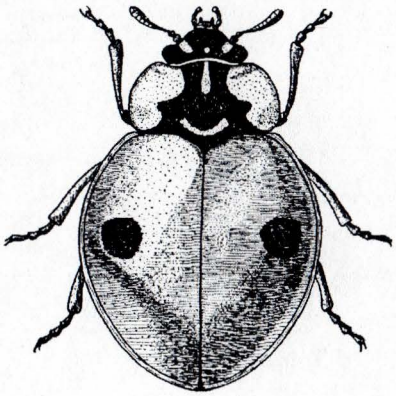
VOL 27 March - mars, 1995 No. 1

BULLETIN



ENTOMOLOGICAL SOCIETY OF CANADA
LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA

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BULLETIN

VOL 27(1) - March / mars, 1995

Contributions and correspondence regarding the *Bulletin* should be sent to the *Bulletin* Editor. Inquiries about subscriptions and back issues should be sent to the E.S.C. at:
Faites parvenir vos contributions au *Bulletin* ou votre correspondance à l'Editeur du *Bulletin*. Pour renseignement sur l'abonnement ou les numéros passés, prière de s'adresser à la S.E.C.:

Entomological Society of Canada
393 Winston Ave.
Ottawa, Ontario
K2A 1Y8

Volume 27 (1), March - mars, 1995

SOCIETY BUSINESS / AFFAIRES DE LA SOCIÉTÉ

Call for Nominations - Second Vice President & Director-at-Large

Nominations for Second Vice President and Director-at-Large must be signed by three members in good standing and received by **30 April 1995** by the Secretary, Dr. P.L. Dixon. (see address below)

Nominations pour Deuxième Vice Président et Directeur doivent être signée par trois membres de la Société et envoyée avant le **30 avril 1995** au secrétaire:

Dr. Peggy L. Dixon
Agriculture and Agri-Food Canada
P.O. Box 37
Mount Pearl, Newfoundland A1N 2C1
Fax 709-772-6064; Tel. 709-772-4763
email address: dixon@nfrssj.agr.ca

Report of the Nominating Committee - 1995

The following list of nominees have agreed to stand for office in the Entomological Society of Canada:

Second Vice-President:	Hugh V. Danks	B.K. Mitchell	
Director-at-Large:	Sheila Fitzpatrick	Robert J. Lamb	Richard J. West
Fellowship Committee:	Edward C. Becker	Samuel R. Loschiavo	William D. Seabrook

submitted by G.H. Gerber,
Chair, Nominating Committee

The deadline for submissions to be included in the next issue (Vol. **27(2)**) is **May 1, 1995**

La date limite pour recevoir vos contributions pour le prochain numéro (Vol. **27(2)**) est le **1 mai 1995**

Please send all correspondence concerning the *Bulletin* to:

Dr. Fiona F. Hunter
Bulletin Editor
Department of Biological Sciences
Brock University
St. Catharines, Ontario
L2S 3A1

Tel. (905) 688-5550 Ext. 3394
Fax. (905) 688-1855
Email: hunterf@spartan.ac.BrockU.ca

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

Dr. Al Ewen
Book Review Editor
Box 509
Dalmeny, Saskatchewan
S0K 1E0

Tel. (306) 254-4380

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 22, 1995.

45th Annual General Meeting

The Annual General Meeting of the Entomological Society of Canada will be held at the Victoria Conference Centre in Victoria, British Columbia on October 17, 1995.

Governing Board Meeting

The Annual Meeting of the Governing Board will be held at the Harbour Towers in Victoria, B.C. on October 14, 1995. If necessary, the meeting will continue on October 15.

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

Dr. Peggy L. Dixon
Agriculture and Agri-Food Canada
P.O. Box 37
Mount Pearl, Newfoundland A1N 2C1
Fax 709-772-6064; Tel. 709-772-4763
email address: dixon@nfrssj.agr.ca

Annonce de la réunion du Conseil Exécutif

La réunion de mi-session du Conseil Exécutif aura lieu au Siège social de la Société d'entomologie du Canada le 22 avril, 1995.

45e réunion annuelle générale

La réunion annuelle générale de la Société d'entomologie du Canada aura lieu au Victoria Conference Centre de Victoria, Colombie britannique, le 17 octobre 1995.

Réunion du Conseil d'administration

La réunion annuelle du conseil d'administration se tiendra au Harbour Towers de Victoria, Colombie britannique, le 14 octobre 1995. Au besoin, la réunion pourra se poursuivre le 15 octobre.

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

Dr. Peggy L. Dixon
Agriculture and Agri-Food Canada
P.O. Box 37
Mount Pearl, Newfoundland A1N 2C1
Fax 709-772-6064; Tel. 709-772-4763
email address: dixon@nfrssj.agr.ca

President's Message

Since the Annual Meeting in Winnipeg, the Society has been concerned with a few important issues. I will now bring you up-to-date on these issues. The English edition of the book *Diseases and Insect Pests of Vegetable Crops* is selling well. To date, over 1000 copies have been sold including all of the hard cover copies. The French edition is due to appear in mid- February. To date, we have received over 150 advance orders. Our thanks are to Joe Shorthouse, Marilyn Dykstra of the Phytopathological Society, and the Marketing Committee for their continuing efforts in promoting the sale of this publication. As we need to sell about 4500 copies of this book just to recover publication costs, I urge all of you to advertise it when you have an opportunity and to buy a copy in support of the Society.

The Society purchased a computer system last year to implement electronic copy-editing of manuscripts and electronic mail. This was done to expedite communications with the Society office, and to reduce publication costs. I am pleased to inform you that the electronic mail is up and running and copy-editing of manuscripts submitted on diskettes is progressing well. Concerns have been raised during the past months regarding the time length of some manuscripts in review. In response to these concerns, Dr. Peter Kevan and the Associate Editors of *The Canadian Entomologist* put in place procedures for prompt querying overdue manuscripts and notification of authors as part of a program for reducing the time duration of manuscript reviews.

Financial concerns continue to occupy the Society. The ESC Executive is in the process of setting up an ad hoc committee to review the organization and operations of the Society with the main objective of maintaining financial viability. The main source of revenue for the Society comes from membership fees. Membership in the Society have been declining since the early 1980's reflecting a decline in employment opportunities for entomologists and a weak national economy. Current membership (ca. 520) is about half of that in the early 1980's. At the same time the cost of operations increased markedly. The declining membership points to a future Society that will be appreciably smaller than it once was, at least until scientific work in entomology is more broadly supported. The strategic review by the ad hoc committee will focus on those aspects of organization and operations that traditionally involved Significant costs to the Society.

Dr. Rick West resigned as Secretary of the Society at the end of 1994. Rick has handled this highly demanding job with dedication, ease and competence. Rick is richly deserving of our thanks for a very fine job. I welcome Dr. Peggy Dixon as the new Secretary of the Society.

Les Safranyik
President

Letter to, and from, The Minister of Finance

The following letter, addressed to the Minister of Finance, was written a year ago in my capacity of Science Policy Chair and CFBS Representative. The letter was the Society's contribution to a lobby organized by CFBS in support of research and post secondary education. The letter and the Minister's reply are published to give members some insight into the Federal Government's approach to science support and development of an R&D policy. You will note from the Finance Minister's reply that the Government appears to be quite receptive to input by organizations as well as individuals into development of a national R&D policy. The Finance Minister addressed in some detail each point raised in my letter save the protection of R&D activities carried out in federal laboratories. One wonders whether this was an oversight or a deliberate omission.

February 18, 1994
The Hon. Paul Martin Minister of Finance
Esplanade Laurier, 21st Floor, East Tower
Ottawa, ON K1A 0G5

Dear Minister:

I am writing on behalf of the Entomological Society of Canada (ESC), an affiliate of the Canadian Federation of Biological Societies (CFBS), to promote action by the Federal Government in support of research and post secondary education in the 1994 Budgetary Announcements.

Creating Opportunities: The Liberal Plan for Canada states that the Liberal Government will "...continue to support basic research including the provision of stable funding for the granting councils, the National Research Council and networks of Centres of Excellence and "...will support the objective of doubling R&D investments in Canada." We support this plan and welcome the announcement by the Secretary of State (Science, Research and Development) of $1 billion in new R&D investments over the coming four years (La Presse, December 13th, 1993). We urge the Government to initiate implementation through the 1994 Budgetary Announcements. We join our colleagues in CFBS in inviting the Federal Government to:

use part of the promised $1 billion increase in R&D investments to increase granting councils' budget by 4% yearly over the next 4 years;

maintain current levels of federal transfer payments for post secondary education;

protect R&D activities carried out in federal laboratories from budget cuts that apply across the board to federal ministries; and

organize a meeting to develop and adopt a national R&D strategy through joint participation by pertinent members of the Cabinet, people representing the life sciences, biomedical research, and other stakeholders.

Research in the life sciences, including biomedicine, is one of the most important investments in the prosperity and quality of life for all Canadians. The country needs a national R&D strategy and policies that ensure long-term growth and stability of this important sector. We invite the Government to establish such policies.

Sincerely,
L. Safranyik, Ph.D.
Vice-President and Chair, Science Policy, ESC

August 4, 1994
Dr. L. Safranyik, Vice-President and Chair Science Policy
Entomological Society of Canada

Dear Dr. Safranyik:

Thank you for your facsimile of February 18, 1994. The large volume of mail received from Canadians, before and after the budget, meant that I could not respond as quickly as I would have liked. Nevertheless, I appreciated receiving your views regarding funding for the federal granting councils and federal transfer payments for post secondary education.

The government recognizes the critical importance of basic research as a part of its overall strategy to ensure economic growth, job creation and innovation in an increasingly sophisticated global economy. Indeed, support for the advancement of science and for research training is a key component of federal science policy. As you may be aware, the granting councils were excluded from the cuts announced in my February budget.

The budget also announced that the government is reviewing its overall spending on science and technology to ensure the effectiveness of its considerable investment in this area. As part of this review, public consultations were launched on June 28, 1994, with the release of the discussion paper *Building a Federal Science and Technology Strategy* and its accompanying *Resource Book for Science and Technology Consultations.*

We are actively seeking ideas and suggestions from Canadians, both from individuals and from organizations, and welcome written submissions on how the federal investment in science and technology can best be applied to support the needs of Canadian society. Canadians will also have the opportunity to participate directly in the national dialogue, for example through a series of local, regional and national workshops and conferences. Further information about the Science and Technology Review and the consultations may be obtained from:

Secretariat for Science and Technology Review Industry Canada, 235 Queen Street, Ottawa, Ontario K1A 0H5 Tel.: (613) 943-7034 Fax: (613) 993-4812 Internet: s&t.review@istc.ca

Regarding federal transfer payments for education, let me assure you that the government recognizes the importance of education and training in ensuring competitiveness in the global economy. As you will note in the enclosed document entitled *Federal Transfers to the Provinces*, it is the government's aim to help Canadians to fulfill their goals.

Transfers from the federal government to other levels of government amount to some $40 billion per year. The post-secondary education component of Established Programs Financing (EPF) — account for approximately $14 billion of that total. In 1994-95, no new restraint measures will be applied to either CAP or EPF transfers. As a result, CAP transfers will grow by a projected 5.4 per cent in 1994-95, while EPF entitlements will grow by a projected 1.3 per cent.

In 1995-96 and beyond, existing legislation provides for EPF entitlements to grow in line with the growth in gross national product (GNP) minus three percentage points. No further changes will be made to the formula governing EPF transfers, pending social security reform in 1996-97. As a result, EPF entitlements are projected to grow by an additional 1.4 per cent in 1995-96.

As we set out in the *Red Book* and the 1994 budget, the government believes that social security reform must be pursued as an active, co-operative effort among federal and provincial governments. Both the federal government and provinces are facing significant deficit and debt problems at the same time as they must build a system which serves people better and one that both federal and provincial governments can financially sustain. To that end, it is important to establish fiscal parameters and a predictable funding environment for reform.

For its part, the federal government will require that entitlements under the social security transfers to provinces and territories (CAP and the post-secondary education component of EPF, or any

successor to these transfers) be no higher after reform in 1996-97 than they are now, in 1993-94.

Relative to current projections of growth of CAP and EPF post-secondary education transfers in the absence of reform, this will enable the federal government to secure a minimum of $1.5 billion in savings in 1996-97.

I appreciate hearing your views about support for basic research and education in general and for the granting councils in particular. I can assure you that I have taken note of your concerns.

Sincerely,
The Honourable Paul Martin, P.C., M.P.

New *Bulletin* Editor in 1996

The Executive Council is soliciting the names of persons willing to serve as *Bulletin* Editor of the Entomological Society of Canada, **beginning January 1, 1996**. The *Bulletin* Editor is responsible for the publication of this medium and the receiving, editing, and distribution of material consistent with the object of the Society. The position requires access (and employer's permission) to use photocopying, phone, fax, computer and mail services; proficiency in word processing; working knowledge of desktop publishing and printing; and experience in editing. A working knowledge of both official languages is a desirable attribute. The new *Bulletin* Editor would likely travel to St. Catharines in November 1995 to work on the December 1995 issue of the *Bulletin* with F. Hunter. Persons willing to submit their names for consideration for this position should send a statement of their qualifications by **June 1, 1995**, to Dr. Les Safranyik (see address, below)

Nouvel éditeur pour le *Bulletin* en 1996

Le Conseil Exécutif sollicite des candidatures pour le poste d'éditeur du *Bulletin* de la Société d'Entomologie du Canada. Ce poste sera disponible **à partir du 1er janvier 1996**. Cette personne sera responsable de la publication du *Bulletin* ainsi que de la réception, de l'édition et de la distribution des textes et documents pertinents aux activités de la société. Les exigences pour ce poste sont l'accès (avec permission de l'employeur) aux services de photocopie, téléphone, télécopieur, ordinateur et poste; une bonne connaissance d'un logiciel de traitement de texte; de l'expérience dans l'édition de texte et la préparation de documents par édition électronique. Une connaissance des deux langues officielles est désirable. Le nouvel éditeur du *Bulletin* devra probablement se rendre à St-Catharines en novembre 1995 pour collaborer à la préparation du numéro de décembre 1995 du *Bulletin* en compagnie de l'éditrice actuelle, F. Hunter. Les personnes intéressées à soumettre leur candidature à ce poste doivent faire parvenir une lettre d'intention et un resumé de leurs qualifications avant le **1er juin 1995** à Dr. Les Safranyik:

Dr. Les Safranyik
c/o Canadian Forest Service
506 West Burnside Road
Victoria, B.C.
V8Z 1M5

The 1995 Joint Meeting of the Entomological Society of Canada and the Entomological Society of British Columbia

Victoria, October 14-18, 1995 *Victoria Conference Centre*

TENTATIVE PROGRAM

Saturday, 14 October 1995-Harbour Towers

0830-1700	Entomological Society of Canada Governing Board Meeting- *Room 415*

Sunday, 15 October 1995- Harbour Towers

1000-1500	Registration
1300-1700	Workshops (2)
2000-2200	Linnaean Games: Preliminary session
2000-2200	Workshop (1)

Monday, 16 October 1995- Victoria Conference Centre

0800-1000	Registration
0830-1000	Opening remarks, ESC Awards, Gold Medal Address
1000-1200	Plenary Symposium: " Social Insects: From Molecule to Hive" - B. Crespi-Simon Fraser University - M.Winston-Simon Fraser University - R. Owen-University of Calgary - D.Gordon-Stanford University
1330-1500	Submitted Papers Submitted Papers: Graduate Student Papers (President's Prize)
1530-1630	Heritage Lecture
1645-1845	Linnaean Games: Finals
1900-2000	Students meet the Board- Harbour Towers
2000-2300	Wine and cheese- Royal B.C. Museum

Tuesday, 17 October 1995- Victoria Conference Centre

0900-1200	Symposium: "Integrated Pest Management in B.C." Workshops (2)
1330-1600	Submitted Papers Poster Session
1630-1730	Entomological Society of Canada Annual General Meeting
1830-2300	Banquet-Harbour Towers

Wednesday, 18 October 1995- Victoria Conference Centre

0900-1200	Symposium: "Biodiversity in the Pacific Northwest" Submitted Papers
1200-1300	Entomological Society of Canada Governing Board Meeting-*Chateau Victoria, Harbour Room*

Associated Meetings:

Canadian Forum for BioControl
Saturday 14 October, 1995 ~ 0900-1730 Chateau Victoria

Western Forum of the Expert Committee on Integrated Pest Management
October 19-21 Chateau Victoria

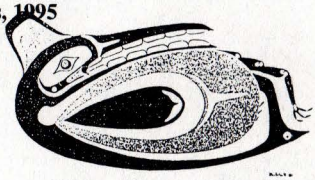
Tentative Workshops:
Cone and seed insects- R. Bennet
Gypsy moths- D. Roden
Biting fly feeding behaviour- W. Friend
Pollination- H. Nadel/P. Kevan
Insect pathology-D. Levin
Forest entomology-T. Shore

For additional information please contact:

