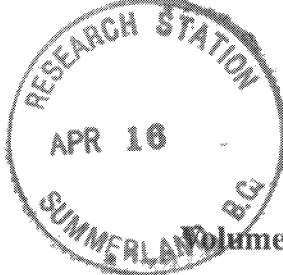


Bulletin

Entomological Society
of Canada

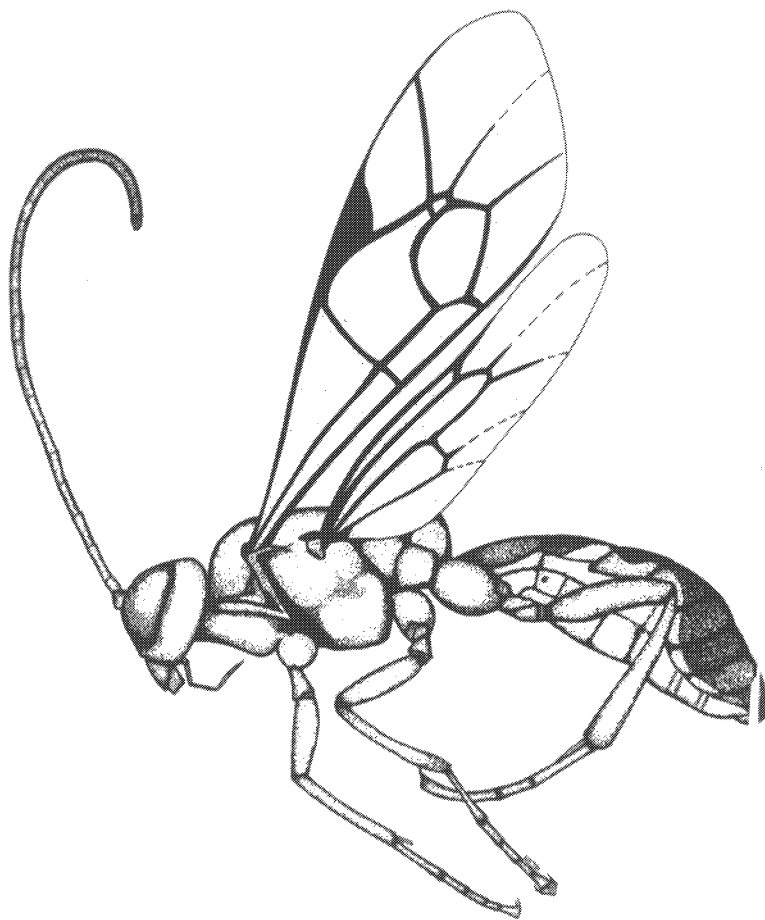
Societe d'Entomologie
du Canada



Volume 28

No. 1

March/mars 1996



Entomological Society of Canada
Societe d'Entomologie du Canada

393 Winston Avenue, Ottawa,
Ontario, Canada K2A 1Y8

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cover/Table des matiers
sur la couverture-arriere

Date of issue/Date de publication
March/mars 1996

Illustrated on the front cover is a male *Lathrolestes luteolator* (Gravenhorst) (Hymenoptera: Ichneumonidae). This parasitic wasp is known to attack the red oak leafminer [*Profenusa alumna* (MacGillivray)] and other pest insect species such as *Caliroa* spp. in eastern North America. Recent research has shown that *L. luteolator* switches host species, attacking *Profenusa thomsoni* (Konow), a birch leafminer, in western Canada. [Habitus illustration courtesy of Hugh Danks, Canadian Museum of Nature, Ottawa.]

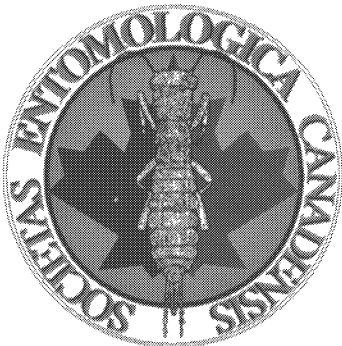
L'illustration de la page couverture représente un mâle *Lathrolestes luteolator* (Gravenhorst) (Hymenoptera: Ichneumonidae). Cette guêpe parasite attaque la mineuse du chêne rouge, [*Profenusa alumna* (MacGillivray)], ainsi que d'autres espèces de ravageurs du nord-est de l'Amérique du Nord, dont certaines tenthrèdes (*Caliroa* spp.). Il a récemment été démontré que *L. luteolator* effectue un transfert d'hôte et attaque maintenant la tenthrède mineuse de Thomson, *Profenusa thomsoni* (Konow), dans l'ouest canadien. (L'illustration est une courtoisie de Hugh Danks, Musée canadien de la nature, Ottawa.)

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 de Canada, publié depuis 1969, donne chaque trois mois les nouvelles des opportunités et renseignements, les détails des opérations de la Société, les dossiers d'un importance scientifique plus large, et les analyses d'ouvrages.

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

SOCIETY BUSINESS/AFFAIRES DE LA SOCIÉTÉ

Notice of Executive Council Meeting

The mid-term meeting of the Executive Council will be held at the Entomological Society of Canada office in Ottawa on April 20, 1996.

La réunion de mi-session du Conseil Exécutif aura lieu au Siège social de la Société d'entomologie du Canada le 20 avril, 1996.

46th Annual General Meeting

The Annual General Meeting of the Entomological Society of Canada will be held at the Lord Beaverbrook Hotel in Fredericton, New Brunswick, on October 8, 1996.

La réunion annuelle générale de la Société d'entomologie du Canada aura lieu au *Lord Beaverbrook Hotel* à Frédéricion, Nouveau-Brunswick, le 8 octobre 1996.

Governing Board Meeting

The Annual Meeting of the Governing Board will be held at the Lord Beaverbrook Hotel in Fredericton, N.B. on October 5 & 6, 1996

La réunion annuelle du conseil d'administration se tiendra au *Lord Beaverbrook Hotel* à Fredericton, N.B., le 5 & 6 octobre 1996.

Matters for consideration at any of the above meetings should be sent to the secretary at the address below:

Veuillez faire part au secrétaire de tout sujet pouvant faire l'objet de discussion à l'une ou l'autre de ses réunions en communiquant à l'address suivante:

Dr. Peggy Dixon
Agriculture and Agri-Food Canada, Box 37
Mount Pearl, Newfoundland A1N 2C1
Tel: 709-772-4763
Fax: 709-772-6064
E-mail: dixonp@nfrssj.agr.ca

Please send all correspondence concerning the
Bulletin to:

Dr. Hugh J. Barclay
Bulletin Editor
Pacific Forestry Centre
506 West Burnside Road
Victoria, B.C.
V8Z 1M5
Tel: (604) 363-0736
Fax: (604) 363-0775
E-mail: hbarclay@al.pfc.forestry.ca

Please send all correspondence concerning Book
Reviews for the Bulletin to:

Dr. Al. B. Ewen
Publications Committee
P.O. Box 509
Dalmeny, Sask.
S0K 1E0
Tel: (306) 254-4380
Email: ewena@duke.usask.ca

The deadline for submissions to be included in the next issue (Vol. 28(2)) is **May 1, 1996**
La date limite pour recevoir vos contributions pour le prochain numéro (Vol. 28(2)) est le **1 mai 1996**



**ESC-AES
96**

**The 1996 Joint Meeting of the
Entomological Society of Canada and the
Acadian Entomological Society**

Lord Beaverbrook Hotel, Fredericton, New Brunswick October 5-9, 1996

TENTATIVE PROGRAM

Saturday, 5 October 1996

08:30 - 17:00 Entomological Society of Canada Governing Board Meeting - Garrison Room

Sunday, 6 October

10:00-15:00 Registration
13:00-17:00 Workshop (2)
17:00-18:30 Linnaean Games
19:30-20:30 Students meet the Board - Petitcodiac Room
20:30-23:00 Wine and Cheese - Ballroom

Monday, 7 October

08:00-10:00 Registration
08:30-10:00 Opening remarks, ESC Awards, Gold Medal Address
10:00-12:00 Plenary Symposium: "Practical Applications of Basic Research" - Graham Thurston
13:30-15:00 Submitted Paper/Graduate Student Papers (President's Prize)
13:30-16:30 Workshop (1)
15:30-16:30 Poster Session
15:30-16:30 Heritage Lecture
16:30-17:30 Acadian Entomological Society Annual General Meeting
19:00-22:00 President's Reception (by invitation only)
17:00-21:00 Linnaean Games: Finals

Tuesday, 8 October

09:00-12:00 Symposium "Tree Resistance to Insects" Dan Quiring
Workshop (1), Submitted papers.
13:30-16:00 Submitted Papers
Poster Session
16:30-17:30 Entomological Society of Canada Annual General Meeting.
18:30-23:00 Banquet

Wednesday, 9 October

09:00-12:00 Symposium "Insects of Wetlands" Donna Giberson
Submitted Papers, Workshop (1)
12:00-13:00 Entomological Society of Canada Governing Board Meeting.

TENTATIVE WORKSHOPS

IPM in Apple Orchards - Rob Smith
Population Dynamics and Management of Hemlock Looper - Rick West
Entomopathogenic Nematodes and IPM - Graham Thurston
Research in Support of IPM programs for Colorado Potato Beetle - Gilles Boiteau
Insect Management in Seed Orchards - Jon Sweeney

For additional information, please contact:

| | | |
|--|----|-----------------------------------|
| Jon Sweeney (Chair) | or | Graham Thurston (Program Chair) |
| Canadian Forest Service, P.O. Box 4000 | | |
| Fredericton, New Brunswick, E3B 5P7 | | |
| Tel: (506) 452-3499 | | Tel: (506) 452-3026 |
| Fax: (506) 452-3525 | | Fax: (506) 452-3525 |
| Email: jsweeney@fcmr.forestry.ca | | Email: gthurston@fcmr.forestry.ca |



**SEC-SEA
96**

**La Réunion conjointe de 1996 de la
Société entomologique du Canada
et de la Société entomologique acadienne**

Hôtel Lord Beaverbrook, Fredericton, N.B., du 5 au 9 octobre 1996

PROGRAMME PROVISOIRE

Le samedi 5 octobre 1996

8 h 30 à 17 h Réunion du Conseil de la Société entomologique du Canada - salle Garrison

Le dimanche 6 octobre 1996

10 h à 15 h Inscription
13 h à 17 h Ateliers (2)
17 h à 18 h 30 Jeux Linnéens
19 h 30 à 20 h 30 Les étudiants rencontrent le Conseil - salle Petitcodiac
20 h 30 à 23 h Vin et Fromage - salle Ballroom

Le lundi 7 octobre 1996

8 h à 17 h Inscription
8 h 30 à 10 h Ouverture, Prix SEC, Allocution - Médaille d'or
10 h à 12 h Symposium plénier: "Applications pratiques de recherche fondamentale"- G. Thurston.
13 h 30 à 15 h Communications scientifiques: Étudiants du troisième cycle (Prix du Président)
13 h 30 à 16 h 30 Atelier (1)
15 h 30 à 16 h 30 Présentation des affiches
15 h 30 à 16 h 30 Allocution - Héritage des anciens
16 h 30 à 17 h 30 Réunion générale annuelle de la Société entomologique acadienne
19 h à 22 h Réception du Président (sur invitation seulement)
17 h à 21 h Jeux linéens: Session finale

Le mardi 8 octobre 1996

9 h à 12 h Symposium "Résistance des insectes à l'arbres" Dan Quiring
Ateliers (1), Communications scientifiques
13 h 30 à 16 h Communications scientifiques
16 h 30 à 17 h 30 Réunion générale annuelle de la Société entomologique du Canada
18 h 30 à 23 h Banquet

Le mercredi 9 octobre 1996

9 h à 12 h Symposium "Les insectes des marécages" Donna Giberson
Communications scientifiques, Ateliers (1)
12 h à 13 h Réunion du Conseil de la Société entomologique du Canada

ATELIERS PROVISOIRS

Lutte intégrée pour la répression des ravageurs dans les vergers - Rob Smith
Dynamique des populations et gestion de l'arpenteuse de la pruche - Rick West
Nématodes entomopathogéniques et la lutte intégrée pour la répression des ravageurs - Graham Thurston.
Recherche supportant les programmes de lutte intégrée pour la répression du doryphore de la pomme de terre - Gilles Boiteau.
Gestion des insectes nuisibles dans des vergers à grains - Jon Sweeney

Pour plus de renseignements, veuillez communiquer avec:

Dr. Jon Sweeney (Président) ou D. Graham Thurston (Président du programme)
Service canadien des forêts, Case postale 4000
Fredericton (Nouveau-Brunswick), E3B 5P7

Téléphone: (506) 452-3499
télécopieur: (506) 452-3525;
Email: jsweeney@fcmr.forestry.ca

Téléphone: (506) 452-3026
télécopieur: (506) 452-3525
Email: gthurston@fcmr.forestry.ca

ESC-AES
96

Fredericton, October 5 - 9, 1996
Lord Beaverbrook Hotel

Check one: Regular or Student

[illegible]

Tide

Address:

City:

Province/State: Postal Code:

Telephone: Fax:

Email:

Registration fees are in \$CDN (including banquet ticket and GST)

Late registration (After August 9, 1996, add \$15.00 to each fee).

