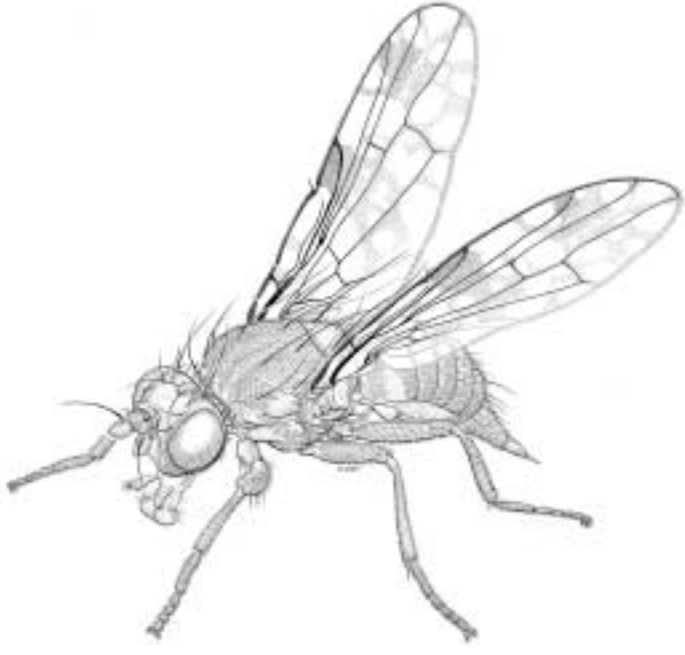
Bulletin

Entomological Society of Canada

Société d'entomologie du Canada

Volume 35
No. 2

June / juin 2003



Entomological Society of Canada
Société d'entomologie du Canada

393 Winston Avenue
Ottawa, Ontario, Canada K2A 1Y8
E-mail: entsoc.can@sympatico.ca
http://esc-sec.org/

Table of contents on back cover
Table des matières sur la couverture-arrière

Date of issue / Date de publication :
June 2002

Entomological Society of Canada, 2002-2003
Société d'entomologie du Canada, 2002-2003

Executive Council / Conseil exécutif

President / Présidente
Sandy Smith
Faculty of Forestry
33 Willcocks St., University of Toronto
Toronto, ON M5S 3BS
Tel: (416) 978-5482, Fax: (416) 978-3834
E-mail: smith@larva.forestry.utoronto.ca

First Vice-President / Premier vice-président
Charles Vincent
Horticultural Research & Development Centre
Agriculture and Agri-Food Canada
430 Gouin Blvd., Saint-Jean-sur-Richelieu
QC J3B 3E6
Tel: (450) 346-4494, ext. 202
Fax: (450) 346-7740
E-mail: vincentch@agr.gc.ca

Second Vice-President / Second vice-président
Robert Lamb
Cereal Research Centre
Agriculture and Agri-Food Canada
195 Dafoe Rd., Winnipeg, MB R3T 2M9
Tel: (204) 983-1458, Fax: (204) 983-4604
E-mail: rlamb@agr.gc.ca

Past President / Président sortant
Bernard Roitberg
Department of Biological Science
Simon Fraser University
Burnaby, BC V5A 1S6
Tel: (604) 291-3585, Fax: (604) 291-3496
E-mail: roitberg@sfu.ca

Directors-at-Large / Conseillers
Owen Olfert (2003), Jon Sweeney (2004),
David Gillespie (2005)

Regional Directors / Directeurs régionaux
Terry Shore (ESBC), Greg Pohl (ESA),
Robert Elliott (ESS), Patricia MacKay (ESM),
David Hunt (ESO), Nancy Laroque (SEQ),
Donna Giberson (AES).

Student Representative
Représentante des étudiants
Tonya Mousseau
Department of Entomology
University of Manitoba
Winnipeg, MB R3T 2N2
E-mail: tonyabeetle@hotmail.com

Trustees / Fiduciaires

Treasurer / Trésorier
Gary Gibson
Entomological Society of Canada
393 Winston Ave., Ottawa, ON K2A 1Y8
Tel: (613) 759-1823, Fax: (613) 759-1927
E-mail: gibsong@agr.gc.ca

Secretary / Secrétaire
Rick West
31 Drover's Heights
Portugal Cove-St. Philips, NF A1M 3G6
Tel: (709) 895-2734, Fax: (709) 895-2734
E-mail: reely.west@roadrunner.nf.net

Bulletin* Editor / Rédacteur du *Bulletin
Paul Fields
Cereal Research Centre
Agriculture and Agri-Food Canada
195 Dafoe Rd., Winnipeg, MB R3T 2M9
Tel: (204) 983-1468, Fax: (204) 983-4604
E-mail: pfields@agr.gc.ca

Webmaster / Webmestre
Barry Lyons
1219 Queen St. E.
Sault Ste. Marie, ON P6A 2E5
Tel: (705) 541-5617, Fax: (705) 759-5700
E-mail: blyonst@nrcan.gc.ca
http://esc-sec.org

The Canadian Entomologist
Editor-in-Chief / Rédacteur en chef
Jean Turgeon
1219 Queen St. E.
Sault Ste. Marie, ON P6A 2E5
Tel: (705) 759-5764
E-mail: editor.canent@nrcan.gc.ca

Divisonal Editors / Rédacteurs de division
Michel Cusson, E-mail: cusson@cfl.forestry.ca
Robert Lamb, E-mail: rlamb@agr.gc.ca
Don Lafontaine, E-mail: lafontained@agr.gc.ca

Head Office / Siège social
Entomological Society of Canada
393 Winston Ave., Ottawa, ON K2A 1Y8
Tel: (613) 725-2619, Fax: (613) 725-9349
E-mail: entsoc.can@sympatico.ca
http://esc-sec.org/

Up Front / Avant-propos

Sandy Smith, President of ESC / Présidente de la SEC

Our Executive Meeting in April marked the half-way point of my term as President. The knowledge and enthusiasm of those who help with the day-to-day operations of this Society continue to impress me and I would like to extend my sincere thanks to all for their support.

Since my last report, I am pleased to say that we have filled three vacant committee chairs for the Society, and are closing in on a potential new Editor for *The Canadian Entomologist*. New committee chairs include: 1) Allan Carroll, Chair of the Publications Committee, Pacific Forestry Centre, Canadian Forestry Service, Victoria, British Columbia; 2) Noubar J. Bostanian, Chair of the Fund Raising Committee, Horticultural Research and Development Centre, Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, Quebec; and 3) Patrice Bouchard, Chair of the Finance Committee, Agriculture and Agri-Food Canada, Ottawa, Ontario. Many thanks to all three for being willing to put their energy towards Society tasks over the next few years.

A few issues came out of the Executive Meeting in April. First, while we remain in sound financial standing, there is a clear need to reduce the costs of publishing to maintain a balanced budget into the future. An increase in fees for institutional subscribers is being recommended along with an examination as to whether publication costs for the *Bulletin* can be reduced. In keeping with this, the decision was taken at the spring Executive Meeting to reduce the size (and cost) of the December *Bulletin* by posting the minutes and full reports of the October Board Meeting on our web site only, with hardcopy

La réunion du conseil d'administration tenue en avril a coïncidé avec la moitié de mon mandat en tant que présidente. Les connaissances et l'enthousiasme des gens qui s'occupent des opérations de la Société sur une base journalière continuent à m'impressionner. Je voudrais sincèrement les remercier de leur aide.

Je suis heureuse de vous annoncer que trois postes vacants de Présidents de Comités ont été comblés depuis mon dernier rapport et que nous avons trouvé un nouveau Rédacteur en chef potentiel pour *The Canadian Entomologist*. Les nouveaux présidents de comités sont : 1) Allan Carroll, Président du Comité de publication, Centre de foresterie du Pacifique, Service canadien des forêts, Victoria (CB); 2) Noubar J. Bostanian, Président du Comité de levée de fonds, Centre de recherche et de développement en horticulture, Agriculture et Agroalimentaire Canada, Saint-Jean-sur-Richelieu (Québec); et 3) Patrice Bouchard, Président du Comité des finances, Agriculture et Agroalimentaire Canada,, Ottawa (Ontario). Merci beaucoup à vous trois d'investir votre énergie dans les tâches de la Société pour les quelques années à venir.

Quelques questions ont été discutées lors de la dernière réunion du conseil d'administration en avril. Premièrement, bien que la Société demeure dans un bon état financier, il est clair que l'on doit réduire les coûts de publication afin de maintenir un équilibre budgétaire à long terme. Une augmentation du coût de l'abonnement pour les institutions a été recommandée, ainsi que la possibilité de réduire les coûts de publication du *Bulletin.* Conformément à cette ligne de pensée, nous avons décidé lors de la réunion printanière du Conseil d'administration de réduire la taille (et le coût) du *Bulletin* de décembre en affichant les procès-verbaux et les rapports complets de la réunion d'octobre du Conseil sur notre site Internet, seulement. Vous pouvez obtenir une copie papier en faisant une demande par écrit au bureau de la SEC.

Deuxièmement, la version électronique de *The Canadian Entomologist* semble aller rondement

access by written request to the ESC office.

Second, electronic publishing of *The Canadian Entomologist* appears to be going smoothly with only minor glitches in some things such as non-recognition of diacritic marks. These will hopefully be worked out soon with the Editor-in-Chief and NRC. And third, the Executive has decided to leave past copyrights for papers in the journal with their authors (or estates) and not to make legal changes with this status.

I see that the first notice of the Annual Meeting in November 2003, organized by the Entomological Society of British Columbia in Kelowna, has been sent out and it looks to be very exciting. The Achievement Awards Committee, chaired by Charles Vincent, has already made their selection for awards this year, with the Gold Medal going to Hugh Danks, the Hewitt to Heather Proctor, and the Criddle to R. Kenner. J.T. Arnason has also been recommended as a Fellow of the Society this year. I am looking forward to seeing you at the fall meeting to congratulate the awardees personally.

On a final note, I would like to draw your attention to the work carried on by a major subcommittee of the ESC, the Biological Survey of Canada (Terrestrial Arthropods). Two weeks ago, I had the pleasure of attending one of their meetings on behalf of the Society, and while I had personally been aware of their activities as a recipient of their regular newsletter, I had never appreciated the significant role that our Society played in their formation nor the extent of their activity. Almost 20 years old, the Survey now has close association with the Canadian Museum of Nature. Over 15 members from across the country meet twice a year in Ottawa to provide update status and set scientific priorities for the study of Canadian arthropod fauna and biodiversity throughout the entire range of our ecosystems; arctic, grasslands, forests, wetlands and freshwater. As such, they contribute to significant advances in the study of arthropods in Canada and represent major ambassadors for entomology worldwide. If you haven't already, please take a look at their website (http://www.biology.ualberta.ca/bsc/bschome.htm) and

avec seulement quelques problèmes mineurs tels que la non-reconnaissance des signes diacritiques. Ce problème sera rapidement corrigé, on l'espère, grâce à l'effort du Rédacteur-en-chef et à RNC. Troisièmement, le conseil a décidé de laisser les droits d'auteur des articles déjà publiés dans le journal aux auteurs (ou patrimoine) et de ne pas faire de changements légaux.

J'ai vu que le premier avis de convocation pour le Congrès annuel de novembre 2003, organisé par la Société d'entomologie de Colombie-Britannique à Kelowna, a été envoyé. Cela semble très enlevant. Le Comité des prix d'excellence, présidé par Charles Vincent, a déjà fait son choix des récipiendaires de cette année. La Médaille d'or ira à Hugh Danks, le Prix Hewitt à Heather Proctor et le Prix Criddle à R. Kenner. J.T. Arnason a aussi été proposé pour devenir Membre associé de la Société. J'attends avec impatience notre rencontre prochaine au Congrès d'automne pour féliciter ces récipiendaires personnellement.

Finalement, je voudrais attirer votre attention sur le travail fait par un sous-comité majeur de la SEC, la Commission biologique du Canada (Arthropodes terrestres). Il y a deux semaines, j'ai eu le plaisir d'assister à l'une de leurs réunions pour le compte de la Société, et bien que je sois personnellement au fait de leurs activités par le biais de leur bulletin de liaison, je n'ai jamais apprécié pleinement le rôle significatif que notre Société a joué dans leur formation ni l'ampleur de leur activité. Ayant presque 20 ans, la Commission est maintenant en association étroite avec le Musée canadien de la nature. Plus de 15 membres de partout au Canada se rencontrent deux fois par année à Ottawa pour faire une mise à jour et déterminer les priorités scientifiques pour l'étude des arthropodes canadiens et la biodiversité dans tous les écosystèmes : arctique, prairie, forêt, zones humides et eaux douces. De ce fait, ils contribuent à l'avancement significatif de l'étude des arthropodes du Canada et sont des ambassadeurs majeurs de l'entomologie à travers le monde. Si vous ne l'avez pas encore fait, jetez un coup d'œil à leur site Internet (http://www.biology.ualberta.ca/bsc/bschome.htm) et prenez la pleine mesure de leurs

get a real sense as to what are some of their great accomplishments supported through your Society.

In closing, I think you can see for yourself with this issue that our new Editor, Paul Fields, has very ambitious plans for the *Bulletin*. I welcome his new direction and hope you will take a few minutes to think about specific contributions you can make to the *Bulletin*, and in that way, add to the value of being an ESC member.

grandes réalisations soutenues par notre Société.

En conclusion, vous pouvez voir par vous-même avec ce numéro que notre nouveau rédacteur, Paul Fields, a des plans très ambitieux pour le *Bulletin*. Je me réjouis de cette nouvelle direction et j'espère que vous prendrez quelques minutes pour penser à la contribution spéciale que vous pourriez faire au *Bulletin*, et de ce fait, ajouter à la valeur d'être un membre de la SEC.

Meeting Announcements / Réunions futures

63rd Annual Meeting of Acadian Entomological Society and Maine Entomological Society
Bar Harbor, Maine, USA, 22-24 June 2003
andrei.alyokhin@umit.maine.edu, http://www.upei.ca/~aes/2003meeting.htm

54th Annual Meeting of the Lepidopterists' Society
Olds College, Olds, Alberta, Canada, 23-27 July 2003
felix.sperling@ualberta.ca, http://alpha.furman.edu/~snyder/snyder/lep/meet.htm

II International Congress of Coleopterology
Prague, Czech Republic, 14 - 21 Sept 2003
http://www.coleocongress2003.cz/

51st Annual Meeting of the Entomological Society of Alberta
Athabasca University, Athabasca, Alberta, Canada, 2-4 October 2003
robert@athabascau.ca, http://www.biology.ualberta.ca/courses.hp/esa/esa2003.htm

59th Annual Meeting of the Entomological Society of Manitoba
Winnipeg, MB, 24-25 October 2003
iranpour@ms.umanitoba.ca, http://home.cc.umanitoba.ca/esm/meet.html

51st Annual Meeting of the Entomological Society of America
Cincinnati, Ohio, USA, 26-29 October 2003
http://www.entsoc.org/annual_meeting/2003/index.html

The XVth International Plant Protection Congress,
Beijing, China, **Postponed** until 11-16 May 2004.
E-mail: ippc2003@ipmchina.net
Web page: http://www.ipmchina.net/ippc/ippcwelcome.html

22nd International Congress of Entomology
Brisbane, Australia, 15-21 August 2004
http://www.ccm.com.au/icoe/index.html

Gold Medal Address / Allocution du médaillé d'or

By Robert Lamb

P. MacKay

Bernie Roitberg (left) presenting Gold Medal to Bob Lamb, 6 October 2002, Winnipeg

What is entomology?

Receiving the Gold Medal of the Entomological Society of Canada is a special honour. For me it represents acknowledgement by peers, entomologists who know my work, entomologists I respect. That the presentation is occurring here is particularly gratifying, because I can publically thank my Winnipeg colleagues who went to the effort of preparing the nomination. Of course the Gold Medal will be a great pleasure to possess, but the opportunity to present the Gold Medal Address is perhaps a more valuable award. Preparing this address provided an opportunity to think about my career, and ask: what sort of entomologist have I become, what have I accomplished, what has been left undone? Fortunately, the time is short and so I can quickly pass over the warty parts of my career, such as: the never-ending struggle to write scientific papers well; the recognition that learning from others might be more valuable than focusing on my own work; learning to keep tidy and complete experimental records. Many of you have assisted by reviewing my papers for *The Canadian Entomologist*, and your contribution is much appreciated. I want also to acknowledge that much of my entomology has been a collaboration with colleagues, with graduate students at the University of Manitoba, and with a particular colleague, Pat MacKay, who has contributed more than she thinks to most aspects of my work.

In assessing my entomological career, I spent some time thinking about the relative importance of applied and basic research, but soon found the apparent dichotomy irrelevant. I realized that I want to ask a broader question: What is entomology? Of course entomology is the study of insects, but that answer only tells us the subject matter, which we all know. In my view, five human activities define our joint endeavour. Entomology is: an aesthetic experience, natural history, a craft, engineering, and a science. I am convinced that no one of these is more or less important than the others. Let me provide a simple definition of each, and then illustrate with an example.

R. Lamb

Figure 1. Mantids carved from stone decorate a Chinese signature stamp.

Bob Lamb is a Research Scientist at Agriculture and Agri-Food Canada's Cereal Research Centre in Winnipeg, Manitoba. He became interested in insects as a teenager in Toronto. His research focuses on the ecology of aphids, flea beetles and more recently wheat midge. Contact information: 195 Dafoe Rd., Winnipeg, MB R3T 2M9, rlamb@agr.gc.ca.

Entomology as an aesthetic experience

The use of insects as subjects for artistic expression. I suspect that the morphological intricacy of insects, and variation in shape and colour, provide motivation for our study. Representing favourite insects as drawings in taxonomic studies, or as figures or photographic images in publications continues to stimulate our work. You might respond that, "As communicating professionals we need to produce images of our research material". I would counter with the suggestion that aesthetic experience comes first and demands an outlet; perhaps using the images of insects in our work often is only an excuse to justify the expression of repressed artistic tendencies. As evidence I offer the observation that many non-entomologists take stimulus from insects to produce art. The proof is in the Art Show conducted in association with this meeting. Other examples include the amazing representations of insects on stamps, particularly those from some African and Asian countries. One particular example that appeals to me is a stone carving by an unknown Chinese artist, who used a pair of combative mantids to decorate a "Chop" or signature stamp (Fig. 1). I now recognize how important the aesthetic experience of insects has been to me. In hindsight I suspect my entomological work would have been better if I had expressed it more artfully.