Terry Shore (Chair),
Canadian Forest Service, Pacific Forestry Centre, 506 West Burnside Rd.,
Victoria, B.C. V8Z 1M5.
Telephone: (604)363-0666
Fax: (604)363-0775
Email: TShore@A1.PFC.Forestry.ca

Bernie Roitberg (Program Chair),
Dept. of Biological Sciences, Simon Fraser University, Burnaby, B.C., V5A 1S6.
Telephone: (604)291-3585
Fax: (604)291-3496
Email: Roitberg@SFU.ca

Hannah Nadel (Organizer of workshops),
7028 Brynwood Crt., Brentwood Bay, B.C., V8M 1G1
Telephone: (604)544-1386
Email:Hannah. Nadel@bbc.amtsgi.bc.ca



La Réunion Conjointe de 1995 de la Société Entomologique du Canada et de la Société Entomologique de la Colombie-Britannique

Victoria, 14-18 Octobre 1995 Victoria Conference Centre

PROGRAMME PROVISOIRE

Samedi, 15 Octobre 1995 - Harbour Towers

0830-1700 Réunion du Conseil de la Société Entomologique du Canada - Salle 415

Dimanche, 15 Octobre 1995 - Harbour Towers

1000-1500 Inscription
1300-1700 Ateliers (2)
2000-2200 Jeux Linnéens: Session préliminaire, Heure de la session finale à confirmer
2000-2200 Atelier (1)

Lundi, 16 Octobre 1995 - Victoria Conference Centre

0800-1000 Inscription
0830-1000 Ouverture, Prix SEC, Allocution - Médaille d'Or
1000-1200 Symposium plénier: "Insectes Sociaux: De la molécule à la ruche"
- B. Crespi - Université Simon Fraser
- M. Winston - Université Simon Fraser
- R. Owen - Université de Calgary
- D. Gordon - Université Stanford

1330-1500 Communications Scientifiques
Communications Scientifiques: Étudiants gradués (Prix du Président)
1530-1630 Allocution Héritage des Anciens
1645-1845 Jeux Linéens: Session finale
1900-2000 Les étudiants rencontrent le Conseil - Harbour Towers
2000-2300 Vin et Fromage - Musée Royal de la Colombie-Britannique

Mardi, 17 Octobre 1995 - Victoria Conference Centre

0900-1200 Symposium: "Lutte Intégrée des insectes en Colombie-Britannique"
Ateliers (2)
1330-1600 Communications Scientifiques
Présentation des posters
1630-1730 Assemblée Générale Annuelle de la Société Entomologique du Canada
1830-2300 Banquet - Harbour Towers

Mercredi, 18 Octobre 1995 - Victoria Conference Centre

0900-1200 Symposium: "La biodiversité du Nord-ouest du Pacifique"
Communications Scientifiques
1200-1300 Réunion du Conseil de la Société Entomologique du Canada - Château Victoria,
Salle Harbour

Autres Réunions :

Forum Canadien pour la Lutte Biologique Samedi 14 Octobre, 1995 - 0900-1730
Château Victoria
Forum du Comité des Experts de l'Ouest sur la lutte intégrée des insectes et des maladies
9-21 Octobre 1995 Château Victoria

Liste Provisoire des Ateliers

Insectes nuisibles des cônes et des graines - R. Bennet

La Spongieuse - D. Roden

Comportement alimentaire des mouches piqueuses - W. Friend

La Pollinisation - H. Nadel / P. Kevan

L'Entomopathologie - D. Levin

L'Entomologie Forestière - T. Shore

Pour de plus amples renseignements adressez-vous à:

Terry Shore (Président),
Service Canadien des Forêts, Centre Forestier du Pacifique, 506 West Burnside Rd.,
Victoria, B.C. V8Z 1M5
Téléphone:(604)363-0666
Télécopieur:(604)363-0775
Courrier électronique: TShore@A1.PFC.Forestry.ca

Bernie Roitberg (Président du Programme),
Département des Sciences Biologiques, Université Simon Fraser, Burnaby, B.C. V5A 1S6
Téléphone:(604)291-3585
Télécopieur:(604)291-3496
Courrier électronique: Roitberg@SFU.ca

Hannah Nadel (Organisatrice des Ateliers),
7028 Brywood Crt., Brentwood Bay, B.C. V8M 1G1
Téléphone:(604)544-1386
Courrier électronique: Hannah.Nadel@bbc.amtsgi.bc.ca

The 1995 Joint Meeting of the Entomological Society of Canada and the Entomological Society of British Columbia

Victoria, October 14-18, 1995
Victoria Conference Centre

REGISTRATION FORM

Check one: Regular ☐ *or* Student ☐

Name:
.....
Last *First* *Initial*

Title:
.....

Address:
.....

City:
.....

Province/State:.....

Postal
Code:.....Telephone:.....Fax:.....

Registration fees are in $ CDN (including banquet ticket and GST).
Late registration (after August 11,1995) add $15.00 to each fee.

Please make cheque payable to *ESC/ESBC Joint Meeting 1995*

Registration, *regular*	☐ $ 110	
Registration, *student*	☐ $ 60	
Registration, *accompanying*	☐ $ 50	
.....		.....
Name of accompanying person		TOTAL

La Réunion Conjointe de 1995 de la Société Entomologique du Canada et de la Société Entomologique de la Colombie-Britannique

Victoria, 14-18 Octobre 1995
Victoria Conference Centre

FORMULAIRE D'INSCRIPTION

Indiquez: Régulier ☐ *ou* Étudiant(e) ☐

Nom:.....
Nom de famille *prénom* *initiales*

Titre:.....

Adresse:.....

Ville:.....

Province/État:.....

Code Postal:.....Téléphone:.....Télécopieur:.....

Frais d'inscription en $Can (incluant les frais de banquet et la TPS).
Inscription tardive (après le 11 août 1995) ajoutez $15.00.
Veuillez établir votre chèque à l'ordre de:"*ESM/ESBC Joint Meeting 1995*"

Frais d'inscription, *régulier*	$110
Frais d'inscription, *étudiant(e)*	$60
Frais d'inscription, *conjoint(e)*	$50
.....	.....
Nom du conjoint	TOTAL

Accomodations:
A number of rooms have been set aside at the Harbour Towers and the Chateau Victoria.

Harbour Towers:
Standard room: single-$60, double-$70
1 bedroom suite with kitchen and hide-a-bed: single/double $80 ; 2 bedroom suite with kitchen and hide-a-bed: single/double $100; -additional guests (over the double occupancy~$15)
RESERVATIONS: 1-800-663-5896

Chateau Victoria
Standard room: single/double- $70; 1 bedroom suite: single/double- $85
Some rooms have a kitchen available for a one time hook-up fee of $15. Some larger suites available.
-additional guests (over the double occupancy~$15)
RESERVATIONS: 1-800-663-5891

It is in the interest of the Entomological Societies of Canada and B.C. that you stay at these hotels and that you let them know you are attending the ESC meeting when making your reservations.

Please return registration form and registration fees to :
Mr. Jim Troubridge
Agriculture Canada
6660 NW Marine Dr.
Vancouver, B.C. V6T 1X2

Hébergement:
Des chambres ont été réservées aux "Harbour Towers" et au Château Victoria.

Harbour Towers:
Chambre standard: occupation simple - $60, double - 70$
Suite avec 1 chambre à coucher, cuisine et divan-lit: occupation simple ou double $80;
Suite avec 2 chambres à coucher, cuisine et divan-lit: occupation simple ou double - $100.
Personne additionnelle - Supplément de $15.

RESERVATIONS:1-800-663-5896

Château Victoria
Chambres standard: occupation simple ou double - $70; Suite avec 1 chambre à coucher: occupation simple ou double -$85
Certaines chambres ont une cuisine disponible pour un supplément de $15 pour la durée du séjour. Des suites plus grandes sont aussi disponibles. Personne additionnelle - Supplément de $15.

RESERVATIONS:1-800-663-5891

En réservant à l'un de ces hôtels, vous supportez les Sociétés Entomologiques du Canada et de la Colombie-Britannique. Il serait bon de mentionner, au moment de votre réservation, que vous participez à la réunion de la SEC.

Veuillez retourner ce formulaire ainsi que les frais d'inscription à:
Mr. Jim Toubridge
Agriculture Canada
6660 NW Marine Dr.
Vancouver, B.C. V6T 1X2

The 1995 Joint Meeting of the Entomological Society of Canada
and the Entomological Society of British Columbia
Victoria, October 14-18, 1995
Victoria Conference Centre

SUBMITTED PAPER, STUDENT PAPER AND POSTER PRESENTATION FORM

Please return to:
Bernie Roitberg (Program Chair),
Dept. of Biological Sciences, Simon Fraser University, Burnaby, B.C., V5A 1S6. Telephone: (604)291-3585 Fax: (604)291-3496 Email: Roitberg@SFU.ca
DEADLINE: Postmarked on June 30, 1995
Type or print in the space below use type no smaller than 12 pitch 10 point (courier typewriter) to allow for reduction. Longer abstracts may be curtailed. Abstracts may be submitted as ASCII files by e-mail or on diskette.

Author(s).....

Address.....

Title.....

Abstract

Form of presentation desired (check one):

	Regular	President's Prize
Oral presentation: 12 min + 3 min discussion:	☐	☐
Poster presentation:	☐	

Name of presenter:.....

*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 months prior to the meeting*
2) *they must be registered at the meeting*
3) *they must be the principal investigator*

La Réunion Conjointe de 1995 de la Société Entomologique du Canada
et de la Société Entomologique de la Colombie-Britannique
Victoria, 14-18 Octobre 1995
Victoria Conference Centre

FORMULAIRE D'INSCRIPTION: COMMUNICATIONS ORALES (RÉGULIÈRES ET ÉTUDIANTS) ET PRÉSENTATION D'UN POSTER

Veuillez retourner à:

Bernie Roitberg (Président du programme),
Département des Sciences Biologiques, Téléphone:(604)291-3585
Université Simon Fraser, Burnaby, Télécopieur:(604)291-3496
B.C. V5A 1S6 Courrier électronique: Roitberg@SFU.ca

DATE LIMITE: 30 juin 1995 **Présenté par**.....

Écrire en lettres moulées ou à la machine dans l'espace prévu. Veuillez ne pas utiliser de caractères plus petits que 10 points ou 12 caractères au pouce (courrier) afin de permettre de réduire le texte. Les résumés trop longs pourront être coupés. Vous pouvez soumettre votre résumé sur disquette ou par courrier électronique sous forme de fichier ASCII.

Auteur(s).....
Organisme et addresse.....
Titre:.....
Résumé:

Type de présentation (ne cochez qu'un choix)	Régulier	Prix du Président*
Communication orale: 12 min. + 3 min de discussion	☐	☐
Présentation d'un poster:	☐	

*Les étudiants sont éligibles au Prix du Président s'ils satisfont aux exigences suivantes:
1) ils doivent être inscrits à un programme d'études post-graduées ou avoir gradué d'un tel programme dans les six (6) mois précédant la réunion
2) ils doivent être inscrits à la réunion
3) ils doivent être le chercheur principal

First Canadian Linnaean Games

The Student Affairs Committee is organizing a "Canadianized" version of the E.S.A's Linnaean Games for the Annual Meeting in Victoria. 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 Victoria is scheduled for Sunday night, with the time of the finals to be announced at a later date. Subject areas for questions will include: behaviour, 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 master list of Linnaean Games questions is available from Troy Danyk (Danyk@abrsle.agr.ca).

The Student Affairs Committee invites all student members of the E.S.C. planning to attend the meeting to submit a team of 4 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 for during registration. Please send in your response by August 1, 1995.

We thank Tom Turpin and Sonny Ramaswamy of the E.S.A. 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:
Elizabeth Tomlin
Department of Biological Sciences
Simon Fraser University
Burnaby, B.C.
V5A 1S6

tel (604) 291-4163
fax (604)291-3496
e-mail tomlina@sfu.ca

Premiers Jeux Linnéens Canadiens

Le Comité des Affaires Étudiantes organise une version canadienne des Jeux Linnéens de la S.E.A pour sa rencontre annuelle de Victoria. 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 régles du jeu, référez-vous au Bulletin de la Société Entomologique Américaine (American Entomologist), 31(3):5-6.

La manche préliminaire des Jeux de Victoria est prévue pour dimanche soir. 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. La liste des questions des Jeux Linnéens est disponible auprès de Troy Danyk (Danyk@abrsle.agr.ca).

Le Comité des Affaires Étudiantes invite tous les étudiant(e)s membre de la S.E.C. qui prévoient participer à la réunion à présenter une équipe de 4 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 1995.

Nous remercions Tom Turpin et Sonny Ramaswamy de la S.E.A. 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'équipes:.....
.....
.....
.....

OU

Nom (personne seule):.....
Institution:.....

Veuillez retourner à:
Elizabeth Tomlin
Département des Sciences Biologiques
Université Simon Fraser
Burnaby, B.C.
V5A 1S6

tel:(604)291-4163
télécopieur:(604)291-3496
Courrier électronique: tomlina@sfu.ca

ACTIVITIES FOR PARTICIPANTS AND THEIR SPOUSES/PARTNERS/FRIENDS AT THE ESC-ESBC JOINT MEETING IN VICTORIA

Victoria offers a wide range of wonderful activities and attractions. We'd like to know which of the following interest you and your "accompanying person(s)", so that we can help you enjoy your visit.

So here we go...what would you and your "AP" like to do?

Activities for conference participants and AP's - Sunday, Oct. 15, 1995

(Please indicate with an X, a circle, or highlighter pen which activities you'd prefer.)

1. Trip to a west coast beach for walking, looking in tide pools, and soaking up (hopefully not literally) the tranquility of the west coast in autumn.
2. A whale-watching boat trip.
3. A salmon-fishing boat trip.
4. A trip to Butterfly World.
5. Tour of the city - including heritage houses - and Butchart Gardens
6. Other - namely:

Activities for conference participants and AP's - Mon-Wed., Oct. 16-18, 1995

1. Trip to a west coast beach for walking, looking in tide pools, and soaking up (hopefully not literally) the tranquility of the west coast in autumn.
2. A whale-watching boat trip.
3. A salmon-fishing boat trip.
4. A trip to Butterfly World.
5. Tour of the city - including heritage houses - and Butchart Gardens
6. Trip to Saltspring Island
7. Golf
8. Chocolate making
9. Other - namely:

Would you like to receive a packet of information from Tourism Victoria?_____
If yes, please include your current address.

Please return this form to: Sheila Fitzpatrick
Pacific Agriculture Research Centre
6660 N.W. Marine Drive
Vancouver, B.C. V6T 1X2

Activités Pour Les Participants el leurs épouses/partenaires/amis à la Réunion Conjointede la SEC/SECB au Victoria

La ville de Victoria vous offre un variété d'attractions et d'activitées marveilleuses. Nous voulons savoire lesquels seront interesant pour vous et le(s) personne(s) qui vous accompagner pour que nous pouvons ameliorer votre visite.

Alors...qu'est ce que vous et vos compagnons voulez faire?

Activité pour Participants du Conférence et leurs conpagnons. Dimanche le 15 Oct.
(s'il vous plait, encircler les activités préferé)

1. Voyage au plage du côté ouest pour marcher, voyer les basins mareé et absorber la tranquilité du côté ouest en automne.
2. Voyage en baleinier.
3. Voyage en bateau pour pêcher au saumon.
4. Voyage au Monde des Papillions.
5. Tour du ville compriscent le maisons d'heritage el le jardin Butchart.
6. Autre. Spécifiqument:

Activité pour Participants du Conférence et leurs conpagnons. Lundi-mercredi, 16-18 Oct, 1995.

1. Voyage au plage du côté ouest pour marcher, voyer les basins mareé et absorber la tranquilité du côté ouest en automne.
2. Voyage en baleinier.
3. Voyage en bateau pour pêcher au saumon.
4. Voyage au Monde des Papillions.
5. Tour du ville compriscent le maisons d'heritage el le jardin Butchart.
6. Voyage à l'isle de Saltspring.
7. Golf
8. Faiscent des chocolats
9. Autre. Specifiquement:

Voulez-vous recevoir un paquet d'information préparé par Tourism de Victoria?_____
Si oui, indiquer votre addresse:

Retourner cet document à: Sheila Fitzpatrick
Pacific Agriculture Research Centre
6660 N.W. Marine Drive
Vancouver, B.C. V6T 1X2

ARTICLES

Remembering our Heritage: Harold Royson Foxlee

H.R. Foxlee was born in Ruislip, England, on 5 May 1884, son of **Richard Augustus Foxlee** and **Mary Ann Matheson**.

He attended the *John Lyon Harrow School for Boys* where his excellence in both the academic and sports curricula soon became apparent. In 1899, during the Annual Athletic Sports Day, held on 3 May, he won first prize in the Senior Hurdles as well as finishing first in the mile race - the silver cups he won on that day (still in proud possession of his son, **Frank**) are concrete proof of his excellence. Although short in stature (only about 5' 7" - the body of a six foot man propped up by short legs!) he was uncommonly nimble on the soccer field. He played forward, was an excellent shot as demonstrated during a game in which he aimed for, and knocked the crutch out from under a one-legged spectator who had been taunting him and his short legs.