Please make cheque payable to ESC/AES Joint Meeting 1996.

| | |
|-----------------------|-------|
| Registration, Regular | \$110 |
|-----------------------|-------|

| | |
|-----------------------|------|
| Registration, Student | \$60 |
|-----------------------|------|

| | |
|----------------------------|------|
| Registration, Accompanying | \$50 |
|----------------------------|------|

Name of accompanying person

TOTAL

Accommodations: A number of rooms have been set aside at the Lord Beaverbrook Hotel. \$70.00 single occupancy, \$75 double occupancy.

Please make your own reservations through:

Lord Beaverbrook Hotel, 659 Queen Street

Fredericton, New Brunswick E3B 5A6

Telephone: (506) 455-3371 Fax: (506) 455-1441

Reservations: 1-800-561-7666 (Toll free within Canada)

Note: When making your reservation, please let the hotel know you are attending the ESC/AES meeting.

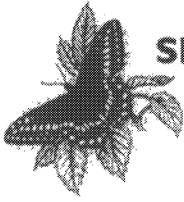
Please return this form and registration fees to:

Dr. E. Eveleigh

ESC/AES Joint Meeting 1996

Canadian Forest Service - Fredericton

P.O. Box 4000, Fredericton, New Brunswick, Canada E3B 5P7



**SEC-SEA
96**

**La réunion conjointe de 1996
de la Société entomologique du Canada
et de la Société entomologique acadienne**

Fredericton, le 5 au 9 octobre 1996
Hôtel Lord Beaverbrook

FORMULAIRE D'INSCRIPTION

Indiquez: Régulier ou Étudiant(e)

Nom:
 Nom de famille Prénom Initiale(s)

Titre:

Adresse:

Ville: Province/État:

Code postal: Téléphone:

Télécopieur: Email:

Frais d'inscription en monnaie canadienne (incluant les frais de banquet et TPS)
Inscription tardive (après le 9 août 1996 ajouter 15,00 \$ pour chaque frais).

Chèque ou mandat poste payable à "ESC/AES Joint Meeting 1996".

| | |
|----------------------------------|-----------|
| Frais d'inscription, Régulier | 110,00 \$ |
| Frais d'inscription, Étudiant(e) | 60,00 \$ |
| Frais d'inscription, Conjoint | 50,00 \$ |

| | |
|--------------------------|----------------|
| Nom du conjoint | TOTAL |
|--------------------------|----------------|

Hébergement: Un nombre de chambres sont réservées à l'Hôtel Lord Beaverbrook. 70,00 \$ chambre simple, 75,00 \$ chambre double.

Prière d'effectuer vos réservations directement auprès de:

Hôtel Lord Beaverbrook, 659, rue Queen
Fredericton, Nouveau-Brunswick E3B 5A6
Téléphone: (506) 455-3371 Télécopieur: (506) 455-1441
Réservations: 1-800-561-7666 (sans frais au Canada)

Note: Lorsque vous ferez votre réservation, veuillez spécifier que vous assisterez à la réunion de ESC/AES.

Veuillez retourner ce formulaire ainsi que les frais d'inscription à:

Dr. Eldon Eveleigh
Réunion conjointe de SEC/SEA de 1996
Service canadien des forêts - Fredericton
Case postale 4000, Fredericton, Nouveau-Brunswick, Canada E3B 5P7



**ESC-AES
96**

**The 1996 Joint Meeting of the Entomological Society
of Canada and the Acadian Entomological Society**

Fredericton, October 5 - 9, 1996
Lord Beaverbrook Hotel

**SUBMITTED PAPER, STUDENT PAPER
AND POSTER PRESENTATION FORM**

Please return to: Dr. Graham Thurston (Program Chair)
Canadian Forest Service - Fredericton, P.O. Box 4000, Fredericton, N. B. E3B 5P7
Tel: (506)452-3026; Fax: (506)452-3525; Email: gthurston@fcmr.forestry.ca

DEADLINE: Postmarked on June 29, 1996

Author(s):

Address:

Title:

Abstract:

Abstracts must not exceed 50 words; they may also be submitted by Email or on diskette.

Form of presentation desired (check one): Regular President's Prize*
Oral presentation: 12 min + 3 min discussion
Poster presentation:
Name of presenter:

Projection equipment:

A Kodak carousel projector and an overhead project will be available for each session. Slides should be provided in a carousel. Please contact the program chair if additional equipment is required. Poster materials must use velcro, not pins or tacks, for attachment to display panels.

* Students are eligible for the President's Prize if they meet the following criteria:

- 1) they must be enrolled in a graduate degree program or have graduated from the program less than six (6) months prior to the Meeting;
- 2) they must be registered at the Meeting; and
- 3) they must be the principal investigator of the paper.

The Logo



**ESC-AES
96**

The Short-tailed Swallowtail, *Papilio brevicauda bretonensis* McDunnough, is a distinctly Acadian insect, restricted to salt marshes along the northern coasts of New Brunswick, Nova Scotia, and Newfoundland. The larvae feed on scotch lovage, *Ligusticum scoticum*. The original pen and ink drawing was made by Nova Scotian artist, Twila Robar-DeCoste, from a photograph taken by Dr. Tony Thomas. T-shirts and/or coffee mugs with the logo will be available for sale at the meeting.



**SEC-SEA
96**

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Fredericton, les 5 au 9 octobre 1996
Hôtel Lord Beaverbrook

**FORMULAIRE D'INSCRIPTION: COMMUNICATIONS ORALES RÉGULIÈRES
ET D'ÉTUDIANT(E)S, ET COMMUNICATIONS POSTERS**

Veuillez retourner à: Dr. Graham Thurston (Président du programme)
Service canadien des forêts, Case postale 4000, Fredericton, N. B. E3B 5P7
Téléphone: (506)452-3026; Télécopieur: (506)452-3525;
Email: gthurston@fcmr.forestry.ca

DATE LIMITE: le 29 juin 1996

Auteur(s):

Adresse:

Titre:

Résumé:

Les résumés ne doivent pas dépasser 50 mots; doivent être envoyés par message électronique ou sur disquette.

Format de présentation (ne cocher qu'une case): Régulier Le Prix du Président*

Communication orale: 12 min + 3 min de discussion

Présentation des affiches:

Nom du présentateur:

Équipement audio-visuel:

Un projecteur Kodak pour diapositives et un rétroprojecteur seront disponible à chaque session. Veuillez contacter le responsable du programme si vous avez besoin d'équipement supplémentaire. Les diapositives devront être fournies dans un panier de projection. Pour les affiches veuillez vous servir de Velcro.

* Les étudiants sont éligibles pour le Prix du Président s'ils satisfont les critères suivants:

- 1) ils doivent être inscrits dans un programme d'études de troisième cycle ou avoir gradué d'un tel programme dans les six (6) mois précédant la Réunion conjointe;
- 2) ils doivent être inscrits à la Réunion conjointe; et,
- 3) ils doivent être le chercheur principal de la communication.

Le logo



**SEC-SEA
96**

Le papillon à queue courte, *Papilio brevicauda bretonensis* McDunnough, est clairement un insecte Acadien, limité aux marécages d'eau salées le long de la côte nord du Nouveau-Brunswick, de la Nouvelle-Écosse et de Terre-Neuve. Le larve se nourrit de livêge écosaise, *Ligusticum scoticum*. Le dessin est fait à la plume par une artiste de la Nouvelle-Écosse, Twila Robar-DeCoste d'après une photo prise par le Dr Tony Thomas. Des t-shirts et/ou tasses à café avec le logo seront en vente à la réunion.



ESC-AES

96

ACTIVITIES FOR PARTICIPANTS AND ACCOMPANYING PERSONS

In Fredericton and the surrounding area, there are a number of excellent tourist attractions. Enclosed are brochures describing some of these attractions and a booklet on tourism in New Brunswick can be obtained by filling out the enclosed postcard and mailing it to the New Brunswick Tourism Office.

PLEASE INDICATE BELOW WHICH OF THE FOLLOWING WOULD BE OF INTEREST TO YOU AND RETURN THIS FORM WITH YOUR REGISTRATION.

- King's Landing Historical Settlement** - travel back in time to 19th century Loyalist New Brunswick. King's Landing is a recreated New Brunswick settlement spanning the time between 1784 to 1900. Spread over nearly 300 acres of rolling farm and forested land on the banks of the Saint John River, are numerous period farm houses, a one-room schoolhouse, church, blacksmith, inn and sawmill (to name only a few of the attractions). Early October is an excellent time to visit King's Landing because much of the harvest is in and the "inhabitants" are all available to chat about life in the 1800's. Buses will take those interested to King's Landing before noon on Sunday, October 6, 1996. The tour will be self-guided and lunch can be purchased at the visitors' center or at the settlement's King's Head Inn. Buses will return to Fredericton around 4PM. Cost, including transportation and admission and applicable taxes, will be approximately \$15 per person. Please see the enclosed brochure.
- Fall Colors Bus Tour.** The Saint John River Valley is renown for its display of autumn foliage. The tour will head down river towards Gagetown where lunch will be supplied at a local restaurant and some stops will be made to visit craft shops and museums. The tour will be on Tuesday, October 8, 1996. Passengers will be picked up at the Lord Beaverbrook Hotel at 10:00 a.m. and will be return at 4:00 p.m. in plenty of time to freshen up before the banquet. Cost, including transportation, lunch and taxes will be approximately \$35 per person.
- Fall Craft Tour-** October 5 and 6 is the weekend of the Fall Craft Tour along the Nashwaak. A number of regional artisans open their workshops to visitors for the weekend. Most of the workshops are small and can only accommodate a few visitors at one time. As a result, we will most likely be unable to arrange transportation for small groups at a price that is economical. Those wishing to go on the tour may want to consider renting a car. Additional information on local craft shops can be obtained by checking the appropriate box on the NB Tourism postcard.

For those arriving on Saturday, October 5, Fredericton has a very active night life with a number bars and pubs providing live music for listening and dancing. A list of activities for the week of the conference will be available at registration.

For further information please contact:

Dr. Chris Lucarotti
Canadian Forest Service - Fredericton
P.O. Box 4000
Fredericton, NB E3B 5P7
phone: 506-452-3538 fax: 506-452-3525 email: clucarotti@fcmr.forestry.ca

I would be interested in the following attractions:

- | | | | |
|----|--------------------------------------|-------------------|-------|
| 1. | King's Landing Historical Settlement | Number of persons | _____ |
| 2. | Fall Colors Bus Tour | Number of persons | _____ |
| 3. | Fall Craft Tour (if available) | Number of persons | _____ |



SEC-SEA 96

ACTIVITÉS POUR LES PARTICIPANTS ET LEURS INVITÉS

Vous trouverez à Fredericton et les régions avoisinantes d'excellentes attractions touristiques. Des brochures décrivant quelques unes de ces attractions sont incluses, une brochure touristique du Nouveau-Brunswick est également disponible en remplissant la carte postale ci-incluse et la retournant au bureau touristique du Nouveau-Brunswick. Veuillez indiquer ci-dessous laquelle des activités suivantes vous intéresse le plus.

VEUILLEZ INDIQUER CI-DESSOUS LAQUELLE DES ACTIVITÉS VOUS INTÉRESSE LE PLUS

1. **Village historique de Kings Landing** - retourner au temps des Loyalistes du Nouveau-Brunswick du 19^e siècle. King's Landing raconte l'histoire néo-brunswickoise depuis 1784 jusqu'en 1900. Étaler sur presque 300 acres de terres cultivées et de terres forestières sur la rive du fleuve Saint-Jean, se trouvent diverses maisons de ferme de l'époque, l'école à classe unique, l'église, la forgerie, l'auberge et le moulin à scie (pour n'en nommer que quelques unes). Le début octobre est un temps excellent pour visiter King's Landing car la moisson est terminée et les habitants sont disponibles pour jaser de la vie en 1800's. Des autobus seront disponibles pour les intéressés à visiter King's Landing le dimanche 6 octobre 1996 en avant midi. L'excursion ne sera pas guidée et le déjeuner peut être acheté au centre des visiteurs ou à l'Auberge King's Head. Les autobus retourneront à Fredericton au environ de 16 heures. Le coût, comprenant le transport, l'admission et les taxes applicables, sera d'environ 15,00 \$ la personne. S'il-vous-plaît vous referez à la brochure ci-incluse.

2. **Tournée des feuillages d'automne en autobus.** Le fleuve Saint-Jean est renommé pour son étalage de feuillage d'automne. La randonnée se poursuivra le long de la rivière en se rendant vers Gagetown où un déjeuner sera servi au restaurant du coin et des arrêts seront effectués pour visiter des magasin d'artisanat et des musées. La tournée sera le mardi, 8 octobre 1996. Les passagers seront ramassés à l'hôtel Lord Beaverbrook à 10 heures et seront de retour à 16 heures. Ils auront donc suffisamment de temps pour se préparer pour le banquet. Le coût, incluant le transport, déjeuner et les taxes applicables, sera d'environ 35.00 \$ la personne.

