of western conifer seed bug, *Leptoglossus occidentalis* Heidemann (Hemiptera: Coreidae) in the Okanagan Valley of British Columbia. Photo: W. Strong

Français à l'intérieur de la couverture avant.