Foxlee was a excellent scholar, one whose uncle wanted him to become a civil engineer. However, his interests lay in the natural world but he had an innate fascination for mechanical contrivances. England was too crowded for him so he decided to seek his fortune elsewhere. There were **Foxlee** relatives living in Australia as well as in South Africa whom he could contact; he decided on the latter destination. His father, knowing of his son's wanderlust, gave him a large leather trunk for his travels and provided him with 100 gold rands. He knew that Harold would probably not be back for some time, and he wanted him to have the where-with-all to get a good start wherever he settled down. However, enroute to South Africa, the black porter stole all of his gold, leaving **Harold** with a slightly biased and provincial opinion of the negroid race.

In South Africa he joined the mounted constabulary to help maintain order during the Boer War. At that time a young foreign correspondent, named Winston Churchill, was covering the war news in that part of the world. Many were the chats he had with this newspaper man who became Britain's Prime Minister in later years. About the time the war ended and many soldiers returned home to England, young Harold also came back to Ruislip. He was not a casualty of war but one of nature. He had acquired an intestinal parasite that left him sick and dysenteric, a malady that required four years of treatment in England before he was well again.

The wanderlust was still with him and England was still too crowded. **Foxlee** decided to emigrate to Canada, another one of "the Colonies" that was touted to be the land of opportunity. The country was

wide open for settlement; railroads were being constructed at a fast pace to keep up with the demand for settlers. **Foxlee** went to work as a construction worker for the Great Northern Railroad near Alex, north of Edmonton. This soon became monotonous and dull so he quit and headed west and south to the mountains of the southern Kootenays in British Columbia. He settled on Robson as the place he could call "home", the grand vistas of mountain, valley, abundance of vegetation and animal life, appealed to him. He worked for the railroad again, also as a construction worker. The handling and laying of railway ties brought him in touch with the lumbering industry; logging soon piqued his interest.

Foxlee once more quit the railraod and went to work for William Waldie and Sons who owned a big saw mill, as well as a planing mill in Castlegar. At first **Harold** worked the sluices; a slide built of logs down which other logs could be skidded on their way down the mountainside to the Columbia River below. **Foxlee's** job was to guard the bottom end of the sluice where it crossed the road that ran parallel to the Columbia River. He had to warn all approaching vehicles and persons travelling the road, of the impending approach of logs that came thundering down the slope and shot out into the river where they were then "boomed" and held in close proximity to the sawmill. He was soon promoted from this "bottom-of-the-rung" position to a position as planer in the planing mill. Here he worked until the Second World War got under way; a planer doing his bit for the lumbering industry.

By 1907, **Harold** had accumulated sufficient personal wealth and property (so he thought!) to permit him to consider a life other than that of a bachelor. He wrote his childhood sweetheart in England and asked her to come to Canada to marry him. The lady in question was **Olive Mary Bunyon** who lived in Northwood, Middlesex, the neighboring community to Ruislip. She accepted his invitation, came to Canada, stayed for a while in Winnipeg where she worked as a governess, and then proceeded on to Robson. They were married in Nelson, B.C. on 23 August 1911. Three children were born of this union: **William Royson** (1914), who was killed in 1941 while serving with the R.A.F.; **Frank Harold** (1917), a chemical engineer and Ph.D. in Chemistry, now living in semi-retirement in Rochester, Michigan; and **Edward Wilson** (1920), also killed in 1941 while serving with the R.C.A.F. during World War II.

When war broke out in 1914, **Harold Foxlee** responded to the Canadian call to arms. He joined the Forestry Battalion of the Canadian Expeditionary Force in 1916 to serve in France until the end of the war. His experience with both, railroads and lumbering, placed him in an essential position in the logging camps in France and the construction of railroads for the movement of heavy guns and supplies to the front. He returned to Canada in 1919 to once more take up his position in the planing mill in Robson.

The Depression years of the 1930s were also felt in the Kootenays and by the **Foxlee** family in Robson. However, the small farm, acquired by **Harold** as a returned war veteran through the Soldier Settlement Board, permitted him to maintain a large garden and a sufficient number of farm animals to supply the family with the everyday necessities of food. Being an avid hunter and fisherman he was able to harvest an abundance of game that was present in the forests and lakes of the region. A large brass-and-mahogany fishing reel (currently on display in his son's home in Rochester), purchased many years previously at Harrods in London, was helpful in bringing in a myriad lake trout for the family's dinner table.

About 1935, the entrepeneurial spirit came alive in **Harold**. Money was scarce and a penny earned - in any manner possible - was a welcome addition to the family coffers. In his many years in the lumber business, and his acquaintence with forest and farm, he was constantly aware of the many insects that also called this region their home. Among these creatures were the showy butterflies and moths, the

denizens of the forest and glade. Collectors all over the world were willing to pay for specimens, so why not collect and sell them? There were many species in the mountains and valleys of the Robson district; collecting would be easy.

He invested in an insect net, ordered pins, needles and sundry entomological equipment from supply houses, and began his collecting vocation. Initially he used a hand lens but later he bought a Zeiss microscope for $500; an instrument he used extensively in his endeavours to make the entomological work easier and his insect identifications more reliable. The specimens he acquired were meticulously pinned, mounted, spread, dried, and labelled. He corresponded with most of the lepidopterists in America and Europe, selling the Robson insect specimens to distant places where they were studied and made part of the collections of many Universities and Museums.

In 1962, **Foxlee** began to add insects other than just the moths and butterflies to his collections. These included the beetles, parasitic wasps, flies, and the myriad other species that flourished in the region. News of his excellent specimens spread quickly. They were so well preserved and mounted that they caught the attention of **J.H. McDunnough** of the Systematics Unit, Division of Entomology, Dominion Department of Agriculture in Ottawa. He commissioned **Foxlee** to collect as many of the insect specimens as he could in the Robson district. For the next 23 years the many thousands of insect specimens that he collected, were dutifully pinned, mounted, labelled, and sent to Ottawa where they rest today in the Canadian National Collection of Insects. Not only did he collect insects for others, he amassed a collection of his own comprising some 35,000 specimens. These were preserved in a series of drawers which he bought from commercial supppliers of entomological equipment.

When World War II broke out, **Harold Foxlee** assisted in the establishment of the National Guard in Canada. He volunteered for guard duty at the heavy-water plant located at the Cominco Mine in Trail, B.C. This plant was started by Cominco in 1941 to supply heavy-water for the American nuclear industry and was later sold to U.S. interests to suppply an ever increasing demand for deuterium and nuclear power. After the war he returned to the planing mill in Robson, remaining there until he retired in 1950.

In his spare time he continued collecting insects although fishing was was also one of his most cherished forms of recreation and relaxation. His wife died in 1953 and was buried in a cemetery in Nelson, B.C. He collected insects until 1969. In 1972 he left his home in Robson and moved into a senior citizen's home in Trail. Here he spent some very comfortable years, enjoying the social activities in the home and performing as a lead singer - he had a re-markabley good baritone voice - in the senior's choir. Age and geriatric diabetes slowed his activities; he died on 17 November 1974, was cremated and his ashes buried beside that of his wife in the cemetery in Nelson, B.C.

Foxlee's insect collection, together with the drawers in which they were housed, were donated to the University of British Columbia. It will take many years to identify and curate all the 35,000 or more specimens now forming part of the *G.J. Spencer Museum* at the University. The books and separates gathered over the years were donated to Selkirk College in Castlegar, B.C. His microscope was given to his grandson, Dr. **Richard Heath Foxlee**, who used it in his medi-cal studies during his residency in San Francisco hospitals.

Although **H.R. Foxlee** had no direct entomological training, his name will long be remembered in the annals of entomology as a pioneer naturalist, conservationist, lepi-teran taxonomist, and superb collector of Canadian insects. The many thousands of specimens, now available for reference and study

in museums and collections throughout the world - and particularly at the University of British Columbia - bear mute testimony to the dedication and expertise given to entomology by a little-known naturalist in a remote corner of southern British Columbia.

Paul W. Riegert
University of Regina
Regina, Saskatchewan

Pesticide Protesters, Public Officials and Public Relations

Publicity about protest campaigns against pesticide (including herbicide) programs often is unconstructive, given that the mass media cannot resist the temptations of negative and sensational aspects. To try to identify how causes of unhelpful publicity might be reduced I analysed interactions in British Columbia around 1970 to 1985 between people about pesticides. I discuss here only one of the five main aspects: consequences of disagreements by officials with protesters. An official in this context is anybody working for a federal,provincial or local government agency or a public utility.

Officials tended to react defensively when they were targets of protests. In doing so they sometimes used tactics that reduced respect in them as unbiased experts and trust in their credibility. Moreover poor public relations by annoyed officials too often aggravated protesters. This usually intensified, expanded and prolonged controversies and the consequent media publicity. Protesters reacted to what they perceived to be official arrogance as manifested by rudeness, condescension, or secretiveness.

Rudeness created protesters:

A Mrs. Kassian asked why a Hydro right-of-way across her organic cattle ranch in the Fraser Canyon was being sprayed and with what. None of your business, she was told. This so irked her that when a while later she heard of a government plan to spray the Canyon she organized the other residents to oppose it. This was the beginning of a massive conflict about a proposed budworm spray program;

A housewife in Coquitlam was sprayed with malathion from an aircraft. She phoned the Vector Control Officer and asked "What is this malatision?" His response was "You wouldn't understand if I told you; when you are intelligent enough to pronounce malathion correctly you can phone me back". Her reaction was to study to become an expert on the hazards of pesticides. The consequence is that she, a certain Mrs. Merriam Doucet, has been a formidable activist in pesticide controversies for more than 20 years.

One manifestation of condescension was when an official said in effect "Trust me; you must believe what I tell you because of who I am" and then did something that turned out to be misleading: to demonstrate that 2,4-D was not a health hazard a Chairman of B.C. Hydro drank a glass of it before an audience of television and other media reporters; according to a Provincial pesticide specialist defending the safety of flea collars any pet that became ill was because its collar was too tight; a university specialist in chemical pesticides wrote in a letter to a newspaper "I myself have literally bathed in it [2,4-D] (in the actual chemical not the watered-down spray) without apparent effects"; and a senior Federal official defending the spraying of a high-density residential area with carbaryl was asked in a

television interview "Can you guarantee that the residents will not be harmed now or later, or 20 years hence from cancer"? His response was " I guarantee no harm".

The more usual manifestation was an attitude by officials that the public in general and housewives in particular were both uninformed and incapable of learning much and that only people with doctorates could be experts. Protesters without professional qualifications were ridiculed and belittled. This did not always work. A plaintive quotation from an official report: "A housewife was able to get better press coverage than leading toxicologists from the USA and Canada".

Doubtless it was relevant that in British Columbia during this period all the leading individual protesters were women while all the officials who reacted against them were men.

What protesters perceived as official secretiveness produced suspicions and fears: What are they concealing from us, and Why? These were influential in prolonging and intensifying protest campaigns. Justification for secrecy that could be identified were questionable: to cover-up misdeeds such as violating stipulations of spray permits; to avoid criticisms notably by keeping quiet about possible hazards; to avoid the costs and trouble of prosecuting those who broke regulations especially when they also were officials; and, apparently, to gain time in the hope that if something is ignored for long enough it will go away.

Like rudeness, suspicions and fears created protesters:

The property of a Mrs. Manchester in the Okanagan was sprayed unexpectedly. She became suspicious when told that the pesticide was not a health hazard if inhaled but noted that the operators were wearing masks. Evasions and procrastinations by officials escalated her enquiries into a major dispute that did not die down until the next year when she won a lawsuit against the Regional District responsible for the spraying.

An organic garden in Coquitlam was sprayed from an aircraft without warning or explanation (actually it was for mosquito control). When the owner did not get satisfactory responses to her questions and complaints she, a Mrs. Thelma McAdam, made active protesting her vocation and is still at it after more than 20 years.

Clearly, in the past officials too often created protester problems unnecessarily and both sides too often got out of control in their attempts to manage each other. This situation has much improved for a variety of reasons: most officials evidently have learned to avoid most kinds of reactions that were intended to impress or suppress but that instead provoked; an increasing proportion of them are women; restrictions and alternatives reduce controversial uses of pesticides; and few people nowadays believe that pesticides cannot be health hazards.

Moreover, officials have come to appreciate that protesters - now better organized as environmentalists - have the ultimate power, which is to influence politicians. In British Columbia this first became obvious in the 1970s when the controversial plan to spray the Fraser Canyon budworms became so publicly politically embarrassing that it was terminated by Provincial Cabinet Order, and the outcries about the Coquitlam mosquito spray program produced The Royal Commission of Inquiry into the Use of Pesticides and Herbicides.

However, some recent illustrations of consequences that could and should have been avoided show that there is still room for improvement in public relations by officials: suspicions of a cover-up for hazardous components arose from use of a pesticide whose formulation could not be revealed because it was a trade secret; fears were created by plans, regarded as arrogant, to spray it in environments where there were people who would not benefit directly and who envisaged harm to themselves and their families; latent hostility and scepticism reappeared when official responses to appeals and protests were perceived as perfunctory and the public pressures caused a local government to prohibit an eradication spray program in its municipality.

It should be obvious by now that officials who behave injudiciously in planning and operations make themselves vulnerable to control attempts by the public and that consequent publicity can discredit both officials and their specialities. The obvious solution: effective monitoring and management of officials by other officials to prevent such behaviour.

Acknowledgements

The study of which this is a part was supported by grants from the Natural Sciences and Engineering and the Social Sciences and Humanities Research Councils of Canada. The data were compiled by Research Assistants Dr. Elspeth Belton and Ms. Laura Doliner, often by personal interviews.

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Canada's Model Forest Program An Initiative for Sustainable Development

Over the past number of years we have seen a dramatic shift in people's perception of the forest and its management. The forest is no longer regarded as a single resource entity. It is now viewed as a reservoir for a variety of environmental and ecological, economic, and cultural values and there has been a growing recognition of the legitimacy of those values in forest management.

Traditional forest management, where we look at only one forest value - timber - can no longer be practiced. Sustainability and more holistic management requires being able to manage our forest resources in ways which will ensure their integrity, productive capacity, resiliency, and biodiversity and satisfy our economic, environmental, and social values.

This, to some extent, has been occurring over the past number of years albeit slowly in some areas. Of course, timber is a forest value and has been considered such for a long time. It has been considered the only real forest value and the only one we have managed for. Some of these other forest values which are currently being recognized as legitimate values and therefore should be managed for include: wildlife such as caribou and small birds, recreation, water and fish, ecosystem health and integrity, and even agriculture and mining.

When the federal government released its comprehensive environmental action plan entitled "Canada's Green Plan for a Healthy Environment" in December 1990, it was this evolving attitude towards and concern for the forests that led to the inclusion of a major forestry component in the Green Plan. The "Partners in Sustainable Development of Forests Program" is a multi-year, multi-million

dollar initiative headed by the Canadian Forest Service designed to shift the management of Canada's forests from sustained yield to sustainable development.

The Partners component will strive to shift the management of Canada's forests from the traditional sustained yield concept to sustainable development. It represents a federal response to the initiatives of the Canadian Council of Forest Ministers to achieve sustainable development of our Canadian forests. As well, it outlines a series of initiatives aimed at enhancing the management of our forests for a variety of uses and users in an environmentally sensitive manner.

One key element to this component of the Green Plan is the Model Forest Program. The Model Forest Program is an unprecedented forest initiative in Canada and the world. It is a network of large-scale, working models of sustainable forestry. Ten sites were chosen across the country. The smallest site is over 110,000 hectares in size, while the largest is over 1.2 million hectares. The ten sites were chosen through a competitive process where proposals were subjected to a technical review by a diverse group of respected individuals. There were 50 proposals submitted and only ten chosen.

These 10 sites represent the biological diversity of Canada's forest ecosystems. Sites are located in the Boreal Forest, the Coastal Temperate Rainforest of British Columbia, the Great Lakes - St. Lawrence Forest of southern Ontario and Quebec, and the Acadian Forest of the Maritimes. Starting in British Columbia, the ten sites are: Long Beach Model Forest, McGregor Model Forest, Foothills Forest, Prince Albert Model Forest, Manitoba Model Forest, Lake Abitibi Model Forest, Eastern Ontario Model Forest, An Inhabited Forest, Fundy Model Forest, Western Newfoundland Model Forest.

In addition to the 10 domestic Model Forests, it was announced at Rio in 1992 that there will be an international component to the Model Forest Program. Currently, two Model Forests have been established in Mexico, one in Russia, and negotiations are proceeding with Malaysia. About 20 other countries have indicated a willingness to participate either jointly or on their own in this Program.

A variety of stakeholder interests are represented in Partnerships formed in each Model Forest. In reading "Our Common Future" by the Bruntland Commission, I came across the following quote by one the individuals interviewed: "We now know that what unites us is vastly more important than what divides us." Success of the Program is dependent upon the Partnerships forged among the many different interest groups in Canada's forest community. These partnerships form the backbone of the Model Forest Program.