3. **Randonnée estivale d'artisanat** - Les 5 et 6 octobre est la fin de semaine de la randonnée estivale d'artisanat le long de la rivière Nashwaak. Un nombre d'artisans régionaux ouvrent leurs ateliers au visiteur tout au long de la fin de semaine. La plupart des ateliers sont petites et peut seulement recevoir quelque visiteurs à la fois. C'est pourquoi nous seront probablement dans l'impossibilité d'arranger a prix raisonnable le transport pour un petit groupe. Les personnes intéressées à y participer devront louer une voiture. Pour plus d'information sur les ateliers régionales peut être obtenue en cochant la case appropriée sur la carte postale de Tourisme Nouveau-Brunswick.

Pour ceux arrivant le samedi 5 octobre, Fredericton offre plein d'activités nocturnes avec plusieurs bars et bistrots mettant en vedette plusieurs genres de musique. Une liste des activités qui auront lieu durant la semaine de la conférence sera disponible au bureau de l'inscription.

Pour plus d'information communiquez avec:

Dr Chris Lucarotti
Service canadien des forêts - Fredericton
Case postale 4000, Fredericton, Nouveau-Brunswick E3B 5P7
Téléphone: (506) 452-3538; Télécopieur: (506) 452-3525; Email: clucarotti@fcmr.forestry.ca

Je serais intéressé dans les activités suivante:

- | | |
|--|---------------------------|
| 1. Village historique de Kings Landing | Nombre de personnes _____ |
| 2. Tournée des feuillages d'automne en autobus | Nombre de personnes _____ |
| 3. Randonnée estivale d'artisanat | Nombre de personnes _____ |

Second Canadian Linnaean Games



**ESC-AES
96**

Following the lead set by Elizabeth Tomlin and the Student Affairs Committee in Victoria last year, the ESC-AES Joint Meeting Organizing Committee is organizing the second annual "Canadianized" version of the E.S.A.'s Linnaean Games. The Games were first held at a meeting of the E.S.A. in 1982, and since then have been a great success. The format of the Games involves teams of four people competing against each other to answer questions about entomology. The primary goal of the Games is to provide an activity for students at meetings that is educational and entertaining. The Games are named after Carolus Linnaeus to recognize his contributions to entomology and to reflect the objective of keeping the competition fun. For more information about the history and rules of the Games, refer to the Bulletin of the Entomological Society of America (now American Entomologist), 31(3): 5-6.

The preliminary round of the Games in Fredericton is scheduled for Sunday, with the time of the finals to be announced at a later date. Subject areas for questions will include: behaviours, Canadian entomological current events and history, crop protection, ecology, forestry, morphology, physiology, taxonomy and toxicology. Questions will be presented orally and visually, with the aid of slides.

The Student Affairs Committee invites all student members of the E.S.C. planning to attend the meeting to submit a team of four people, or your name (so that we can put you on a team). Depending on the response, there may be space available for a "drop-in" team that you can sign up during registration. Please send in your response by August 1, 1996.

We thank Al York, Tom Turpin and Sonny Ramaswamy of the E.S.A. and Elizabeth Tomlin for providing advice, information and equipment for the Canadian Linnaean Games.

Linnaean Games Registration Form

Name of Team:

Institution:

Team Members:

.....

.....

.....

OR

Name of Individual:

Institution:

Please return to:

Colleen Teerling
Department of Forestry and Environmental Management
University of New Brunswick
Fredericton, New Brunswick E3B 6C2
Tel.: (506) 453-4501; Fax (506) 453-3538

Deuxièmes Jeux linnéens canadiens



**SEC-SEA
96**

Suivant l'initiative de Elizabeth Tomlin et le Comité des affaires étudiantes à Vancouver l'an dernier, le Comité organisateur de la réunion conjointe de SEC-SEA organise les deuxièmes jeux annuels linnéens version canadienne. Les jeux ont été tenus pour la première fois lors d'une réunion de la S.E.A. en 1982, et depuis, ont connu beaucoup de succès. Le jeu met en compétition des équipes de quatre joueurs qui doivent répondre à des questions d'entomologie. Le but principal du jeu est de donner l'occasion

aux étudiant(e)s qui sont à la réunion de participer à une activité à la fois éducative et divertissante. Les jeux sont nommés en l'honneur de Carl von Linné, afin de reconnaître sa contribution au domaine de l'entomologie, ainsi que pour illustrer l'objectif de garder la compétition agréable. Pour plus de renseignements sur l'histoire et les règles du jeu, référez-vous au Bulletin de la Société entomologique américaine (American Entomologist), 31(3):5-6.

La manche préliminaire des Jeux de Fredericton est prévue pour dimanche. La date et l'heure de la finale seront annoncées plus tard. Les questions porteront sur les sujets suivants: le comportement, les événements actuels et l'histoire de l'entomologie canadienne, la phytoprotection, l'écologie, la foresterie, la morphologie, la physiologie, la taxonomie et la toxicologie. Les questions seront posées sous forme orale et visuelle, à l'aide de diapositives.

Le Comité des affaires étudiantes invite tous les étudiant(e)s membres de la S.E.C. qui prévoient participer à la réunion à présenter une équipe de quatre personnes, ou à donner leur nom (afin qu'ils soient placés dans une équipe). Il est possible qu'il y ait des places disponibles pour former une équipe improvisée au moment de l'inscription. Veuillez faire parvenir votre réponse avant le 1er août 1996.

Nous remercions Al York, Tom Turpin et Sonny Ramaswamy de la S.E.A. et Elizabeth Tomlin pour les conseils, l'information et l'équipement qu'ils nous ont fournis pour les Jeux Linnéens Canadiens.

Jeux linnéens canadiens: Formulaire d'inscription

Nom de l'équipe:

Institution:

Noms des membres:

de l'équipe:

.....

OU

Nom (personne seule):

Institution:

Veuillez retourner à: Colleen Teerling
Département de foresterie et de gestion environnementale
Université du Nouveau-Brunswick
Fredericton, Nouveau-Brunswick E3B 6C2
Téléphone: (506) 453-4501; Télécopieur: (506) 453-3538

Committees and Representatives for 1995-96

A- Permanent committees/ Comités permanents

Nominations/ Nominations

L. Safranyik, Chair, Victoria
R. Footitt, Ottawa
N. Holliday, Winnipeg

Elections/ Élections

J. Corrigan, Chair, Guelph
A-M. Cooper, Guelph
D. Caloren, Guelph
G. Boivin, ex officio, St-Jean-sur-Richelieu

Fellowships/ Compagnons

G. G. E. Scudder, 1996, Chair, Vancouver
P. Harris, 1996, Lethbridge
W. J. Turnock, 1997, Winnipeg
G. B. Wiggins, 1997, Toronto
E. Becker, 1998, Ottawa
S. Loschiavo, 1998, Winnipeg
G. Boivin, ex officio, St-Jean-sur-Richelieu

B- Continuing Committees/ Comités en cour

Achievement Awards/ Prix d'excellence

H. V. Danks, Chair, Ottawa
V. M. Behan-Pelletier, Ottawa
J. R. Byers, Lethbridge
G. Boivin, ex officio, St-Jean-sur-Richelieu
S. A. Marshall, ex officio, Guelph

Annual Meeting/ Réunion annuelle

1996, Maritimes, J. Sweeney
1997, Alberta, B. K. Mitchell
G. Boivin, ex officio, St-Jean-sur-Richelieu

Bilingualism/ Bilinguisme

J. Delisle, Chair, Québec
J. Brodeur, Québec
M. Cusson, Québec
G. Boivin, ex officio, St-Jean-sur-Richelieu

Bylaws, Rules & Regulations/ Règlements

W. Turnock, Chair, Winnipeg
G. Boivin, ex officio, St-Jean-sur-Richelieu

Endangered Species/ Espèces menacées

S. A. Marshall, Chair, Guelph
D. Langor, ESA, Edmonton

S. Cannings, ESBC, Vancouver
H. Chiasson, SEQ, St-Charles-sur-Richelieu
G. Boivin, ex officio, St-Jean-sur-Richelieu

Finance/ Finance

E. Becker, Chair, Ottawa
G. Gibson, ex officio, Ottawa
G. Boivin, ex officio, St-Jean-sur-Richelieu

Heritage/ Héritage

R. DeBoo, Chair, Victoria
G. Boivin, ex officio, St-Jean-sur-Richelieu

Insect Common Names/ Noms communs d'insectes

R. Roughley, Chair, Winnipeg
E. Belton, ESBC, Vancouver
D. Langor, ESA, Edmonton
R. Smith, AES, Kentville
K. Moore, ESS, Saskatoon
J. Boisclair, SEQ, Saint-Hyacinthe
G. Boivin, ex officio, St-Jean-sur-Richelieu

Membership/ Adhésion

J. Stewart, Chair, Charlottetown
T. Shore, ESBC, Victoria
D. Langor, ESA, Edmonton
J. Sweeney, AES, Fredericton
P. Kusters, ESS, Saskatoon
G. Chouinard, SEQ, Saint-Hyacinthe
G. Boivin, ex officio, St-Jean-sur-Richelieu

Public Education/ Éducation publique

L. Dosdall, Chair, Vegreville
T. Shore, ESBC, Victoria
B. K. Mitchell, ESA, Edmonton
J. Doane, ESS, Saskatoon
R. J. Lamb, Winnipeg
P. Fields, Winnipeg
D. Coderre, Montreal
J. Sweeney, Fredericton
D. Larson, St-John's
G. Boivin, ex officio, St-Jean-sur-Richelieu

Publications/ Publications

A. Ewen, Chair, Dalmeny
D. Eidt, Fredericton
S. Fitzpatrick, Vancouver
C. Cloutier, Québec
A. Keddie, Edmonton

P. Mason, Saskatoon
P. Kevan, ex officio, Guelph
V. Behan-Pelletier, ex officio, Ottawa
F. Hunter, ex officio, St-Catherines
H. Barclay, ex officio, Victoria
B. Patterson, ex officio, Ottawa
G. Boivin, ex officio, St-Jean-sur-Richelieu

Scholarships/ Bourse d'études

J. Soroka, Chair, Saskatoon
R. Alfaro, ESBC, Victoria
D. Langor, ESA, Edmonton
J. Conroy
G. Surgeoner,
C. Cloutier, SEQ, Sainte-Foy
K. MacKenzie, AES, Kentville
S. Lindgren, Prince George
G. Boivin, ex officio, St-Jean-sur-Richelieu

Keith Kevan Scholarship Subcommittee

J. Soroka, Chair, Saskatoon
G. Gibson, Ottawa
R. Roughley, Winnipeg
G. Scudder, Vancouver

Research-Travel Grants/ Octrois pour la recherche et les déplacements

L. Hollett, Chair, Corner Brook
I. Otvos, Victoria
D. Coderre, Montréal
W. Bowers, St. John's
D. Langor, Edmonton
G. Boivin, ex officio, St-Jean-sur-Richelieu

Science Policy/ Politique scientifique

S. A. Marshall, Chair, Guelph
H. V. Danks, Vice-chair, Ottawa
M. Goettel, Lethbridge
P. Dixon, St-John's
P. Harper, Montreal
G. Boivin, ex officio, St-Jean-sur-Richelieu

Student Affairs/ Affaires étudiantes

T. Danyk, Chair, Lethbridge
L. Jeffs, Saskatoon
A. Chau, Burnaby
C. Godin, Ste-Anne-de-Bellevue
G. Boivin, ex officio, St-Jean-sur-Richelieu

C-Ad-Hoc Committees/ Comités ad hoc

Headquarters/ Siège social

R. Anderson, Chair, Ottawa
G. Boivin, ex officio, St-Jean-sur-Richelieu

Marketing/ Comité du marketing

K. Floate, Chair, Lethbridge
J. D. Shorthouse, Sudbury
R. Westwood, Winnipeg
G. Boivin, ex officio, St-Jean-sur-Richelieu

WWW site/ Site WWW

G. Boivin, Chair, St-Jean-sur-Richelieu
D. Blades, Victoria
B. Mitchell, Edmonton
S. Marchall, Guelph

Nominations Committee Report

The following list of nominees for offices of the Entomological Society of Canada has been received from the Nominating Committee.

Le Comité des nominations a soumis la liste des candidats suivants pour des postes de la Société d'entomologie du Canada.

Second Vice-President

Linda L. Gilkeson, Cedric Gillott

Director-at-Large

Lloyd Dosdall, John R. Spence, Jeff G. Stewart

Fellowship Committee

George H. Gerber, John A. McLean, Bernard Roitberg

Additional nominations must be signed by three members in good standing and received by **30 April 1996** by the secretary, Dr. Peggy Dixon.