Natural history

Experience of the natural world through cataloguing the diversity of life and the day to day activities of living things. Put this way, natural history is clearly a stimulus for taxonomy. This conclusion does not imply that aspects of taxonomy are not also scientific. Nevertheless, I suspect that special something that makes a fine taxonomist is the same thing that makes a fine natural historian. Natural history also provides motivation for much ecology. This fascination with living things and their habits is probably most clearly exemplified by the widely popular pastime of birding, but insect watching also seems to be gaining popularity with some North Americans. Natural history of insects is closely related to the idea of entomology as an aesthetic experience. At one time the natural historian would record their insect subjects on paper in water colours. Now, most of us use a camera. How many of you have a store of insect photographs that capture a life history event, or simply fix the image of an insect in it's natural environment?

R. Lamb

Figure 2. A colony of the native aphid, *Uroleucon rudbeckiae,* in its natural habitat, with three eggs of a predatory fly (Syrphidae) and a parasitoid (Hymenoptera) approaching.

The example of insect natural history that I want to share with you is a project Pat MacKay and I are conducting on a native aphid, probably *Uroleucon rudbeckiae* (Fitch) (Homoptera: Aphididae), that lives on tall coneflower, *Rudbeckia laciniata* (Asteraceae) (Fig. 2). We began watching this aphid in our garden seven or eight years ago. We now keep track of the comings and goings of the aphid, as well as its parasitoids and predators, on a weekly and often daily basis in our garden. This obsession includes two extended field trips to Riding Mountain National Park during our holidays. What we have done is watch, collect, and catalogue, oblivious to any central scientific question. We have become well acquainted with the life history of this aphid and the surprisingly large community associated with

it, but this knowledge has come from a disorganized integration of casual observations. We had no immediate objective other than the enjoyment provided by observing this community. The project is now drifting towards ecological research, although I suspect it's value, if any, will be in the summary we produce of the natural history of this system. I am sure also that the scientific questions that evolve will be interesting to the extent that they reflect the reality of the interactions among species, as revealed by our natural history observations. Years ago I remember arguing that the way to do entomology is to identify an important scientific question, choose a suitable research organism, and proceed to answer the question. I now believe that approach is backward, scientific questions will mostly grow out of a deep understanding of the natural history of insects.

Craft

The activity of combining physical entities or processes in a way that makes a useful product. The simplest way to explain what I mean is to provide an example. I have chosen a monitoring system for wheat midge, *Sitodiplosis mosellana* (Géhin) (Diptera: Cecidomyidae). A group of us wanted to help farmers make control decisions (Lamb *et al.* 2002). We took what we know about the life history of the wheat midge, put that together with agronomic practices and decision making processes, and came up with a tool that farmers can use to estimate wheat midge densities in relation to an economic threshold. I won't go into a lot of detail, because the method is simple. Farmers put 10 spaced, sticky traps in a field at the crop stage when female midges begin to lay eggs. The traps are fastened to stakes at the height of the wheat spikes where females oviposit, left exposed for three nights, collected, and examined (Fig. 3). If four or more midges occur on the 10 traps then farmers are economically justified in applying insecticide; if three or fewer are present they probably should not spray. Using the method for three years in commercial wheat fields, we found that farmers make correct decisions 70-80% of the time. Previously, farmers had no reliable way to determine whether or not they should apply insecticide to millions of hectares. I find it amazing that such a simple, small scale sampling method could usefully assess insect densities in such a large habitat, but it works.

Figure 3. A sticky trap used to monitor wheat midges, *Sitodiplosis mosellana,* in wheat, showing trapped adults circled in black.

This is entomological craft because there is a useful product, that depends on integrating components of a system in an effective way. In this case the critical components are the height at which traps operate, and the duration of the trapping period, which allows time for farmers to act on the information provided by the traps. The sticky traps are cheap and readily available, and the whole process can probably be carried out by a farmer in 1-2 hours per field. The number of traps was selected not based on any understanding of insect distribution, but on the number of traps we thought farmers would be willing to handle. The sampling method has almost no scientific content and would not provide a precise sampling tool for researchers, but it is effective for the purpose intended. Entomological craft comes from a breadth of experience with insects and the ways they interact with their environ-

ment. Entomological craft need not have a commercial application. In that first year or two when graduate students are floundering in developing their research projects, they may not be floundering at all but learning their craft. Most entomological research would fail without a large measure of craft.

Engineering

The application of scientific principles and statistical methods in the creation of a useful process or product. Like craft, engineering results in a useful product, but the development of the product depends upon the application of scientific principles and usually statistical methods. As an example, I selected the development of an economic threshold for the potato aphid, *Macrosiphum euphorbiae* (Thomas), on flax (Wise *et al.* 1995). An economic threshold is the useful product which allows farmers to apply pest control in a cost-effective way. Economic thresholds depend on the application of ecological principles that describe herbivore-plant interactions, to quantify the dollar value of crop losses per unit of insect density. Two critical steps are usually involved: determining the seasonal population dynamics of the pest in relation to crop phenology, and quantifying the relationship between crop loss and herbivore density, often using simple linear regression.

In the case of the potato aphid on flax, both the density of the herbivore and the age of the crop were considered. Multiple plot trials with the crop at different stages were treated with insecticide to manipulate insect density (Fig. 4). The economic thresholds turned out to be three aphids per plant when flax is in full bloom and eight aphids per plant when seed capsules have formed but are still green. These are surprisingly low aphid densities, considering the respective biomass of aphid and plant. To me, this work is perfectly analogous to applying different degrees of force (analogous to aphid density) to steel beams of different age (analogous to the plants), to determine the least expensive but structurally sound beam for a building (analogous to an economic threshold). This is a clear example of engineering, with the development of a useful product by applying scientific and statistical principles. Interestingly, very little in the way of new science is produced, and the results refer rather narrowly to a particular situation: in this case, the damage that a single aphid population causes to a particular crop variety under the growth conditions that occur where the tests are conducted. Nevertheless, the product may be very useful. I now realize that entomological engineering does have implications for entomological science, however. If the threshold turns out to be applied successfully, then the scientific principles on which the threshold are based will be tested over and over again in a large scale, real world environment.

R. Lamb

Figure 4. Plots of flax at different growth stages used to determine economic thresholds for the aphid, *Macrosiphum euphorbiae* .

Entomological science

The creation and testing of hypotheses in a way that increases our understanding of the world of insects. To illustrate entomological science, an hypothesis is required, for example: Domestication of a plant species to produce a crop reduces the defences of the crop to herbivory by insects. This hypothesis has breadth, and might help us understand the interactions between thousands of insect herbivores and perhaps hundreds of plant species. If true, the hypothesis has important implications for both plant and animal agriculture, and probably also forestry. I suspect that most of you think the hypothesis is likely to be true, and would be surprised to learn that it has rarely been tested. To

Figure 5. A female wheat midge, *Sitodiplosis mosellana,* resting on a wheat spike after ovipositing.

illustrate entomological science I will briefly describe a test of the hypothesis, using the wheat midge interacting with wheat and its ancestors (Wise *et al.* 2001). In this case we looked at the susceptibility of 42 accessions (genetically distinct lines) from 17 species in the genus *Triticum*, including ancestors of the common commercial wheat. We were able to order the wheat species into five evolutionary lineages based on their ploidy levels (number of chromosomes) and the presence of particular genomes (common groups of chromosomes). Within each lineage, the degree of domestication of the wheats could roughly be quantified based on spike (inflorescence) and seed characteristics. Early farmers selected for traits such as large seeds and the ability to easily separate seeds from the leaf-like glumes that cover them. The wheat midge lays its eggs on wheat spikes (Fig. 5), and larvae feed on the surface of developing seeds under the glumes. Therefore, traits important to humans may also affect the wheat midge.

Based on the hypothesis, we expect that ancient wheats will be less susceptible to the wheat midge than highly-domesticated modern commercial wheats. When we measured the amount of infestation by wheat midge on all the accessions and species, we found that the degree of infestation was low in the least domesticated wheats and high in the most domesticated wheats. The pattern was consistent in all five lineages, but the degree of infestation did not always increase consistently with each step towards domestication in a lineage. The tightness with which glumes adhere to the seed surface explained much of the variation, and so apparently both wheat midges and humans benefit from feeding on seeds that sit freely within the glumes. These results are largely consistent with our original hypothesis, and represent one of the first real tests of this interesting scientific hypothesis.

One cynical rule of research is: Stop when you are ahead! We didn't stop. Sam Migui, a former PhD student working in our lab, tested the hypothesis again (Migui 2002). Being a graduate student, I asked him to do much more work than I was willing to do. He used the same wheats to test the role of domestication on two types of plant resistance, antibiosis and tolerance, for three species of cereal aphids, *Rhopalosiphum padi* (L.), *Schizaphis graminum* (Rondani) and *Sitobion avenae* (Fabricius). To make a long story shorter, he found no association between resistance to the aphids and degree of domestication. He did find a pattern of resistance related to ploidy level: those species which have the fewest chromosomes are the most resistant. In *Triticum*, ploidy level and domestication are confounded, and so the task of disentangling the role of domestication and other evolutionary forces for susceptibility to herbivory will be difficult. I think we have found yet again that apparently simple, straightforward biological hypotheses often turn out to be anything but.

For me, entomology is a multi-faceted discipline. Now that I have categorized the facets to my satisfaction I realize that, yes, I have done entomological science. I also realize that I have done a great deal of entomological engineering

and craft, and this work has been very satisfying. In part the satisfaction comes from knowing the work has been useful to many people, and also from the challenge of applying entomological experience. Finally, entomology is natural history and an aesthetic experience, and I now wish that these facets of entomology were more prominent in my work. I suppose that is another way of saying that they will be in my future entomology. Thank you for conferring on me the Gold Medal of the Entomological Society of Canada, and thank you for providing me with the opportunity to think about what entomology means to me.

References

Lamb RJ, Wise IL, Gavloski JE, Kaminski LA, Olfert OO. 2002. Making control decisions for *Sitodiplosis mosellana* (Diptera: Cecidomyidae) in wheat (Gramineae) using sticky traps. *The Canadian Entomologist* **134**: 851-854.

Migui, SM. 2002. *Host relationships of three aphid species on wheat in the genus* Triticum*: Potential for crop resistance in spring wheat.* PhD Thesis. University of Manitoba, Winnipeg, Canada.

Wise IL, Lamb RJ, Kenaschuk EO. 1995. Effects of the potato aphid *Macrosiphum euphorbiae* (Thomas) (Homoptera: Aphididae) on oilseed flax, and stage-specific thresholds for control. *The Canadian Entomologist* **127:** 213-224.

Wise IL, Lamb RJ, Smith MAH. 2001. Domestication of wheats (Gramineae) and their susceptibility to herbivory by *Sitodiplosis mosellana* (Diptera: Cecidomyidae). *The Canadian Entomologist* **133**: 255-267.

Book Reviews / Critiques de livres

Books to be reviewed

If you are interested in reviewing one of the following books, please contact Allan Carroll, Chair of the Publications Committee.

Basset Y, Novonty V, Miller SE, Kitching RL (*Editors*). 2003. *Arthropods of tropical forests*. Cambridge University Press

Held LI. 2002. *Imaginal Discs: The genetic and cellular logic of pattern formation.* Cambridge University Press

Majerus MEN. 2003. *Sex Wars: Genes, bacteria and biased sex ratios.* Princeton University Press

Resh VH and Carde RT (*Editors*). 2003. *Encyclopedia of insects.* Academic Press Publishers.

Waldbauer G. 2003. *What good are bugs? Insects in the web of life.* Harvard University Press

Please send correspondence concerning book reviews to the Chair of the Publications Committee:

Allan Carroll
506 West Burnside Road
Pacific Forestry Centre
Victoria, BC, Canada V8Z 1M5
Tel: (250) 363-0639
Fax: (250) 363-0775
E-mail: acarroll@pfc.cfs.nrcan.gc.ca

Thinking of measuring juvenile hormone titres in your experimental insect? Take a deep breath!

By Michel Cusson

Investigators working in the area of insect development and/or reproduction, with an interest in regulatory mechanisms, almost invariably reach a point where they need data on juvenile hormone (JH) titres in their test animal. This should seem obvious given the key role that JH plays in orchestrating both development and reproduction in most insects. Despite the great deal of attention that approaches to such measurements received in the 1970's and early 1980's, JH titre determinations remain a considerable challenge today, in part due to the dwindling expertise in this area. But why are these measurements so difficult to make when the titres of many other hormones can be determined with relative ease?

First, one must realize that JH is a lipid (a sesquiterpene, Fig. 1) which, in most insects, is present in such small quantities (pg-ng range per ml hemolymph) that it is literally lost in a sea of other lipids (predominantly sterols and di- and triglycerides), which can (and will!) interfere with the accuracy of the measurements. Thus, whereas the levels of many hormones can be measured with a simple radioimmunoassay, with minimal preparatory purification, measuring JH titres, be it by physico-chemical or immunological methods, typically requires several steps of delicate extraction, chromatographic purification and even derivatization before the actual quantification can be carried out.

Second, JH is highly sensitive to degradation by various enzymes, namely a JH-specific esterase that is very stable and which could significantly alter JH titres after sacrificing the animals if these are not processed immediately. In addition, this enzyme converts the active hormone, a methyl-ester, to an inactive (or less active) form—JH acid—which may not be distinguished from JH by some of the analytical methods (*e.g.*, some radioimmunoassays).

Lastly (the list is longer, but I will stop here), although most insects produce only one form of JH (JH III), the Lepidoptera make four additional structural homologues which differ in biological activity and which cannot be quantified independently using a bioassay or radioimmunoassay without prior painstaking purification of each individual homologue. The same comment applies to the higher Diptera, which produce both JH III and a bis-epoxide form of this hormone.

What, then, are your options if you are interested in measuring JH titres in a given insect? Before hand, you should be aware that there are three broad categories of quantitative approaches for making JH titre determinations: (i) physico-chemical methods (involving a GC-MS step), (ii) radioimmunoassays and (iii) bioassays. These go in decreasing order of complexity and requirements for specialized equipment, but they also provide measurements in decreasing order of reliability. Before you get started, you may have reasons to suspect that the animal you work on has very low JH titres owing to the existence of dependable titre data on a related species. For example, caterpillars from which measurements have been made were found to have remarkably low levels of JH (Cusson *et al.* 2000). In contrast, other insects such as adult cockroaches (Tobe *et al.* 1985) and bumble bees (Bloch *et al.* 2000) have JH titres several orders of magni-

Michel Cusson, PhD, is an insect physiologist/biochemist at the Laurentian Forestry Centre (NRCan-CFS), Quebec City. His current work focuses on developmental disturbances by polydnaviruses and on the characterization of JH biosynthetic enzymes. Contact information: mcusson@RNCan.gc.ca, *telephone: (418) 648-3944, fax: (418) 648-5849; Natural Resources Canada, CFS-LFC, 1055 du P.E.P.S., PO Box 3800, Sainte-Foy, QC, Canada G1V 4C7.*

tude higher. Thus, you should keep in mind that the lower the titres, the greater the need for extensive purification prior to quantification, particularly if a physico-chemical approach or radioimmunoassay is being used.

As alluded to above, the method of choice is the gas chromatography/mass spectrometry method, namely the one developed by Bergot *et al.* (1981), for which there exist a few variations (*e.g.*, Teal *et al.* 2000). If you are interested in measuring the titres of individual JH homologues in a lepidopteran insect, this method is virtually the only one you can rely on. However, the average insect physiology laboratory does not have the required equipment (GC/MS) and/or expertise (in both analytical and organic chemistry) to face the challenge of this procedure. One option may be to strike a collaboration with one of the few groups that are still involved in this type of work or that have the expertise to guide you through the procedure in their laboratory. They may ask that you carry out some of the sample extraction and cleanup in your own laboratory, which is not too overwhelming provided that you use a detailed protocol (I can provide one). Alternatively, if you have access to a GC/MS and the funds to hire a resourceful chemist, you may be able to meet the challenge without having to depend on the contribution of an outside laboratory—but be prepared to devote plenty of time to this endeavour.

There exist several JH radioimmunoassays (*e.g.*, Goodman *et al.* 1995; Strami *et al.* 1981), all of which can provide fairly dependable measurements provided that samples are extensively purified prior to running the assay. The equipment required for carrying out this procedure (*e.g.*, vacuum concentrator, scintillation counter, centrifuge, TLC tank and HPLC pump) is more likely to be found in any modern laboratory than a GC/MS. However, you will need to obtain a suitable antiserum from a collaborator or be willing to take the steps necessary to generate one and characterize it. You will also need a minimum of expertise in sample extraction and chromatography, and be ready to spend many hours (i.e., weeks) fine tuning/adapting the procedure for your samples. If you intend to use this approach to measure JH titres in a Lepidoptera, you should make every effort to find an antiserum displaying a similar level of affinity for all JH homologues present in the sample so that you can reliably measure the titre of "total JH" (see Cusson *et al.* 1997, 1999). Lastly, measurement accuracy will be enhanced by the use of natural enantiomers of JH in the assay (Cusson *et al.* 1997).

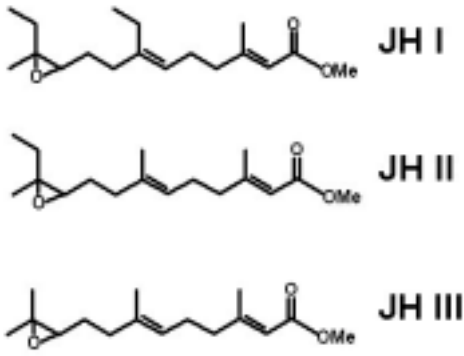


Figure 1. Stick representation of the three most common juvenile hormones.

Bioassays were the first methods used to directly estimate JH titres. They involve the injection or topical application of a JH extract in or onto an insect chosen for its ability to display clear morphological changes (*e.g.*, in pigmentation) following JH treatment. The insect is first treated with known doses of synthetic JH, and a score (say, from 0 to 5), representative of the degree of morphological change, is attributed to each dose, thus constituting a "standard curve" from which values for test samples can then be read. Sample preparation does not need to be as extensive for this method as for the other two, but one needs to establish a colony of the insect (*e.g.*, *Manduca* black mutant; Fain and Riddiford 1975) chosen for scoring. It goes without saying that bioassays will not provide accurate estimates of absolute titres.