These areas are managed for a full range of user interests, from natural area conservation to industrial wood production.

The Program will assist managers throughout Canada in developing and implementing ecologically sound and scientifically advanced management practices. As well, it will demonstrate, both nationally and internationally, sustainable development in forestry.

There are three objectives to the Model Forest Program. These relate to the national program. Each Model Forest has its own set of objectives, but are also bound by the national level objectives: 1) to accelerate the implementation of sustainable development in forestry, and in particular the concept of integrated resource management; 2) to develop and apply new and innovative concepts and techniques in the management of forests; and 3) to test and demonstrate the best sustainable forestry practices

available.

A national network of Model Forests is very important. Canada's forests are wide ranging and very diverse, having some impact on every Canadian's life either economically, culturally, or spiritually. The Model Forest Program will help Canadians learn more about the forest of Canada and their importance to the country's economy, ecological well-being, and cultural identity.

The Model Forest Program, with its network of Model Forests across the country, will help people to identify with each other in sharing a common background — Canada's forests.

With the international component coming on-line, this idea can be extended to include other nations, other peoples, and other cultures.

Canada is a responsible custodian of 10% of the world's forests. This responsibility requires the implementation of sustainable development in forest management.

The Model Forest Program can help achieve sustainable development in forestry by facilitating the cooperation of government agencies, private industry, organizations, and individuals, not only in local areas, but also nationally and throughout the international community. It will allow a greater sharing of knowledge, technology, and experiences helping the entire forest sector advance towards sustainability as a whole rather than on a regional or localized basis.

This network of Model Forests shows that by working together we can find lasting solutions to the challenge of preserving the economic, ecological and recreational values of our future generations.

Brian Bonnell
Model Forest Coordinator
Canadian Forest Service
Newfoundland and Labrador Region

Western Newfoundland Model Forest: A collaborative effort in integrated resource management and sustainable development

In June 1992, following a national competition launched by the Canadian Forest Service, the Western Newfoundland Model Forest became one of a network of ten large-scale, working models of sustainable forestry across Canada. The Model Forest is part of the boreal forest of Canada and consists predominantly of balsam fir. In terms of forest site types, the area covers the majority of the Western Newfoundland Ecoregion and extends into both the Central Newfoundland and Long Range Barrens Ecoregions. The Western Newfoundland Model Forest is an area of 707 060 hectares bounded on the north by Gros Morne National Park, the east by the Buchans Plateau and Lloyds River, the south by the Burgeo highway, and the west by the Gulf of St. Lawrence.

Partnerships

A variety of stakeholder interests are represented in Partnerships formed in each Model Forest. Success of the Program is dependent upon the Partnerships forged among the many different interest

groups in Canada's forest community. These partnerships form the backbone of the Model Forest Program.

The Western Newfoundland Model Forest currently has seven Partners representing a variety of interests united in a common effort to achieve sustainability in the management of our forest resources: Corner Brook Pulp and Paper Limited, Newfoundland Forest Service, Wildlife Division, Abitibi-Price Inc., City of Corner Brook, Humber Environment Action Group, and Westviking College. It is a goal of the Model Forest to expand its partnership to include a variety of other stakeholders which are currently not represented.

Project Summary

The balsam fir forest of western Newfoundland is the primary source of raw material for two of the province's three newsprint mills. This forest also provides many other values to the more than 35,000 residents of the Model Forest area. It contains some of the most rich and varied wildlife habitat in the province including the only known concentration of the threatened Newfoundland Pine Marten. It is heavily used for many forms of outdoor recreation, is a supply of fuelwood and other timber for domestic use by the residents and contains the water supply for several communities in the area.

Traditional forest management in this area has concentrated on timber production and largely ignored or left to chance other resource values. Because of this, conflicts between timber management and other resource values are arising with increasing frequency. Clearly, the only way to resolve these issues is through a process which adequately addresses all aspects of resource management. Integrated resource management tools to resolve such conflicts are not currently available. The Model Forest project in western Newfoundland will develop the tools necessary for integrated resource management; will develop a planning process, incorporating public involvement, required to effectively utilize these tools; and will test and demonstrate this process within the Model Forest area. Costs and trade offs between conflicting resource values will be evaluated and means of resolving conflicts will be investigated.

Land Tenure and Timber Resources

Corner Brook Pulp and Paper Limited owns approximately 29.5% of the forest land base and has a license on a further 36%. Crown land amounts to 20% of the land, 2% of which is under the jurisdiction of the City of Corner Brook. Abitibi-Price Incorporated owns, or has a license on, 12.3% of the land base.

Over 90% of the area is made up of the balsam fir working group. Black spruce and softwood-hardwood working groups comprise the remaining 10%. The age class structure is relatively even among the five age classes: 1-20 years, 21-40 years; 41-60 years, 61-80 years, 81+ years.

The annual allowable cut is estimated at 296 000 cubic metres of which 240 000 cubic metres comes from Corner Brook Pulp and Paper's limits, 36 000 cubic metres from unalienated Crown Land, and the balance from Abitibi-Price limits.

Wildlife and Fisheries Resources

The Western Newfoundland Model Forest contains a variety of wildlife species. In addition to the pine marten, the area contains several caribou herds, a large moose and black bear population, and a variety of furbearers, other small mammals, and avifauna.

The island population of pine marten is presently estimated to be between 400 and 500 animals, down from a 1985 population estimate of between 631 and 875, with the highest density in the Grand Lake-Little Grand Lake area. Present estimates indicate that there are approximately 250 marten within the proposal area. Due to their long gradual decline, the Newfoundland Pine Marten was listed as "threatened" in April 1986.

There are ten scheduled salmon rivers, plus their tributaries, within the Model Forest area. The Humber River, which flows into the Bay of Islands at Corner Brook, is considered a 'world class salmon river' and has a long history of recreational salmon fishing. The Atlantic salmon and brook trout are the two most important species for the recreational fishery of Newfoundland.

Recreational Opportunities

Marble Mountain, an alpine ski resort, is fast developing a reputation as being one of the major ski hills in eastern Canada. As well, there is a fairly extensive system of groomed cross-country ski trails in many of the communities.

There are five Provincial Parks and three private parks within the Model Forest offering a variety of camping and day use experiences. As well, there are several intensive cottage development areas at Bonne Bay Pond, George's Lake, Pinchgut Lake and South Brook.

Forest access roads provide access to wilderness, and hunting and sport fishing areas. The Western Newfoundland Model Forest includes some of the province's most significant geological, botanical and scenic features. The entire Blow-Me-Down/Lewis Hills/Serpentine Lake area is rich in a wide variety of rare and endemic plants. The Serpentine River is the only major river on the island that is still undisturbed by dams, hydro lines, roads, bridges or other significant human developments and activities. Serpentine Lake is located less than 20 kilometres from Corner Brook giving the area a high potential for recreation development.

Community Considerations

The City of Corner Brook originated as a direct result of the early forest industry on the West Coast. In the early 1900's the Town of Curling was the primary growth area centred around a prosperous herring fishery, but the establishment of a saw mill in Corner Brook in 1864 determined the future of the area. By 1925 the British firm of Armstrong-Whitworth had completed construction of the present mill. The mill would become the largest pulp & paper mill of its type in the world for much of its life. The ownership of the mill changed several times between 1925 and 1938 when it was taken over by Bowater's. Bowater owned the mill from 1938 until 1984 when it was purchased by Kruger Inc. of Montreal, the present owners.

The residents of Corner Brook accept the mill, located downtown at the core of the City, as an integral part of their daily lives. Its whistle blows four times a day signalling the passage of time in people's everyday lives. Evidence of the harvesting and silviculture operations is readily visible in the countryside surrounding the City.

Non-timber values of the forest are considered quite important in Newfoundland as many people engage in some form of wilderness activity from hunting and fishing to hiking, skiing, and photography. Access and use of the forest is perceived by Newfoundlanders to be an inherent right. The forest is very close to all residents. In many of the small communities it is their backyard. In Corner Brook, a short drive will place you in the midst of wilderness. Newfoundland is home to a variety of wildlife species

and the protection and preservation of their natural habitats is considered essential not only to the overall health and existence of these species, but also for our own enjoyment and enrichment. Angling for Atlantic salmon and brook trout has become part of the traditional way of life for most Newfoundlanders. Domestic fuelwood is used by approximately 40% of all households in the area. Domestic fuelwood cutting in Newfoundland has a very long and strong traditional background. In 1766, an order of Governor Paliser stated "that lands that are not actually fenced in shall remain open for the public and common to all persons without distinction, to cut wood for the purpose of the fishery, fuel, etc." This sense of regarding the forest as common property available to all is still very strong in Newfoundland. Newfoundland's forests are areas where people derive their livelihood, recreation, education, appreciation of the wilderness, spiritual well-being, and the drinking water and food which sustains their lives. In an area with a very high unemployment rate, the forest allows people not only to feel free, but also provides the opportunity for them to provide some of their own basic needs such as food and shelter and feel more self-sufficient. This is a diverse and dynamic area open to all, where people are not trying to subdue the natural environment but rather coexist within it.

Major Issues

Traditional forest management in Newfoundland has concentrated on timber production and largely ignored or left to chance other resource values. Because of this, conflicts between timber management and other resource values are arising with increasing frequency.
Integrated resource management requires an entirely new way of thinking which goes well beyond individual agencies' resources to managing for all legitimate resource values in terms of a series of long-term land use objectives. All participants in an integrated resource management process will have to be educated to this new way of examining the issues.

One of the most pressing issues in the Model Forest is the current situation with respect to the pine marten. This furbearer is listed on the "threatened" list of Canadian wildlife species. Both the provincial Wildlife Division and the Wilderness and Ecological Reserve Advisory Council (WERAC) consider survival of the marten a top priority.

One of the central forest management problems on areas of Crown Land is control of domestic fuelwood cutting. Problems include poor utilization, high grading, illegal cutting, and the extreme difficulty in control.

The lack of an adequate appreciation of the economic, social, and environmental values of the forest resources has resulted in a series of frustrated attempts at increasing public involvement in the timber management process. As well, there are few mechanisms in place in the present management regime to allow for effective public participation in the planning and management of the forest resources. A major timber harvesting operation has been initiated within the Corner Brook protected water supply. The City of Corner Brook's main concern is the maintenance of a clean and sustainable supply of water for the residents of the City. However, they also wish to allow timber harvesting to take place within the water supply area as it represents a close, abundant, and inexpensive supply of timber for the mill.

Strategic Goals

The strategic goals delineated below provide the foundation upon which the management of the Western Newfoundland Model Forest is based. They summarize what the partnership wishes to achieve. Further, they are the guiding principles upon which management of the Model Forest is based. The five strategic goals are:

1. To develop an integrated resource management planning process for Newfoundland.

2. To integrate wildlife and timber management objectives.
3. To integrate water quality and timber management objectives.
4. To instill within the public a greater awareness of forest resource management.
5. To operate the Model Forest as a Working Forest.

Long-term Commitment

The Western Newfoundland Model Forest was established through the recognition that a partnership was required in order to facilitate the wise management of the Province's forest resources for the benefit of the people and the natural environment. The partnership wishes "To develop an integrated resource management planning system which can be adapted for use in all parts of the Province..."

Each of the partners in this project is committed to integrated resource management and each has made available to the project important resources which are key to their operations. Forest Management District 15 is clearly the most important wood supply area for the Corner Brook mill. The southern section of the Model Forest contains forests which are crucial to maintaining an already tenuous wood supply to the Abitibi-Price mill in Stephenville. The Model Forest area contains the last remaining population of the Newfoundland Pine Marten. An adequate, unpolluted supply of water is vital to the City of Corner Brook. Any of the partners could have taken a narrow, single use approach to managing the resources under its authority, yet all have freely and eagerly participated in the development of this project and are committed to integrated resource management.

A Working Forest

The Western Newfoundland Model Forest will be operated as a working forest within which harvesting and silviculture activities will continue, in accordance with approved management plans. Research is also a component of the Model Forest project. Information gathered on the area's non-timber resources, and modified harvesting and management techniques will be tested and evaluated in order to better balance the multiple uses of the forest.

Better technical tools will be developed for integrating non-timber values into forest management plans. These will include a system for terrain sensitivity analysis, and ecological land classification, and habitat simulation models for key wildlife indicator species such as the pine marten.
New ways to achieve effective public involvement in the management of the resource will be investigated. This will involve increased public consultation, public information programs and education for resource managers.

Knowledge gained in our Model Forest will be shared, through active technology transfer programs, with the network of Model Forests, the local community and the international community.

Brian Bonnell
Model Forest Coordinator
Canadian Forest Service
Newfoundland and Labrador Region

"Methods of Insect Collection" Project Broadens Public Awareness at a Balsam Fir Ecology Bus Tour

The Western Newfoundland Model Forest, a representative of the Boreal Forest Type in the Model Forest Network, provides a free, summer, Balsam Fir Ecology, bus tour. It was enhanced this past summer by the inclusion of the "Methods of Insect Collection" project. This project's collaborators were the Westviking College, the Newfoundland Insectarium, the NRCan Forest Insect and Disease Survey and the NRCan Semiochemical Working Group. The following NRCan Forest Insect and Disease Survey employees provided assistance. Dr. R. West filed an insect supplies list and with Mr. R. Pardy, issued a "Methods of Insect Collection" handout. Mr. D. Stone set up the field traps, provided information and furnished the scented, pheromone trap. Mr. Lloyd Hollett of the planned Newfoundland Insectarium lent a Malaise trap and identified some insect samples while Westviking College provided information. The insect traps and supplies were purchased form Argiope of Aylmer, Quebec. The project was synchronized with the bus tour about the middle of July.

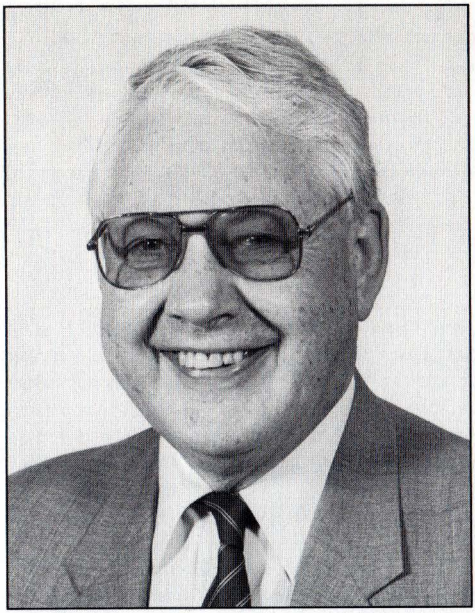
During the preboarding meetings our tour guests had an opportunity to see my display of Western Newfoundland insects and furthermore, the sweep net, beating sheet traps, black light trap and aspirator trap were demonstrated. The pheromone trap, pitfall trap, Malaise trap and yellow pan traps were functionally incorporated into the interpretation at forest bus tour stops. As well, I kept a sweep net in out tour bus and caught butterflies, flies, damselflies and dragonflies so that our guests could appreciate large live insects which were later released. In September school students from grades 5 and 6 joined us on the tours. This year signals a rise in our Eastern Hemlock Looper (*Lambdina fiscellaria fiscellaria* (Guen.)) population density as the pheromone trap became brimming full with some 3000 of them. The student reaction to this abundance of moths was squealing and eye opening wonder, especially when they found out that only males had been sampled. The slugs loved our soapy water filled, yellow pan traps. Their resultant drowning and putrification drew a carrion beetle (*Nicrophorus* sp.) which provided an interesting experiment in the insect's role in decomposition and nutrient recycling. The Malaise trap was an audience magnet. I and many guests had the opportunity to be fascinated by the sight of a trapped, outlandish Ichneumon Wasp (*Rhyssa* sp.).

The visitors were quite inquisitive about the features and purposes of the traps. They enjoyed seeing and understanding insect research in action, though on a display level. Each week our guests could enter a T-shirt give-away. The winner received a shirt with the Western Newfoundland Model Forest logo and a ladybug picture.

Weekly forays were made to maintain the traps and collect samples for mounting. Some insects, mainly from the Malaise trap will become part of the Westviking College entomology collection. Along with the insects, the traps, especially the yellow pan traps, collected a selection of invertebrate samples such as a slug, earthworm, caterpillar, spider and Wood Frog. This past summer our attendance sheet showed a large increase over 1993 and some of the credit for this belongs to the "Methods of Insect Collection" project. This project was a successful addition to the Western Newfoundland Model Forest's Balsam Fir Ecology Bus Tour.

Stan Pieda
Westviking College
Corner Brook
Newfoundland

IN MEMORY



Dr. Donald Raymond Wallace (1929-1995)

It is with deepest sympathy that we mourn the passing of our good friend and colleague Donald Raymond Wallace. Don passed away 29 January 1995 after a lengthy and courageous battle with cancer. Don, the son of Raymond and Mabel Wallace, was born in Waterloo, Quebec where his family had farmed for many generations. It was from Waterloo High School that he graduated in 1947.