S'il y a d'autres mise en candidature pour ces mêmes postes, celles-ci doivent être signée par trois membres de la Société et envoyée avant le **30 avril 1996** au secrétaire Dr. Peggy Dixon.

Student Affairs Committee Update

It has come to my attention that some people may not know what the Student Affairs Committee (S.A.C.) is, or what it does. The Committee was established at the Annual General Meeting on September 29, 1987, when the name of the Employment Committee was changed to the Student Affairs Committee. The rules and regulations were revised to reflect the new emphasis of the Committee. The S.A.C. has two objectives: 1) to advise Student Members, the Governing Board, and the Society on programs of the Society for students on other matters concerning students, and 2) to advise Student Members and the Society on the training of entomologists and on the future job opportunities for entomologists in Canada. The Committee has met these objectives over the years by publishing Annual Reports and Updates in the Bulletin, conducting employment surveys, coordinating employment workshops at Annual Meetings, collecting and publishing job/study opportunities in the Bulletin, and coordinating the First Canadian Linnaean Games. The S.A.C. consists of a maximum of five Society Members, including the Chair; at least two of Committee members should be Student Members of the Society. Student Members are encouraged to use, and consider, the S.A.C. as their official liaison between themselves and the Governing Board.

I am pleased to announce that the S.A.C. has a full compliment of members, all of whom are students. The Committee consists of: Troy Danyk, Chair (Simon Fraser University), Amanda Chau (Simon Fraser University), Claude Godin (Macdonald College), Lloyd Jeffs (University of Saskatchewan), Eric Lucas (Universite du Quebec a Montreal); Sherah Vanlaerhoven (Simon Fraser University) is acting as advisor to the Committee.

There are about 600 members in the Society, 100 of whom are students. Regional representation, on Oct. 30, 1995: British Columbia, 27; Alberta, 15; Saskatchewan, 2; Manitoba, 5; Ontario, 21; Quebec, 12; New Brunswick, 3; Nova Scotia, 1; Newfoundland, 1; U.S.A., 8; Switzerland, 2; Ireland, 1; Japan, 1; Mexico, 1. Student Members compose 17% of Society membership, and I would like to see this percentage increase. One of the goals of the S.A.C. in the coming year will be to increase the awareness of the Society among students, and to encourage students who are not members to join.

Copies of the Report of the Strategic Review Committee have been distributed to all S.A.C. members. This report outlines a number of significant changes to the structure and nature of the Society. The report is under review by the S.A.C. to determine the effect that these changes may have on Student Members and the Society as a whole. I plan to submit a report from the S.A.C. To the Governing Board.

If anyone has an issue that they think the S.A.C. may wish to consider, please contact me at: Agriculture and Agri-Food Canada, Lethbridge Research Centre, P.O. Box 3000, Lethbridge, AB, T1J 4B1, Canada; e-mail danyk@abrsle.agr.ca; fax 403-382-3156; phone 403-327-4561.

Troy Danyk
Chair, Student Affairs Committee
Lethbridge, Alberta

Call for Nominations - Fellows

Nominations are invited for Fellows in the Entomological Society of Canada. Fellows may be active or special members or entomologists who have made outstanding contributions to the advancement of entomology.

Nominations must be signed by four active members of the Society and are then reviewed by the Fellowship Selection committee. Names are submitted to the Executive Council for approval. A brief biography of the candidate and a statement of her/his contribution to entomology should be included in the nomination. Nominations should be received by the Committee by 31 January 1996. They should be sent in an envelope marked "Confidential" to:

Dr. G.G.E. Scudder,
Department of Zoology,
University of British Columbia,
Vancouver, B. C.
V6T 1Z4

PERSONALIA

Members in the News

Simon Fraser University has honoured Dr. H. R. MacCarthy, B.C.'s elder statesman of entomology, with the Chancellor's Distinguished Service Award for his long service to entomology in B.C. and more recently to SFU in the Pest Management Program. Dr. MacCarthy has been at the forefront of research in entomology in B.C. and has also been an exceptional teacher at SFU.

Simon Fraser University has also honoured Thelma Finlayson, another long-time entomologist and internationally recognized expert on insect parasites, with an honorary Doctor of Laws degree. Mrs. Finlayson is SFU's first Professor Emerita and, although retired for several years, continues to counsel students.

Obituaries

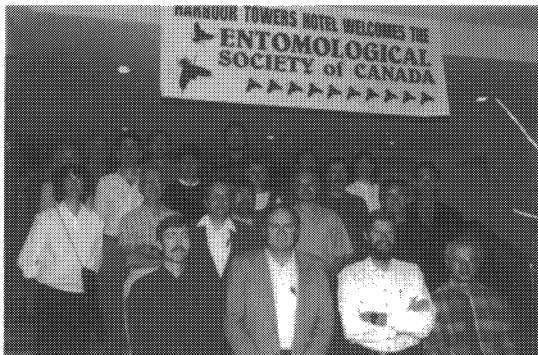
Frederick Palmer Ide died on January 19, 1996. Professor Ide was a meteorologist and entomologist and combined these specialties to study the effects of weather on insect populations. He was also a specialist in stream ecology. He died after a brief illness.

Guy E. Shewell died on February 19, 1996. Guy was widely known for his work on diptera and was a Fellow of the Entomological Society of Canada.

Eric Rockburne was a technician with the Lepidopterists and before that with the late Stirling McLead. He is survived by his wife and family.

Annual General Meeting Photographs

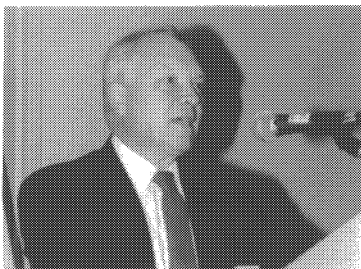
The photographs from the Annual General Meeting in Victoria are belatedly included here.



Back row: A. Ewen, B. Footitt, T. Shore, P. Kevan, F. Hunter.
Second row: E. Belton, K. Moore, J. Brodeur, P. Dixon,
B. Lyons, N. Holliday. Third row: S. Fitzpatrick, C. Gillott,
H. Danks, R. West, B. Mitchell, J. Sweeney. Front row:
S. Marshall, L. Safranyik, G. Boivin, G. Gerber.



Les Safranyik, President of ESC, giving the
Presidential Address.



Geoff Scudder giving the Heritage lecture



Reinhart Brust giving the Gold Medal address



Les Safranyik congratulating Gordon Hewitt award winner, David Langor



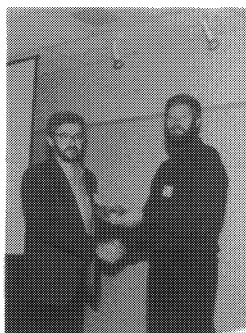
Les Safranyik presenting post-graduate scholarship award to Alida Janmaat from SFU



Les Safranyik presenting the Keith Kevan scholarship to David Caloren from the University of Guelph



Les Safranyik passing the gavel to incoming president, Guy Boivin



President Boivin presenting service award to outgoing treasurer, Bob Footitt



President Boivin presenting service award to retiring Bulletin editor, Fiona Hunter

NEWS OF ORGANIZATIONS

A New Annotated List:

Invitation To People Interested In The Arthropod Fauna Of Canada

The Biological Survey of Canada (Terrestrial Arthropods) is updating its annotated list of personnel interested in the taxonomy and ecology of the Canadian arthropod fauna, and their projects. The resulting list will be published, with indexes, and made available to facilitate cooperation among entomologists. (An earlier published list is considerably outdated.)

A short questionnaire has been designed to ensure that entries in the list will accurately reflect the interests of respondents, and has been sent to potential respondents known to the Survey. Anyone interested in the fauna of terrestrial arthropods in Canada who has not yet received a questionnaire is invited to request one from The Biological Survey of Canada (Terrestrial Arthropods), Canadian Museum of Nature, P.O. Box 3443, Station "D", Ottawa, Ontario, Canada K1P 6P4. Tel. 819-994-0120; Fax: 819-953-6220; email: hdanks@mus-nature.ca.

The Biological Survey of Canada, a joint enterprise of the Canadian

Museum of Nature and the Entomological Society of Canada, helps to support studies of the systematics and ecology of insects and their relatives from a national scientific perspective. In its coordinating role, the Survey produces and publishes syntheses of scientific information, organizes active cooperative projects, and pursues a variety of general concerns in systematic and faunistic entomology. In addition, it acts as a clearing house for information on personnel, projects and facilities and on current field activities or other matters related to study of the fauna.

Biological Survey of Canada (Terrestrial Arthropods) Survey Report

The Scientific Committee met in Ottawa on 26 and 27 October 1995.

Scientific Projects

1. *Arthropods of Canadian Grasslands*

A workshop for the SAGE project (Study of Arid Graminoid Ecosystems) took place immediately after the meeting, 28-29 October, aimed at standardizing the sampling protocols for arthropods in grasslands. This large cooperative project will involve a very wide range of agencies in many different grasslands and similar systems.

A draft brief about the importance of arthropods in ecosystem management was also reviewed by the Committee, and will be prepared as a Survey brief in time to support the development of the SAGE project.

2. *Arctic Invertebrate Biology*

The committee reviewed the draft of a letter reiterating the importance of the arctic in Canada, and the current difficulties in obtaining support, and securing permits for research, and agreed that the letter should be sent on behalf of the Committee to various agencies concerned about arctic matters.

3. *Family Keys*

Funding has been obtained to allow illustrations of some groups to be prepared, so that additional progress can be made on the next (exopterygote insects) fascicle of the keys to the families of arthropods in Canada.

4. *Arthropod Fauna of the Yukon*

Mr. J.A. Downes reported that 3/4 of the papers for the proposed Yukon volume are now essentially complete, and very interesting results have been obtained. Arrangements were made to accelerate preparation of remaining chapters, notably the synthesis chapter.

5. *Seasonal Adaptations*

Noting that the Survey has had a project on insect seasonal adaptations for many years, Dr. H.V. Danks urged that the Survey remain alert for possibilities to develop future initiatives in this field (including elements such as cold-hardiness), because they help to broaden the Survey's approach to characterizing the fauna.

Other scientific priorities

1. *Invasions and reductions*

Work by Dr. S.A. Marshall to define a specific project on invasions and reductions had identified interesting patterns in the occurrence of routinely collected and relatively easily identified species in the University of Guelph collection. A specific proposal to define the project further will be prepared for consideration at the next meeting.

2. *Workshops*

A subcommittee agreed to consider further the possible value of less specialized workshops on basic identification, sampling, and other elements, and the resources needed to make them feasible.

3. *Analysis of gaps in taxonomic knowledge*

Provisional protocols for tabulating data for faunal analysis and available taxonomic expertise were reviewed, and core protocols for determining known, expected or estimated numbers of species were agreed to. Additional elements including estimates of reliability and information on expertise will be added.

4. Support for collections infrastructure

Briefs entitled "Recommendations for Support of Biological Collections Infrastructure in Canada, with Special Reference to Terrestrial Arthropods" have been submitted to the Natural Sciences and Engineering Research Council and to the Biodiversity Convention Office.

5. Canada's Biodiversity Strategy

The Committee discussed ways to arrive at a plan for implementing the Canadian Biodiversity Strategy. A subcommittee agreed to develop on behalf of the Committee a focussed document for submission to the Biodiversity Convention Office.

6. Old-growth forests, and residues

Dr. S.A. Marshall noted the desirability and relative ease of retaining residues from forest biodiversity projects. The Committee discussed ways to store and preserve such residues. Dr. R.S. Anderson and other members of the Committee agreed to develop these themes further.

7. Endangered species

Dr. S.A. Marshall reported that his extensive discussions with the Canadian Wildlife Service on behalf of the ESC and the BSC appear to have had no influence on recent legislation, the Wildlife Trade Act and the Endangered Species Act. There appears to be a misguided emphasis on protecting individual insects from a non-existent threat, but there should be some basis for specific regulations beyond the need to create a perception. The Endangered Species Act does not consider habitat protection.

Liaison and exchange of information with other organizations

1. Canadian Museum of Nature

In the absence of an official representative from the CMN, Dr. H.V. Danks outlined recent important developments at the Museum in two arenas. First, reorganizations continue in science. Six projects now are established and continue to be developed. Second, because of environmental issues, the start of a new consolidated facility has been delayed and consequently several buildings were closed on health and safety grounds after the meeting.

2. Biological Resources Division, CLBRR

Dr. J. Surprenant, Program Chair, BRD, reported that the former CLBRR will be changing (on April 1, 1996) to the Eastern Cereal and Oilseed Research Centre, one of 18 Centres of Excellence in Agriculture and Agrifood Canada. The Centre will have 3 program areas, Crops (cereals and oilseeds), Land Resource Unit, and Biosystematics. The director of the new Centre will be Dr. J. Dueck. Dr. Surprenant reported that focus in biosystematics is now put on agricultural problems. More cooperative studies will be carried out, and the financial involvement of cooperators will be linked to how closely the project reflects the mandate of Agriculture Canada. Hence, there will have to be 100% cost-recovery for non-mandate or "service" work. BRD is becoming more and more involved with Internet, including a BRD home page and some publications on the Internet.