In view of the difficulties associated with measuring JH titres, many workers have resorted to indirect approaches such as the *in vitro*

measurement of rates of JH biosynthesis by individual pairs of *corpora allata* (CA) using a radiochemical assay (Pratt and Tobe 1974; Tobe and Pratt 1974); in some insects, the biosynthetic activity of the CA is well correlated with JH titres (*e.g.*, Tobe *et al.* 1985). Assessing the level of transcription of a JH-regulated gene such as the JH esterase gene (Feng *et al.* 1999) may also, in some cases, provide a reasonable idea of the relative changes in JH titres.

It is clear from the foregoing discussion that measuring JH levels in an insect is no easy task. One hopes that recent biotechnological progress will lead to new, simpler procedures for making these titre determinations. In the meantime, do not hesitate to contact me should you have questions on the issue of JH titre measurements.

Bergot BJ, Ratcliff M, Schooley DA. 1981. Method for quantitative determination of the four known juvenile hormones in insect tissue using gas chromatography-mass spectrometry. *Journal of Chromatography* **204**: 231-244

Bloch G, Borst DW, Huang Z-Y, Robinson GE, Cnaani J, Hefetz A. 2000. Juvenile hormone titers, juvenile hormone biosynthesis, ovarian development and social environment in *Bombus terrestris. Journal of Insect Physiology* **46**: 47-57

Cusson M, Delisle J, Miller D. 1999. Juvenile hormone titers in virgin and mated *Choristoneura fumiferana* and *C. rosaceana* females: Assessment of the capacity of males to produce and transfer JH to the female during copulation. *Journal of Insect Physiology*. **45**: 637-646.

Cusson M, Miller D, Goodman WG. 1997. Characterization of antibody 444 using chromatographically purified enantiomers of juvenile hormones I, II and III: implications for radioimmunoassays. *Analytical Biochemistry* **249**: 83-87

Cusson M, Laforge M, Miller D, Cloutier C, Stoltz D. 2000. Functional significance of parasitism-induced suppression of juvenile hormone esterase activity in developmentally delayed *Choristoneura fumiferana* larvae. *General Comparative Endocrinology* **117**: 343-354

Fain MJ, Riddiford LM. 1975. Juvenile hormone titers in the hemolymph during late larval development of the tobacco hornworm, *Manduca sexta* (L.). *Biological Bulletin* **149**: 506-521

Feng QL, Ladd TR, Tomkins BL, Sundaram M, Sohi SS, Retnakaran A, Davey KG, Palli SR. 1999. Spruce budworm (*Choristoneura fumiferana*) juvenile hormone esterase: hormonal regulation, developmental expression and cDNA cloning. *Molecular and Cellular Endocrinology* **148**: 95-108

Goodman WG, Orth AP, Toong YC, Ebersohl R, Himura K, Granger NA. 1995. Recent advances in radioimmunoassay technology for the juvenile hormones. *Archives of Insect Biochemistry and Physiology* **30**: 295-306

Pratt GE, Tobe SS. 1974. Juvenile hormone radiobiosynthesised by corpora allata of adult female locusts *in vitro. Life Science* **14**: 575-586

Strambi C, Strambi A, De Reggi ML, Hirn MH, Delaage MA. 1981. Radioimmunoassay of insect juvenile hormones and of their diol derivatives. *European Journal of Biochemistry* **118**: 401-406

Teal PE, Proveaux AT, Heath RR. 2000. Analysis and quantitation of insect juvenile hormones using chemical ionization ion-trap mass spectrometry. *Analytical Biochemistry* **277**: 206-213

Tobe SS, Pratt GE. 1974. The influence of substrate concentration on the rate of insect juvenile hormone biosynthesis by corpora allata of the desert locust *in vitro*. *Biochemical Journal* **144:** 107-113

Tobe SS, Ruegg RP, Stay BA, Baker FA, Miller CA, Schooley DA. 1985. Juvenile hormone titer and regulation in the cockroach *Diploptera punctata. Experientia* **41**: 1028-1034

Altises servis sur un plateau.

Par Magali Breton, Florent Courtin, et Yvan Pelletier

Petit coléoptère noir lustré de la famille des chrysomèles, l'altise adulte de la pomme de terre (*Epitrix cucumeris* (Harris)) a ses pattes arrières très développées, ce qui lui permet de sauter facilement si elle est dérangée sur la plante. En revanche, l'altise ne vole pas ou très peu. L'altise mesure de 2 à 5 mm de long. Ses antennes peuvent représenter de la moitié aux deux tiers de la longueur du corps (Holliday et Stewart 1994; Duval 1996). Cette tendance à s'enfuir dès l'approche d'un entomologiste rend l'échantillonnage de la densité de population des adultes relativement difficile surtout si le filet fauchoir n'est pas une option.

Ayant observé que la très grande majorité des altises avaient tendance à sauter vers le sol et non vers d'autres feuilles quand elles étaient dérangées, nous avons construit un plateau en carton, fendu en son milieu avec un trou au centre pour laisser passer la tige de la plante et possédant un système de charnière (Fig. 1). La surface du plateau était recouverte de Vaseline™ (gelée de pétrole blanche). Contrairement au Tanglefoot™, la Vaseline™ ne colle pas les feuilles, ce qui évite de détériorer la plante, tout en étant suffisamment collante pour retenir les insectes prisonniers. Ce plateau doit être suffisamment large pour couvrir l'aire de saut des altises. Le plateau que nous avons utilisé avait pour dimensions 80 cm x 74 cm. Le trou central avait un diamètre d'environ 9 cm. Les plantes à échantillonner ont été approchées lentement, afin de ne pas faire fuir les altises. Au moment de l'échantillonnage, le plateau a été placé sous la plante (on peut se servir d'une tige pour soulever lentement le feuillage) puis a été légèrement secouée pour faire sauter les altises. Au bout de 10 secondes, nous avons retiré le plateau du tour de la plante et avons compté le nombre d'altises prises au piège.

L'efficacité des pièges élaborés a été évalué en comparant les résultats avec une autre méthode, le «Whole Plant Bag Sampling» (WPBS) (Senanayake *et al.* 1993; Senanayake et Holliday 1988; Byerly *et al.* 1978). Dix jours avant l'échantillonnage, un sac a été placé autour d'une plante choisie au hasard dans la parcelle de pomme de terre. Au moment de l'échantillonnage, la plante a été approchée doucement puis le sac relevé et refermé hermétiquement aux deux extrémités. La plante a alors été coupée à sa base. Nous avons placé le sac récolté au congélateur (-15°C) pendant quelques heures. Ceci a permis de rendre le comptage des altises, une fois con-

F. Courtin

Figure 1: Échantillonnage de la population d'altises avec la méthode du plateau.

Yvan Pelletier, pelletiery@agr.gc.ca, dirige le Laboratoire de Physiologie des insectes au Centre de recherches sur la pomme de terre d'Agriculture et Agroalimentaire Canada à Fredericton. Intéressé par les insectes depuis son jeune âge, il complète sa maîtrise à l'Université Laval, puis son doctorat à Pennsylvania State University. Ses activités de recherche portent surtout sur le développement de cultivars de pomme de terre résistants aux insectes mais également sur la nature moléculaire de la résistance des insectes aux insecticides. Magali Breton et Florent Courtin étaient des étudiants à l'École Supérieure d'Ingénieurs et de Techniciens pour l'Agriculture en France lors de leur séjour de trois mois à Fredericton pendant l'été 2001.

gelées, plus facile. La plante a été minutieusement observée tige par tige et foliole par foliole. La terre et les folioles restantes ont été passées sur un tamis afin de séparer au maximum la terre des altises. Enfin, le sac a été à son tour minutieusement inspecté.

Pour chaque piège, nous avons procédé à dix échantillons, choisis au hasard dans une parcelle de pomme de terre. Cette expérience a été réalisée sur deux jours, mi-juillet 2001, par temps ensoleillé et chaud (25°C).

Le nombre moyen d'altises collectées avec la méthode WPBS était de 11.7 (SEM 2.61) et avec le plateau de 8.9 (SEM 0.99). Le test de comparaison des moyennes a montré qu'il n'existait pas de différence significative entre les deux.

On peut donc facilement et économiquement évaluer la densité de population d'altises adultes au moyen du plateau collant. L'échantillonnage est effectué rapidement et n'est pas influencé par le port de la plante. Nous avons effectué ces essaies avec la pomme de terre mais la méthode peut facilement être adaptée à d'autres cultures.

Byerly KF, Gutierrez AP, Jones RE, Luck RF. 1978. A comparison of sampling methods for some arthropod populations in cotton. *Hilgardia* **46**: 257-282.

Duval J. 1996. Les altises. http://www.eap.mcgill.ca/AgroBio/ab_head.htm

Holliday NJ, Stewart JG. 1994. L'altise de la pomme de terre. pp 276-277, In : *Maladies et ravageurs des cultures légumières au Canada*.

Senanayake DG, Holliday NJ. 1988. Comparison of visual, sweep-net, and whole plant bag sampling methods for estimating insect pest population on potato. *Journal of Economic Entomology* **81**:1113-1119.

Senanayake D.G, Pernal S.F, Holliday N.J. 1993. Yield responses of potatoes to defoliation by the potato flea beetle (Coleoptera: Chrysomelidae) in Manitoba. *Journal of Economic Entomology* **86**:1527-1533.

Editor's Note: For the September issue I thought it would be a great time for someone to write about how to make an effective presentation: setting up clear slides with PowerPoint, tips for speaking in public or even how to make a good poster. Other topics I thought could be covered in this column would be useful experiments for an undergraduate entomology lab, how to measure temperature, or tricks for rearing insects.

Volunteers sought for butterfly census

The North American Butterfly Association (NABA) Butterfly Counts is an ongoing program of NABA to census the butterflies of North America (United States, Canada and partially Mexico) and to publish the results. Volunteer participants select a count area with a 15-mile diameter and conduct a one-day census of all butterflies sighted within that circle. The counts are usually held in the few weeks before or after July 4th in the USA, July 1st in Canada and September16th in Mexico

For more information on the count program, and how to conduct a count, please contact:

NABA Butterfly Counts
2533 McCart
Fort Worth, TX 76110
E-mail: naba@naba.org
web site: www.naba.org

from http://esc-sec.org/photo_archive/photo_archive.htm

The Winston Lab, Simon Fraser University

The Winston lab is at Simon Fraser University (SFU), Burnaby, British Columbia. There are many entomology labs at SFU, including the Borden, Gries, Roitberg and Crespi labs. Check them out at http://www.sfu.ca/biology/. We share lab and office space with John Borden and his students, and they nicely tolerate the occasional bee flying around in exchange for honey in the fall. We are (affectionately?) known as the Swarm Team. Every summer there is a hotly contested cheesecake competition and a cookie competition at Halloween. Our bees have been featured on the TV shows; *Smallville*, and the *X-files*, and a recent 'B' movie *Killerbees!* Our main problems are the inevitable bee stings, and early mornings when we must be up before the bees. To combat these issues and maintain our high morale, we consume a steady diet of Tim Horton's fare. Other benefits of being in the Winston lab are the great people, and of course all the honey.

Professor Mark L. Winston; winston@sfu.ca, http://www.sfu.ca/biology/faculty/winston/
Mark received his BA and MA from Boston University, and his PhD from the University of Kansas. He has been a professor at Simon Fraser University since 1980. He is a member of the

R. Long

Members of Mark Winston's Lab at SFU. From left to right: Robin Whittington, Mark Winston, Anna Birmingham (glasses), Erik Von Krogh, Lora Morandin (top), Shelley Hoover (bottom), Michelle Franklin (top), Desiree Tommasi (bottom, glasses), Robin Cho, Jacopo Miro (top), Nick Charette (bottom), Heather Higo, Alita Krickan and Tracy Lau. Missing: Alice Miro, Claudia Ratti and Mowgli (dog).

Centre for Pest Management, the Behavioural Ecology Research Group and the Chemical Ecology Research Group, as well as a Fellow of the M.J. Wosk Centre for Dialogue and Director of the Undergraduate Semester in Dialogue. Mark is the author of numerous scientific articles, as well as many books and book chapters.

The Swarm Team

Technician

Heather Higo; hhigo@sfu.ca
What would we do without Heather? 'Lab tech' doesn't begin to describe her work. Heather is responsible for the maintenance and care of all the honey bee colonies, she assists the graduate students with their projects, and even manages to do her own research on many aspects of honey bee biology and pollination. Heather received her BSc and MSc from SFU.

Graduate students

Lora Morandin; PhD student, lmorandi@sfu.ca
Lora is currently studying the relationship between modern agricultural practices and pollinators. Her research focuses on; 1) the effects of pesticides on bee health and learning ability, and 2) the effects of different types of agriculture (organic, conventional and genetically modified) on wild bee diversity, abundance, and pollination efficacy. Lora's research is conducted at SFU and in rural Alberta. Lora did her BSc and MSc at the University of Western Ontario, working on bumble bee pollination of greenhouse tomatoes with Terence Laverty, UWO and Peter Kevan, University of Guelph.

Shelley Hoover; PhD student, sehoover@sfu.ca, http://www.sfu.ca/~sehoover/
My primary research objective is to investigate how natural selection pressures have acted on social

S. Hoover

Chris Tucker and Heather Higo doing some spring beekeeping, Burnaby B.C., May 2002.

insects to produce different life history strategies, colony types and reproductive modes. I am interested in; 1) the evolution of multiple mating in honey bees, 2) genetic and environmental variation in honey bee behaviour and physiology and 3) factors influencing worker reproduction in social insects. Specifically, I have been looking at pheromones that inhibit honey bee worker ovary development, genetic and environmental variation in worker reproduction, and selecting for high and low levels of worker honey bee reproduction. I have also been collaborating with Ben Oldroyd at the University of Sydney, looking at factors leading to the 'Anarchistic Syndrome' in which honey bee workers lay eggs despite the presence of a reproductive queen. I did my BSc at the University of Northern British Columbia, and worked on rootcollar weevils and ambrosia beetles with Staffan Lindgren and aquatic insects with Josef Ackerman.

Anna Birmingham; MSc student, alb@sfu.ca
Anna also works in greenhouses, studying the orientation and social structure of bumble bees in greenhouses. She has looked at; 1) the incidence of drifting bees, 2) whether landmarks aid bee orientation in greenhouses and 3) the reproductive status of drifting and resident bees. She has found that the incidence of drifting bees in greenhouses is high and the drifting bees are more reproductively active in their host colonies than the resident bees. Anna is famous for having bikes stolen, and trying to avoid accidents. Anna completed her BSc at the University of Western Ontario, looking at the foraging constancy of bumble bees with Terence Laverty.

Robin Whittington; MSc student
Robin recently defended her MSc thesis examining factors that limit bumble bee colony growth and pollination on commercial greenhouses. She investigated; 1) whether bumble bees received adequate nutrition in tomato greenhouses, 2) whether bumble bees forage outside the greenhouses and if so how much?, 3) the relative merits of *Bombus impatiens* and *B. occidentalis* as greenhouse pollinators and 4) the protozoan parasite *Nosema bombi*. Robin did her BSc at SFU, and will be working in Banff this summer. She will be sorely missed.

Claudia Ratti; MSc student, cratti@sfu.ca
Claudia is the most recent addition to the lab. She will be studying native bee abundance and diversity in berry crops in the Fraser Valley. Claudia graduated with her BSc from the University of Waterloo.

Undergraduate stundents

Michelle Franklin; BSc student, mfrankli@sfu.ca
Michelle has been working in the lab since 2001, and has recently completed and NSERC undergraduate project looking at the effects of a new pesticide on bumble bee health, learning and foraging ability. She hopes to continue in biology, studying aquatic habitats, and will graduate from SFU in fall 2003.

Mascot

Mowgli

Mowgli is Lora's dog, and a full-fledged lab member. She often provides a much-needed Frisbee break, and her breath isn't all that bad.

Editor's Note: If you would like to share what is happening in your laboratory, please contact me. This is good way for potential graduate students to learn about your lab.

The Student Wing / L'aile étudiante

By Tonya Mousseau


M. Alperyn

Greetings to everyone from the ESC student representative! It is my pleasure to be introducing *The Student Wing*, a column in the *Bulletin* devoted entirely to graduate students. At the request of the students, a list of recently defended theses is included. If you know of someone who is a Canadian abroad or from a Canadian University that has successfully completed his or her thesis in the last six months, send the information to me to be published in the next *Bulletin*. Graduate students are also encouraged to write in questions, which can then be answered by experts in the field.

I look forward to meeting with everyone at the ESC 2003 meeting in British Columbia. This year, there will be a special 'informal' students night to be held at the Kelowna Curling Club, a short walk from the hotel. There will be food, pool tables, dartboards, and most importantly, a bar. This will be our chance to get acquainted with each other and share research experience.

Thesis roundup / Un foisonnement de thèses

Nancy Champagne; champagne.nancy@caramail.com, MSc, avril 2003. *Évaluation de la diversité entomologique au sol et effet de la modification de la gestion des végétaux sur les insectes au sol le long d'emprises autoroutières de trois milieux différents (agricole, forestier et périurbain) dans le sud du Québec (Canada).* Directeur : Jean-Pierre Bourassa, Université du Québec à Trois-Rivières

Eleanor Fast; efast1@po-box.mcgill.ca, MSc, April 2003. *Diversity of Brachycera (Diptera) in a Quebec old growth forest*. Supervisor: Terry Wheeler, University: McGill University

Myungpyo Jung, jung7504@hanmail.net, MSc, February 2003. *Analysis of soil-dwelling spider community in agricultural landscape.* Supervisor: Joon-Ho Lee, Seoul National University

Samuel M. Migui; samuel.migui@csiro-europe.org, PhD, April 2002. *Host relationships of three aphid species on wheat in the genus* Triticum*: Potential for crop resistance in spring wheat.* Supervisor: Robert Lamb, University of Manitoba

Allison C. Poff; allison_poff@hotmail.com, MSc, April 2003. *Adaptive oviposition behaviour in the goldenrod stem galler,* Eurosta solidaginis *(Diptera: Tephritidae).* Supervisor: Richard Sweitzer, University of North Dakota

Kelly Shoemaker; shoemakk@biology.queensu.ca, PhD, March 2003. *Interactions between immunity and reproduction in the cricket,* Gryllus texensis. Supervisor: Shelley Adamo, Dalhousie University

Alice Sinia; asinia@sfu.ca, http://www.sfu.ca/~roitberg/la/people/alice_sinia.htm, MPM (Masters of Pest Management), January 2003. *Effect of plant feeding on predation and forage behaviour in* Dicyphus hesperus *Knight (Heteroptera: Miridae).* Supervisor: Bernie Roitberg, Simon Fraser University

David Wade; dwade@mb.sympatico.ca, MSc, October 2002. *The effect on the spider (Araneae) fauna of tallgrass prairie and its implications on prairie management.* Supervisor: Robert Roughley, University of Manitoba

Questions and answers / Questions et résponses

What are the "key" classic books every graduate student should read, for example, on entomology in general, on the scientific method, on research design, or on statistical analysis? **Kathy Bleiker**, University of Montana

Entomology

Borror, DJ, Triplehorn CA, Johnson NF. 1989. *An introduction to the study of insects.* 6th edition. Montreal: Saunders College Publishing

Chapman RF. 1998. *The insects, structure and function*. 4th edition. Cambridge: Cambridge University Press

Essig EO. 1972. *A history of entomology*. New York: Hafner Publishing Company

Gillott C. 1995. *Entomology*. New York: Plenum Publishing Co.