Don received his B.Sc. in biology and chemistry from Bishop's University in 1951. He undertook both of his graduate degrees at McGill University completing his M.Sc. in 1959 and his Ph.D. in 1964. The title of his M.Sc. thesis was "Occurrence of the Swaine jack pine sawfly and external anatomy of the mature feeding larvae". Don continued, what would become a life-long interest, his investigations into sawfly biology with his Ph.D. thesis entitled "Egg pigmentation, a new criterion for use in diprionid sawfly taxonomy".

Don joined the Forest Biology Division of Canada Agriculture in 1951. His first assignment was with the Forest Insect and Disease Survey where he contributed to its formation and growth, and served for several years as Officer-in-Charge. He had a major role in developing rearing techniques and in processing survey data for compilation of regional reports. Don also gained international recognition for his work on sawflies and biological control. Don's areas of research and publication have included the biology and systematics of Neodiprion sawflies, the regulation of the life cycle of diprionid sawflies by physical factors, the biological control of forest insects, studies on the cold-hardiness and dispersal of the gypsy moth, modelling of pest systems and the life system of N. sertifer and its development. He also collaborated in studies on resting spore germination in the entomopathogen, Entomophaga canadensis, and Trichogramma releases against spruce budworm. As a project leader, he developed a multidisciplinary research team to understand the population dynamics of forest insects in Ontario. As a senior scientist, he contributed to the development of other research programs at Ontario Region and elsewhere in the Canadian Forest Service. In 1993, Don retired from the Canadian Forest Service and in June of 1994 was awarded Scientist Emeritus status.

Don was a member of the Entomological Society of Canada, Entomological Society of America, Entomological Society of Ontario, Canadian Society of Zoologists, American Association for the Advancement of Science, International Society of Hymenopterists and the International Organization for Biological Control. He served as President of the Entomological Society of Ontario for the 1992-1993

term and enthusiastically fulfilled his duties as President-Elect, President and Past-President. Don served as Visiting Professor in Entomology (1965-66) at the University of Wisconsin, as an Honourary Lecturer at the Sault College of Applied Arts and Technology, and as an Associated Member of the Faculty of Graduate Studies at Guelph University.

Those of us who had the privilege to work with Don on a day-to-day basis, marvelled at the depth and breadth of his knowledge and his remarkable tenacity at sticking to the highest possible standards. No compromises to the system, but nothing but generosity to his colleagues. Don's dedication to the development of the local program and his high level of integrity for the practise of science strengthened his contribution. Don was known for his meticulous nature, his technical expertise and his love of a challenge. Everyone from engineers to graduate students sought his advice on subjects ranging from thermostats to physiology. He accommodated everyone with grace and encouragement.

Don was a devoted and loving husband and family man. He is survived by his wife Phyllis; his children David, Greg and Kim; his grandchildren Broc, Sasha, Megan and Aaron; and his brother Ralph.

In private life, Don was as active as he was in his professional life, devoting time to many worthwhile organizations. He served as Head Judge for the Regional Science Fair sponsored by the Rotary Club of Sault Ste. Marie. He was active for many years in the Canadian Figure Skating Association and participated in the managing of major figure skating competitions. Don also served on the Board of Directors of the Canadian Red Cross Association. Other avocational interests included travel, photography, computers, and gardening.

Donations in Don's name can be made to the Rotary Club of Sault Ste. Marie for the Don Wallace Science Scholarship Fund. We, his friends, will miss his wisdom, his counsel and his sense of humour.

Barry Lyons and Vince Nealis
Canadian Forest Service
Sault Ste. Marie, Ontario

NEWS OF ORGANIZATIONS

Biological Survey of Canada (Terrestrial Arthropods) Survey Report

The Scientific Committee met in Ottawa on 27 and 28 October 1994.

Scientific projects

1. Arthropods of Peatlands

The proceedings of the symposium on arthropods of peatlands in Canada were published after the meeting.

2. Arthropod fauna of the Yukon

Progress continues with the planned book on arthropods of the Yukon. Nearly all taxonomic chapters are in final form, and introductory and synthetic sections are proceeding at varying rates.

3. Arctic invertebrate biology

Several international studies relevant to or allied with the Survey's project are under way, and a Canadian component continues. Three publications associated with the Survey's arctic project appeared in 1994.

4. Boreal arthropods

Work on sucking insects on *Pinus contorta* and *P. banksiana* is proceeding, including continuing efforts to verify and use information in the databases of the Forest Insect and Disease Survey.

5. Arthropods of Canadian grasslands

Updated information and new findings were provided from ongoing projects in B.C., Alberta and Manitoba.

Other scientific priorities

1. Arthropod fauna of soils

A recent workshop for a joint U.K. / U.S. all taxa soil biodiversity inventory project recognized that the major bottleneck in doing such work is created by taxonomic difficulties in many groups of soil organisms. The new NSF programme of Partnerships for Enhancing Expertise in Taxonomy (PEET) is one way of solving this taxonomic bottleneck. Several major conferences relevant to studies of soil organisms have taken or will soon take place.

2. Old-growth forests

A draft summary of information about existing entomological projects on old-growth forests in Canada was discussed and will be developed further. A symposium on biodiversity (including forest diversity) will take place at the 1995 ESC / ESBC meetings in Victoria, organized by Dr. Rob Bennett.

3. Workshop on Coleoptera

The May 1995 workshop on adult beetle identification has been confirmed, although the dates had to be changed by one week, to 22-27 May.

4. Endangered collections and collections infrastructure

The Committee discussed a draft document, to be addressed to the Natural Sciences and Engineering Research Council, emphasizing the need for adequate support for collections and collections infrastructure. Revised document(s) will be prepared for consideration at the next meeting of the Committee.

5. Response to Canada's biodiversity strategy

The consensus of the Committee was that the draft biodiversity strategy document (just released) is very useful, given its reference to inventories and to taxonomists, etc. A subcommittee was charged with developing suggestions for an implementation strategy, to be considered at the next meeting of the Committee. In the meantime, the Survey will send a letter supporting the strategy.

6. Endangered species

The Committee discussed legislation relating to endangered species that would have the effect of making systematics research very difficult. It endorsed the resolutions about endangered species and allied legislation carried by the ESC during its October 1994 meetings and will contact bodies with

environmental concerns.

7. Recovery of damaged ecosystems

Dr. Shorthouse continues to develop approaches for funding from private industry for work allied to the restoration of damaged ecosystems.

Liaison and exchange of information with other organizations

1. Canadian Museum of Nature

Dr. P. Colgan, Executive Vice-President, CMN, reported that the Museum is now custodian of its own properties, allowing its operations, except those at the Victoria Memorial Museum Building, to be consolidated in a single large building in Aylmer, Quebec, to be built within the next 18 months.

In addition, efforts continue to focus and integrate the work of the Museum. Science, public programmes and business enterprises have to become more integrated, and these efforts will have impacts on research and on collection development. The Centres of Knowledge are now focussed around the themes of biodiversity, of change in natural diversity especially in polar regions, and of planetary origins and evolution. The CMN is attempting to develop a network for a national collection strategy. The CMN and the Federal Biosystematics Group also are developing memoranda, position papers and other documents in support of systematics and collections. Dr. Colgan confirmed the CMN's approval in principle for a parasitology module of the Biological Survey.

2. Biological Resources Division, CLBRR

Dr. R. Asselin, Director, CLBRR, reported that Dr. Paul Marriage, Programme Chair for BRD, continues to be sick, and a competition for his replacement is in progress. Initiatives such as the matched investment initiative are being taken to enhance revenues. In addition, fees for service (including identifications) are being implemented.

The CLBRR is installing Internet servers to allow some future outside access to databases. Some regrouping of studies is being considered within BRD, chiefly to help reduce the reporting load. Agriculture Canada has been involved, with CMN and CFS, in the initiatives taken by the Federal Biosystematics Group.

3. Entomological Society of Canada

Dr. L. Safranyik, President, ESC, reported on the very successful 1994 annual meeting of the Society. He reviewed recent developments in the Society, including continued concerns with financial matters, and declining memberships and journal subscriptions, and some future plans, including a major long-term review of Society operations.

4. Parasitology (Canadian Society of Zoologists)

Dr. D. Marcogliese, Chair, Parasitology Module, noted that the module now functions independently of the CSZ. The module is working on several projects, including an expanded revision of the Directory of Parasitologists. Dr. Marcogliese circulated several publications of interest to the Committee, including a summary of standard methods for measuring and monitoring biological diversity for amphibians, and information about meetings on biodiversity.

5. Canadian Forest Service

Dr. B. Moody, CFS, reported that Dr. Allan van Sickle, Pacific Forestry Centre, had pointed out that the contract commented on by Survey members at the April 1994 meeting was intended to give the

Forest Insect and Disease Survey, with its more traditional experience on forest pests, a better background of the whole area of diversity, and some possible applications of FIDS data. Dr. van Sickle had also encouraged the possibility of cooperative work between FIDS and the Survey.

Dr. Moody outlined some other developments, including the fact that Federal-Provincial forestry agreements, which currently support much research, are being phased out when they expire.

6. Canadian Wildlife Service

Mr. Nadeau, Endangered Species Division, CWS, reported that work related to endangered species is going on, with many legislative moves, including the Wild Animal and Plant Protection Act and initiatives for an endangered species act (consultation will take place over the next few months).

Other items

1. Regional developments

Information of potential interest in a Survey context was reviewed, including the following samples. In British Columbia, study of biodiversity, including invertebrates, is proceeding especially in the context of conservation and endangered species. The Centre for Biodiversity at the University of British Columbia is hiring a permanent director. The University of Northern British Columbia opened to students in September 1994. The book *Alberta Butterflies* will be published in spring 1995. Dr. R. Brust will be retiring from the Department of Entomology of the University of Manitoba in 1995, and will not be replaced. In Ontario, new students of systematics and biodiversity are in place at the University of Guelph, and at Laurentian University. Considerable effort continues at all levels for the restructuring of the Canadian Museum of Nature. In Quebec, a position for a systematist is in the process of being staffed at Macdonald College. However, entomology staff positions have been lost elsewhere. The Naturalium du Quebec closed after eleven years. The Montreal Insectarium continues to attract many visitors. The Base de Données sur les Invertebrés du Québec (BADIQ) project has evolved to a larger database, still at the Université du Québec à Chicoutimi. The *Revue d'entomologie du Québec* has been discontinued, but the Québec society is publishing a high-quality bulletin, entitled *Antennae*. Newfoundland saw no major forest pest outbreak in 1994. The 1995 "entomology weekend" was held in Gros Morne National Park in June. The 1995 weekend will take place on Brunette Island (close to St. Pierre). Student involvement in entomology, and other fields, is very high at the Memorial University of Newfoundland. All zoologists at the Nova Scotia Museum have taken or will soon take forced early retirement. It is becoming still more difficult to work in the Arctic, because of increasing bureaucracy and guidelines, procedures and required permissions for study. A proposed amendment to the Arctic College Act would include loss of the Science Institute of the Northwest Territories. The Churchill Northern Studies Centre plans to hold another course on northern insects in 1996.

2. Other matters

The Committee also considered developments related to Support for systematics, Analysis of gaps in taxonomic knowledge and expertise, International liaisons, Activities of the Secretariat, BRD handbooks, Potential contacts with the Natural Sciences and Engineering Research Council, Past liaisons with the National Park Service, Membership of the Scientific Committee, and other matters.

H.V. Danks
Ottawa, Ontario

International Commission on Zoological Nomenclature

The following applications were published on 20 December 1994 in Vol. 51, Part 4 of the *Bulletin of Zoological Nomenclature*. Comment or advice on these applications is invited for publication in the *Bulletin of Zoological Nomenclature* and should be sent to the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD.

Case 2893 ***Temnorhynchus*** **Hope, 1837 (Insecta, Coleoptera): proposed conservation**

Frank-Thorsten Krell
Eberhard-Karls-Universität, Zoologisches Institut, Lehrstuhl für Spezielle Zoologie, Auf der Morgenstelle 28, D-72076, Tübingen, Germany

Abstract. The purpose of this application is to conserve the name *Temnorhynchus* Hope, 1837, a genus of lamellicorn beetles, which is threatened by the unused senior objective synonym *Coptorhinus* Dejean, 1833. Until recently it was believed that *Coptorhinus* Dejean was preoccupied by *Coptorhinus* Guérin Méneville, [1838] but a clarification of the publiation dates has shown that Dejean's name is the older.

Case 2865 **BRACHYPTERINAE Erichson, 1845 (Insecta, Coleoptera) and BRACHYPTERINAE Zwick, 1973 (Insecta, Plecoptera): proposed removal of homonymy**

P.A. Audisio & R. Fochetti
Dipartimento de Biologia Animale e dell'Uomo (Zoologia), Università degli Studi di Roma 'La Sapienza', Viale dell'Università 32, I-00185 Rome, Italy

P. Zwick
Limnologische Flussstation Schlitz des Max-Planck-Instituts für Limnologie, Postfach 260, D-6407 Schlitz, Germany

Abstract. The purpose of this applciation is to remove the homonymy between two family-group names in Coleoptera and Plecoptera. It is proposed that the complete name of the stone-fly genus *Brachyptera* Newport, 1848 be adopted as the stem, giving the corresponding family-group name BRACHYPTERAINAE Zwick, 1973. The beetle name BRACHYPTERINAE Erichson, 1845 would remain unchanged.

Case 2917 ***Coproica*** **Rondani, 1861 and** ***Ischiolepta*** **Lioy, 1864 (Insecta, Diptera): proposed conservation of usage by the designation of** ***Limosina acutangula*** **Zetterstedt, 1847 as the type species of** ***Coproica***

Terry A. Wheeler
Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1

John E. Swann
Department of Entomology, The Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada M5S 2C6

Abstract. The purpose of this application is to designate *Limosina acutangula* Zetterstedt, 1847 as the type species of the sphaerocerid fly genus *Coproica* Rondani, 1861 in accordance with the original concept, accepted understanding and usage. The original fixation of *Ischiolepta pusilla* (Fallén, 1820) as the type was based on a misidentification. The usage of *Ischiolepta* Lioy, 1864 will also be conserved.

Case 2907 ***Sphaerocera*** **Latreille, 1804 and** ***Borophaga*** **Enderlein, 1924 (Insecta, Diptera): proposed conservation;** ***Sphaerocera curvipes*** **Latreille, 1805 and** ***Phora flavimana*** **Meigen, 1830: proposed conservation of the specific names**

Brian V. Brown
Entomology Section, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007, U.S.A.

Curtis W. Sabrosky
Systematic Entomology Laboratory, U.S. Department of Agriculture, c/o Smithsonian Institution, Washington, D.C. 20560, U.S.A.

Abstract. The purpose of this application is to conserve the name *Sphaerocera* Latreille, 1804 and that of its type species *Sphaerocera curvipes* Latreille, 1805 (family SPHAEROCERIDAE Macquart, 1835), together with the name *Borophaga* Enderlein, 1924 and that of its type species *Phora flavimana* Meigen, 1830 (family PHORIDAE Curtis, 1833). The name *Sphaerocera* has for many years been accepted as valid for a group of acalyptrate flies. A specimen of *Musca subsultans* Linnaeus, 1767 (the type species of *Borborus* Meigen, 1803) which has been treated as the holotype of *M. subsultans* has been identified as an example of *P. flavimana*. Recognition of the identity of this specimen would render the name *Borophaga*, which is in use for a phorid genus, a junior subjective synonym of *Borborus*, a name which was long used in the sense of *Sphaerocera*. Suppression of *Borborus* and the specific name of *M. subsultans* is proposed.

PUBLICATIONS
BOOK NOTICES

Vincent, C., G. Boivin, P. Martel, D.L. Benoit, and H.G. Milaire. 1994. ***Integrated Pest Management Glossary/Lexique de la lutte intégrée.*** **Terminology Bulletin/ Bulletin de terminologie 221, Ministry of Supply and Services Canada. 141 pp. Softcover, no price supplied. ISBN 0-660-58989-3. [Available from Canada Communications Group - Publishing, Ottawa, Ontario K1A 0S9.]**

The *Integrated Pest Management Glossary/Lexique de la lutte intégrée* contains approximately 1,100 terms relating to the study and practice of integrated pest management. The Glossary was prepared by scientists from the research station of Agriculture and Agri-Foods Canada in Saint-Jean-sur-Richelieu and from the Institut national de la recherche agronomique de Versailles, France in collaboration with a translator-reviser and a terminologist employed by the government of Canada. The terms were taken from a base list derived from specialized dictionaries and other publications on integrated pest management and compiled by the Agriculture Canada scientists.

The *Glossary* is divided into two parts. The first half comprises an alphabetical treatment of the

1,100 English terms. Each page is divided into two columns with English terms on the left and their corresponding French terms on the right column. In the second half of the book, which treats the French terms, this arrangement reverses with French terms on the left columns and the English ones on the right. Terms are arranged alphabetically, and where appropriate, indication is given of whether they are nouns or adjectives. No definitions or explanantions are given for the terms, only the corresponding French or English words, although abbreviations (e.g., AI and MA for active ingredient and matière active, respectively) are provided where appropriate. For a few terms, the *Glossary* indicates whether usage applies more specifically to Canada (e.g., arroser for the verb to spray), France (e.g., phytopharmacie for pesticide science or plant protection), or the United States (e.g., supporting crop for cover or companion crop).