3. Entomological Society of Canada

Dr. G. Boivin, President, ESC, reported that a very successful annual meeting of the Society had been held in Victoria, during October, with very high attendance and participation. He referred to the importance of the Society's current Strategic Review.

4. Canadian Forest Service

Dr. O. Hendrickson, Environmental Impact & Biodiversity Coordinator, CFS, reported that the CFS Science and Technology programmes are being reorganized into 10 science and technology research networks, including a Forest Health Network and a Biodiversity Network, effective 1 April 1996. The Forest Health Network will incorporate parts of the old Forest Insect and Disease Survey (which no longer exists). The Biodiversity Network will incorporate elements of biosystematics, but is still being organized.

5. Canadian Society of Zoologists: Parasitology

Dr. D. Marcogliese, Chair, parasitology module steering committee, reported that the pending parasitology module continues with three major projects. The Perch Project awaits analysis of data, which will allow the project to be evaluated. The directory of parasitologists has been updated in a much more comprehensive form. A survey

of taxonomic expertise should also be ready soon.

Dr. Marcogliese updated the Committee about the closure of the centre of parasitology at the Mont-Joli laboratory. He also reported on some other recent matters related to biodiversity, and circulated several publications of potential interest to the Survey.

6. *Ecological Monitoring and Assessment Network, Environment Canada*

Dr. Patricia Roberts-Pichette, Senior Scientific Advisor, EMAN, participated in various discussions of projects and priorities, including grasslands, workshops and other matters.

7. *Biodiversity Convention Office, Environment Canada*

Mr. J. F. Herity introduced the context and participated in discussion of an implementation plan for the Canadian Biodiversity Strategy (see above).

8. *Canadian Wildlife Service*

Mr. G. Lee, Chief, Habitat Conservation, Canadian Wildlife Service, introduced the Committee to recent developments concerning the Monarch butterfly, in reviewing the content of a declaration for "creation of an international network of Monarch butterfly reserves". Mr. Lee pointed out that the potential importance of this declaration to the BSC lies in the fact that for the first time it broadens the biodiversity area of interest beyond "popular" species like birds, whales and caribou, which could be the means to generate additional recognition of the contribution of entomologists to the Canadian biodiversity base. Members of the Committee urged that eventually an insect specialist be on the CWS staff, and encouraged the service to look for other opportunities or case studies dealing with arthropods.

Other items

1. *Regional developments*

Information of potential interest to the Survey was reviewed, including the following samples from different areas of the country.

In British Columbia, work on some priorities for rare and endangered species has been funded, notably on the butterflies of the South Okanagan. Substantial resources are available or potentially available for biodiversity work on insects in B.C. in the context of forest management. Dr. V. Marshall, Canadian Forest Service, has taken early retirement.

The book *Alberta Butterflies* has been published to very favourable reviews. Additional interesting faunal samples have been obtained from Alberta wells. The 1995 Entomological Society of Alberta annual meeting includes a diverse programme of displays and other events aimed at raising public awareness.

Many Ontario institutions are suffering or awaiting budget cuts from the provincial government. Two entomologists from the Department of Environmental Biology at the University of Guelph have retired or will soon retire without replacement. The scope of work in some government agencies is being restricted. However, several students are working at the Royal Ontario Museum. Dr. G.B. Wiggins is still active, and a second enlarged edition of Dr. Wiggins' book on North American caddisfly larvae is now in press. A recent spider exhibit at the ROM attracted very great public attention.

The 1995 Annual Meeting of the Société d'entomologie du Québec took place in Montreal soon after the Scientific Committee meeting. Applications for a graduate student fellowship at Macdonald College (sponsored by the CMN) are being sought.

Dr. D.J. Larson outlined the current economic crisis in Newfoundland, resulting from a total ecosystem collapse in the north Atlantic caused by successive exploitation and extermination or reduction of many species, especially fish. During the annual Newfoundland entomology outing, wide-ranging collections were made during one week on the uninhabited offshore Brunette Island. The Acadian Entomological Society meeting took place in June. Dr. G. Bennett, Head of the International Reference Centre for Avian Haematozoa, has retired, and the centre has been dissolved. The very valuable collection and other materials from the Centre were accepted by the Queensland Museum in Brisbane, Australia, in the absence of interest from Canadian institutions.

Dr. Larson reported on the proposed Torngat Mountains National Park in Labrador. Recent developments (related to mineral potential and to traditional fishing interests) have gutted the original park area of its biological richness, a matter of concern because the park system should be one way of maintaining areas of high biodiversity. Dr. Larson and Dr. A. Raske reported on studies in forest habitats. Mr. K. Pardy, who curated the Newfoundland forestry insect collection for many years, has retired, and Dr. Raske also retired in the fall of 1995.

2. Other matters

The Committee discussed additional matters, including the arthropod fauna of soils, damaged ecosystems, activities of the Survey Secretariat, international liaisons and membership of the Scientific Committee.
H.V. Danks, Ottawa, Ontario

PUBLICATIONS

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Al B. Ewen Chair, Publications Committee

BOOK REVIEWS

Bacillus thuringiensis, An Environmental Biopesticide: Theory and Practice. 1993. Edited by Philip F. Entwistle, Jenny S. Cory, Mark J. Baily and Stephen Higgs. John Wiley & Sons Ltd. West Sussex, England. 311 pages. \$120.00 US. ISBN 0471-93306-6

In the preface, the editors stated that their intention was to bring together the contributions of microbiologists, entomologists, biochemists and others from industry, academia and government research agencies who are responsible for the successful development of *Bacillus thuringiensis* (Bt) as an effective biopesticide. Authored by twenty-three scientists, the book covers the development of Bt from basic research, to operational use, to environmental consequences and its future prospect. It appears to be organized into three general subject areas. The current knowledge of Bt from a biological, biochemical and molecular genetic perspective is presented first, followed by a review of the applied research and development of this group of microbial entomopathogens into effective microbial insecticides and their delivery systems (transgenic or direct application). Finally, the environmental consequences of its use and introduction into a broader segment of the society through commercial development, are briefly reviewed.

The introduction provides an overview of the advancements in basic research and the increasing operational success of specific Bt strains against a variety of insect groups. The basic research of the Bt toxins and associated genes and of the molecular organizational structure-function relationship that has been reported is well reviewed. The review of the diversity of toxins and genes dwells primarily on the genetic makeup of toxin genes with a limited review of the diversity of the toxins. Review of the toxins, their structure, diversity, mutations and hybrids is presented in the second of the two chapters that deal primarily with the molecular characteristics of the Bt toxins. Where details are limited, the authors provide an extensive reference list that interested readers can use to pursue a more detailed and in depth review and discussion.

Review of the practical use of Bt begins with the efforts and successes in transgenic studies in microbes and plants. Microbes are used as delivery systems to expand the host range of susceptible pests and as a means of improving residual insecticidal activity. Expression of Bt toxins in susceptible plant tissues brings a measure of protection to susceptible tissue from a variety of pests otherwise not readily susceptible to Bt. The book provides a good overview of the current state of the art of this highly technical field relative to Bt. The review of conventional use of Bt by application of formulated spore and crystal preparations against the Diptera and Coleoptera, is adequate. Against Lepidoptera, the author adequately reviewed methods of integration of Bt with other compatible control strategies used against agricultural and other crop pests and pests of conifer forests. However, there is little reference to three decades of research efforts to optimize the use of Bt in deciduous forests of the eastern US, primarily against the gypsy moth, *Lymantria dispar*. Approximately a year prior to this publication, an extensive review of the use of *B. thuringiensis* subsp. *israelensis* (Bti) and *B. sphaericus* against Diptera (mosquitoes and blackflies) was published. Although there may be some unintentional repetition of information, the two publications complement each other and the authors have managed to review adequately, though briefly, the high points of the development

of the operational use of Bt. The isolation of strains of *B. thuringiensis* subsp. *tenebrionis* (Btu) that are insecticidal to Coleoptera is relatively recent; they have been registered for use only since 1991. The biochemical and genetic characteristics of the associated insecticidal crystal proteins of this group of Bt strains are reviewed in prior chapters. By comparison there have been few field studies conducted with this Bt strain and these were conducted primarily against the colorado potato beetle, *Leptinotarsa decemlineata*. Nonetheless the authors have provided a reasonable overview of the host range of susceptible pests and its impact on nontarget species.

There is increasing concern for the environmental consequences of extensive use of Bt and of genetically modified organisms (Bt or others with toxin genes) and their effect on the ecosystem (benefits/safety/harm) is being measured and analyzed more intensely than ever before. A brief overview of the role of Bt as an entomopathogen, its residence in the phylloplane and in the soil and its impact on nontarget species when used as a conventional bioinsecticide is provided. Also included is a brief glimpse into the complexity associated with the conduct of risk assessment studies including the introduction of genetically modified organisms (transgenic or Bt variants), their impact as non-indigenous species on the ecosystem species, the potential transfer of their genetic information (i.e. toxin genes), their survival, establishment and multiplication and dissemination. There is increasing concern about the potential development of resistance to Bt, particularly with the reported development of resistance in diamond-back moth, *Plutella xylostella*, after repeated field treatment and in indian meal moth, *Plodia interpunctella*, found in grain bins. The current status, the potential for resistance development, cross resistance to Bt with chemicals, the genetic and mechanism of resistance development, and current thought on development of strategies to delay the development of resistance are reviewed. Though the reviews are brief, they are accompanied with a representative list of references. Finally there is a brief review of the production and application of Bt in developing countries utilizing local resources; this is balanced with a brief review of the production methods and quality control methods currently used in modern production fermentation facilities. Many facets of *Bacillus thuringiensis* are reviewed in this book and it is this broad presentation that makes it an attractive desk reference to students and professionals conducting research in the field and to anyone interested in its development as an effective biopesticide.

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Hiratsuka, Y., Langor, D.W. and P.E. Crane. A Field Guide to Forest Insects and Diseases of the Prairie Provinces. Nat. Resour. Can., Can. For. Serv., Northwest Region, North. For. Cent., Edmonton, Alberta. Spec. Rep. 3. ISBN 0-660-15948-1. Distributed by UBC Press, Vancouver, B.C. V6T 1Z2. xiv + 297 pp. Soft cover, \$29.95 (Can.).

This is a good book. At the end of the Introduction, the authors state they hope readers will find the field guide to be user-friendly, useful and informative. I think they have accomplished these aims and more.

This field guide covers the most important and common fungi, insects, and other agents (weather, chemicals, birds and other animals) that damage forest trees in the prairie provinces. The authors say the guide was written for forest management and protection personnel and others (e.g., students and teachers) but it also will be useful for those of us who are concerned about the health of these species as ornamentals.

The book is divided into three major sections: insects and diseases of conifers (further subdivided into foliage and buds, roots, stems and branches, seedlings, seeds and cones), insects and diseases of broadleaf trees (subdivided into foliage and buds, roots, stems and branches, seeds) and other damaging agents. The major sections are colour coded which makes it easier to find your way around the guide. A typical chapter contains text sections on Symptoms and Signs, Distribution and Hosts, Life Cycle (or disease cycle), and Damage, with emphases given to Symptoms and Signs, and Damage. The authors say the photographs (of which there are many) were chosen for their diagnostic value, as befits a field guide. The guide also contains a general reference section, a host index listing damaging agents by host and part of host affected (very useful), a general index listing common and scientific names of hosts and pests, and a 5 page glossary. An extremely useful short list of precautions to take when collecting, packaging and shipping samples is included in the Introduction. Also, there are nine tables of symptoms, signs and distribution, mostly of diseases and mostly diagnostic that I found quite useful.

No currently recommended methods of control for the insects or disease-causing organisms discussed are given. The authors say that this information can be obtained easily from garden centres for small scale work and from

federal and provincial agencies for larger scale measures. This is not universally true. Many garden centres employ people who do not know which pesticide to recommend even if the pest is known. Even though control recommendations change, from year to year in some cases, it would have been useful to include the current recommendations in this field guide.

However, even with that reservation, I would recommend this guide to anyone interested in identifying the insects and diseases that are damaging the trees of the prairies. Stick a copy in your jacket as you tramp through the forest or have a copy on hand in your garden tool shed.

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Tomlin, C. (ed) 1994. *The Pesticide Manual. Tenth Edition: A World Compendium.* The British Crop Protection Council and The Royal Society of Chemistry, Farnham, U.K. 134pp. \$(U.S.)175.00

This is the 10th edition of this standard reference which replaces the 9th edition published in 1991. There are 1281 compounds described with much increased and expanded coverage of biologicals. This 10th edition now includes the *Agrochemicals Handbook* and this has resulted in additional data on environmental fate and an expanded section on ecotoxicology. I especially appreciated the inclusion of references to reviews of toxicology or other important papers.