Gullan PJ, Cranston PS. 1994. *Insects: An outline of entomology*. New York: Chapman & Hall

Price PW. 1997. *Insect ecology.* 3rd edition, New York: John Wiley & Sons

Riegert PW. 1980. *From arsenic to DDT*. Toronto: University of Toronto Press

Methodology

Ford ED. 2002. *Scientific method for ecological research.* Cambridge: Cambridge University Press

Robertson JL, Preisler HK. 1992. *Pesticide bioassays with arthropods*. Boca Raton, FL: CRC Press

Southwood TRE. 1988. *Ecological methods*. 2nd edition. Boston: Kluwer Academic Publishers

Statistics

Sokal RR, Rohlf FJ. 1997. *Biometry.* 3rd edition. Englewood Cliffs, NJ: W. H. Freeman & Co.

Zar JH. 1996. *Biostatistical analysis*. New York: Prentice Hall

Motulsky H. 1995. *Intuitive biostatistics.* Oxford: Oxford University Press

Pest management

Jervis M, Kidd N. 1996. *Insect natural enemies: Practical approaches to their study and evaluation.* New York: Chapman & Hall

Metcalf CL, Flint WP, Metcalf RL. 1962. *Destructive and useful insects: Their habits and control.* New York: McGraw-Hill Book Company

Metcalf RL, Luckmann WH. 1994. *Introduction to insect pest management.* 3rd edition. New York: John Wiley & Sons

Regnault-Roger C, Philogène BJR, Vincent C. (*Editors*). 2002. *Biopesticides d'origine végétale*. Paris: Lavoisier Tech. & Doc.

Tanada Y, Kaya HK. 1993. *Insect pathology.* New York: Academic Press Inc.

Van Driesche RG, Bellows TS. 1996. *Biological control*. New York: Chapman & Hall

Vincent C, Coderre D. (*Editeurs*). 1992. *La lutte biologique.* Paris: Gaëtan Morin (Editeur, Montréal) & Lavoisier Tech. & Doc.

Vincent C, Panneton B, Fleurat-Lessard F. (*Editeurs*). 2000. *La lutte physique en phytoprotection.* Paris: Editions INRA

Vincent C, Panneton B, Fleurat-Lessard F. 2001. (*Editors*). *Physical control methods in plant protection.* Heidelberg: Springer-Verlag/INRA

Writing

Day RA. 1998. *How to write and publish a scientific paper.* 5th edition. Phoenix: Onyx Press
Elbow P. 2000. *Everyone can write essays: Towards a hopeful theory of writing and teaching writing.* Oxford: Oxford University Press

Answer provided by **Charles Vincent**, ESC First Vice-President

Questions looking for answers / Questions sans résponses

Are there any programs to facilitate exchange of students (three to six months) between provinces among universities and government or private industries? **Dominique Fleury**, Institut des Sciences de l'Environnement (UQM).

I'll soon be finishing my graduate degree in entomology and I am thinking ahead to getting a job. What are some different career paths in entomology? What can I do with my degree? **Jen Perry**, Simon Fraser University

Editor's Note: If you have a question or an answer to the above questions, or you have other items for The Student Wing*, please contact Tonya Mousseau,* tonyabeetle@hotmail.com*, Department of Entomology, University of Manitoba, Winnipeg, MB, Canada R3T 2N2.*

Graduate student position available

Resistance of wild potatoes to aphids A graduate student assistantship at the PhD level is available for a student to evaluate the interactions between wild potatoes and potato infesting aphids. The candidate will characterize the influence of plant chemicals, and other factors associated with resistance in wild *Solanum* species, on the preference and performance of aphids. The candidate will also be able to investigate the resistance of hybrids of wild *Solanum* species to the aphids, as both wild potato species and hybrids of wild potato species are available at the Potato Research Centre, Agriculture and Agri-Food Canada, in Fredericton. This project is part of an international initiative on potato resistance to aphids that includes; the University Picardie-Jules Vernes (France), Université du Québec à Montréal, Cavendish Farms, the University of New Brunswick and Agriculture and Agri-Food Canada.

The successful candidate will start a graduate program in summer (June) or fall (September) 2003. An annual stipend of $14,500 is available in addition to other sources of income from scholarships and GTA's. To apply, contact by e-mail or send CV with names, addresses and telephone numbers of three references to either:

Yvan Pelletier
Potato Research Centre
Agriculture and Agri-Food Canada
PO Box 20280, 850 Lincoln Road
Fredericton, New Brunswick
Canada E3B 4Z7
Telephone: (506) 452 3260
E-mail: pelletiery@agr.gc.ca

Dan Quiring
Population Ecology Group
University of New Brunswick
Fredericton, New Brunswick
Canada E3B 6C2
Telephone: (506) 453-4922
E-mail: quiring@unb.ca.

ESC awards and scholarships

Postgraduate awards
Two postgraduate awards of $2000 will be offered to assist ESC student members beginning study and research leading to a first post-graduate degree in entomology. The postgraduate awards will be made on the basis of high scholastic achievement. **Deadline: 10 June 2004**

Research-travel grants
Two research-travel grants of a maximum of $2000 will be awarded to help ESC student members increase the scope of the graduate training. Applications will be judged on scientific merit. **Deadline: 14 February 2004**

For complete details, consult;
http://esc-sec.org/students.htm, *Bulletin ESC* 2002 34 (4): 165-173, or Dave Gillespie at gillespied@agr.gc.ca

Prix et bourses de la SEC

Bourse pour étudiants post-gradués
La Société d'entomologie du Canada offrira deux bourses d'une valeur de 2000 $ chacune pour aider des étudiantes et étudiants de la SEC qui débutent des études post-graduées et des recherches en vue de l'obtention d'un premier diplôme d'études supérieures en entomologie. Les bourses seront accordées aux étudiants ou étudiantes en raison des seuls critères de réussite académique. **Date limite : le 10 juin 2004**

Subventions de recherche-voyage au niveau des études supérieures
Deux subventions de recherche-voyage, d'un maximum de 2000 $, ont pour objet d'aider les étudiants et étudiantes de la SEC à élargir le champ de leur formation supérieure. Les candidatures seront jugées selon leur mérite scientifique. **Date limite : le 14 févier 2004**

Pour de plus amples renseignements consulter;
http://esc-sec.org/students.htm, *Bulletin SEC* 2002 34 (4): 165-173, ou Dave Gillespie à gillespied@agr.gc.ca

Arctic and boreal entomology course: Churchill, Manitoba

General Scope of Course:
Interactions of the northern entomo-fauna with biotic and abiotic elements (*e.g.* plant/insect relationship, entomophathogens, insects and wildlife, coastal and freshwater habitats). This course will be of interest to students and individuals interested in the ecology of insect communities across one of the world's most important ecotones.

Particulars:
The course will be held at the Churchill Northern Studies Centre (CNSC) located in Churchill, Manitoba from 9-24 August 2003. The cost is $1000 US (approximately $1500 CND). This includes room and board at CNSC, supplies, use of equipment and laboratory space. Cost does **NOT** include travel to and from Churchill. There will be evening lectures and discussions, with field excurisons to: tundra, krumolz, seasides, boreal forest at the tree line and glacial moraines.

Instructors:
Rob Roughley, Professor, University of Manitoba and
Peter Kevan, Professor, Department of Entomology
University of Guelph, Guelph, Ontario Canada N1G 2W1, pkevan@uoguelph.ca
See the web site for additional details: http://www.uoguelph.ca/~pkevan/courses/arcent.html

Scholarship fund

Once again the Society would like to thank and acknowledge the very generous donors to the ESC scholarship fund. Donations to the scholarship fund totaled $4710 in 2002. These tax-deductible donations are very important to the Society. The scholarship fund generated $6930 in interest during 2002, but $8000 in scholarships and travel grants were awarded. In 2003, $9000 in awards will be granted. It is only because of your generosity that the scholarship fund is self sustaining. Donations can be made at any time and a receipt for income tax purposes in Canada will be issued. Please make cheques payable to the Entomological Society of Canada.

2002 Scholarship donors

G. Ball
E. Becker
J. Borden
G. Byers
R. Byers
A. Cameron
J. Churcher
B. Cooke
J. Cunningham
K. Davey
P. de Groot
J. Delisle
P. Dixon
R. Edwards
P. Fields
S. Fitzpatrick
R. Forbes
G. Gibson
D. Gillespie
M. Goettel
P. Harris
N. Holliday
R. Jaques
R. Leech
S. Lindgren
S. Loschiavo

And those who gave anonymously

Fonds de bourses d'études

La Société tient à remercier, une fois de plus, les généreux donateurs et généreuses donatrices au Fonds de bourses d'études de la SEC. Nous avons reçu un total de $4710 en 2002. Ces dons déductibles d'impôt sont très importants pour la Société. Le Fonds de bourses d'études a généré $6930 d'intérêt en 2002, mais $8000 en bourses d'étude et de voyage ont été attribués. En 2003, $9000 seront attribués en bourses. C'est seulement grâce à votre générosité que le fonds peut être autosuffisant. Les dons peuvent être faits pendant toute l'année, et un reçu pour fin d'impôt vous sera envoyé. Veuillez libeller votre chèque à la Société d'entomologie du Canada.

Donateurs et donatrices 2002

M. MacGillivray
L. MacLauchlan
J. McLean
L. Merrill
T. Okubo
I. Otvos
D. Peschken
B. Philogène
T. Poland
D. Quiring
L. Rankin
B. Roitberg
L. Royer
R. Shepherd
J. Shorthouse
S. Smith
T. Smith
A. Stevenson
J. Sweeney
J. Turgeon
V. Vickery
J. Webster
R. Westwood
D. Wood
P. Wood

Et ceux et celles qui ont donné de façon anonyme

Research-travel-grant winners

The winners of the Entomological Society of Canada Graduate Research-Travel Grants are Patrik Nosil, Department of Biology, Simon Fraser University, Burnaby, British Columbia and Tara Gariepy, Department of Biology, University of Saskatchewan, Saskatoon, Saskatchewan. Patrik Nosil will use the grant to travel to California to collect populations of *Timema* walking sticks as part of his studies on the evolution of host races in phytophagous insects. Tara Gariepy will use the grant to travel to Europe to collect specimens of *Peristenus* spp. in order to develop molecular marker tools to aid in studies of non-target effects of exotic natural enemies.

Application for membership (new members only)
*Demande d'adh*ésion (nouveaux membres seulement)

Entomological Society of Canada / Société d'entomologie du Canada
393 Winston Ave., Ottawa, Ontario, Canada K2A 1Y8
Tel: (613) 725-2619, Fax: (613) 725-9349

Name & Address (please print): / Nom & Adresse (lettres moulées SVP) :

_____

_____

Telephone (bus.) / Téléphone (au travail) : ( ) _____

E-mail/courriel : _____ Fax : ( ) _____

Keywords describing interest (up to six): _____
Décrivez vos intérèsts en utilisant jusqu'à six mots clés : _____

Membership is a personal affiliation; publications are the personal property of the individual member.
La cotisation est une affiliation personnelle; les publications payées ici appartiennent à l'individu.

Membership Dues with / Cotisation avec
The Canadian Entomologist ☐ Print/Imprimé ☐ Web or/ou or/ou ☐ Both/Les deux
and/et *Bulletin* ☐ Print/Imprimé

☐ REGULAR / RÉGULIER	Canada:	$85.60 Cdn (GST/TPS incl.) or/ou	
		$92.00 Cdn (HST/TVH incl.)	.....
OR	USA & Int'l:	$74.00 US or/ou $100.00 Cdn	.....
☐ STUDENT / ÉTUDIANT	Canada:	$42.80 Cdn (GST/TPS incl.) or/ou	
		$46.00 Cdn (HST/TVH incl.)	.....
	USA & Int'l:	$36.00 US or/ou $45.00 Cdn	.....

Membership with / Cotisation
Bulletin only/seulement ☐ Print/Imprimé

☐ STUDENT / ÉTUDIANT	Canada:	$21.40 Cdn (GST/TPS incl.) or/ou	.....
		$23.00 Cdn (HST/TVH incl.)	.....
	USA & Int'l:	$18.00 US or/ou $25.00 Cdn	.....

Endorsement / Signature du professeur.....

TOTAL PAID / PAYÉ ☐

Official receipt / reçu officiel ☐ Yes/Oui
Name and contact information on the ESC Web Membership Directory? ☐ Yes/Oui
Nom et vos coordonnées dans l'annuaire Web de la SEC des membres? ☐ No/Non

Cheque or money order payable in Canadian or US Funds as detailed above, through Canadian or US Institution to the Entomological Society of Canada.
Chèque ou mandat poste payable ($ Canadiens ou US, ci-dessus) par établissement canadien ou US à la Société d'entomologie du Canada.

☐ MASTERCARD ☐ AMEX or/ou ☐ VISA
#..... Exp. Date ...../..... Signature.....

Silveira FA, Melo GAR, Almeida EAB. 2002. ***Abelhas Brasileiras: Sistemática e Identifiçno.*** *Ministério do Meio Ambiente, Probio - PNUD, Fundaçno Araucária. Belo Horizonte. 253 pp. ISBN 85-903034-1-1 (paper) *US$30.00 (S&H included).* *North and Central American distribution by Eduardo Almeida, Dept. of Entomology, 3126 Comstock Hall, Cornell University, Ithaca, NY - 14853

Brazil is one of the most biologically diverse places on Earth, but only a very small proportion of its biota, especially insects, has actually been described. An exception to this would be the bees of Brazil which are apparently well known, having received the attention of several of the world's prominent bee systematists and biologists. Moreover, Brazil's melittologists and ecologists have been leaders in global initiatives in pollinator conservation, now a forefront concern for the Convention on Biological Diversity. Therefore, this book *Abelhas Brasileiras: Sistemática e Identifiçno* (*Brazilian Bees: Systematics and Identification*) should be very useful to entomologists, ecologists and botanists interested in bee biology, taxonomy and pollination studies in Brazil.

Written in Portuguese, this volume presents the bees of Brazil down to the level of subgenus. Like its counterpart, "The Bee Genera of North and Central America" (Michener *et al*., 1994; Smithsonian Institution Press), this volume provides a regional key for bee identification. The book is soft-bound, but strong. The cover is stiff and attractive, illustrating a small array of the bees of Brazil. This is important for a book that contains working keys which will be used beside a binocular microscope. The paper is high-quality, not shiny, and the print is crisp and clear.

Part A of the book presents a well-illustrated account and description of general bee anatomy (Chapter 1), an informative description of collection and preservation techniques that includes specimens in alcohol and how to remove pollen, resins, and gums (Chapter 2), an account of the origins and biogeography of Brazilian bees (Chapter 3), a general classification of bees (Chapter 4), and a brief introduction to the state of knowledge about Brazilian bees (Chapter 5).

Part B of the book provides illustrated keys (almost 300 illustrations by M. Fátima Seleme Zagonel) for identification of Brazilian bees, including a key to family level (Chapter 6). The subsequent chapters (7-11) provide keys to subfamilies, tribes, subtribes, genera, and subgenera of Andrenidae, Apidae, Colletidae, Halictidae, and Megachilidae, respectively. Many of the morphological characters described in the text are illustrated to allow the user to understand exactly what is useful and to distinguish key features. In addition, illustrations fall within a page or two of their mention, which facilitates their ease of use as one does not have to flip far to find them.

The taxonomy primarily follows Michener's *Bees of the World* (2000 - Johns Hopkins Press). Differences lie primarily in the classification of the Apidae, tribe Apini. The classification followed here places four previously recognized tribes (Apini, Bombini, Euglossini, and Meliponini) into subtribes of Apini. The other major difference is the recognition of the subfamily Paracolletinae (Colletidae), containing genera recently placed back into the Colletinae by Michener (2000). Smaller differences lie in the recognition of several genera described as subgenera by Michener, leading to much higher numbers of recognized genera (eg., 27 versus 10 genera of meliponine bees). In total, 202 genera are recognized from Brazil, including three proposed since the publication by Michener (2000). A list of species presently described from Brazil (more than 1500) are included with the generic/subgeneric descriptions, with citations for species level taxonomic keys. At the end is a five-page glossary (Part C), an extensive bibliography (Part D), and a taxonomic index (Part E).

The Preface, by Padre Jesus Santiago Moure, who may be considered the father of Brazilian melittology praises this book for the important contribution that it is. All in all, the authors, the illustrator, and the publishers are to be congratulated heartily for the preparation of an excellent publication, not just for its scientific content and scope, but also for the quality of production.

Cory Sheffield and Peter Kevan
University of Guelph

Entomologists receive the Order of Canada

The following was taken, in large part, from the website of the Governor General of Canada, www.gg.ca

Geoffrey G. E. Scudder

Vancouver, British Columbia

His reputation for excellence is far-reaching. An entomologist, he is a world authority known for important research, including the discovery that certain species can help track the effects of environmental degradation and global warming. He served as head of the University of British Columbia's renowned Department of Zoology for 15 years and has held other leadership roles, notably president of the ESC (1986-1987) and of the Canadian Society of Zoologists (1989-1990). In addition, he is very active in promoting conservation, particularly in BC, where he is involved with numerous biodiversity projects. He was elected as a Fellow of the ESC in 1977, and he was awarded the ESC Gold Medal in 1975. He was appointed as a Member of the Order of Canada on 1 May 2002.