To ensure the relevance of their contribution, the authors have included terms relatively new to integrated pest management (e.g., microencapsulated formulation, pesticide impregnated fabric, juvenile hormone analogue), and although the book was obviously not intended as a dictionary of integrated pest management, it will be very useful for English/French and French/English translations.

Kavanaugh, D.H. *Carabid beetles (Insecta: Coleoptera: Carabidae) of the Queen Charlotte Islands, British Columbia.* Memoirs of the California Academy of Sciences, Number 16. Paperbound 8½ X 11 inches, 113 pp., ISBN 0-940228-17-3. (Available from Scientific Publications, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118, U.S.A.) $25.00 or $40.00 (US).

Reviews the history of scientific research in the archipelago. Provides diagnosis, description, and geographical and habitat distributions of 62 predaceous ground beetle (carabid) species. Includes illustrated key for identification of adults of all species. Illustrates beetle habitats in 27 color photographs. Discusses the importance of carabid beetles in biogeography. Analyzes faunal affinities of carabid beetles and compares them with other insect groups and the archipelago's flora. Reconstructs the history of the carabid fauna and its implications for the biotic history of the archipelago. Discusses the glacial refugium controversy and the evidence provided by carabid beetles. Includes 158 bibliographic references.

PUBLICATIONS
BOOK REVIEWS

Disney, R.H.L. 1994. *Scuttle flies: the Phoridae.* Chapman & Hall, New York. xii + 467 pp. ISBN 041256520X (hardcover) $119.95

As they are one of the most biologically diverse, yet overlooked groups of insects, a new book on Phoridae is long overdue. R.H.L. Disney, the British expert on phorids, has provided us with an admirable compilation of the life history information about this group, along with a much-needed new World key to genera. Also, an extremely useful annotated list of phorid genera, with references to the latest keys, is given. In another review of this book (Brown in press-b) I commented about Disney's treatment of phylogenetic and evolutionary aspects; here I will confine myself to comments about taxonomy and the new key, surely the most interesting parts for the working phorid taxonomist.

Although he contends that this book is just a compilation of what is known about phorids (p. 2),

there is also a strong argument made for Disney's own view of phoridology. In my genus-level revision of the Phoridae (Brown 1992), I made a number of new proposals for grouping at both the genus and species level. In this book Disney has categorically refused to recognize any of these changes, citing them as universally premature or unjustified. For example, I elevated a subgenus of the genus *Borophaga* to full generic status because its species shared three hypothesized synapomorphies with the genera *Stichillus* and *Trineurocephala* but none of the synapomorphies of other *Borophaga*, or those that link *Borophaga* with *Abaristophora* and *Antipodiphora*. Disney referred this group (*Peromitra*) back to subgeneric status because he claimed that "polarities of a number of the postulated transformation series... ... are in contention," and that the subgeneric level is "more sensible" until a "consensus is achieved." Because there are only the two of us researching this problem at this time, I suggest that such a consensus will not be reached soon.

Disney's new key to phorid genera works extremely well, and will benefit all beginning phoridologists. I might quibble about a detail here and there, such as that the distinction between females of *Apocephalus* and *Pseudacteon* can indeed be made quite easily (couplet 178), but this is minor criticism. My high-school work-study student uses this key to identify phorid genera reliably.

Overall, this book should be considered the single most important resource for a phorid researcher, but it should be accompanied by a knowledge of both sides of the current debate about phorid classification (Brown 1992, in press-a, Disney 1993). Disney's "definitive monograph on Phoridae" will be a combination of a compilation like this one, interpreted in a phylogenetic context.

Brown, B. V. 1992. Generic revision of Phoridae of the Nearctic Region and phylogenetic classification of Phoridae, Sciadoceridae and Ironomyiidae (Diptera: Phoridea). *Memoirs of the Entomological Society of Canada*. **164**: 1-144.

---------- in press-a. Reply to Disney. *Journal of Natural History*.

---------- in press-b. Review of "Scuttle flies: the Phoridae". *Proceedings of the Entomological Society of Washington*.

Disney, R. H. L. 1993. Mosaic evolution and outgroup comparisons. *Journal of Natural History*. **27**: 1219-1221.

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Noyes, J.S. and M. Hayat. 1994. *Oriental mealybug parasitoids of the Anagyrini (Hymenoptera: Encyrtidae) with a world review of Encyrtidae used in classical biological control and an index of encyrtid parasitoids of mealybugs (Homoptera: Pseudococcidae).* The Natural History Museum, London. Sold by CAB International Wallingford, Oxon, 0X10 8DE, UK. Hard cover. 554 pp. US110.00 (65 pounds sterling, + 4.20 pounds for postage outside UK).

The book is logically organized, with the keys, tables, descriptions and illustrations clearly laid out. Apart from the usual book chapters (abstract, acknowledgements, introduction, and index) the following chapters are included: Historical review of systematic work on Oriental Anagyrini, Biology of Anagyrini, Distribution, Economic importance of Encyrtidae, Materials and methods, Abbreviations

of depositories, Terms and measurements, Phylogeny and classification of Encyrtidae, Phylogeny of Anagyrini, and Key to Oriental Anagyrini (females). Over half the book is devoted to the revision of Oriental species, including keys. About 850 references are included.

The keys are rigorously dichotomous and should be easy to use (provided one has well prepared specimens) though I did not try them myself. Twenty genera are keyed and defined. Biology and use in biocontrol are summarized for each and keys to the known Oriental species are given. Each species treated (145 of them, including 20 new) is divided into Diagnosis, Female Male [descriptions], Variation, Hosts, Distribution, Material examined, and Comments. For previously described species complete literature citations are provided with an indication of content for each reference and, in place of a complete redescription, a few additional descriptive lines are provided when deemed necessary. For some species their importance is given in a separate section entitled Use in biocontrol. The literature cited for each is complete and the biology of each genus is comprehensively summarized. Descriptions of closely related species are placed next to each other which makes for their easy comparison. Each species is well illustrated.

The authors provide a critical appraisal of taxonomic characters used previously and discussion of why they use the characters they do. They tend to be conservative and are commendably cautious in keeping species separate if they have any doubt as to their status. Similarly, they do not synonymize genera until they are certain about their status; this meant sinking some of their own, previously described, genera. Therefore, their decisions appear to be very sound taxonomically. A relief is that no new genera were created in a family that already has several hundred genera.

The figures are excellent but unfortunately about 60 of the 495 figures were poorly reproduced with critical portions being faded out. Since I received the book for review the senior author has managed to have the necessary figures redone properly. I hope that anyone buying the book will have these included.

A major selling point for the book is the two well organized appendices (140 pages) — a summary of worldwide use of Encyrtidae in biological control, and a host-parasitoid index of encyrtids reared from mealybugs. Appendix 1 is arranged alphabetically by host order, family, genus, and species. Under each species is listed the cited scientific name for each literature reference to the species, the geographic area treated and, where known, the status of the biocontrol project. Appendix 2 is organized alphabetically by mealybug host, with the geographic area and reference tabulated for each species of encyrtid recorded from it in the literature. Because each state record for use in biological contol is given separately (for the USA) this results in quite a duplication of some literature but the detailed treatment will be invaluable for researchers in biological control.

I have a few, mostly minor, criticisms that detract little from the overall importance of the work. The species diagnoses should separate the species in question from other, similar species. Thus, the Comments section, where the authors compared closely related species, should have been united with the Diagnoses. There is a certain amount of duplication in the text. For example, a diagnosis may be up to a half length of a female description (or one third of both sexes), yet is given with only slightly different wording. Some of the writing in the keys, diagnoses, or descriptions could have been given in telegraphic rather than telephonic style without loss of clarity and with an overall saving of space (and thus cost). In a few cases there is an indication that the types were not examined, yet the species in question were those described by the junior author and actually reside in his personal collection. Therefore, it should

have been made clear that it is the senior author who had not examined them. In other cases, through no fault of their own, primary types were simply inaccessible to the authors but the reasons for this were not given. Author names are provided with the scientific names of all hosts in Appendix 2 but not in Appendix 1 or the main body of the book. Thus the author for host species other than Pseudococcidae are not given anywhere. The derivation of scientific names for the newly described species was not usually given. Finally, the acronym BRC instead of CNC was inadvertently used for the Canadian National Collection in one place (p. 147). Otherwise, only one typographical error was found.

This book is more than a comprehensive revision of the Anagyrini of the Oriental region. The chapter on economic importance of Encyrtidae should be useful to all biological control workers using parasitic insects. The chapter on phylogeny and classification provides essential information for any taxonomist of Encyrtidae worldwide.

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Stamp, N.E. and T.M. Casey. (eds) 1993. *Caterpillars - Ecological and Evolutionary Constraints on Foraging.* Fourledge, Chapman & Hall Inc., New York, N.Y., U.S.A. 587 pp.

A book on foraging that covers only one developmental stage of one group of insects would appear to arbitrarily limit a discussion of foraging patterns. For example, would not reading chapters on the "Effect of temperature on foraging of caterpillars" (ch. 1) or on "Invertebrate predators and caterpillar foraging" (ch. 5), be a less useful investment of readers' time than reading general critiques on the influence of temperature and predators on the foraging behaviour of all insects? Concentrating on only one life stage of one order of insects might appear more suitable if caterpillars differed from other insect groups in ways that made the constraints on their foraging unique. However, this does appear to be the case. The authors make the case that caterpillars are a model insect herbivore for studies of plant-herbivore interactions, feed on a large variety of hosts in a multitude of different ways, are an important part of every terrestrial ecosystem, and often (i.e., in most forests) eat more leaves than all other herbivores combined. Then what can justify the exclusive concentration on caterpillars? As stated in the book's preface, the authors feel that "research on foraging strategies of insect herbivores and caterpillars in particular must take more of a multiple factor approach. To develop a more unified theory of foraging patterns, we need to take into account how two or more constraints, such as food quality and natural enemies combined or interaction effects of nutrients and allelochemicals, influence caterpillars". In other words, the authors feel that to understand real-world processes we need to establish a framework to evaluate individual and combined constraints on foragers both from an ecological and evolutionary perspective. It is the stated goal of this book to provide such a framework. Considering this goal the limitation of discussion to caterpillars is both justified and appropriate. Constraints on the foraging of caterpillars are as well (or better) known than for other insect herbivores and certainly all the factors limiting the foraging of all insects would be too big a task for one book. The goal of this book is thus both unique and ambitious.

The book is divided into three parts. Part I deals with abiotic and biotic constraints on caterpillar foraging. Casey, in a particulary (ch.1) well organized chapter, evaluates responses to temperature, which vary along a continuum from strict thermoconformation to behavioural thermoregulation, from

physiological, ecological and evolutionary perspectives. Slansky (ch.2) discusses how caterpillars modify their feeding rate to regulate intake of nutrients, thereby potentially affecting their exposure to predators and allelochemicals. While providing a critical review of current literature on heterogeneity in quality within individual leaves, Dussourd (ch.3) combines analyses of plant anatomy and caterpillar behaviour to test propositions that herbivores respond not just to phytochemicals, but to structures in which they reside. A large body of literature has examined the influence on herbivore distribution of direct interactions between herbivores, but few authors have evaluated the role of indirect interactions between herbivores. One of the highlights of this book is the examination of this question by Damman (ch.4) and his conclusion that indirect, resource- or enemy-mediated interactions are common and frequently include positive, as well as negative, effects. The influence of the different foraging abilities and behaviours of invertebrate predators, parasitoids, and birds on the foraging patterns of caterpillars is discussed in chapters by Montllor and Bernays (ch.5), Weseloh (ch.6) and Heinrich (ch.7), respectively. Montllor and Bernays conclude that invertebrate predators limit caterpillar host plant range whereas Weseloh concludes that parasitoids select for herbivores to increase host plant range. The influence of size on caterpillar behaviour is discussed by Reavey (ch.8).

Part II of this book examines caterpillar "life-styles" in terms of the cryptic, aposematic, gregarious, and mutualistic patterns. Stamp and Wilkens (ch.9) state that crypsis probably reflects the compromise between avoiding a diverse array of natural enemies and obtaining required food but conclude that the cost:benefit ratio, in terms of mortality rate:growth rate, of crypsis is currently unknown. Bowers (ch.10) concludes that aposematism in caterpillars is also poorly understood, especially the costs of morphological and behavioural traits associated with aposematism, such as hairs/ spines and regurgitation. Both Bowers and Stamp and Wilkens offer outlines for future research to rigorously examine the cost:benefit ratios for aposematism and crypsis. Concluding this section, are chapters examining the benefits and costs of being gregarious (Fitzgerald, ch.11) or mutualistic (Baylis and Pierce, ch.12). With the emphasis on the costs, as well as benefits, of supposedly adaptive behaviours, these four chapters provide several unique perspectives.

In part III, five chapters explicitly attempt to evaluate the influence of multiple factors on caterpillar population dynamics (Haukioja, ch. 13), seasonality (Janzen, ch.14) and foraging (Stamp, ch.15; Kukal ch.16; and Barbosa, ch.17). This section thus deals with more complexity than the first two sections, which may be responsible for the decreased cohesion of this section. The chapter on foraging by arctic caterpillars appears better situated in Part I and authors seem to refer much more to the systems in which they work than in previous sections. This is best exemplified in the chapter by Janzen where he states that his goal is to "discuss descriptively a few aspects of the seasonality of a particular tropical dry forest caterpillar fauna." Although Part III was less cohesive, I did enjoy reading it. Janzen did not carry out a literature review but did share his insights, and frequently unpublished data, concerning why caterpillars in a dry tropical forest are seasonal. Interestingly, in two chapters that evaluated the influence of abiotic and biotic conditions on caterpillars in the tropics and in the arctic, Janzen and Kukal both hypothesized that the rapid development of many caterpillars during the early portion of the rainy season/arctic summer was due in large degree to the high numbers of natural enemies during the latter half of these seasons. Through critical reviews of the literature, both Haukioja and Stamp demonstrate that the *combined* effects of several factors on the distribution and abundance of caterpillars are still poorly understood. Stamp convincingly illustrates how experimental protocol can be formulated to address this lacune. In the concluding chapter, Barbosa makes a strong case that constraints are so different in agroecosystems, compared to natural systems, that caterpillars should not be expected to forage in similar ways in both systems. This would necessitate researchers attempting to understand the

behaviour of caterpillars in agroecosystems to study them in agroecosystems, rather than extrapolating from studies in other systems.

In general, this book achieves its stated goal of evaluating the influence of all constraints on the foraging of caterpillars. The Editors have produced a very readable and informative book. However, the book succeeds much better with respect to the ecological than the evolutionary perspective. Most authors did point out behaviours that would or would not be adaptive (although constraints reducing density were often uncritically assumed to reduce fitness), and several spent considerable time discussing the benefit:cost ratios for different foraging behaviours, but the dominant perspective of the book is ecological, rather than evolutionary. The genetic versus environmental influence on phenotype is alluded to but infrequently discussed. Nevertheless, because the goal of this book is so ambitious, a small shortcoming in one area does not detract from its overall contribution. Ideas from, as well as ideas stimulated by reading this book should influence research into the influence of multiple factors on herbivore behaviour, distribution and abundance for a considerable period of time. This is an enjoyable, informative book that should be required reading for all who are interested in caterpillars, foraging behaviour, insect - plant relationships, or population and community ecology.

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Hunt, James H. and Christine A. Nalepa. 1994. *Nourishment and Evolution in Insect Societies.* Westview Press, Boulder Colorado. 448 pp, $(US)84.00

This edited volume is one of a relatively new series put out by Westview Press, "Studies in Insect Biology," but continues a long tradition of thorough reviews in contemporary topics of importance to Entomologists. Hunt and Nalepa have put together an interesting collection of essays concerning how nourishment has influenced the evolution of insect social behaviour. Like most good syntheses, this one begs the question: "Why didn't someone so this sooner?"

The answer is that our attention and research energy have been focused on other, less functional factors involved in social evolution, to the unfortunate exclusion of hypotheses such as those presented here. Sociality has always been a difficult problem for evolutionary biology because of the existence of altruistic, non-reproductive individuals, and for many years researchers have focused on potential selective agents such as kin selection, inclusive fitness and parental manipulation to explain sociality. More recently, however, we have begun to look more closely at ecological pressures that favour sociality, so that today's picture is more varied and balances in its explanation for insect social behaviour, as it should be.

The authors propose that nourishment has been a major component in the evolution of social behaviour, because by being social individuals can better collect large quantities of scattered resources, provide a more balanced flow of nutrients to most individuals, and allow for the unequal distribution of food to one or a few reproductive individuals. Their approach here is to recognize that each taxon is different, and that there is a great range in how each social group has responded to nourishment paradigms in its evolution. They also wisely do not take up the position of "true believers" in their hypothesis, but point out that nourishment is only one of many selective agents that have been important for social

evolution, and in fact nourishment has been more significant for some groups than others.