Headings have been modified somewhat from the 9th edition. Entries are described in alphabetical order under a series of headers beginning with the preferred common name, normally the ISO name, where it exists. Compounds are classified under their primary use (herbicides, insecticides etc.) and the chemical structure provided where applicable. Other common names are given (there is a full french ISO system of common names and a few Canadian ones) as well as the IUPAC, Chem Abstracts names (and number) and code names where applicable.

Physico-chemical properties (previously, properties) normally given include molecular weight and formula, form (whether solid, liquid etc.) and an extensive list of solubility in common solvents. Also often included are such physical properties as melting point, boiling point, vapour pressure, specific gravity and partition coefficient between octanol and water. A section entitled commercialisation (previously development) includes a record of first synthesis, patents and manufacturer. A list of manufacturers and their addresses is given under a separate directory.

Mode of action is now given under a new heading "applications". Previously this information, along with the type or family of herbicide or insecticide, e.g. organophosphorus insecticide, was placed separately, opposite the structural formula. However, this shift has allowed for a more detailed description of the toxic action and possible selectivity. This section also includes a section on uses (previously a separate item) which covers what organisms are controlled and on what crops. Brief descriptions of phytotoxicity, common formulation types and compatibility are often included. Lists of trade names are given but are not exhaustive. This lack is admitted in the preface and seems an almost impossible task. Common mixtures are also listed: this is particularly useful for those interested in herbicides.

The section on analytical procedures has been updated and expanded to provide more and more recent references. The incorporation of the *Agrochemicals Handbook* has resulted in a much expanded section on toxicology which is now presented under the headings of mammalian toxicology, ecotoxicology and environmental fate. These sections are more complete for some products than others but this reflects only the availability of information. Mammalian toxicity is usually given on the basis of LD50 values for acute oral, percutaneous, and inhalation exposures, most often for rats. Results of feeding trials to assess chronic effects and figures on acceptable daily intake are also provided. Toxicity class for both WHO and EPA systems and (in some cases) status in the Ames test or other assay for carcinogenicity are also included. References to recent reviews in FAO publications are given for products covered. The section on ecotoxicology includes, where data are available, effects on birds, fish, bees and *Daphnia*. The final section here is titled environmental fate and covers metabolism in plants, mammals and soil. References are often included.

Entries are given in alphabetical order based on common names. However, these are cross referenced through indexes of Chem Abstracts Service registry numbers, molecular formulae, code numbers, trade names and

chemical names. A sixth index, which separates pesticides into classes (e.g. carbamates, benzoylureas) is also included. There is a new section on resistance to pesticides which is of marginal value. It does serve to introduce the various committees on resistance (e.g. IRAC, the Insecticide Resistance Action Committee) but gives little of their makeup. Certainly, the lists of resistant species are not exhaustive.

There are other handbooks and compilations of information on pesticides but I believe this to be the most extensive and likely to be most widely used single source. The Farm Chemicals Handbook, produced annually by the Meister Publishing, Willoughby, Ohio, is probably the other major entry in this area (it has been selected by the E.S.A. as the source of official common names in society publications). My 1993 version is listed at \$69 U.S. However, the Pesticide Manual contains substantially more information of interest to researchers. The tenth edition of this standard reference will continue to be a key source for toxicologists, analytical chemists and most researchers who work with pesticides.

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Goldsmith, M.R., and Wilkins, A.S. (eds.). 1995. Molecular Model Systems in the Lepidoptera. Cambridge University Press, New York. xii + 542 pp. Hardcover. \$(U.S.)125.

The idea for this book was generated in 1988 following the first workshop on the Molecular Genetics and Molecular Biology of the Lepidoptera in Crete. However, rather than publishing a series of research reports, the editors and contributors agreed there was a greater need for a collection of reviews of selected areas in the molecular biology of Lepidoptera, with evolution, development and regulation as the unifying themes. The result is a volume that provides a contemporary picture of the 'status' of lepidopteran molecular biology and, despite the breadth of topics covered, has a strong degree of cohesion among the chapters (and a significant amount of cross-referencing), a feature for which the editors must be congratulated.

The book contains 16 chapters, in the first of which Willis et al. set the stage by presenting a short history of Lepidoptera as model systems. The authors first point out the special features of the order that render its members attractive to researchers (beauty and variety, large body size, and economic importance), then review the areas of insect biology that have benefitted significantly from work with Lepidoptera (endocrinology including control of diapause and eclosion, hemolymph biochemistry and humoral immunity, gene action and biochemistry, tissue culture and virology).

Goldsmith correctly points out in Chapter 2 (on silkworm genetics), how studies of fundamental genetic principles have paralleled those of *Drosophila melanogaster*. Compared to the latter, DNA content and chromosome number are respectively 4 and 7 times greater in most lepidopteran species. Small and nondistinctive chromosomes with diffuse centromeres render conventional cytogenetic investigations difficult, but this is slowly changing with the application of molecular cytogenetic methods. Unlike in *Drosophila*, males are the homogametic sex (ZZ) whereas females, depending on the species, can be ZW, ZO, ZZW or ZZWW. There is no crossing over in females and no dosage compensation associated with the Z chromosome. The chapter describes in detail phenotypes and linkage relationships of genetic traits (mostly in *Bombyx mori*) representing several morphological, developmental, physiological, biochemical and behavioral characters. Particularly fascinating are those mutations that convert the normally monophagous silkworm to a polyphagous form. Implications for behavioral ecology may be significant if the responsible genes can be characterized using modern molecular techniques, some of which are described here.

After a general introduction to the nature of mobile elements, Eickbush's chapter (#3) describes in varying detail the anatomy, genomic distribution and properties of two retroposon elements and seven retrotransposable elements in (mostly) *B. mori*. Interestingly, neither *Drosophila* nor mammalian systems harbor as wide a variety of elements as does the latter. Many retroresponsible elements in *B. mori* are more similar to those of other organisms than to each other, a point that Eickbush uses to support arguments for horizontal transfer. Phylogenetic relationships among elements suggest that those which are characterized by non-LTRs (long terminal DNA repeats) are more ancient than those possessing LTRs.

Chapter 4 by Regier et al. considers the application of molecular techniques to the study of phylogenetic relationships. The authors note that the Lepidoptera 'seems particularly ripe for exploiting new phylogenetic approaches' as the order is large (150,000 named species) and well characterized at the family level and below, yet relationships among higher taxa are poorly understood, in large part due to the morphological uniformity (lack of useful morphological characters) in the group. However, they make it clear that the molecular phylogeny of

Lepidoptera is at the neonate stage, with relatively few useful 'indicator' molecules identified to date.

In Chapter 5, Nagy summarizes the embryogenesis and experimental embryology of Lepidoptera, integrating the classical descriptive work with recent molecular studies. The author makes many comparisons with the situation in *Drosophila*, particularly with respect to mechanisms of segmentation and embryonic axis formation.

An analysis of homeotic genes whose products help specify the identities of segmental structures is critical for understanding developmental processes in insects. Chapter 6, by Ueno et al., reviews current information on the E-complex cluster of genes and the *Nc* gene in *B. mori*. The latter gene may play a role in regulating silk gland development and expression of silk protein genes. Segment transformation effects of a few mutants are described and compared with those of *Drosophila*. Unlike in *Drosophila*, some E mutants cause opposite directional transformations on dorsal and ventral sides of the organism. Molecular data in Lepidoptera are presently limited to homeobox and flanking sequences in a few genes. As the authors recognize, more detailed research at this level is required, some of which is already in progress.

Chapter 7 by Kafatos et al. begins with an overview of choriogenesis followed by a description of chorion morphology and variation observed in a few lepidopteran species. Considerable details are provided on the underlying genes, their structure, organization and expression as well as on the localization, identification and mode of action of their regulating elements.

The previous chapter is aptly followed by Eickbush and Izzo's discussion of evolutionary aspects (Chapter 8). The approximately 100 genes encoding a similar number of chorion proteins fall into six major multigene families, largely organized according to time of choriogenesis. Most genes occur in α -like and β -like pairs. Differential levels of sequence conservation among exon, intron and flanking regions of genes within and among the multigene families afford an opportunity for evaluating the relative contributions of selection and recombinational forces. The detection of sequences indicative of so-called recombinational "hot-spots" add considerable evidence for accepting gene conversion as an important evolutionary factor at the molecular level.

The silk gland, its components and products are described in Chapter 9. This remarkable, modified salivary gland accounts for roughly 95% of total protein in larvae. The organ is compartmentalized into regions that express different genes, a system that authors Hui and Suzuki use to investigate regulation of development. Current knowledge regarding regulatory elements and their possible binding sites associated with the silk protein genes are described. An interesting feature is the likelihood that some of the regulatory elements are in fact homeodomain proteins.

Chapter 10, confusingly entitled "Control of transcription of *Bombyx mori* RNA polymerase III", should perhaps more aptly be "Control of tRNA transcription in *Bombyx mori*". Approximately 85% of the posterior silk gland protein, fibroin, consists of three amino acids. Accordingly, the organ possesses abundant quantities of corresponding participants in polypeptide synthesis such as tRNA, tRNA synthetase and, in turn, factors regulating their production, including RNA polymerase III. Much of Sprague's chapter focuses on describing promoter domains, transcription regulating factors and their binding sites associated with genes that encode alanine-tRNA (tRNA^{Ala}). The author's aim is to understand what accounts for the differential transcription of two forms of tRNA^{Ala}, one of which is constitutively produced in most cells and another, differing by a single nucleotide, which is temporally regulated in the posterior silk gland.

Riddiford's chapter (#11) (hormonal regulation of gene expression during lepidopteran development) first reviews the endocrine basis for molting, metamorphosis and reproduction, then examines how the ecdysteroid-induced cascade regulates gene activity and how juvenile hormone may modify this mechanism, using as examples genes expressed in the epidermis and fat body. Finally, information on putative ecdysteroid and juvenile hormone receptors in lepidopteran systems is presented, together with speculation on the interactions between the receptors and genes.

The major focus of Chapter 12, by Truman, is how hormones work to effect remodelling of neurons in the central nervous system during metamorphosis. As Truman points out, this area of endeavor has not yet entered the molecular phase, though the groundwork has been done for what should prove to be an excellent system for the study of hormone action at the gene level.

The molecular genetics of olfaction is the subject of Chapter 13. Drawing largely on the work done on the antennae of *Manduca sexta* and *Antheraea polyphemus*, Vogt examines the hypothesis that gene regulatory mechanisms are the basis of cellular identity of sensory neurons and the resulting ability of the brain to perceive specific odors. The author describes a biochemical model for olfaction, then discusses the status of the search for odorant receptor proteins. Throughout the chapter, frequent comparisons are made with the vertebrate olfactory system.

In Chapter 14 Mulnix and Dunn review the molecular biology of the immune response. Following a synopsis of the various means by which insects resist disease, the authors discuss the structure, mode of action and genetic regulation of the various antibacterial proteins, concluding with consideration of how antibacterial gene expression is regulated.

Iatrou in Chapter 15 presents a fascinating review of 'engineered baculoviruses' from two perspectives. First, he discusses the potential for baculoviruses to be used as vectors for the introduction of chromosomal genes of interest into cells of lepidopteran hosts (currently, understanding of gene regulation has been hampered to a large extent by a lack of expression systems allowing the introduction of cloned genes into insect cells); and second, he considers the feasibility of improving the effectiveness of baculoviruses as insect biocontrol agents by incorporating into their genome genes for accelerating the demise of their hosts.

In the final chapter of the book ('Epilogue: Lepidopterans as model systems - questions and prospects'), Wilkins and Goldsmith summarize the threefold significance of Lepidoptera in biological science; their unique or special features, their value as model systems, and their importance in comparative studies both of other insects and of other animals.

The volume includes a comprehensive reference list of almost 1600 entries, though less than 20% of these are dated 1990 or later, probably reflecting the generally long delay in getting volumes of this type into print. The only disappointing section of the book is the index which is very incomplete and covers less than 14 pages. It includes both subject and author listings, though curiously the pages cited for the latter are all in chapters 1 and 2, and even for these chapters are only a partial listing. The subject index would have benefitted from additional cross-listing of entries; for example, attacins and cecropins are given discrete entries, whereas hemolin and sapecins are listed only under antibacterial proteins.

In conclusion, the book contains a diverse collection of chapters on basic research at the molecular level using lepidopteran model systems. The chapters are well written, each having a sound introduction that provides the setting for the detailed body of information to come. Though presumably aimed at the researcher and graduate student level, undoubtedly some chapters could form an excellent source of information for senior undergraduates preparing term papers. It is difficult to see who would find the entire contents of the book attractive, other than a fervent molecular biological lepidopterist! Individual chapters will be of interest to a wide-ranging audience, including geneticists, physiologists, endocrinologists, phylogeneticists, and virologists. However, the book however, be a valuable resource in university and research institution libraries.

Chapters 1, 4, 5, and 11 to 16 were reviewed by C. Gillott, chapters 2, 3, and 6 to 10 by W. Chapco.