Geoffrey Scudder

Victor Arnold Dyck

Saskatoon, Saskatchewan and Vienna, Austria

He is a respected entomologist whose life's work has had a positive effect on insect pest control practices around the world. A specialist in agricultural research and the use of Sterile Insect Technique, he led the Agriculture Canada codling moth research project in the Okanagan Valley, which had a major impact on the fruit tree industry of BC. His consulting work in Zanzibar helped to eliminate their tsetse fly population. Currently a consultant for the International Atomic Energy Agency, he has contributed, through his enthusiasm, his research abilities and his leadership skills, to the development of the agricultural and economic sectors of many countries. He was appointed as a Member of the Order of Canada on 30 May 2001.

Samuel Loschiavo

Winnipeg, Manitoba

A highly respected entomologist, he has made major contributions to Canadian society through his innovative research work. His studies were instrumental in improving the storage capability and quality of prairie cereals used worldwide today. His inventions have been adopted, and are being used in research programs and practical applications in many countries. A longtime volunteer in his province's social and cultural arts communities, he founded or co-founded such institutions as the Italian Canadian League of Manitoba Memorial Foundation and Winnipeg's Folklorama. He has served on the Board of Directors of many organizations including Villa Rosa, Manitoba Folk Arts Council, Citizenship Council of Manitoba, Manitoba Historical Society and granting agencies. He served as President of ESC in 1980-81, and was elected as a Fellow of the ESC in 1988. Earlier, he was President of the Entomological Society of Manitoba in 1966-67, and elected as Honourary Member in 1988. He was appointed as a Member of the Order of Canada on 15 November 2000.

J. Dupuis

Sam Loschaivo receiving the Order of Canada from the Governor General of Canada, Her Excellency, The Right Honourable Adrienne Clarkson.

By Lazlo (Les) Magasi

Just what was FIDS?

One of the side effects of becoming older is that one gets asked things like "Would you write something on the history of FIDS?" Gladly. However, I must start by pointing out that the trouble with history is that the beginning of almost any story is shrouded in clouds, poor records and poorer memories - and that I was not there at the beginning.

What about FIDS, the Forest Insect and Disease Survey, or, simply (and affectionately) just "the Survey"? The group survived for 60 of the 100 years of the Canadian Forest Service - the longest uninterrupted project in CFS history, which by itself is a remarkable achievement. This story is mainly about the Atlantic Region.

In the early 1930s, the European spruce sawfly was happily chomping its way through thousands and thousands of acres (in those days it was acres) of prime mature forests in the Maritimes and parts of Quebec. In 1936, the Dominion Entomological Laboratory, Fredericton, was responsible for forest insect investigations (and agricultural insects) not just in New Brunswick and Prince Edward Island, but also in the Gaspé. Some people thought it important to "track the outbreak", so in 1936, following lengthy correspondence between R.E. Balch, Officer-in-Charge of the Fredericton Laboratory, and J.J. de Gryse, Ottawa, the Canadian Forest Insect Survey was established. During that first year, "Mr. Balch was in general charge… assisted by Messers Bennett and Patterson and several seasonal helpers", and they submitted two samples to Ottawa. That's how it all started.

In 1939, the Forest Insect Survey collected 1312 samples, when the unit was directed by Reg Balch and staffed by Lloyd Hawboldt (in charge) and four part-timers. Fredericton operated as one of three laboratories in Canada. Subsequently, FIDS units were established in other regions and national reports were produced from 1936 to 1995, constituting an invaluable record of population gradations and outbreaks. But this story is about FIDS in the Maritimes.

In addition to the Maritimes, Fredericton also looked after Newfoundland from 1944 (5 years before Newfoundland became a province of Canada) until 1959, when the Corner Brook Laboratory was recognized as a separate functional FIDS unit under the direction of Joe Carroll. Survey activities were continued on a somewhat reduced scale during the early 40s, "due to difficulties arising out of uncontrollable conditions created by the national emergency", a much understated reference to the Second World War.

Things started to pick up after the war… …and there they were, rambling along in a surplus army truck, Canada's decommissioned veterans, soldiers, sailors, airmen and merchant marines. They were ready - just a year after the cessation of hostilities - to protect the Canadian forests as the first crop of Rangers of the Forest Insect and Disease Survey in the Atlantic Region. Times changed and others followed, but that was the real start.

The Rangers were always the heart and soul of FIDS operations. The first Ranger ever hired was Jerry Moran in 1946 (a lieutenant seriously wounded in Normandy on D-Day). He later became the first and only Chief Ranger ever in the

---

Les Magasi is a mycologist who was head of the FIDS unit in Fredericton from 1974 to 1996. He was a student in forestry at Sopron University in Hungary when Hungary rebelled against Communist rule. The entire forestry school was brought to British Columbia under the sponsorship of UBC. Les received his BSc Forestry and MSc from UBC, and PhD from New York State University in Syracuse. He retired in 1997, but maintains his interest in forestry. This article was written for the Atlantic Forestry Centre in-house newsletter Out on a Limb *in celebration of the 1999 Canadian Forestry Service Centennial* "A century of innovative solutions". *Adapted for the* Bulletin *by Doug Eidt.*

FIDS work conference at Fredericton, 1992
Front row: Mike Power, Newfoundland Forest Research Centre, St. John's; Denis LaChance, Laurentian Forest Research Centre, Québec; Les Magasi, Maritimes Forest Research Centre, Fredericton; Les Carlson, HQ, Ottawa; Ed Hurley, Fredericton; Bruce Pendrel, Fredericton. Back row: Ben Moody HQ; Herb Cerezke, Northern Forest Research Centre, Edmonton; John Hudak, Newfoundland Forest Research Centre; Gordie Howse, Great Lakes Forest Research Centre, Sault Ste. Marie; Al Van Sickle, Pacific Forest Research Centre, Victoria.

Maritimes. Other Rangers that year were Ken Fraser, Jim Seaton and Lawney Williams. The first Ranger with both insect and disease survey responsibilities was Carl Burlock in 1966, the first francophone Ranger Regis Cormier in 1984, the first Ranger with a university degree Wayne MacKay in 1980, and the first Ranger with a forestry degree - and also the last Ranger ever hired, in 1992 - was Gérard Lemieux. (We tried but never managed to hire the first female Ranger - that distinction belongs to FIDS - Pacific).

In 1951, "it was decided that…the results of the combined [insect and disease] surveys should be presented in a single report", so the Forest Disease Survey was officially recognized, and the first annual report written by Mert Stillwell, a forest pathologist at Fredericton. Although officially still separate for another decade, there was much cooperation with the Insect Survey and when the Forest Insect and Disease Survey was formalized in 1962, it was already just that.

Some of the major developments within FIDS included: the establishment of a sub-laboratory in Nova Scotia in 1947, first at Halifax, then in 1951 in permanent quarters at Debert; the inception in 1951 of an organized Forest Disease Survey; the incorporation of a coding system and the installation in 1952 of punch-card business machines at Fredericton; the opening of a new laboratory at Corner Brook and the establishment in 1959 of independent FIDS operations in Newfoundland.

Identification and rearing operations were centralized at Fredericton and the Nova Scotia segment was moved to Truro in 1966. Punch-card records were computerized in 1967. Five posi-

tions were lost in the sweeping "deadwood" layoffs of 1969. Pest Detection Officer programs for provincial and industrial cooperators were established in New Brunswick in 1973, and in Nova Scotia and Prince Edward Island soon after. FIDS was moved from the overcrowded forestry laboratory to off-site rented quarters in 1974, the 'exile' ending in 1988 with the completion of the Hugh John Flemming Forestry Complex. FIDS survived numerous audits, reviews, investigations and changes in strategic directions from the mid 60s until early 1995 when the remnants became the foundation upon which the Forest Health Network was built.

Responsibility for the operation of the Survey in the Maritimes rested with Reginald Balch in 1937, Lloyd Hawboldt from 1938 to 1943, Ed Reeks from 1944 to 1955, Bob Forbes from 1956 to 1974 and Les Magasi from 1974 to the end, in 1996.

During its 60 years of operation in the Maritimes FIDS had over 70 staff members, over 100 students, many temporary assistants and hundreds and hundreds of federal, provincial, industrial, municipal, educational and private cooperators. They all contributed - in countless ways - to a better understanding of the forestry, biological and environmental sciences, to the improvement of forest management and to the protection of the forest environment.

Recently deceased
Compiled by Ed Becker

Stuart G. Brown, husband of Marguerite, #205, 920 Glenwood Ave., Kelowna BC V1Y PP2, (250) 860-6482, died on 8 September 2002, at age 85. Stuart used to work with the old Plant Protection Division, first in Victoria, then in Ottawa from 1961 until retirement.

Daphne T. Fairey, age 57, wife of Nigel, P. O. Box 844, Beaverlodge AB T0H 0C0, (780) 354-8715, died on 6 March 2003 from a brain tumor. Daphne worked for several years at the Lethbridge Research Station on leafcutting bees and was a member of the ESC.

Cal Sullivan, husband of Marjorie, 80 Indian Rd., Sault Ste. Marie ON P6A 4Y5, (705) 253-8419, died on 27 March 2003 at age 77. Cal spent his career (38 years) at the Great Lakes Forest Research Centre as a Research Scientist and Program Manager.

Maurie Taylor, husband of Doris, 3319 Harrington St., Saskatoon SK S7H 3Y2, (306) 374-7180, died on 9 April 2003, at age 87. For 30 years he was at the Dominion Entomological Laboratory (now Agriculture and Agri-Food Canada), Saskatoon. Initially he was engaged in research into the biology and control of cutworms and armyworms in field crops. From 1961 until retirement he was extension entomologist and scientific liaison officer at the research station.

By June Herbert

Harold Stulz
1902-2003

A. T. Lightfoot

Harold Stultz was born in Saint John, N.B., in 1902. His family moved to Chrystal Springs Farm, Steeves Settlement, in 1922. Following his early education in Saint John and Havelock he attended the Provincial Normal School. He graduated from Acadia University with a BA in 1928, then did graduate studies at Osborne Zoology Laboratory, Yale University, from 1928-1930. From 1930 to 1933 he taught Nature Study at Greenwich Country Day School, Greenwich, Conn. At this time he developed an interest in the theory of economic entomology and decided he would be a professional entomologist in Canada. He entered Macdonald College in 1933, completing his graduate studies in 1937.

Harold's professional entomological career began at the Dominion Entomological Laboratory in Annapolis Royal, N.S., in 1935. Later the headquarters moved to Kentville where he remained until retiring in 1968. The major portion of his career was devoted to studying a number of species of Lepidoptera. He extensively studied the bionomics of the codling moth. In the 1930's this pest had become a serious problem for apple growers in other parts of the world due mainly to the failure of arsenical sprays. An upsurge of this pest in parts of the Annapolis Valley caused alarm. Harold undertook a detailed study of the biology of this pest, including the effectiveness of lead arsenate applied at different times for control, and its parasites and predators. The entomological team at the laboratory was then encouraged to undertake extensive studies on the relationship of sprays to an increase in pest problems thus initiating the ecological studies on the fauna in apple orchards in general. This became known as the integrated pest control program to permit maximum effectiveness of natural enemies and the minimum use of chemical sprays. Harold's contributions to this program included a study of the natural enemies of the eye-spotted bud moth, life history and natural control of the pale apple leaf roller, and the spotted tentiform leaf miner. He carried out a fall survey of apple aphid species which served to alert growers to current conditions and to the best time to apply controls.

In relationship with the certification program of the strawberry-growing industry, he surveyed strawberry fields in the Maritimes to determine which of the known aphid species and leaf roller vectors of the strawberry virus disease were present. This led to aphid controls to improve the disease-free certification program. Harold also studied field mice and their damage to apple trees. His early warning system led to mice suppression to manageable levels.

Following his retirement he was employed for six months in 1969 with the Nova Scotia Department of Agriculture to compile the first fruit tree protection guide for use by fruit growers. The following summer, the provincial government called upon Harold to serve as Extension Entomologist for his knowledge of fruit tree pests and diseases. This friend and benefactor of agriculture was an encyclopedic source of information for colleagues at the Research Station, for extension entomologists, and for many growers.

He also made invaluable contributions to his church and community; the most outstanding as director of the Kings Branch of the Children's Aid Society/Family and Children's Service for 42 years. Harold died at the age of 100 years on 10 March 2003.

Society Business / Affaires de la société

53rd Annual General Meeting and Governing Board Meeting

The Annual General Meeting of the Entomological Society of Canada will be held at The Grand Okanagan Lakefront Resort and Conference Centre, Kelowna B.C. on Tuesday, 4 November 2003 at 16:30. The Governing Board Meeting will be held at the same location on Saturday, 1 November 2003 from 8:30 to 17:00. Matters for consideration at either of the above meetings should be sent to Rick West, Secretary of the ESC.

Action items from the mid-term executive council meeting

By Rick West, Secretary

The following items were identified for action at the 12 April 2003 meeting of the Executive Council.

Treasurer

Due to declines in institutional subscribers, individual memberships and exchange rates, revenues will have to increase to maintain balanced budgets. The Executive requested a review of production costs for the *Bulletin* to identify areas where costs can be reduced. **Action: R. Lamb, P. Fields.**

ESC Headquarters Committee

Roof repairs were made in 2002, and interior repairs to water damage will be contracted in 2003. The Executive Council authorized V. Behan-Pelletier to contract work under $5000. **Action: V. Behan-Pelletier.**

Finance Committee

President Smith will appoint a new Chair of the Finance Committee. **Action: S. Smith.**

Fee structure for individual and institutional members

Extra costs result from members who wish to receive both hard copy and online versions of *The Canadian Entomologist*. B. Roitberg moved and S. Smith seconded that a surcharge of $10.00 be charged to members who want to receive both online and hard copy versions of *The Canadian Entomologist*. This motion was approved by e-mail ballot by the Board in May 2003. **Carried. Action: G. Gibson.**

The e-version of the journal has value-added content and institutional subscriptions may fall as a result of the availability of electronic access. It is important that the cost-structure for institutions covers costs of publication and distribution. B. Roitberg moved and C. Vincent seconded that the following cost-structure for institutional subscribers of *The Canadian Entomologist* be applied:

	Canadian Subscribers	Foreign Subscribers
Printed version only:	200.00 (Cdn)	200.00 (USD)
E-version only:	200.00 (Cdn)	200.00 (USD)
Printed + e-version:	300.00 (Cdn)	300.00 (USD)

This motion was approved by e-mail ballot by the Board in May 2003. **Carried. Action: G. Gibson.** The cost-structure for 2004 must be in place by 31 July 2003.

Renewal form for institutions for new products and cost structure

The Publications Committee is charged with producing a renewal form for institutions in consultation with G. Gibson, emphasizing value-added benefits. **Action: A. Carroll, G. Gibson.**

Scientific Editor

President Smith will contact J. Turgeon to discuss NRC notification of subscribers advising them of when a new issue is online. **Action: S. Smith, J. Turgeon.**

Search for a new Editor-in-Chief

J. Turgeon is leaving in December 2003. President Smith leads the search for a replacement. **Action: S. Smith.**

Editor - *Bulletin*

B. Lyons is requested to send an e-mail to members advising them when a new issue of the *Bulletin* is online. **Action: B. Lyons**.

Web site

G. Gibson requested links to subscription information and purchasing *Memoirs* and copies of *Diseases and Insect Pests of Vegetable Crops in Canada.* **Action: B. Lyons.**

Password access to *Bulletin*

The Publications committee recommends that all issues, including current issue, be available to non-members. At last year's meeting in April 2002, the Executive Council agreed that access to full *Bulletin* content be for members only. At present, only the current e-issue of the *Bulletin* is restricted to members by password. Archival e-issues are freely available. However, in view of the recommendation of the Publications Committee, and the need for institutional subscribers to have ready access to current issues of the *Bulletin*, R. Lamb moved and C. Vincent seconded that all issues of the *Bulletin* be made freely available on the web site. **Carried. Action: B. Lyons.**

Minutes and December *Bulletin*

In order to reduce the size (and cost) of the December *Bulletin*, board meeting minutes and full reports will be made available to members on the web site and, for members who do not have internet access, by written request to the ESC office. A notice to this effect will appear in the December *Bulletin* along with a summary of the actions arising from the meetings. **Action: P. Fields, R. West, B. Lyons, S. Devine.**

Electronic publishing with NRC Press

President Smith will discuss any problems with J. Turgeon. Some minor glitches such as non-recognition of diacritic marks persist. **Action: S. Smith**.