Hunt and Nalepa have done a fine job of selecting authors and topics, although a chapter on bumble bees and more on wasps might have been useful. Nevertheless, this book provides a fairly thorough review of nourishment and evolution in insect societies, and is as interesting for the diversity of ideas presented as it is for the unifying themes that emerge. I would certainly recommend this book for anyone interested in social insects, but it will have a wider appeal to evolutionary biologists and animal nutritionists. I especially enjoyed this book because it takes a very simply and basic component of life, the need for food, and elaborates on it in a new, refreshing way.

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Houck, M.A. (ed.). 1994. *Mites. Ecological and Evolutionary Analyses of Life-History Patterns.* Chapman and Hall, New York, London. 357 pp. ISBN 0-412-02991-X. Hardcover U.S. $67.50.

Mites are remarkably diverse and widespread. The chapters in this volume, relatively few in relation to that diversity, nevertheless outline an extraordinary range of habitats, life-styles, adaptations and genetic mechanisms in mites, suggesting that mites not only are of interest in comprehending biodiversity and specific responses to selection, but also have great potential for testing general biological concepts. As E.E. Lindquist points out in a useful foreword, these chapters include but tidbits of an almost endless buffet of fascinating associations. . . between mites and other organisms.

The volume is dedicated to the acarologists E.W. Baker and G.W. Wharton, whose achievements are summarized in a preface by the editor. The book stems from a 1989 symposium, by which the Acarological Society of America publicly recognized those two scientists, with updated and additional contributions. Life-history patterns are here interpreted rather broadly, and subjects covered range widely across aspects of evolution, adaptation and transmission of genetic material.

The chapters are not closely related to one another for the most part, despite several recurrent themes such as evolution and dispersal in the context of host relationships. The eleven main chapters are as follows; the size of each chapter and the number of reference citations give some idea of the degree of detail: *Poecilochirus carabi*: Behavioral and Life-History Adaptations to Different Hosts and the Consequences of Geographical Shifts in Host Communities, by M. Brown and D.S. Wilson (22 pp., 27 refs); Life-History Patterns of Hummingbird Flower Mites in Relation to Host Phenology and Morphology, by R. K. Colwell and S. Naeem (22 pp., 43 refs); Mites as Potential Horizontal Transfer Vectors of Eukaryotic Mobile Genes: *Proctolaelaps regalis* as a Model, by M. A. Houck (25 pp., 85 refs); Evolution of Life-History Patterns in the Phytoseiidae, by M.W. Sabelis and A. Janssen (29 pp., 22+55 refs); Evolutionary Aspects of Oribatid Mite Life Histories and Consequences for the Origin of the Astigmata, by R. A. Norton (37 pp., 198 refs); Life-History Modifications in Astigmatid Mites, by B. M. O'Connor (24 pp., 72 refs); Life-History Patterns of Astigmatid Inhabitants of Water-Filled Treeholes, by N.J. Fashing (26 pp., 77 refs); The Evolution of Parasitism and the Distribution of Some Dermanyssoid Mites (Mesostigmata) on Vertebrate Hosts, by F.J. Radovsky (32 pp., 75 refs); Evolution and Life-History Patterns of Mites Associated with Bees, by G.C. Eickwort (34 pp., 67 refs); Adaptation

and Transition into Parasitism from Commensalism: A Phoretic Model, by M.A. Houck (30 pp., 73 refs); Cytogenetics of Holokinetic Chromosomes and Inverted Meiosis: Keys to the Evolutionary Success of Mites, with Generalizations on Eukaryotes, by D.L. Wrensch, J.B. Kethley and R.A. Norton (61 pp., 208 refs).

The content varies from enumerations of basic biology, such as the habitats and feeding habits of various members of a group, to wide hypotheses, sometimes based on tenuous evidence. In one or two chapters, potentially numbing detail and wishful development of general concepts are combined. Nevertheless, the book successfully makes many important points despite the range of subject matter, authors and approaches. The sheer number and diversity of habitats colonized by mites are emphasized, and the possible patterns of evolutionary radiation are instructive (O'Connor, Radovsky, Eickwort, Houck). Some of the relationships are very old, for example bee lineages everywhere carry the same mite groups. The host/resource environment for phoretic mites is very complex, suggesting more generally the key need for synchrony of mite life cycles with the animals used for resources or transport (e.g. Brown and Wilson for dung-beetle mites, Colwell and Naeem for hummingbird mites). Colwell and Naeem illustrate that very many different features contribute to the close adaptations. However, Norton emphasizes the point that evidence for many adaptations to ecological circumstances in oribatid mites is weak, and most such features (such as the slow metabolic rates of oribatids that permit them to survive in cold environments) stem instead from the general phylogenetic traits of the group. In a different arena, the very long chapter by Wrensch et al. discusses the probable importance and ubiquity of holokinetic chromosomes (which have no centromere, and hence behave differently during division than the monocentric chromosomes on which standard textbook accounts are based). This chapter therefore challenges conventional wisdom that thelotoky (parthenogenetic development of female offspring), potentially a key feature of mite adaptation, is an evolutionary dead end.

Many chapters demonstrate that substantial interesting information is already available, but at the same time show that knowledge of many subjects still is severely limited. That some authors can even attempt detailed summaries of information for taxa with thousands of species confirms how scattered the information is. The contents of the book also illustrate differences, both real and stemming from the relative attention that has been paid to particular subjects, between mites and insects. For example, diapause, a touchstone for the analysis of many insect life histories, is barely mentioned, and does not even rate an index entry.

The book is well produced, and I noticed only a handful of typographical or editing errors. The thirteen-page index is useful. Unfortunately, the chapters have no uniform set of abstracts that would help the general user of the book. Several chapters have no synoptic section, four have a summary, and three have conclusions. A couple of chapters provide a prospectus for future work.

I conclude that many biologists, not just acarologists, will find information of value here, and may well concur with Lindquist's exhortation as to the particular value of mites for the study of biological phenomena. The price of U.S. $67.50, by no means excessive for a book of this sort, may nevertheless restrict its acquisition mainly to libraries.

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Books Dealing with Insects

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Children generally are fascinated by insects and we should encourage their curiosity by providing them with information. There are several children's insect books on the market, but often they are difficult to find and not appropriate for the intended age group. Below is a list of books from my collection which may serve to pique or strengthen children's curiosity for insects.

AGES 2 to 5

Brown, G. 1993. *Look at Insects.* Simon and Schuster. $5.00. ISBN 0-671-88310-0.

Carter, D.A. 1993. *Colors.* Simon and Schuster. $6.50. ISBN 0-671-86875-6. Both books are pop-ups which serve to teach the recognition of colors and different insects. The first has five pop-ups while the second has seven. These are literally pocket books.

Wallwork, A. 1994. *Bugs.* Kids Can Press. $6.95. ISBN 1-55074-203-5. This book teaches recognition of ten insects or their relatives on thick cardboard pages. Large pictures with lots of color.

AGES 3 AND UP

Berenstain's M. 1992. *Butterfly Book.* A Golden Book. Western Publishing Co. Inc. 25 pp. $1.99. ISBN 0-307-10023-5. Book is shaped like a butterfly. Shows 11 common butterflies, well illustrated and discusses some basic facts about butterfly biology.

Carle, C. 1986. *The Grouchy Ladybug.* Harper Trophy Ed. HarperCollins Publishers. $6.95. ISBN 0-06-443116-9. Demonstrates the concept of sharing and can be used to teach how to read time. As well it shows that ladybugs are beneficial insects.

Entomological Society of America. 1983. *Coloring Fun with Insects.* Entomological Society of America. 48 pp. ISBN 0-938522-22-1. Coloring book with 47 different insects to color by number.

Fitzsimons, C. 1987. *My First Insects.* Harper and Row Publishers Inc. 10 pp. $12.00. ISBN 0-06-021889-4. A pop-up field guide by habitat such as meadows, forests, parks and your home. It explains the general interactions of the insects shown in each habitat.

Hawcock, D. and L. Montgomery. 1994. *Ant.* Random House Inc. $7.99. ISBN 0-679-8569-X.

Hawcock, D. and L. Montgomery. 1994. *Bee.* Random House Inc. $7.99. ISBN 0-679-8570-3.

Hawcock, D. and L. Montgomery. 1994. *Spider.* Random House Inc. $7.99. ISBN 0-679-8571-1. These three books have information on anatomy, how the arthropod lives and one large pop-up. Colorful. Fun books for all.

Pallotta, J. 1986. *The Icky Bug Alphabet Book.* Charlesbridge Publishing. 29 pp. $5.99 ISBN 0-88106-450-5.

Pallotta, J. 1992. *The Icky Bug Counting Book.* Charlesbridge Publishing. 30 pp. $5.99. ISBN 0-88106-496-3. Both books help with recognition of insects while counting and learning the alphabet. As well, each insect has a bit of its biology explained. The counting book would help in developing the sense of observation by looking for and counting the number of insects on the pages.

Rushak, L. 1994. *Nature by Numbers.* Simon and Schuster. $16.50. ISBN 0-671-88619-X. A beautifully illustrated pop-up book to help count to 10. It features concepts of interaction and change in nature. For example, bees are pollinators and caterpillars become butterflies.

AGES 6 AND UP

Batulla, B. 1985. *Insects-Nature Stories for Children.* Hyperion Press Ltd. 40 pp. $4.95. ISBN 0-920534-21-X. A Canadian insect coloring book with 19 different insects. There is a color plate

on the back cover to suggest the proper colors. With each picture there is a nature story about the insect and some biological information. An inspirational book for children.

Berhard, E. 1992. *Ladybug*. Holiday House. 29 pp. $16.00. ISBN 0-8234-0986-4. The book is filled with ladybug facts. It presents anatomy, several species, its life cycle, some folklore, its use as a beneficial insect. There is a glossary too.

Fichter, G.S. and K. Kest. 1993. *Butterflies and Moths*. A Golden Book. 36 pp. $7.00 ISBN 0-307-11435-X.

Fichter, G.S. and K. Kest. 1993. *Bees Ants and Wasps*. A Golden Book. 36 pp. $7.00 ISBN 0-307-11435-4-1. Learn how to tell the difference between butterflies and moths, as well as bees, wasps and ants, and how to identify the many common species through the many beautiful illustrations. Both books have many "Did you Know" sections and the biology is well explained.

Glenn, G.S. Jr. 1991. *Start Exploring Insects*. Running Press. 128 pp. $8.95. ISBN 1-56138-043-1. A coloring book with a different slant. Insects from around the world are discussed from an ecological perspective. Tropical rain forests, butterfly gardens as well as rearing are presented. On the inside cover there is a folded poster for coloring.

Heller, R. 1992. *How to Hide a Butterfly and Other Insects*. Platt and Munk Publishers. 32 pp. $2.95. ISBN 0-448-4077-X This is a fun book that demonstrates camouflage for seven insects or relatives. Lots of colors. It would be a good book to help develop a sense of observation.

Hickman, P.M. *Bugwise*. Kids Can Press Ltd. 96 pp. $9.95. ISBN 0-921103-91-3. A worthwhile activity book that has an ecological slant. The activities suggested are great for the entire family.

Holley, B. 1986. *Bugs and Critters*. Hayes Publishing Ltd. 32 pp. $2.95 ISBN 0-88625-118-4. Great value for the money. Fact after fact about insect biology. Insects are also grouped by habitats such as ponds, your house and the forest. There is even a glossary.

Kneidel, S. 1994. *Pet Bugs*. Wiley and Sons. 117 pp. $13.95. ISBN 0-471-31188-X. A unique book in that it tells you how to start growing your own insect zoo for 23 species of insects. It gives lots of biology.

Legg, G. 1993. *Minibeasts*. Zigzag Publishing. 32 pp. $5.00 ISBN 1-874647-13-5. A survey of the insect world. Interesting factual information along with impressive artwork.

Maynard, C. 1994. *Incredible Insects*. Mini-Beasts. General Publishing Co. Ltd. 32 pp. $5.95. ISBN 1-55144-025-3. Lots of great photos of insects. The pictures leap out at you. The book is jam-packed with information. Layout is attractive.

Milne, L.J. and M. Milne. 1992. *Insects and Spiders*. Doubleday. 45 pp. $16.00. ISBN 0-385-26396-1. Find out the differences between insects and spiders. Many illustrations help survey the insects and spiders.

Mitchell, J. 1992. *Both Sides Now*. Scholastic Inc. 30 pp. $20.00. ISBN 0-590-44668-7. This is a picture book with lots of detailed drawings of insects put to words of Canadian songwriter J. Mitchell's song "Both Sides Now". It is inspirational and certainly is worth the money.

Mound, L. 1990. *Eyewitness Books - Insects*. Alfred A. Knopf Inc. 64 pp. $17.00. ISBN 0-679-80441-2. Reading this book is like being in an insect zoo where the hundreds of photos seem to be jumping off the pages. The corresponding text is equally fascinating. This book is a must.

Pearce, Q.L. 1987. *The How and Why Activity Book of Insects*. Price Stern and Sloan. 32 pp. $2.95. ISBN 0-8431-4294-4. This is another unique book in that it has many games dealing with insects. There are crossword puzzles, mazes, word games, fill in the blanks, observation challenges, and lots of insect terminology. Great value.

Pyle, R.M. and K. Kest. 1993. *Peterson Field Guide Coloring Book-Insects*. Houghton Mifflin Co. 64 pp. $8.00. ISBN 0-395-67088-8. There are 241 different insects to color with color plates to suggest the true coloring. As well there are some biological facts for each species. This book will help develop a sense of observation and paying attention to detail.

Starosta, P. 1991. *Animal Close-ups -The Bee.* Charlesbridge Publishing. 27 pp. $5.00. ISBN 0-88106-430-0. Described as the book for children who are curious about nature. The life cycle of the honey bee is explained clearly with the use of magnificent photos. There is even a photo of a stinger jabbed in someone's skin.

Stidworthy, J. 1990. *Pond and Streams.* Troll Associates. 31 pp. $4.95. ISBN 0-8167-1964-0. Lots of diagrams and explanations. This is an interesting ecology book which demonstrates how aquatic organisms interact with one another. Of course there are plenty of insects.

Still, J. 1991. *Amazing Butterflies and Moths.* Stoddart Publishing Co. Ltd. 29 pp. $9.95. ISBN 0-7737-2475-3. Some impressive close-up photos presented with some little known facts.

Suziki, D. and B. Hehner. 1986. *Looking at Insects.* Stoddart Publishing. 96 pp. $8.95. ISBN 0-7737-5062-2. An activity book loaded with lots and lots of projects that help understand how insects live and react to the world around them.

Terry, T. and M. Linton. 1987. *Ants.* Viking Penguin Inc. 32 pp. $3.95. ISBN 0-14-150885-6. Interesting book on the biology of ants. Well illustrated and it contains a glossary.

Whaley, P. 1988. *Eyewitness Books-Butterflies and Moths.* Stoddart Publishing Co. Ltd. 64 pp. $17.00. ISBN 0-7737-2182-7. A great book because as you open the book you feel like you are entering an insect museum. There are literally hundreds of butterfly and moth photographs of high quality that are pleasingly laid out. As well each photograph is commented on with remarkable detail. This book is a must.

Whitcombe, B. 1988. *Insects.* Primax. 20 pp. $5.95. ISBN 0-86112-489-8. A survey of insects describing how some insects live, some defend themselves, how they grow. It helps identify the general kinds of insects.

Woelflein, L. 1993. *The Ultimate Bug Book.* Western Publishing Company. $25.95. ISBN 0-307-17600-2. This is a book with giant pop-ups. They are intricate, colorful and very delicate. This book could become a collector's item. There are pull tabs, flaps, and more. It serves as an introduction to the world of insects.

AGES 10 AND UP

Herberman, E. 1990. *The Great Butterfly Hunt.* Simon and Schuster. 48 pp. $5.95. ISBN 0-671-69427-8. The book describes the discovery of the Monarch butterfly migration routes from Canada to Mexico and the biology of this magnificent insect. As well there is some discussion of the potential destruction of its overwintering sites in Mexico.

Howard, R. J., J. A. Garland and W.L. Seaman. 1994. *Diseases and Pests of Vegetable Crops in Canada.* The Canadian Phytopathological Society and the Entomological Society of Canada. 554 pp. $80.00. ISBN 0-9691627-2-3. This is an excellent book for those who want to know more about insects and plant diseases in their garden. There are 136 color plates with each plate holding 7 or 8 photos of insects and their damage and disease symptoms. As well there are detailed biologies and control suggestions presented.

Rose, A.H. and O.H. Lindquist. 1980 *Insects of Eastern Larch, Cedar and Juniper.* Environment Canada. Publication 28. 304 pp. ISBN 0-660-10421-0.

Rose, A.H. and O.H. Lindquist. 1982. *Insects of Eastern Hardwood Trees.* Environment Canada. Publication 29. 304 pp. ISBN 0-660-11205-1.