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POSITIONS AVAILABLE

Graduate Research Assistantship: Plant-insect Interactions M.Sc. or Ph.D. research assistantship in chemical ecology of plant-insect interactions. Current research emphasises: 1) environmental and genetic effects on tree-insect interactions, 2) effects of CO₂ on tree chemistry, lepidopteran performance, and tritrophic interactions, and 3) natural products toxicology. Experimental organisms include deciduous trees (emphasis on aspen), and multiple spp. of Lepidoptera (gypsy moth). Highly motivated individuals with superior academic credentials and well developed interpersonal skills are encouraged to apply. Interest in chemical aspects of interactions required. Stipend of 50% Research Assistantships provided (ca. \$16,500 US). Excellent medical health plans. Position available Summer or Fall, 1996. Inquiries: Send letter describing research interests and academic qualifications to Dr. Rick Lindroth, Dept. of Entomology, 237 Russell Labs, 1630 Linden Drive, Madison, WI 53706; e-mail lindroth@entomology.wisc.edu; tel 608-263-6277. Candidates with exceptional academic records may be competitive for University Fellowships. (Posted: Nov 9, 1995).

Post-Doctoral Research Associate: Chemical Ecology of Cockroaches Available Feb 1, 1996. Research on the chemical ecology of cockroaches, including identification of pheromones, studies of their biosynthetic pathways and endocrine regulation, and assays of other attractants and repellents. Qualifications: Ph.D. in entomology, insect physiology, biochemistry, behaviour, or related fields. Experience in chemical ecology, including extraction, purification, behavioral assays and identification of semiochemicals. Instrumentation skills, including G.L.C., M.S., T.L.C., H.P.L.C., electrophysiology (E.A.G., G.L.C.-E.A.D. Or single unit) and radiochemical experience desirable. Submit resume, transcripts, relevant reprints and manuscripts, letter describing background, skills and interests, and names, addresses and phone nos. of 3 references to Dr. Coby Schal, Dept. of Entomology, Box 7613, North Carolina State University, Raleigh, North Carolina 27695-7613; coby_schal@ncsu.edu. Closing date when a successful candidate is found. (Posted Nov 29, 1995).

Post-doctoral Positions: Natural Enemies in Rice and Non-rice Habitats

The International Rice Research Institute, Philippines may have 2 post-doc positions in early 1996. Position 1 concerns population dynamics of natural enemies and their prey/hosts in rice and non-rice habitats. Position 2 concerns movement of natural enemies among rice and non-rice habitats, focusing on the use of molecular markers to examine population structure of generalist predators and parasitoids. Extensive experience with molecular markers and population genetics is highly desirable for position 2. Field work in Burma, Vietnam, and China, and at I.R.R.I. Post-docs will help in training scientists from national agricultural research systems. Funding available for up to 3 years; a generous package of salary and benefits will be offered. For info on position 1, contact Dr. K.L. Heong, k.heong@cgnet.com, and Dr. Michael Cohen, m.cohen@cgnet.com, for info on position 2. (Posted: Dec 11, 1995).

Post-doctoral Position: Insect Behaviour

Position to investigate causes for western corn rootworm oviposition in soybean fields. Full-time, temporary position is funded for 2 years; renewal depends on additional funding. Proposed start May 1, 1996. Qualifications: Ph.D. in Entomology; experience with host-plant attraction of insects using wind tunnel, olfactometer, electroantennogram and/or mark-release-recapture techniques. Experience with corn rootworms desired, but not required. Should have good working knowledge of experimental design and statistical analysis, and good written and oral communication skills. Salary is \$25,000 US annually plus benefits. Applications accepted until position filled. Applicants should send a letter detailing qualifications and interest, a resume, copies of publications, transcripts (copies okay), and the names, addresses (including e-mail), and phone nos. of 3 references to Dr. Eli Levine, University of Illinois, 607 East Peabody Dr., Champaign, IL 61820; tel 217-333-6826; fax 217-333-4949; e-mail e-levine@uiuc.edu. (Posted Dec 15, 1995).

Ph.D. Research Assistantship: Dynamics of a Tropical Social Insect

Available Fall, 1996. The goal of the project is to investigate the cause-effect relationship between group dynamics and colony size in a tropical social insect. Field work will be in Costa Rica. Techniques will include the marking of workers for individual recognition and videotaping of behaviour at the nest. The assistantship is funded for 4 years, and has an annual stipend of \$16,146 US plus fringe benefits and out-of-state tuition remission. Contact Prof. Robert L. Jeanne, Dept. of Entomology, University of Wisconsin, Madison, WI 53706; tel 608- 262-0899; fax 608-262-3322; e-mail jeanne@entomology.wisc.edu. (Posted: Dec 26, 1995).

Research Assistantship: Restoration Ecology for Fender's Blue Butterfly

Investigate methods to restore habitat for the Fender's blue butterfly from April to July, 1996 (start and end dates flexible). The assistant will census seeded species and remove unwanted plant species from 3 experimental plots near Eugene, Oregon. Experience in ecological field research and in plant identification desired. Compensation: Room and board in Eugene, plus \$700 US/mo stipend. To apply, send a resume, a letter of interest and 2 letters of recommendation to Cheryl Schultz, Dept. of Zoology, University of Washington, Box 351800, Seattle, WA 98195-1800. Info: tel 206-685-6893; e-mail schultzc@zoology.washington.edu. (Posted Jan 4, 1995).

Post-doctoral Research Assistantships: Insect-parasite Biology

Three positions concerned with immunological control of mosquitoes and malaria transmission, immunological control of the sheep scab mite, and lectin-sugar interactions between malaria and the mosquito, respectively. Appointments made A.S.A.P. and funded for 1-3 years. Successful applicants will have experience to Ph.D. level or above in one or more of the following techniques: immunology (in particular antigen preparation and monoclonal antibody production), cell biology, preparative chromatography, molecular biology, lectin biochemistry or analytical glycobiology. Experience with insect vectors or parasites an advantage, but not essential. Submit a letter of interest, and a detailed C.V. that includes a summary of research experience, a list of publications and names and addresses of 3 referees. Application forms and further info available from Personnel Services, University of Aberdeen, Regent Walk, Aberdeen, U.K. AB9 1FX; tel 01224-272727, quoting reference nos. ZZ0102R, ZZ0103R or ZZ0104R. Informal enquiries made to Dr. Peter Billingsley; tel 01224-272882; fax 01224- 272396; e-mail p.billingsley@abdn.ac.uk. (Posted Jan 15, 1996).

Graduate Opportunity: Ecology of Insect Herbivores

Research leading to M.Sc. or Ph.D. degree on the population dynamics or community ecology of insect herbivores in an agroforestry system. This is one component of a multidisciplinary alley cropping program conducted by the

University of Missouri Center for Agroforestry. Starting date, May to Aug, 1996. Minimum requirements are B.Sc./M.Sc. in entomology, forestry, or biology. Minimum G.P.A. of 3.0 (4.0 scale) on final 60 hours of undergraduate work (for M.Sc. candidates). Stipend of \$10,200 US (M.Sc.) or \$12,000 US (Ph.D.) per year with waiver of tuition fees for qualified students. Interested people should forward official transcripts from all colleges and universities attended, G.R.E. scores, 3 letters of recommendation, and a letter of intent outlining specific research interests and career goals to Marc J. Linit, Dept. Of Entomology, University of Missouri, Columbia, MO 65211; tel 573-882-7779; fax 573-882-1469. (Posted Jan 17, 1996).

Graduate Opportunity: Tick Research

My research program focusses on the physiology, endocrinology, pharmacology of ticks, and I'm hoping to welcome 2 more graduate students to my team between May 1996 and Jan., 1997. For further info, contact Reuben Kaufman, Dept. Of Biological Sciences, University of Alberta, Edmonton, AB T6G 2E9; e-mail reuben_kaufman@biology.ualberta.ca; tel 403-492-1279; fax 403-492-9234. (Posted Jan 19, 1996).

Museum Positions: Insect Systematists

The Dept. of Entomology at the Bohart Museum of Entomology seeks 2 insect systematists. Job 1 will be a senior level position in insect systematics. It is an endowed chair with a large stipend. We are most interested in hiring a parasitoid wasp specialist. Teaching would probably involve 1 course per year, although this has not been worked out yet. Job 2 will be a Cooperative Extension entomologist in insect diagnostics. This will be a 60% extension specialist, 40% research in systematics position. This individual will be responsible for setting up an insect diagnostics service at U.C. Davis. For info, contact Lynn S. Kimsey, Director, Bohart Museum of Entomology, Dept. Of Entomology, University of California, Davis, CA 95616; e-mail lskimsey@ucdavis.edu. (Posted Jan 23, 1996).

Programme Manager: Locust and Grasshopper Biocontrol

The International Institute of Biological Control seeks a programme manager to administer a collaborative research programme for the biological control of locusts and grasshoppers using a mycopesticide. The 3-year programme (1996-1998) is a continuation of 6 years previous work, which has developed a preliminary biological insecticide based on fungus spores suspended in oil. The programme manager will be employed by C.A.B. International, and based at I.I.B.C., Ascot, U.K. A summary of duties includes: maintain financial control; oversee personnel and related administration; liaise with national authorities, donors, collaborating organizations and consultants; act as secretary and convener to the Programme Management Committee and be responsible for arranging its meetings; collaborate with the scientific leader; ensure that correct protocol is maintained with governments and other agencies; arrange the drafting of formal documents required to facilitate collaboration. The programme manager will be expected to travel widely to and within Africa. The successful candidate will be experienced in project management and associated financial management; fluency in both French and English a very desirable asset. Vacancy will be filled A.S.A.P. For more info, contact Dr. Jeff Waage, Director, I.I.B.C., Silwood Park, Buckhurst Road, Ascot, Berks U.K. SL5 7TA; e-mail j.waage@cabi.org; fax 44-1344- 875007; tel 44-1344-872999. (Posted Jan 24, 1996).

Apiary Positions

Position 1 is for a Beekeeper in Fort MacLeod, AB from Apr. 15 to Oct. 15, 1996. Experience with all general duties with honey bee farm preferred. Duties include: preparation of hives, movement and feeding of bees, honey extraction from combs and repair and maintenance. Must have own transportation to the job site. Pay is \$8.00/hr for 10 hrs/day. For more info, phone 403- 687-2244, or Jerry at 403-687-2244.

Position 2 is for an apiary worker near Granum, AB from Apr. to Oct., 1996. A minimum of 3 years experience with all aspects of beekeeping required. Duties include: work with bees and equipment, removal of combs from hives and honey extraction, preparation of hives for honey season and preparation of hives for winter. Pay is \$8.00/hr. For more info, write to Greidanus Farms, Inc., Box 151, Granum, AB T0L 1A0; tel 403-787-3764. (Posted Jan 26, 1996).

Position 3 is for a full-time Beekeeper from end-Mar. to end-Oct. Experience as beekeeper mandatory; valid class 3 drivers license an asset. Pay \$10/hr.

Position 4 is for General Labour Beekeeper. Knowledge of beekeeping required. Pay \$8/hr. For more info about positions 3 and 4, contact Intermiel Inc., 10291 Rg. La Fresniere, St-Benoit, PQ J0N 1K0; tel M. or Mme. Macle at 514-258-2713. (Posted Feb 7, 1996).

Post-doctoral Position: Insect Physiology/Ecology

Research position related to the overwintering biology of insects. Current research efforts centre on physiological and ecological aspects of insect cold-hardiness. One major effort focuses on the role of ice nucleating active bacte-

ria in regulating the supercooling capacity of insects and their use as biological control agents for overwintering insect pests. Individuals with experience in one or more areas of physiology, ecology, or environmental microbiology are encouraged to apply. Search remains open until a suitable candidate found. Two-year appointment (third year possible). Start date Aug. or Sept., 1996. Annual stipend \$22,500 US plus fringe benefits. For more info, contact Richard E. Lee, Jr., Dept. of Zoology, Miami University, Oxford, OH 45056; tel 513-529-3141; fax 513-529-6900; e-mail lee@msmail.muohio.edu. To apply, send a cover letter briefly describing your research interests; C.V.; transcripts of all academic work; reprints; 3 letters of reference and their phone nos. to Douglas H. Taylor, Chair, Dept. of Zoology, Miami University, Oxford, OH 45056. (Posted Jan 28, 1996).

Research Positions: Aquatic Herbivores

Three positions during from mid-May to mid- to late-Aug, 1996; based at the Univ. of Notre Dame. Project assesses macrophyte-herbivore interactions in northern Indiana lakes. Work includes: collecting plants and herbivores from lakes, caring for organisms returned to the lab, performing lab feeding assays with herbivores (eg., insects, snails, crayfish, and fish) and macrophytes, measuring nutritive value, toughness, and chemical defense of plants, and data analysis. Undergrads or graduates with interest and experience in plant-herbivore interactions, aquatic ecology, and/or chemical ecology encouraged to apply. Pay at least \$1,000 US/month. Applicants provide a letter of interest, transcripts (copies okay), resume including work experience, the names and addresses of 2 references, and the period of time you would be available to Greg Cronin, Dept. Of Biological Sciences, University of Notre Dame, Notre Dame, IN 46556; fax 219-631-4153; e-mail gcronin@nd.edu. Applications received after Apr. 15, 1996 not considered. (Posted Jan 30, 1996).