Copyright and license to publish in *The Canadian Entomologist* and the *Bulletin*

The Publications Committee is charged with producing a copyright and licence to publish form for the *Bulletin*, similar to the form already produced for *The Canadian Entomologist.* **Action: Allan Carroll.**

Legal issues regarding copyright, Bell and Howell

President Smith will draft a letter to be sent from the ESC office to persons wishing to copy or

reprint articles which have appeared in the journal advising them that the Society does not own copyright and that they must contact authors directly. **Action: S. Smith.**

Conditions of use document

Before accessing documents and photos provided at the ESC web site, a "conditions of use" acknowledgement needs to be made by the user. The Publications Committee is charged with producing a "conditions of use" document by 31 May 2003 in consultation with J. Turgeon, G. Gibson, C. Vincent (photos) and B. Lyons. **Action: A. Carroll**

Testing of new institutional policies

Testing of new institutional policies will be carried out shortly in consultation with J. Turgeon, NRC and S. Devine. **Action: G. Gibson.**

Approval of NRC-proposed link to ESC

J. Turgeon is working with NRC to provide a link to the ESC web site from *The Canadian Entomologist* site. **Action: J. Turgeon.**

Translation of Society documents

R. Lamb will contact L. Royer regarding sources who can translate Society documents at a reasonable cost. **Action: R. Lamb.** Translation of Society documents is a high priority. **Action: L. Royer.**

Bylaws, Rules and Regulations Committee

Society documents will be sent to B. Lyons for posting under the members' section on the web site. **Action: R. West, B. Lyons**

Membership Committee

The committee will review benefits for honorary members and recommend any changes to the Executive Council and Bylaws, Rules and Regulations Committee. **Action: J. Sweeney.**

Separate English and French membership forms need to be produced by the Membership Committee in consultation with G. Gibson. **Action: J. Sweeney.**

The Committee is requested to contact the Regional Directors for access to the membership lists of the Affiliated Societies and Peter Kevan (Entomol-L) regarding solicitation of new memberships. **Action: J. Sweeney.**

A member of the Executive Council will contact federal bureaucrats to discuss ways in which memberships could be paid for through, *e.g.*, A-base and educational funding. **Action: S. Smith.**

Survey of members

C. Vincent moved and R. Lamb seconded that the survey drafted by the Committee for distribution to members be approved and distributed in both official languages by e-mail and through the web site. **Carried. Action: J. Sweeney, B. Lyons.**

Policies to encourage amateur entomologists to join the ESC

The Executive Council recommended that J. Sweeney and L. Braun contact the SEQ through the Regional Director, N. Larocque, to determine if any of the actions carried out by the SEQ to attract amateur entomologists could be applied to the ESC. **Action: J. Sweeney, L. Braun, N. Larocque.**

Student Awards Committee

The Executive Council requests that the Committee draft a new application form. **Action. D. Gillespie.**

Conference Travel Award guidelines

The Fund-raising Committee needs to establish the Conference Travel Award in consultation with the Student Awards committee which has already produced a draft of the award guidelines. **Action: N. Bostanian, D. Gillespie.**

Science Policy Committee

The Canadian Society of Zoologists has requested that the ESC write a letter to the NRC encouraging Canada to rejoin the International Union of Biological Societies. **Action: R. Lamb.**

Photo copyright and use on web site

Following advice from an Agriculture Agri-Food Canada lawyer to C. Vincent, the Executive Council recommends that, before access to photos on the web site, an agreement be made that photos not be resold. C. Vincent will provide B. Lyons with the conditions of use for access to web photos within two months. **Action: C. Vincent.**

Student Affairs Committee

The committee should contact T. Shore to discuss ways in which students with similar research interests can meet and to post a job/CV board, if that is the wish of the Student Affairs Committee. The Committee is requested to clarify whether or not it is recommending that student CVs be included on the web site or whether that this is just an idea that is being considered. **Action: T. Mousseau.**

Marketing strategy for *The Canadian Entomologist*

The Executive directed the Marketing Committee to develop a marketing strategy for *The Canadian Entomologist* and to provide an update on the university class exercise that was developing a ESC marketing strategy. **Action: L. Braun.**

PowerPoint presentation of Society activities

A PowerPoint presentation will be prepared in time for presentation to the Board in fall 2003. **Action: L. Braun.**

Discount for members to attend annual meeting

P. de Groot is asked to negotiate a differential fee structure for registration at the 2004 Annual Meeting with the AES. A fee structure for the 2003 meeting has been set with the ESBC and is posted at http://esbc.harbour.com/registration2003.html.
Action: P. de Groot.

Maintaining entomological information and databases provided by members on the web site

R. Lamb reported that several repositories for archival entomologically-related information were being discontinued and that there was a need to protect such information. The Publications Committee is charged, in consultation with R. Lamb , D. Eidt, and B. Lyons, with recommending whether or not to maintain archival information such as databases, species lists and technical notes on the web site. **Action: A. Carroll, R. Lamb, D. Eidt, B. Lyons.**

Committee and Representatives
Comités et représentants

Standing committees
Comités permanents

Nominations / Nominations
B. Roitberg, Chair, Burnaby
R. Bennett, Victoria
J. Delisle, Ste.-Foy
S. Smith, *ex officio*, Toronto

Elections / Elections
R. Hallett, Chair, Guelph
J. MacIntyre-Allen, Guelph
A. Martin, Guelph
S. Smith, *ex officio*, Toronto

Continuing committees
Comités en cours

Achievement Awards
Prix d'excellence
C. Vincent, Chair, St.-Jean-sur-Richelieu
Y. Pelletier, Fredericton
R. Roughley, Winnipeg
J. Spence, Edmonton
S. Smith, *ex officio*, Toronto

Annual Meeting / Réunion Annuelle
P. de Groot, Chair, Sault Ste. Marie
S. Smith, *ex officio*, Toronto

Bilingualism / Bilinguisme
L. Royer, Chair, Corner Brook
H. Chiasson, St.-Jean-sur-Richelieu
M. Roy, Québec
S. Smith, *ex officio*, Toronto

Bylaws, Rules & Regulations
Règlements
M. Goettel, Chair, Lethbridge
G. Boiteau, Fredericton
N. Holliday, Winnipeg
S. Smith, *ex officio*, Toronto

Finance / Finance
P. Bouchard, Chair, Ottawa
P. Mason, Ottawa
D. Parker, Ottawa
M. Sarazin, Ottawa
G. Gibson, Treasurer, Ottawa
S. Smith, *ex officio*, Toronto

Fund Raising / Levée de fonds
N. Bostanian, Chair, St.-Jean-sur-Richelieu

Headquarters / Siège social
V. Behan-Pelletier, Chair, Ottawa
J. Cumming, Ottawa
G. Gibson, *ex officio*, Ottawa
S. Smith, *ex officio*, Toronto

Heritage / Patrimoine
D. Eidt, Chair, Fredericton
E. Becker, Ottawa
S. Smith, *ex officio*, Toronto

Insect Common Names
Noms communs d'insectes
H. Chiasson, Chair, St.-Jean-sur-Richelieu
M. Roy, Ste.-Foy
S. Smith, *ex officio*, Toronto

Marketing / Comité du marketing
L. Braun, Chair, Saskatoon
H. White, Winnipeg
O. Olfert, Saskatoon
S. Smith, *ex officio*, Toronto

Membership / Adhésion
J. Sweeney, Chair, Fredericton
R. Elliot, ESS, Saskatoon
D. Giberson, AES, Charlottetown
D. Hunt, ESO, Harrow
N. Larocque, SEQ
P. MacKay, ESM, Winnipeg
G. Pohl, ESA, Edmonton
T. Shore, ESBC, Victoria
S. Smith, *ex officio*, Toronto

Publications / Publications
A. Carroll, Chair, Victoria
R. Bennett, Victoria
G. Boivin, St.-Jean-sur-Richelieu
P. de Groot, Sault Ste. Marie
L. Gilkeson, Victoria
P. Kevan, Guelph
P. Fields, *ex officio*, Winnipeg
D. Lyons, *ex officio*, Sault Ste. Marie
S. Smith, *ex officio*, Toronto
J. Turgeon, *ex officio*, Sault Ste. Marie

Science Policy and Education
Politique scientifique et éducation
R. Lamb, Chair, Winnipeg
G. Boiteau, AES, Deer Lake
R. Bourchier, ESA, Lethbridge
K. Davey, Downsview
P. Kevan, Guelph
R. Elliot, ESS, Saskatoon
D. Hunt, ESO, Harrow
N. Larocque, SEQ
P. MacKay, ESM, Winnipeg
T. Shore, ESBC, Victoria
S. Smith, *ex officio*, Toronto

Student Affairs / Affaires étudiantes
T. Mousseau, Chair, Winnipeg
B. Sarauer, Saskatoon
C. Schmidt, Edmonton
D. Gillespie, *ex officio*, Agassiz
S. Smith, *ex officio*, Toronto

Student Awards
Prix aux étudiantes et étudiants
D. Gillespie, Chair, Agassiz
J. Delise, Ste.-Foy
D. Currie, Toronto
N. Holliday, Winnipeg
D. Larson, St. John's
J. Myers, Vancouver
T. Wheeler, Ste-Anne-de-Bellevue
S. Smith, *ex officio*, Toronto

Ad hoc Committees
Comités ad hoc

Joint Meeting Document
Document du congrès conjoint
T. Shore, Chair, Victoria
J. Sweeney, Fredericton
S. Smith, *ex officio*, Toronto

53e L'assemblée générale annuelle et la réunion du comité directeur
L'Assemblée générale annuelle de la Société d'entomologie du Canada aura lieu au Grand Okanagan Lakefront Resort and Conference Centre, Kelowna C.-B. le mardi 1 novembre 2003 à 16 h 30. La Réunion du comité directeur de la SEC aura lieu au même endroit le samedi, 1 novembre 2003 de 8 h 30 à 17 h 00. Veuillez faire part au secrétaire, Rick West, de tout sujet pouvant faire l'objet de discussion à ces réunions.

Nominations Committee Report
The following have been nominated and agreed to stand for election in 2003:
Second Vice President:
Neil Holliday, Dan Quiring
Director-at-Large:
Rose De Clerck-Floate, Staffan Lindgren

Erratum
The photos of Charles J. S. Bethune and William Saunders were mislabeled in the last issue (*Bulletin of the ESC* 35(1): 17). The photo in the center is William Saunders CMG LLD, and the photo on the right is Charles J. S. Bethune MA DCL. Thanks to eagle-eyed John Garland for noting this error.

Joint Annual Meeting of The Entomological Society of Canada and The Entomological Society of British Columbia

The Grand Okanagan Lakefront Resort and Conference Centre Kelowna B.C., November 1 – 5, 2003

On behalf of the Entomological Societies of British Columbia and Canada we cordially invite you to attend the Joint Annual Meeting to be held in the beautiful Okanagan Valley of British Columbia.

The Grand Okanagan is a spectacular facility on the shores of Okanagan Lake in the downtown area of Kelowna. We have negotiated an excellent room rate with the hotel ($99 regular, $135 suite) and encourage you to stay there **and to tell them you are with the Entomology Society of Canada conference**. It is this room subscription that enables the organizers to provide this caliber of facility. Hotel reservations can be made at (800) 465-4651, or see their website at http://www.grandokanagan.com/.

The Okanagan Valley is the wine, fruit and recreation centre of British Columbia and provides a host of extracurricular activities. Kelowna is a thriving city with a population of about 100,000. It is easily accessible via several major airlines including Air Canada and WestJet, or is approximately a five-hour drive from Vancouver.

For information on some social activities associated with the meeting including dining, wine tours and golf, see http://www.corkandcaddie.com/ESBCJAM.htm.

The theme for this meeting will be *Insects in Shifting Environments*. This theme is meant to focus on two similar and topical issues: 1) invasive species 'shifting' to new environments and effecting a change, and 2) impacts on insects of 'shifting' environments such as climate or anthropogenic changes.

Several additional meetings are scheduled to take place in conjunction with the JAM including the Canadian Forum for Biocontrol, Western Forum on Pest Management, Western Committee on Crop Pests, Western Committee on Plant Diseases, and Mountain Pine Beetle Symposium.

Keep an eye on our meeting webpage for further information as we continue to develop the program. It can be reached through the Entomological Society of British Columbia webpage at http://esbc.harbour.com/ or the Entomological Society of Canada webpage at http://esc-sec.org.

For further information contact:

Terry Shore
JAM 2003 Organizing Chair
Canadian Forest Service
506 West Burnside Road
Victoria, British Columba, Canada V8Z 1M5
Telphone: (250) 363-0666
E-mail: tshore@pfc.forestry.ca

Tentative Program

Saturday, November 1

08:30-17:00 ESC Governing Board Meeting
Contact: Rick West, Secretary, ESC

Sunday, November 2

13:00-14:15 Opening Session, ESC Awards, Gold Medal Address
14:30-16:30 Plenary Session: Insects in Shifting Environments
Moderator: Bernie Roitberg (Simon Fraser University)
19:00-21:00 President's Reception (By invitation)
18:00-22:00 Student Mixer (no-host bar and food, Kelowna Curling Club)

Monday, November 3

08:30-11:00 Symposium A: Adaptations and constraints:
A symposium in honour of Richard Ring
Moderators: Robb Bennett (BC Ministry of Forests)
Neville Winchester (U. of Victoria)
Symposium B: Insect responses to climate change: Plausible scenarios and their implications
Moderator: Richard Fleming (CFS, Sault Ste-Marie)
11:00-13:00 Poster Session: Contributed and President's Prize
Lunch provided
13:00-16:30 Workshop A: Resistance of two kinds: Insecticides and host plants
Organizers: Yvan Pelletier (AAFC, Fredericton)
C. Vincent (AAFC, St-Jean-sur-Richelieu)
(vincentch@agr.gc.ca)
President's Prize Papers – Concurrent Sessions
19:30-20:30 Student Reception – Wine Museum
20:30-22:30 General Reception – Wine Museum

Tuesday, November 4

08:30-11:00 Symposium C: Introduced species: Friends and foes and those we do not know
Moderator: Judy Myers (UBC)
Symposium D: Biodiversity
Moderator: Geoff Scudder (Emeritus, UBC)
11:00-12:30 Contributed Papers – Concurrent Sessions
12:30-13:30 Lunch (on your own)
13:30-15:00 Symposium E: Graduate Student Symposium
Moderator: Jacques Brodeur (Université Laval)
13:30-16:30 Workshop B: Ecology and structure of aphid populations
Organizers: Kevin Floate (AAFC, Lethbridge) (floatek@agr.gc.ca)
Bob Lamb (AAFC, Winnipeg) (rlamb@agr.gc.ca)

Tuesday, November 4

13:30-16:30	Workshop C:	Temperate Fruit Flies: ecology, behaviour, and management Organizer: Howard Thistlewood (AAFC, Summerland) (thistlewood@agr.gc.ca)
13:30-16:30	Contributed Papers – Concurrent Sessions	
16:30-17:30	ESC Annual General Meeting	
18:30-19:30	No host bar	
19:30-22:00	Banquet and Entertainment	

Wednesday, November 5

09:00-10:00	Heritage Lecture: Richard Ring
10:00-10:30	ESBC Annual General Meeting
10:30-12:00	Contributed Papers – Concurrent Sessions

Associated meetings

Thursday, October 30
Friday, October 31
Mountain Pine Beetle Symposium
Contact: Terry Shore (CFS Victoria)
tshore@pfc.forestry.ca

Thursday, October 30
08:30-17:00
Canadian Forum for Biological Control
Contact: Rose De Clerck-Floate (AAFC, Lethbridge)
floate@agr.gc.ca

Friday, October 31-
Saturday, November 1
Western Forum and Western Committees on Crop Pests and Plant Diseases
Contact: Hugh Philip (B.C. Ministry of Agr. and Fisheries, Kelowna)
hugh.philip@gems8.gov.bc.ca

The Grand Okanagan Lakefront Resort and Conference Centre Kelowna B.C.

CALL FOR SUBMITTED PAPERS AND POSTERS

This and additional information is available on: http://esbc.harbour.com/jam.html

DEADLINE: Postmarked 7 July 2003

Categories of presentation:

Oral presentation - Regular, President's Prize*
Poster presentation - Regular, President's Prize*

*Students are eligible for the President's Prize (1 per session) if:

- Currently enrolled in a degree program or have graduated from a degree program since the last annual meeting (October, 2002)
- Registered at the meeting and have indicated the wish to participate in this category at the time the title and abstract were submitted
- The principal investigator and presenter of the paper or poster

Language: Presentations may be in French or English

Oral presentation: 12 min + 3 min questions and discussion
Presentations in PowerPoint are encouraged. To minimize potential incompatibilities between the software versions you use to develop and we use to display these presentations, we recommend limited use of animation, use of common Windows fonts for text and symbol fonts for equations. **Do not mail your presentation** but bring to meeting on diskette or CD after testing this copy on a different machine. If using 35 mm slides, please provide your own carousel. Please note method of presentation when submitting your abstract.

Poster presentation:
Posters can be set up on Sunday morning (November 2) and left in place for the duration of the meeting. Presenters are requested to attend their posters in particular during the designated poster session on Monday (November 3) from 11:30 - 12:15.

Information required: 1) Author(s) name(s), 2) name of presenter, 3) address 4) title, 5) abstract, 6) category, 7) language of presentation, and 8) method of presentation (PowerPoint or 35 mm slide). Submit this information by e-mail, on diskette or CD (Word or WP format). Abstracts should be 70 words or less. If longer than 70 words, the editors reserve the right to reduce accordingly. If possible, please provide your information in both French and English. All abstracts will be placed on the website.

Please submit to Chair, Scientific Program

Vince Nealis
Pacific Forestry Centre
506 W. Burnside Road, Victoria
British Columbia, Canada V8Z 1M5
Telephone: (250) 363-0663
Fax: (250) 363-0775
E-mail: vnealis@pfc.forestry.ca or vnealis@nrcan.gc.ca

Congrès Conjoint des Sociétés d'entomologie du Canada et de la Colombie-Britannique

Le Grand Okanagan Lakefront Resort et au Conference Centre, Kelowna, C.-B., du 1-5 novembre 2003

Au nom des Sociétés d'entomologie de la Colombie-Britannique et du Canada, nous vous invitons cordialement à assister au Congrès annuel conjoint qui aura lieu dans la splendide Vallée de l'Okanagan en Colombie-Britannique.

Le Grand Okanagan est un magnifique hôtel sur les bords du lac Okanagan au centre-ville de Kelowna. Grâce au nombre anticipé de réservations, nous avons négocié des prix plus qu'avantageux (chambre régulière $99; suite $135) pour des chambres de cette qualité. Nous vous encourageons donc à réserver dans cet hôtel **et à mentionner que vous venez à la conférence de la Société d'entomologie du Canada**. Les réservations pour l'hôtel peuvent se faire par téléphone au numéro sans frais (800) 465-4651 ou sur le site Internet de l'hôtel http://www.grandokanagan.com/.

La Vallée de l'Okanagan est le centre vinicole, fruitier et récréatif de la Colombie-Britannique et offre un éventail d'activités. Kelowna est une cité prospère. Sa population est d'environ 100,000 habitants. Elle est facilement accessible via toutes les lignes aériennes majeures y compris Air Canada et WestJet. Elle est approximativement à 5 heures de route de Vancouver.

Pour plus d'information sur les différentes activités sociales associées au congrès (repas, tour des vignobles, et golf), veuillez consulter le site Internet suivant : http://www.corkandcaddie.com/ESBCJAM.htm.

Le thème de ce congrès sera les insectes dans des milieux changeants. Ce thème vise à faire le point sur deux sujets similaires et d'actualité : 1) les espèces envahissantes qui s'établissent dans de nouveaux milieux en provoquant des changements, et 2) les impacts des changements comme le climat ou les changements du milieu découlant de l'activité humaine sur les insectes.

Plusieurs autres réunions auront lieu conjointement avec le JAM. Ce sont le Forum canadien pour la lutte biologique, le Forum de l'Ouest sur la gestion des ravageurs, le Comité de l'Ouest sur les ravageurs des cultures, le Comité de l'Ouest sur les maladies des plantes, et le Symposium sur le dendroctone du pin ponderosa.