SCHOLARSHIPS AND GRANTS

Entomological Society of Canada Postgraduate Awards 1996

The Entomological Society of Canada will offer two postgraduate awards of \$2,000 each to assist students beginning graduate study and research leading to an advanced degree in entomology. The postgraduate awards will be made on the basis of high scholastic achievement.

Invitation for Applications

Eligibility - Postgraduate Award: The successful applicants must be either Canadian citizens or landed immigrants with Bachelor's degrees from Canada universities. Applicants must begin their first year of postgraduate studies between 15 June 1994 and 31 December 1996. The studies and research must be carried out at a Canadian university. Each award is conditional upon certification by the Department Head that successful applicants have been accepted into the first year of a program of study and research for an advanced degree with full graduate status. A student who was unable to gain admission or enters graduate school as a qualifying candidate is not eligible to receive an award.

Method of Application - Applicants must submit a properly completed form, with support documents. Applications must be received by the Secretary of the Society no later than 10 June 1996.

Process of Selection and Award Presentation - Applications will be reviewed by a committee of the Society. An announcement of the two winners will be made at the annual meeting of the Society and each winner will receive a certificate. Payment of the award will be made in October 1996.

Regulations

Earnings from Other Sources - Award holders are permitted, under normal circumstances, to demonstrate, instruct or assist in non-degree related research for a maximum of 200 hours per annum, provided that the Head of their Department considers it desirable and that it does not hinder the progress of their studies. Apart from these assistantships, award holders will devote their full time to study and research and will not undertake any paid work during the school term. They may hold other awards and scholarships.

Transfers - Awards are made on the condition that the winners engage in a program of graduate studies and

research for an advanced degree in entomology in Canada. Students, who after receiving the award, wish to change their graduate program or transfer to a foreign university may be asked to decline the award. Any change in the course of study, department or university in which an award winner is registered requires prior approval of the Scholarship Committee. A request for permissions to transfer must be supported by statements from Heads of Departments.

Additional Allowances - The award stipends are all-inclusive. There is no provision for additional grants by the Society for any purpose. Additional grants, for example, to attend meetings, pay course fees, meet publications costs, etc., will not, under any circumstances, be authorized.

All communications regarding these awards, including requests for applications, should be addressed to:
Dr. P. Dixon, ESC Secretary, Research Centre, Agriculture and Agri-Food Canada, P.O. Box 37, Mount Pearl, Nfld.
A1N 2C1, Telephone: 709-772-4763, Fax: 709-772-6064, Email: dixonp@nfrssj.agr.ca

La Société d'entomologie du Canada Bourse pour Étudiants Post-Gradués 1996

La Société d'entomologie du Canada offrira deux bourses d'un montant de \$2,000 chacun pour aider des étudiants qui entreprennent des études post-graduées et des recherches en vue de l'obtention d'un diplôme d'études supérieures en entomologie. Les bourses seront accordées aux étudiants ou étudiantes en raison des seuls critères de réussite académique.

Avis

Éligibilité - Bourse Post-graduée: Les candidats doivent être Canadiens ou résidents reconnus du Canada et détenir un baccalauréat d'une université canadienne. Les candidats doivent obligatoirement avoir débuté leur première année d'études post-graduées entre le 15 juin 1994 et le 31 décembre 1996, et effectuer leur étude et recherche dans une université canadienne. Les bourses ne seront accordées que lorsque les directeurs de Département auront certifié que les candidats choisis sont inscrits en première année d'un programme d'études supérieures, et ce avec tous les privilèges attachés au statut d'étudiant gradué. Un étudiant qui n'a pu être admis à l'École des Gradués, ou qui s'inscrit en vue de compléter l'obtention de crédits, n'est pas éligible à la bourse.

Procédure - Les candidats devront soumettre leur candidature à l'aide du formulaire approprié et y joindre tous les documents requis. Les demandes devront être reçues par le Secrétaire de la Société au plus tard le 10 Juin 1996. Préciser que vous voulez les formulaires pour la Bourse Post-graduée ou la Bourse Keith Kevan.

Sélection et remise des bourses - L'analyse des candidatures se fait par un comité de la Société, et l'annonce des récipiendaires se fera à la réunion annuelle de la Société où ils recevront un certificat. Le paiement de la bourse aura lieu en octobre 1996.

Règlement

Autres sources de revenus - Un boursier pourra normalement donner des séances de cours ou de démonstration et être auxiliaire de recherche jusqu'à un maximum de 200 heures par année, en autant que le Directeur de son département considère cela profitable et que ces tâches additionnelles ne nuisent pas au progrès de l'étudiant. Sauf pour ces assistances, un boursier devra consacrer tout son temps à ses études et recherches et n'accepter aucune autre rémunération. Il peut cependant jouir d'une autre bourse ou d'un prix.

Transferts - Les bourses sont accordées à condition que les boursiers entreprennent des études graduées en vue de l'obtention d'un diplôme en entomologie au Canada. Les boursiers qui décideront de changer de champ d'études, ou de transférer dans une université hors du Canada peuvent se voir retirer leur bourse. Après acceptation de la bourse, tout changement de programme d'études, de département ou d'université devra recevoir au préalable l'approbation du Comité de la Bourse de la SEC. Une telle demande doit être accompagnée de documents provenant des Directeurs des départements concernés.

Frais supplémentaires - La somme offerte est invariable. En aucun cas la Société n'accordera de montant supplémentaire. Des frais additionnelles, par exemple, pour assister aux réunions scientifiques, payer des frais de cours, défrayer des coûts de publications, etc., ne seront autorisés sous aucune considération. Toute correspondance rela-

tive aux bourses, incluant les demandes de formulaires doit être adressée à:

Dr. P. Dixon, Secrétaire SEC. Centre de Recherche, Agriculture et Agro-Alimentaire Canada, P.O. Box 37, Mount Pearl, Nfld. A1N 2C1, Téléphone: 709-772-4763, Télécopie: 709-772-6064, Email: dixonp@nfrssj.agr.ca

UPCOMING MEETINGS

Quebec Society for Plant Protection

Please take note that the next meeting of the Quebec Society for Plant Protection will be held at Université Laval (Quebec City) on 6-7 June 1996. The theme of the Symposium (6 June) will be: Physical control methods in plant protection. Veuillez prendre note que la prochaine assemblée annuelle de la SPPQ aura lieu à l'Université Laval les 6 et 7 juin 1996. Le thème du Symposium (6 Juin) sera: La lutte physique en phytoprotection

L'équipe responsable du Congrès est: C. Vincent, B. Panneton, C. Laguë et S. Yelle.

For further information: Pour informations prière d'entrer en contact avec:

Dr. Charles Vincent
Centre de recherche et de développement en horticulture
Agriculture et agro-alimentaire Canada
430 boul. Gouin, Saint-Jean-sur-Richelieu, Qué., Canada J3B 3E6
Tel. (514) 346-4494 ext. 202/Fax (514) 346-7740
E-mail (Internet): VINCENTCH@EM.AGR.CA

North American Benthological Society

North American Benthological Society - 44th Annual Meeting, Kalispell, Montana, June 3-7, 1996.

The 44th Annual Meeting of the North American Benthological Society will be held at Kalispell, Montana, on June 3-7, 1996. The program features four days of invited, contributed, and poster sessions and workshops on benthic communities and their role in aquatic ecosystems. The Plenary Session of the meeting will be: "Ecology of Pristine River Systems." Special Sessions include: "Contemporary theories in river ecology: lessons learned, lessons forgotten" and "The status and future of taxonomy and reference museums in benthology." Abstracts are due on December 4, 1995. For more information contact:

Dr. Jack A. Stanford, Program Chair
or

Dr. F. Richard Hauer, Local Arrangements Chair
Flathead Lake Biological Station, 311 BioStation Lane, Polson, MT 59860 USA
Tel: (406) 982-3301, Fax: (406) 982-3201

Second North American Forest Insect Work Conference

To be held April 6-12, 1996, in San Antonio, Texas. For information contact Ronald F. Billings, Texas Forest Service, San Antonio, Texas. Tel: (409) 639-8170; Fax: (409) 639-8175

MISCELLANEOUS

Invitation for Entomological Research in Siberia

"Kontakt" Station extends an invitation to conduct entomological research in Siberia. The Station is part of the Institute of Biological Problems of the North (Far Eastern Branch), Russian Academy of Sciences, and is located in the Kolyma River Basin 450 km north of Magadan. The station is set in larch forest on the upper range of timberline with typical mountain tundra above. The Station is promoting international research opportunities in various areas of entomology, such as aquatics, pollination, soil, and general collecting. Ground transportation and comfortable room and board are available. Contact Dr. Evgeniy Tikhmenev for further information.
E-mail: ibpn@ibpn.magadan.su

**There are nice bugs, then all the rest. . .
these people know them by name !**

What do law enforcement agencies and honeybees have in common? The link is not as remote as it might seem. Participants at the Joint Annual Meeting of the Entomological Society of Canada and the Entomological Society of B.C. gathered in Victoria this fall to present their research on subjects ranging from honeybee evolution to forensic entomology.

The Entomological Society of Canada was formed in 1863 to promote everything from education to research on insects. The society now has 540 members nation-wide with more than half that number attending the Victoria meetings, including over 80 students. Participants at the conference came from a variety of disciplines, including veterinary, medical, agricultural, forest, and ecological entomology.

One of the biggest draws at the conference was forensic entomologist Dr. Gail Anderson's presentation titled, "Death and dismemberment: the use of insects to determine the time of decapitation." Dr. Anderson's work has been widely used by law enforcement agencies to diagnose the time of death in accidents and crime-related death. The accuracy of Dr. Anderson's work has made her a significant factor in homicide investigations.

The conference was also an opportunity for forest entomologists from across Canada to present their research efforts. Sponsored in part by the Canada / British Columbia Partnership Agreement on Forest Resource Development (FRDA II), the conference highlighted various projects being carried out by scientists from the Canadian Forest Service (CFS), the B.C. Ministry of Forests, several universities, and other institutions. "FRDA II sponsored the conference based on the fact that a lot of the information that transpired would involve forest health issues that would affect British Columbia," said Dr. Les Safranyik, Past President of the Entomological Society of Canada and CFS scientist.

Safranyik said the joint conference was "one of the most successful meetings in terms of representing significant progress in resolving some basic scientific issues relating to forest health problems such as the spruce weevil."

Scientists with the Canadian Forest Service (CFS) in Victoria, presented 11 papers describing their work and led two pest management workshops. Several additional papers were presented by CFS scientists from other establishments, on various aspects of forest insect biology and management.

With such an abundance of insect diversity in British Columbia, it's no surprise that a major symposium on the diversity of insects in the Pacific Northwest attracted much attention from conference participants. Presentations at the symposium included everything from the monitoring of insect biodiversity in the Pacific Northwest to the tracking of rare and endangered invertebrates, such as spiders, in British Columbia.

The conference attracted 30 percent more people than the organizing committee had originally anticipated, with a total registration of 305 entomologists and students, and as the Entomological Society of Canada is open to "all students and lovers of entomology," you can be sure no one was turned away at the door.

Submitted by Lyana Patrick, Canadian Forest Service

ENTOMOLOGICAL SOCIETY OF CANADA
LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA
393 Winston Ave., Ottawa, Ontario K2A 1Y8
Application for membership - (new members only)
Demande d'adhésion (nouveaux membres seulement)

Name and Address (please print):

Nom et Adresse (lettres moulées):

telephone (bus.) / téléphone (au travail):

Fax:

Electronic mail address / Adresse électronique:

Key words describing interests (up to six):
Décrivez vos intérêts en utilisant jusqu'à six
mots clés:

MEMBERSHIP DUES / COTISATION

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|---|------------|
| Regular member ¹ / Membre actif ¹ | \$80.00 * |
| US & Other | \$74.00 US |
| Student member ¹ / Membre étudiant ¹ | \$40.00 * |
| US & Other | \$36.00 US |
| Student member - <i>Bulletin</i> only / Membre étudiant - <i>Bulletin</i> seulement | \$20.00 * |
| US & Other | \$18.00 US |

¹ includes *The Canadian Entomologist* and *Bulletin*

¹ incluant l'abonnement au *The Canadian Entomologist* et au *Bulletin*

Endorsement / Signature du professeur _____

Students - ask your professor to endorse form/demandez l'appui de votre professeur

| | |
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If you need an official receipt please check:

Si vous désirez un reçu officiel, indiquez, s'il vous plaît:

Enclose cheque or money order payable to: Entomological Society of Canada

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Peter Kevan

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