Consultez fréquemment le site Internet du congrès pour de plus amples renseignements puisque l'on continuera à développer le programme. Vous pouvez accéder à ce site par le site Internet de la Société d'entomologie de la Colombie-Britannique (http://esbc.harbour.com/) ou celui de la Société d'entomologie du Canada (http://esc-sec.org/).

Pour plus amples renseignements contacter :

Terry Shore
Président du comité organisateur JAM 2003
SCF, 506 West Burnside Road
Victoria CB, Canada V8Z 1M5
Téléphone: (250) 363-0666
Courriel: tshore@pfc.forestry.ca

Programme provisoire

Samedi, 1 novembre

08:30-17:00 Réunion du comité directeur de la SEC
Contact : Rick West, Secrétaire, SEC

Dimanche, 2 novembre

13:00-14:15 Séance d'ouverture, prix et bourses de la SEC,
mot du récipiendaire de la médaille d'or
14:30-16:30 Séance plénière : Insectes dans des milieux changeants
Modérateur : Bernie Roitberg (Université Simon Fraser)
19:00-21:00 Réception du Président (sur invitation)
18:00-22:00 Soirée-rencontre des étudiants
(bar payant et hors-d'œuvres, Kelowna Curling Club)

Lundi, 3 novembre

08:30-11:00 Symposium A : Adaptations et contraintes :
Un symposium dédié à Richard Ring
Modérateurs : Robb Bennett (Ministère des forêts, CB)
Neville Winchester (U. de Victoria)
Symposium B : Réponses des insectes aux changements climatiques :
Scénarios possibles et leurs implications
Modérateur : Richard Fleming (SCF, Sault Ste-Marie)
11:00-13:00 Séance des affiches : ordinaires et en compétition pour le prix du président
Dîner fourni
13:00-16:30 Atelier A : Résistance de deux types : Insecticides et plantes-hôtes
Organisateurs : Yvan Pelletier (AAC, Frédéricton)
C. Vincent (AAC, St-Jean-sur-Richelieu)
(vincentch@agr.gc.ca)
Présentation en compétition pour le prix du président – Séances concomitantes
19:30-20:30 Réception des étudiants– Musée du vin
20:30-22:30 Réception générale – Musée du vin

Mardi, 4 novembre

08:30-11:00 Symposium C : Espèces introduites :
Amis, ennemis et ceux que l'on ne connaît pas
Modérateur : Judy Myers (UCB)
Symposium D : Biodiversité
Modérateur : Geoff Scudder (Professeur émérite, UBC)
11:00-12:30 Présentations ordinaires – Séances concomitantes
12:30-13:30 Dîner (à votre choix)

Mardi, 4 novembre

13:30-16:30	Symposium E : Symposium des étudiants gradués Modérator : Jacques Brodeur (Université Laval)
13:30-16:30	Atelier B : Écologie et structure des populations de pucerons Organisateurs : Kevin Floate (AAC, Lethbridge), (floatek@agr.gc.ca) Bob Lamb (AAC, Winnipeg), (rlamb@agr.gc.ca)
13:30-16:30	Atelier C : Atelier C : Les drosophiles des zones tempérées : Écologie, comportement et lutte Organisateurs : Kevin Floate (AAC, Lethbridge), (floatek@agr.gc.ca) Bob Lamb (AAC, Winnipeg), (rlamb@agr.gc.ca)
13:30-16:30	Présentations ordinaires – Séances concomitantes
16:30-17:30	Assemblée générale annuelle de la SEC
18:30-19:30	Bar payant
19:30-22:00	Banquet et réception

Mercredi, 5 novembre

09:00-10:00	Conférence du patrimoine : Richard Ring
10:00-10:30	Réunion générale annuelle de la SECB
10:30-12:00	Présentations ordinaires – Séances concomitantes

Réunions conjointes

Jeudi-vendredi, 30-31 octobre	**Symposium sur le dendroctone du pin ponderosa** Contact : Terry Shore (SCF, Victoria) tshore@pfc.forestry.ca
Jeudi, 30 octobre	**Forum canadien pour la lutte biologique** Contact : Rose De Clerck-Floate (AAC, Lethbridge) floate@agr.gc.ca
Vendredi-samedi 31 octobre - 1er novembre	**Forum et comités de l'Ouest sur les ravageurs des cultures et les maladies des plantes** Contact : Hugh Philip, (B.C Min. of Agr. and Fisheries, Kelowna) hugh.philip@gems8.gov.bc.ca

INVITATION À SOUMETTRE DES COMMUNICATIONS ET DES AFFICHES

Cette information est aussi disponible à : http://esbc.harbour.com/jam.html
DATE LIMITE : Le 7 juillet 2003 (le cachet de la poste faisant foi)

Catégories de présentation :

Présentation orale –	**Ordinaire, Prix du président***
Présentation par affiches -	**Ordinaire, Prix du président***

*Pour être admissible au Prix du président (1 par séance), vous devez satisfaire aux conditions suivantes :

- Être inscrit à un programme de deuxième ou troisième cycle ou avoir terminé un tel programme après de dernier congrès (octobre 2002)
- Être inscrit à la conférence et indiquer le désir de participer dans cette catégorie lors de la soumission de votre communication
- Être le chercheur principal et le présentateur de l'exposé ou de l'affiche

Langue : Les présentations doivent être en français ou en anglais.

Présentation orale : 12 min + 3 min de questions et discussion
Nous vous encourageons à créer des présentations PowerPoint. Afin de minimiser les chances d'incompatibilités entre la version de programme que vous utiliserez pour créer votre présentation et celle qui sera utilisée pour la présenter, nous vous conseillons de restreindre l'utilisation des animations, d'utiliser des caractères communs d'édition de Windows pour les textes et les caractères symboles pour les équations. **Ne postez pas votre présentation**, apportez-la au congrès sur une disquette ou un CD après avoir testé votre document à l'aide d'un autre ordinateur. Si vous utilisez des diapositives 35 mm, veuillez les placer dans un magasin circulaire. Veuillez indiquer la méthode de présentation lors de la soumission de la communication.

Présentation d'affiches :
Les affiches peuvent être placées le dimanche 2 novembre, et exposées pour toute la durée du congrès. Nous demandons aux présentateurs d'être présents pour répondre aux questions particulièrement pendant la séance prévue à cet effet le lundi 3 novembre de 11:30 – 12:15.

Informations requises : 1) Nom(s) de(s) auteur(s), 2) nom du présentateur, 3) adresse, 4) titre, 5) résumé, 6) catégorie, 7) langue de la présentation, et 8) méthode de présentation (PowerPoint ou diapositives 35 mm). Soumettez ces informations par courriel, sur disquette ou CD en format Word ou WP. Les résumés ne doivent pas dépasser 70 mots. Si votre résumé dépasse la limite de mots acceptée, les éditeurs se réservent le droit de le couper. Si possible, envoyez ces informations en français et en anglais. Tous les résumés seront publiés sur le site Internet.

Veuillez soumettre au président du programme scientifique :
Vince Nealis
Centre de foresterie du Pacifique
506 W. Burnside Rd., Victoria, CB, Canada V8Z 1M5
Téléphone: (250) 363-0663 Fac: (250) 363-0775
Courriel: vnealis@pfc.forestry.ca ou vnealis@nrcan.gc.ca

McCAY, DUFF
& COMPANY LLP
CHARTERED ACCOUNTANTS

141 LAURIER AVE. WEST
6TH FLOOR
OTTAWA, ONTARIO K1P 5J3
TEL: (613) 236-2367
FAX: (613) 236-5041
1 (800) 267-6551
mccayduff@mccayduff.com
WEB: www.mccayduff.com

THOMAS W. HOWARTH, CA
BRYAN E. SULLIVAN, CA
ALBERT G. MONSOUR, B.ADMIN. CA
BLAIR E. DAVIDSON, B.COMM. CFP, CA
G. WARREN TRICKEY, B.COMM. CA
ROBERT D. SHANTZ, B.MATH. CA
MARGARET N. EGAN, B.ADMIN. CA, C.I.M.

CONSULTANT-ELDREN E. McCONNELL, CA

AUDITORS' REPORT

To the Members,
Entomological Society of Canada.

We have audited the non-consolidated balance sheet of the Entomological Society of Canada as at December 31, 2002 and the non-consolidated statements of revenue and expenditure - General Fund, surplus and cash flows for the year then ended. These financial statements are the responsibility of the Society's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

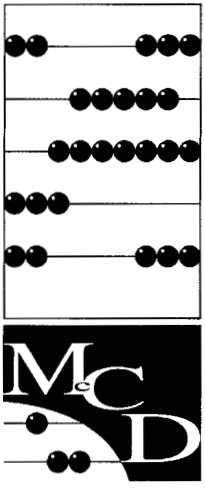
The Society accounts for its investment in a joint venture using the cost method. Canadian generally accepted accounting principles require that investments in joint ventures be accounted for using the proportionate consolidation method. Had the proportionate consolidation method been used, assets would have decreased by $512, liabilities would have increased by $150 and equity would have increased by $30,917.

In our opinion, these non-consolidated financial statements present fairly, in all material respects, the financial position of the Society as at December 31, 2002 and the results of its operations and cash flows for the year then ended in accordance with Canadian generally accepted accounting principles, except that they are not prepared on a proportionate consolidated basis as described in note 5. As required by the Companies Act, we report that, in our opinion, these principles have been applied on a basis consistent with that of the preceding year.

McCay Duff & Company LLP

Chartered Accountants

Ottawa, Ontario,
March 7, 2003.



Associated World-wide with Jeffreys Henry International

ENTOMOLOGICAL SOCIETY OF CANADA

BALANCE SHEET

AS AT DECEMBER 31, 2002

ASSETS

	General Fund	Endowment Fund	Building Fund	Scholarship Fund	2002 Total	2001 Total
CURRENT						
Cash	$ 179,643	$ 11,574	$ -	$ 27,416	$ 218,633	$ 269,390
Term deposit	78,918	-	-	4,283	83,201	31,782
Accounts receivable	11,793	-	-	-	11,793	14,888
Accrued interest receivable	3,678	754	-	1,843	6,275	6,157
Prepaid expenses	3,552	-	-	-	3,552	5,834
	277,584	12,328	-	33,542	323,454	328,051
INVESTMENTS (note 4)	191,868	64,749	-	100,010	356,627	344,230
INVESTMENT IN BOOK PROJECT (note 5)	30,555	-	-	-	30,555	37,555
CAPITAL ASSETS (note 6)	-	-	159,287	-	159,287	164,257
	$ 500,007	$ 77,077	$ 159,287	$ 133,552	$ 869,923	$ 874,093

LIABILITIES

CURRENT						
Accounts payable and accrued liabilities	$ 31,429	$ -	$ -	$ -	$ 31,429	$ 51,445
Deferred revenue	97,967	-	-	-	97,967	116,423
	129,396	-	-	-	129,396	167,868

SURPLUS

BALANCE - END OF YEAR	370,611	77,077	159,287	133,552	740,527	706,225
	$ 500,007	$ 77,077	$ 159,287	$ 133,552	$ 869,923	$ 874,093

Approved on behalf of the Board:

Governor

Governor

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

STATEMENT OF SURPLUS

FOR THE YEAR ENDED DECEMBER 31, 2002

	General Fund	Endowment Fund	Building Fund	Scholarship Fund	2002 Total	2001 Total
BALANCE - BEGINNING OF YEAR	$ 336,671	$ 75,700	$ 164,257	$ 129,597	$ 706,225	$ 636,443
Net revenue (expenditure) for the year	36,679	1,377	(7,709)	3,955	34,302	69,782
Interfund transfers	(2,739)	-	2,739	-	-	-
BALANCE - END OF YEAR	$ 370,611	$ 77,077	$ 159,287	$ 133,552	$ 740,527	$ 706,225

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

STATEMENT OF REVENUE AND EXPENDITURE - GENERAL FUND

FOR THE YEAR ENDED DECEMBER 31, 2002

	Canadian Entomologist		Memoirs and Other Publications		Society		2002		2001
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Actual
REVENUE									
Regular membership	$ 15,200	$ 14,480	$ -	$ -	$ 15,200	$ 14,480	$ 30,400	$ 28,960	$ 29,920
Student membership	760	780	-	-	1,960	1,800	2,720	2,580	2,820
Emeritus	-	-	-	-	840	760	840	760	900
Subscriptions	100,000	106,940	-	-	23,650	16,270	123,650	123,210	126,290
Reprints	10,500	11,209	-	-	-	-	10,500	11,209	9,720
Page charges	30,240	32,129	-	-	-	-	30,240	32,129	33,989
Back issues/Royalties	-	-	-	-	3,000	2,545	3,000	2,545	3,936
Sales of Memoirs	-	-	2,000	1,746	-	-	2,000	1,746	3,116
Sales of Arctic Arthropods and Bibliography	-	-	200	150	-	-	200	150	90
Gain on currency exchange	-	-	-	-	-	14,599	-	14,599	18,499
Translation/Extras	3,000	6,798	-	-	-	-	3,000	6,798	8,982
Office postage	-	-	-	-	-	3,318	-	3,318	4,753
Miscellaneous	-	-	-	-	1,000	3,165	1,000	3,165	6,826
REVENUE - Carried Forward	$ 159,700	$ 172,336	$ 2,200	$ 1,896	$ 45,650	$ 56,937	$ 207,550	$ 231,169	$ 249,841

ENTOMOLOGICAL SOCIETY OF CANADA

STATEMENT OF REVENUE AND EXPENDITURE - GENERAL FUND

FOR THE YEAR ENDED DECEMBER 31, 2002

	Canadian Entomologist		Memoirs and Other Publications		Society		2002		2001
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Actual
REVENUE - Carried forward	$ 159,700	$ 172,336	$ 2,200	$ 1,896	$ 45,650	$ 56,937	$ 207,550	$ 231,169	$ 249,841
EXPENDITURE									
Publishing and mailing	106,000	105,022	-	-	-	-	106,000	105,022	103,768
Reprint costs	9,000	8,968	-	-	-	-	9,000	8,968	8,249
Bulletin publishing and mailing	-	-	-	-	14,000	20,487	14,000	20,487	17,710
Salaries and benefits	17,595	17,450	-	-	17,595	17,450	35,190	34,900	34,400
Editor's expenses	5,000	3,614	-	-	-	-	5,000	3,614	1,699
Office	3,350	4,797	-	-	3,350	4,797	6,700	9,594	9,636
Professional fees	2,250	1,880	-	-	2,250	2,820	4,500	4,700	4,000
Prizes, awards, brochure	-	-	-	-	2,000	977	2,000	977	1,501
Honoraria	1,000	1,000	-	-	2,625	2,625	3,625	3,625	3,625
Committees	-	-	-	-	1,500	-	1,500	-	419
Other organizations/ Societies	-	-	-	-	1,450	2,170	1,450	2,170	459
Annual Meetings:									
Grant	-	-	-	-	4,000	2,500	4,000	2,500	4,000
Honorees	-	-	-	-	2,000	-	2,000	-	1,535
Governing Board:									
Interim meeting	-	-	-	-	2,500	1,778	2,500	1,778	1,664
Annual meeting	-	-	-	-	6,000	7,488	6,000	7,488	3,710
Other meetings	-	-	-	-	1,000	1,402	1,000	1,402	-
President's discretionary expenses	-	-	-	-	2,000	100	2,000	100	200
General	-	-	-	-	-	811	-	811	1,880
	144,195	142,731	-	-	62,270	65,405	206,465	208,136	198,455
REVENUE (EXPENDITURE) FROM OPERATIONS	15,505	29,605	2,200	1,896	(16,620)	(8,468)	1,085	23,033	51,386
Interest on investments	-	-	-	-	8,000	13,496	8,000	13,496	14,852
Gain on sale of investment	-	-	-	-	-	150	-	150	-
NET REVENUE (EXPENDITURE) FOR THE YEAR	$ 15,505	$ 29,605	$ 2,200	$ 1,896	$(8,620)	$ 5,178	$ 9,085	$ 36,679	$ 66,238

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED DECEMBER 31, 2002

	2002	2001
CASH PROVIDED BY (USED FOR)		
OPERATING ACTIVITIES		
Net revenue (expenditure) for the year		
- General Fund	$ 36,679	$ 66,238
- Endowment Fund	1,377	(532)
- Building Fund	(7,709)	(10,288)
- Scholarship Fund	3,955	14,364
	34,302	69,782
Items not involving cash		
- amortization	4,970	5,177
- gain on sale of investments	(300)	-
	38,972	74,959
Net change in non-cash working capital balances related to operations		
- accounts receivable	3,095	18,255
- accrued interest receivable	(118)	(143)
- prepaid expenses	2,282	(1,992)
- accounts payable and accrued liabilities	(20,016)	(13,718)
- deferred revenue	(18,456)	3,231
	(33,213)	5,633
	5,759	80,592
INVESTING ACTIVITIES		
Purchase of investments	(52,097)	(142,743)
Proceeds on disposal of investments	40,000	130,000
Decrease in Investment in Book Project	7,000	7,500
	(5,097)	(5,243)
INCREASE IN CASH AND CASH EQUIVALENTS DURING THE YEAR	662	75,349
Cash and cash equivalents - beginning of year	301,172	225,823
CASH AND CASH EQUIVALENTS - END OF YEAR	$ 301,834	$ 301,172
CASH AND CASH EQUIVALENTS		
Cash	$ 218,633	$ 269,390
Term deposit	83,201	31,782
	$ 301,834	$ 301,172

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 2002

1. PURPOSE OF ORGANIZATION

The purpose of the Organization is to study, promote and advance the study of entomology through meetings, symposia and the publication of original research results. Entomological Society of Canada is incorporated without share capital under Part II of the Canada Companies Act and is exempt from income taxes.

2. SIGNIFICANT ACCOUNTING POLICIES

(a) Accrual Basis of Accounting

Revenue and expenditure are recorded on the accrual basis, whereby they are reflected in the accounts in the period in which they have been earned and incurred respectively, whether or not such transactions have been finally settled with the receipt or payment of money.

(b) Investments

Investments are recorded at cost, which is not in excess of market value.

(c) Capital Assets and Amortization

Capital assets are stated at cost, less accumulated amortization. Amortization is being claimed on the building at the rate of 4% on the reducing balance basis. All other capital asset additions are expensed as they are incurred.

(d) Volunteer Services

The Organization receives volunteer services, the value of which cannot be reasonably estimated. Therefore, no representation of these costs are reflected in the financial statements.

(e) Fund Accounting

The purpose of each fund is as follows:

General Fund

This fund accounts for the Society's primary operating activities.

Endowment Fund

The direction of the bequest, by which this fund was founded, states that without imposing any legal obligation, hope is expressed that the principal will not be eroded and that the income will be utilized to aid in the publication of the Canadian Entomologist.

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 2002

2. **SIGNIFICANT ACCOUNTING POLICIES** (Cont'd.)

(e) **Fund Accounting** (Cont'd.)

Building Fund

This fund was created through an appropriation from the General Fund to recognize the expenses of the building independent of operational expenditures. Prior Board approval has been given to appropriate from the General Fund an amount equal to the current year net expenditure in the Building Fund, excluding amortization on the building.

Scholarship Fund

This fund was created with the objective of awarding scholarships for post-graduate studies in entomology. The fund derives its revenue from donations and from the interest on the invested capital. The money is awarded in three different forms: scholarship for post-graduate studies, travel grant to subsidize student travel expenses incurred in relation to their post-graduate studies; or the Keith Kevan Scholarship which is a scholarship for post-graduate studies oriented toward systematics.

3. **FINANCIAL INSTRUMENTS**

Interest Rate Risk and Credit Risk

The Society's financial instruments consist of cash, term deposit, accounts receivable, investments, accounts payable and accrued liabilities and deferred revenue. Unless otherwise noted, it is management's opinion that the Society is not exposed to significant interest rate or credit risk.

Currency Risk

Currency risk is the exposure to the Society's financial instruments due to changes in exchange rates. The Society is exposed to currency risk through its subscription revenues. The Society monitors its foreign subscription rates to minimize its risk.

Fair Values

The carrying amounts reported in the balance sheet for cash and term deposits, accounts receivable, accrued interest receivable, investments, investment in book project and accounts payable and accrued liabilities approximate fair values due to the immediate or short-term maturities of these financial instruments.

ENTOMOLOGICAL SOCIETY OF CANADA

NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 2002

4. INVESTMENTS

	2002	2001
General Fund		
Bonds, at cost (market value 2002 - $201,833, 2001 - $187,406)	$ 191,868	$ 179,571
Endowment Fund		
Bonds, at cost (market value 2002 - $70,767, 2001 - $71,408)	$ 64,749	$ 64,749
Scholarship Fund		
Bonds, at cost (market value 2002 - $105,644, 2001 - $106,235)	$ 100,010	$ 99,910

5. INVESTMENT IN BOOK PROJECT

The Entomological Society has invested in the joint project for the publication of "Diseases and Pests of the Vegetable Crop in Canada" in conjunction with the Canadian Phytopathological Society. Both revenue and expenditure are to be shared in an equitable manner. The investment is recorded using the cost method. For the December 31, 2002 fiscal period no accrual was made for sales net of costs as it will be recognized as received. The remaining investment is expected to be recovered over the next few years.

6. CAPITAL ASSETS

	2002			2001
	Cost	Accumulated Amortization	Net	Net
Land	$ 40,000	$ -	$ 40,000	$ 40,000
Building	202,799	83,512	119,287	124,257
	$ 242,799	$ 83,512	$ 159,287	$ 164,257

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

SCHEDULE OF ENDOWMENT FUND REVENUE AND EXPENDITURE

FOR THE YEAR ENDED DECEMBER 31, 2002

	2002	2001
REVENUE		
Interest revenue	$ 4,557	$ 4,305
EXPENDITURE		
Page charges and reprints	3,180	4,837
NET REVENUE (EXPENDITURE) FOR THE YEAR	$ 1,377	$(532)

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

SCHEDULE OF BUILDING FUND REVENUE AND EXPENDITURE

FOR THE YEAR ENDED DECEMBER 31, 2002

	2002		2001
	Budget	Actual	Actual
REVENUE			
Rental income	$ 6,420	$ 6,585	$ 6,510
EXPENDITURE			
Amortization	5,420	4,970	5,177
Insurance	800	1,051	925
Property taxes	5,000	5,040	4,937
Repairs and maintenance	4,950	1,767	3,579
Utilities	2,000	1,466	2,180
	18,170	14,294	16,798
NET RENTAL REVENUE (EXPENDITURE) FOR THE YEAR	$(11,750)	$(7,709)	$(10,288)

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA

SCHEDULE OF SCHOLARSHIP FUND REVENUE AND EXPENDITURE

FOR THE YEAR ENDED DECEMBER 31, 2002

	2002	2001
REVENUE		
Interest revenue	$ 6,930	$ 6,950
Recovery of award	165	769
Donations	4,710	15,183
Gain on sale of investment	150	-
	11,955	22,902
EXPENDITURE		
Scholarship awards and travel grants	8,000	8,538
NET REVENUE FOR THE YEAR	$ 3,955	$ 14,364

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

McCAY, DUFF
& COMPANY LLP
CHARTERED ACCOUNTANTS

141 LAURIER AVE. WEST
6TH FLOOR
OTTAWA, ONTARIO K1P 5J3
TEL: (613) 236-2367
FAX: (613) 236-5041
1 (800) 267-6551
mccayduff@mccayduff.com
WEB: www.mccayduff.com

THOMAS W. HOWARTH, CA
BRYAN E. SULLIVAN, CA
ALBERT G. MONSOUR, B.ADMIN, CA
BLAIR E. DAVIDSON, B.COMM, CFP, CA
G. WARREN TRICKEY, B.COMM, CA
ROBERT D. SHANTZ, B.MATH, CA
MARGARET N. EGAN, B.ADMIN, CA, C.I.M.

CONSULTANT- ELDREN E. MCCONNELL, CA

AUDITORS' REPORT

To the Members,
Entomological Society of Canada.

We have audited the balance sheet of the Entomological Society of Canada - Scholarship Fund as at December 31, 2002. This financial statement is the responsibility of the Fund's management. Our responsibility is to express an opinion on this financial statement based on our audit.

Except as explained in the following paragraph, we conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

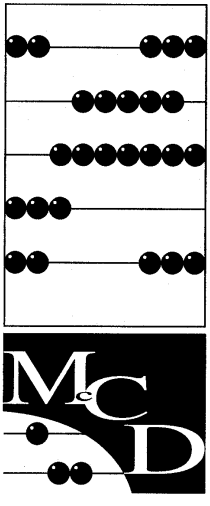
In common with many charitable organizations, the Fund derives revenue from cash donations, the completeness of which is not susceptible to satisfactory audit verification. Accordingly, our verification of this revenue was limited to the amounts recorded in the records of the organization and we were not able to determine whether any adjustments might be necessary to donation revenue, net revenue for the year, assets and surplus.

In our opinion, except for the effect of adjustments, if any, which we might have determined to be necessary had we been able to satisfy ourselves concerning the completeness of donations referred to in the preceding paragraph, this financial statement presents fairly, in all material respects, the financial position of the Fund as at December 31, 2002 and the results of its operations for the year then ended in accordance with Canadian generally accepted accounting principles.

McCay Duff & Company LLP

Chartered Accountants

Ottawa, Ontario,
March 7, 2003.



Associated World-wide with JHI Jeffreys Henry International

ENTOMOLOGICAL SOCIETY OF CANADA
SCHOLARSHIP FUND

BALANCE SHEET

AS AT DECEMBER 31, 2002

	2002	2001
ASSETS		
CURRENT		
Cash	$ 27,416	$ 32,256
Term deposit	4,283	4,137
Accrued interest receivable	1,843	1,832
	33,542	38,225
INVESTMENTS (note 2)	100,010	99,910
	$ 133,552	$ 138,135
LIABILITIES		
CURRENT		
Due to Entomological Society - General Fund	$ -	$ 8,538
SURPLUS		
BALANCE - BEGINNING OF YEAR	129,597	115,233
Revenue		
Interest	7,080	6,950
Recovery of award	165	769
Donations	4,710	15,183
	11,955	22,902
Expenditure		
Scholarship awards and travel grants	8,000	8,538
Net revenue for the year	3,955	14,364
BALANCE - END OF YEAR	133,552	129,597
	$ 133,552	$ 138,135

Approved on behalf of the Board:

Director

Director

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

ENTOMOLOGICAL SOCIETY OF CANADA
SCHOLARSHIP FUND

NOTES TO FINANCIAL STATEMENT

DECEMBER 31, 2002

1. SIGNIFICANT ACCOUNTING POLICIES

(a) Accrual Basis of Accounting

Revenue and expenditure are recorded on the accrual basis, whereby they are reflected in the accounts in the period in which they have been earned and incurred respectively, whether or not such transactions have been finally settled with the receipt or payment of money.

(b) Volunteer Services

The Fund receives volunteer services, the value of which cannot be reasonably estimated. Therefore, no representation of these costs are reflected in the financial statement.

2. INVESTMENTS

	2002	2001
Bonds, at cost (market value 2002 - $105,644, 2001 - $106,235)	$ 100,010	$ 99,910

3. FINANCIAL INSTRUMENTS

The Organization's financial instruments consist of cash, accrued interest receivable, term deposits and investments. Unless otherwise noted, it is management's opinion that the Organization is not exposed to significant interest rate, exchange rate or credit risks arising from these financial instruments.

Fair Values

The carrying amounts reported in the balance sheet for cash, term deposits and accrued interest receivable approximate fair values due to the immediate or short-term maturities of these financial instruments. Long-term investments are recorded at cost with market value reported in note 2.

4. STATEMENTS OF INCOME AND CASH FLOWS

These statements have not been prepared as all the relevant information is apparent from the other financial statement.

McCAY, DUFF & COMPANY LLP, CHARTERED ACCOUNTANTS

Bulletin of the Entomological Society of Canada

Editor
Paul Fields

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.

Published by the
Entomological Society of Canada
393 Winston Ave.
Ottawa, Ontario, Canada K2A 1Y8
http://esc-sec.org
entsoc.can@sympatico.ca

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.

Send correspondence to:

Paul Fields
Bulletin Editor
Cereal Research Centre
195 Dafoe Road
Winnipeg, MB, Canada R3T 2M9
Telephone: (204) 983-1468
Fax: (204) 983-4604
E-mail: pfields@agr.gc.ca

ISBN: 0071-0741
Printed in Canada

Submission deadline for the next issue, 31 July 2003

Bulletin de la Société d'entomologie du Canada

Rédacteur
Paul Fields

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.

Publié par
Société d'entomologie du Canada
393 Winston Ave.
Ottawa, Ontario, Canada K2A 1Y8
http://esc-sec.org
entsoc.can@sympatico.ca

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.

Envoyer vos sousmissions à :

Paul Fields
Rédacteur du Bulletin
Centre de recherche sur les céréales
195, chemin Dafoe
Winnipeg, MB, Canada R3T 2M9
Téléphone : (204) 983-1468
Télécopieur : (204 983-4604
courriel: pfields@agr.gc.ca

ISBN: 0071-0741
Imprimé au Canada

Date de tombée pour le prochain numéro : 31 juillet 2003

The Buzz / Bourdonnements

Paul Fields, Bulletin Editor / Rédacteur du Bulletin

I hope you enjoy the new format of the *Bulletin* and the additional articles that appear in this issue. Tonya Mousseau, the ESC Student Representative, will be organizing a new section of the *Bulletin*: *The Student Wing*. This feature developed when Tonya and I asked the students what they are interested in reading in the *Bulletin*. One of the features in this section will be the announcement of recently defended theses. If you know of someone that has recently completed their graduate studies, please forward the details to Tonya. The graduate students have been a great help in a column that begins this issue, *Lab Profile*. This column will feature an entomology lab, giving us an insight into the inhabitants of the lab, both human and arthropod. If you would like to share what is happening in your lab, please contact me.

Another new column is *Tricks of the Trade*. The goal of this column is to share the techniques we use every day in our labs, field sites, offices and classrooms. We don't find these techniques published in the scientific literature, but these methods are crucial to studying insects and communicating our results.

The Executive of the ESC has decided at their April meeting that the *Bulletin* will be immediately accessible to all on the ESC web site. In addition to the 1000 printed copies that go out to our members and libraries around the world, the *Bulletin* now has a much wider audience. So if you have an idea that you would like to share with the entomological community, I think the *Bulletin* is an excellent format.

J'espère que le format amélioré du *Bulletin* vous plaira, ainsi que les autres nouveautés que vous trouverez dans ce numéro. Tonya Mousseau, représentante des étudiants de la SEC, sera responsable d'une nouvelle rubrique, *L'aile étudiante*, une idée qui a pris forme après un sondage des étudiants sur les sujets qu'ils aimeraient voir dans le *Bulletin*. On y trouvera entre autres des annonces de soutenance de thèse récentes. Si vous connaissez quelqu'un qui vient de terminer ses études supérieures, communiquez les détails à Tonya. Les étudiants gradués ont été le moteur d'une autre nouvelle rubrique appelée *Profil de labo*, qui met en vedette un laboratoire d'entomologie et ses habitants, tant humains qu'arthropodes. Si vous avez envie de décrire votre labo, communiquez avec moi.

Nous présentons aussi *Trucs et astuces*, dont le but est d'informer au sujet des techniques utilisées tous les jours dans nos labos, nos travaux sur le terrain, nos bureaux et nos salles de classe. Jamais on ne voit ces techniques publiées dans les revues scientifiques, pourtant il s'agit de méthodes essentielles à l'étude des insectes et à la communication des résultats.

Lors de sa réunion d'avril, le conseil exécutif de la SEC a décidé que dorénavant le *Bulletin* sera accessible à tous dans notre site Web. Au delà des 1000 exemplaires imprimés à l'intention des membres et de bibliothèques autour du monde, le *Bulletin* rejoint maintenant un public beaucoup plus vaste. Donc, si vous avez une idée géniale à transmettre à la communauté entomologique, je crois que le *Bulletin* vous fournira un lieu excellent pour le faire.

Officers of Affiliated Societies. 2002-2003
Dirigeants des sociétés associées, 2002-2003

Entomological Society of British Columbia

President	Lorraine MacLauchlan
President-Elect	Gail Anderson
Past President	Rob Cannings
Editor (Journal)	Ward Strong
Editor (Boreus)	Cris Guppy
Sec.-Treasurer	Robb Bennett

B.C. Ministry of Forests, 7380 Puckle Rd.
Saanichton, BC V8M 1W4
Tel: (250) 652-6593, Fax: (250) 652-4204
E-mail: robb.bennett@gems6.gov.bc.ca
http://www.harbour.com/commorgs/ESBC/

Entomological Society of Alberta

President	Derek Kanashiro
Vice President	Heather Proctor
Past President	Hector Carcamo
Editor (Proceedings)	Andrea Kalischuk
Editor (Website)	Troy Danyk
Secretary	Mike Undershultz
Treasurer	Trevor Hindmarch

#62, 52152 RR 225, Sherwood Park, AB T8C 1C6
E-mail: tdhindmar@yahoo.ca, Tel: (780) 732-7238
http://www.biology.ualberta.ca/courses.hp/esa/esa.htm

Entomological Society of Saskatchewan

President	Cedric Gillott
President-Elect	Jack Gray
Treasurer	Dwayne Hegedus
Newsletter Editors	Wayne Goerzen
	Brian Galka
Secretary	Larry Grenkow

Agriculture and Agri-Food Canada
107 Science Place, Saskatoon, SK S7N 0X7
Tel: (306) 956-7293
E-mail: grenkowl@agr.gc.ca
http://www.usask.ca/biology/ess/

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

Entomological Society of Manitoba

President	Neil Holliday
President-Elect	John Gavloski
Past-President	Paul Fields
Treasurer	Ian Wise
Newsletter Editor	Nicole Lauro
Editor (Proceedings)	Terry Galloway
Member-at-Large	Tonya Mousseau
Secretary	Noel White

Agriculture and Agri-Food Canada
195 Dafoe Rd., Winnipeg, MB R3T 2M9
Tel: (204) 983-1452
E-mail: nwhite@agr.gc.ca
http://home.cc.umanitoba.ca/esm/

Entomological Society of Ontario

President	Bruce Gill
President-Elect	Jim Corrigan
Past-President	Barry Lyons
Treasurer	Blair Helson
Editor (Journal)	Yves Prévost
Secretary	David Hunt

Agriculture and Agri-Food Canada
2585 Country Rd. 20, Harrow, ON N0R 1G0
Tel: (519) 738-2251 ext 427
E-mail: Huntd@agr.gc.ca
http://www.utoronto.ca/forest/eso/eso.htm

Société d'entomologie du Québec

Président	Daniel Gingras
Président-sortant	Yves Mauffette
Vice-président	Michel Cusson
Trésorier	Stéphane Villeneuve
Rédacteur (Antennae)	Christine Jean
Secrétaire	Annabelle Firlej

Agriculture et Agroalimentaire Canada
430 Boul. Gouin
St-Jean-sur-Richelieu, QC J3B 3E6
E-mail: secretariat@seq.qc.ca
http://www.seq.qc.ca/

Acadian Entomological Society

President	Andrei Alyokhin
Vice-President	Cassie Gibbs
Treasurer	Charlene Donahue
Secretary	Charlene Donahue

Department of Biological Sciences
5722 Deering Hall, University of Maine
Orono, ME 04469 USA
E-mail: charlene.donahue@maine.gov
http://www.upei.ca/~aes/

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.

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.

Illustrated on the front cover is Tephritis angustipennis (Loew) (Diptera: Tephritidae). This fruit fly is markedly boreal in distribution in North America, and also in northern and eastern Europe. Habitus drawing by B. Flahey, from McAlpine *et al.* (Editors) 1981-1989, "Manual of Nearctic Diptera, Vol 2", reproduced with permission from Agriculture and Agri-Food Canada.

On trouvera sur la couverture une illustration de Tephritis angustipennis (Loew) (Diptera:Tephritidae). Cette mouche a une répartition principalement boréale et se rencontre d'un bout à l'autre de l'Amérique du Nord. On la trouve également en Europe orientale et septentrionale. Habitus dessiné par B. Flahey, d'après McAlpine *et al.* (éditeurs) Manual of Nearctic Diptera Vol. 2, reproduit avec la permission d'Agriculture et Agroalimentaire Canada.

List of contents / Table des matières **Volume 35 (2), June / juin 2002**

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.

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.