Rose, A.H. and O.H. Lindquist. 1984. *Insects of Eastern Pines.* Environmnt Canada. Publication 1313. 127 pp. ISBN 0-660-1370-8.

Rose, A.H. and O.H. Lindquist. 1985. *Insects of Eastern Spruces, Fir and Hemlock.* Environment Canada. Publication 23. 304 pp. ISBN 0-660-11818-1. The four books on tree insects are well worth buying. They are loaded with photos of the feeding insects and their biology is well explained. Great for around your home, park and at the cottage.

Helena Cronin. 1993. *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today.* 490 pp. paperback, Cambridge University Press, New York, N.Y. $19.95 U.S.

This is a two-metaphor book in two parts about the evolution of evolutionary thinking. Helena Cronin analyses the reasons for the fall and redemption of Darwin's theory of sexual selection and the way in which a modern selective perspective at the level of genes rather than individuals has solved the puzzle of altruism. Through female preferences and male competition, male ornamental behaviour is sexually selected. Effusive signals like the peacock's train are made functional by a selection running counter to the costs of natural selection. Though today sexual selection is part of the mainstream of evolutionary biology, its ascendancy is only of the last few decades and Cronin traces the reasons why the theory was neglected for almost a century. She apportions Wallace much of the blame (along with J.S. Huxley), describing how Wallace worked steadily to minimize and reject this part of Darwin's thesis. Wherever and whenever he could, Wallace explained ornament as promoting protection and recognition, as the product of natural, and not sexual, selection.

I think the most insightful and valuable aspect of this book is the new perspective it offers of Wallace and female choice. Though resistant to the idea of sexual selection Wallace actually didn't entirely reject it. And to the extent that females choose he argued they would choose the same features favoured by natural selection. In Cronin's phrase, they choose their mates on the basis of "good sense", a discrimination adaptive because it is in accordance with the genes that natural selection is choosing. So Wallace is seen as the progenitor of today's "good genes" hypotheses. Darwin argued for what Cronin calls a "good taste" choice. Whatever becomes established arbitrarily as the preference of the females becomes the basis for male fashion. Good taste is the preference of the majority. And so the Fisherian runaway model has its affinity with Darwin's concept of how sexual selection operates.

The ant portion of the book addresses the problem presented by the eusocial insects. How can a process that selects for selfish individuals evolve self sacrifice? This problem "dissolves" away, with the "gene-centred" perspective of Richard Dawkins. Indeed selection is viewed as acting on the only true replicators, genes. It acts only indirectly on individuals as being "gene vehicles". This is a major theoretical premise of the book. Classical Darwinism invoked the differential reproduction of individuals but this perspective, says Cronin, is now superseded by the differential reproduction of genes. Altruism arising by kin selection is no longer a puzzle if one analyses the problem at the level of the genes.

There is much truth in this. But sometimes both Cronin and her genic-level mentor get carried away. One particularly blatant instance involves the dental hygiene of lions. To illustrate just how obscure the effect of an altruistic gene might be, Cronin quotes an example (p. 265) from Dawkins. A lion mutates a gene for bad teeth. This gene dictates that the lion chews more slowly at a kill so indirectly affording its kin more food. Such a gene is thus altruistic in its effect, increasing in the population on this basis by kin selection. But Cronin to the contrary, the logic here is not "unassailable". This gene resides in an individual that must compete with other individuals in the context of converting food into metabolic energy. Tooth decay has serious implications for selection in other "Wallacean good sense" contexts. If the decay-enhancing gene is to survive and prosper it must do so within a surviving individual. Some selection is best viewed as occurring at the individual level. The author's over-enthusiastic acceptance of the ascendancy of gene-level selection may be the book's greatest weakness.

In creating this history of thought as detected in the writings of evolutionists and evolutionary

critics Cronin gives each chosen item an intricate examination. Things are regarded deliberately and from all aspects. Yet she contrives to make her writing lightly entertaining and conversational. And sometimes she achieves great clarity of explanation; a good example of this lucidity is her account of how the ideas of game theory, evolutionarily stable strategies and uncorrelated asymmetry in aggression, have illuminated the ritualized battles of animals. Sometimes in smoothing the reader's way she adopts a coy "all will be revealed" approach which I found patronizing. It is annoying to be told repeatedly what you *will* comprehend once you are conducted carefully by the writer to the bottom of the next page. And the device of personifying natural selection sometimes became tedious.

Entomologists who also diagnose themselves as behavioural ecologists and/or evolutionists will enjoy this book and find therein much valuable information. But the book does not give, and is apparently not intended to give, a balanced picture of the field. There is almost nothing about the sex-based differences in investment that drive the process of sexual selection, and nothing about the importance of resources and their monopolization for understanding of sexual selection's relevance to mating systems. There is no mention of Bateman or of Emlen & Oring. The contributions of Trivers regarding parental investment and reciprocal altruism are conspicuous by their absence.

Perhaps these omissions are not unrelated to an unfortunate pro-British bias. Errors in "good of the species" thinking are attributed almost entirely to Americans, mostly ecologists from Chicago, while Williams' contribution to the demise of such thinking is praised but very underplayed. Credit for the most important insights into sexual selection and altruism goes to Englishmen. Of course from Darwin and Wallace to Fisher, Parker, Maynard Smith and Hamilton one must concede British importance, perhaps even predominance. But there are so many others contributing hugely: Alcock, Alexander, Arnold, Bradbury, Borgia, Eberhard, Lande, Trivers, Thornhill, West-Eberhard, Wilson.

Though this book somewhat misrepresents the history of sexual selection and altruism within behavioural ecology, and is too enthusiastic about gene-level selection, it is immensely valuable and entertaining and contains some very genuine insights, especially in regard to the role of Wallace. I recommend it.

G.K. Morris
Department of Zoology
Erindale College
University of Toronto
Mississauga, Ontario

SCHOLARSHIPS AND GRANTS

Grants for North American Dipterological Research

The Third International Congress of Dipterology, held in Guelph, Canada in 1994 closed its proceedings with a small surplus balance. This surplus, along with donations from other sources, has been used to establish The Dipterology Fund, a non-profit fund for the support of dipterological research in North America.

Each year, up to four grants will be made to a maximum value of $1,000 Cdn each. There are two categories of support available from The Dipterology Fund:

Student Research and Travel Grants. These grants, available to undergraduate or graduate student, and postdoctoral fellows in dipterology, may be used to support travel to conference or field meetings, travel to museums or other research institutions, or field work for collecting or research.

Development Grants for North American Dipterology. This category is for proposals in areas other than those described above. Funding in this category would include, but are not be restricted to, grants to support field meetings or other activities of North American dipterological societies, to bring visiting scientists to North American Diptera Collections, and to support research activities of individual dipterists who are not full-time students and who lack other conventional means of research support.

Applications for funding should include a one page research proposal or justification of the proposed activities and an estimated budget for the proposed research or activity (including consideration of funding available from other sources). Applications from individual dipterists should include a 1-2 page curriculum vitae.

Applications for the 1995 competition must be received by the Chair of the Grants Committee on or before **April 15, 1995**. Decisions will be announced by early May. Any questions regarding the application procedure or The Dipterology Fund should be directed to the Chair of the Grants Committee. Eight copies of each application package should be submitted to:

Dr. Terry Wheeler
Chair, The Dipterology Fund
Department of Natural Resource Sciences
McGill University, Macdonald Campus
Ste-Anne-de-Bellevue, Quebec H9X 3V9

Tel. 514-398-7937 Fax. 514-398-7990

Entomological Society of Canada Postgraduate Awards 1995 and Keith Kevan Scholarship

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.

In memory of Dr. D. Keith McE. Kevan, the Entomological Society of Canada is also offering one postgraduate award of $1,000 to assist graduate students studying systematics in entomology. The award will be made on the basis of high scholastic achievement and excellence in insect systematics.

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 1993 and 31 December 1995. 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.

- **Keith Kevan Scholarship**: The successful applicant must be a graduate student at the time of application, studying at a Canadian university or be a Canadian citizen studying abroad.

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 **11 June 1995**. Please specify if you are applying for the Postgraduate Award or the Keith Kevan Scholarship.

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 1995.

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 is 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
Agriculture and Agri-Food Canada
P.O. Box 37
Mount Pearl, Nfld. A1N 2C1
Telephone: 709-772-4763
Fax: 709-772-6064

La Société d'entomologie du Canada Bourse pour Étudiants Post-Gradués 1995 et Bourse Keith Kevan

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.

Aussi, en mémoire de Dr. D. Keith Mc.E. Kevan, la Société d'entomologie du Canada offrira une bourse d'un montant de $1,000 pour aider les étudiants qui entreprennent des études en taxonomie des insectes. Cette bourse est accordée en raison des critères d'excellence académique et de la prééminence en taxonomie des insectes.

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 1993 et le 31 décembre 1995, 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'incrit en vue de compléter l'obtention de crédits, n'est pas éligible à la bourse.

- **Bourse Keith Kevan**: Le(La) candidat(e) doit être étudiant(e) gradué(e), inscrit(e) à une université canadienne ou citoyen canadien étudiant à l'étranger.

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 **11 Juin 1995.** 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 1995.

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

Dr. P. Dixon, ESC Secretary
Agriculture and Agri-Food Canada
P.O. Box 37
Mount Pearl, Nfld. A1N 2C1
Téléphone: 709-772-4763
Télécopie: 709-772-6064

POSITIONS AVAILABLE

Graduate Fellowships in Ecology and Geography

The Departments of Biological Sciences and Geography at the University of California, Santa Barbara invite applications for fellowships in a new Ph.D. program in The Dynamics of Spatially Structured Ecological Systems. The program provides training in modelling and experimental approaches and combines the traditional ecological emphasis on dynamic processes with geography's focus on analysis of spatial pattern. Each student will begin by taking a sequence of graduate courses in ecology and geography, tailored to his/her background, and then will pursue dissertation research in a primary area of interest. The program is supported by 5-year NSF Research Training Grant and Graduate Research Training awards. Students in good standing will receive stipends for three years and will be supported by TA- and RA-ships in the remaining years. Support for research and related travel is also available. Faculty participants are S. Cooper, S. Gaines, S. Holbrook, J. Melack, W. Murdoch, R. Nisbet, R. Schmitt and A. Stewart-Oaten in the Biological Sciences Department, and F. Davis, J. Dozier, M. Goodchild, and D. Siegel in the Geography Department. Prospective students should send standard applications to either the Biological Sciences or Geography Departments, U.C. Santa Barbara, Santa Barbara, CA 93106, and a separate letter indicating interest in the program to the RTG Program Coordinator, Biological Sciences Dept., UCSB. Contact the coordinator for more information: phone 805-893-7670, fax 805-893-3777, e-mail ecolrtg@lifesci.lscf.ucsb.edu. (Posted: December 5, 1994).

Graduate Opportunities in the Department of Biology

My students and I study chemical and acoustic communication in arctiid moths. We are interested in how chemical and acoustic signals are produced, how they travel through the environment, how they are detected, how the receiver responds to them, and ultimately how they have evolved. The colourful arctiids on which we concentrate provide a diversity of interactions with which to work and allow a comparative approach to many evolutionary questions. My students and I combine analytical chemical techniques, sonographic analysis, electrophysiological techniques, infrared videography and cladistic analyses in exploring communication systems that are well beyond are own sensory capabilities. Our

field studies are carried out in North Carolina, Florida, and in the rainforests of Ecuador. Teaching Assistantships are available with annual stipends of $10,500.00 (MS) and $11,500.00 (Ph.D.), tuition is included, and a modest research allowance is made available to each student. For more information e-mail, write or call: William E. Conner, Department of Biology, Wake Forest University, P.O. Box 7325, Winston-Salem, NC 27109; conner@wfu.edu, biology@wfu.edu; phone 910-759-5315. (Posted December 30, 1994).

Two Positions: Teaching/Research Post-Doctoral

1. Biology

The Biology Department at Syracuse University is seeking a Post-Doctoral Associate to contribute to the research and teaching activities of the department. The successful candidate will be expected to aid in the development and administration of a one-semester introductory Biology course for majors, stressing the diversity of organisms. Major responsibility will be to guide students in laboratory and field projects, exploring how organisms monitor and respond to their environment. These teaching responsibilities will occur from July to December; balance of time can be devoted to research with a faculty member, or to assist in design and development of new laboratory courses. Applicants should have a disciplinary focus at the organismal level. Appointment is for up to three years and will begin July 1, 1995. Please send detailed curriculum vitae and names of three references to: Prof. H. Ernest Hemphill, Biological Research Laboratories, Syracuse University, 130 College Place, Syracuse, NY 13244.

2. Evolutionary Biology

The Biology Department at Syracuse University is seeking a Post-Doctoral Associate in the area of Evolutionary Biology. Duties will involve teaching a one-semester course on Evolution for undergraduates. Balance of time will be devoted to research with one of six faculty members in Population Biology, with research interests in Ecological Genetics, Molecular Evolution, Behavioral Ecology, Plant Physiological Ecology, Community and Ecosystems Ecology, and Animal Physiological Ecology. Appointment is for up to three years, with a preferred starting date of August 28, 1995. Please send detailed curriculum vitae and names of three references to: Prof. William T. Starmer, Department of Biology, Syracuse University, Lyman Hall, 108 College Place, Syracuse, NY 13244. For additional info about either position, contact Jim Coleman, Assistant Professor of Biology, Department of Biology, 130 College Place, Syracuse University, Syracuse, NY 13244; phone 315-443-3748, fax 315-443-2012, e-mail: jcoleman@mailbox.syr.edu. (Posted: January 3, 1995).

Entomologists

Management and technician positions are available in Garwood, New Jersey and Carson, California. Successful candidates should have a BS from a recognized university, knowledge of microscopic and macroscopic techniques and experience or knowledge of federal regulatory practices. Must be familiar with AOAC and AACC procedures for light and heavy filth extraction in food products. Extensive experience in analyzing samples on FDA detention with past FDA employment desirable. Good interpersonal and analytical skills are a must. Requires developed written and oral communication skills. Send resume and salary requirements to: Human Resources, Silliker Laboratories, 900 Maple Road Homewood, IL 60430; fax 708-957-8460. (Posted: January 9, 1995).

Assistant or Associate Professorship in Ecology

The University of California, San Diego, seeks a scientist interested in broad scale (time or space) pattern in ecological dynamics. Candidates should meet the following qualifications: proven ability to secure extramural research funding; some empirical content to research; enthusiasm for teaching.

Candidates should apply for this position electronically, if possible. Send the following information to the address ecojob@biology.ucsd.edu: a Curriculum Vita, a Statement of Research Accomplishments and Goals, a Publication List, a List of Three to Five References (hopefully with email and fax addresses). (Posted January 12, 1995).

Graduate Student Opportunity

A graduate student assistantship will become available 1 July 1995 for a student pursuing a master's degree at the Dept. of Entomology, University of Nebraska. Includes M.S. stipend of $11,000 plus per year for two years, paid tuition, and research materials. The research project is a study of the recently discovered population of the endangered American Burying Beetle near Gothenburg, Nebraska. An intense field season in July and August of 1995 and 1996 will involve sampling to determine population size and distribution, investigation of ecological relationships that include how the vertebrate prey base may affect the population, how interspecific competition by other species of Nicrophorus species may affect the population, and an evaluation of potential limiting factors such as land use and vegetation type. Establishment of a small breeding colony may be indicated depending on U.S. Fish & Wildlife Service approval. Applicants should have a B.S. in entomology or biology and have a strong interest in working with insects. A willingness to be in the field for two months (and away from home in Lincoln) is absolutely essential. A willingness to work with carrion and its associated insect fauna is essential. Inquiries for application to graduate school should be sent to: Dr. Lance Meinke, Chair, Graduate Committee, Dept. of Entomology, University of Nebraska, Lincoln, NE 68588-0816. For more info, contact: Brett C. Ratcliffe, Curator & Professor, Systematics Research Collections, W436 Nebraska Hall, University of Nebraska, Lincoln, NE 68588-0514; tel 402-472-2614, fax 402-472-8949, e-mail bcr@unlinfo.unl.edu. (Posted: January 18, 1995).

UPCOMING MEETINGS / RÉUNIONS À VENIR

The A.J. Nicholson Centenary Meeting: On the Frontiers of Population Ecology
April 18-22, 1995, Canberra, Australia
CONTACT: Mrs. L. Lawrence, CSIRO Division of Entomology, GPO Box 1700, Canberra, ACT 2601, Australia

47th International Symposium on Crop Protection
May 9, 1995, University of Gent, Belgium
The following topics will be treated: Insecticides, Nematology, Applied Soil Zoology, Semio-chemicals; Fungicides, Phytopathology, Phytovirology, Phytobacteriology; Herbicides, Herbology, Plant Growth Regulators; Biological and Integrated Control; Residues, Toxicology, Formulations, Application techniques.
CONTACT: Dr. ir. L. Tirry, Faculty of Agricultural and Applied Biologial Sciences, Coupure links 653, B-9000 Gent (Belgium). Tel. 32 (0) 9 264.61.52; Fax. 32 (0) 9 264.62.39.

43rd Annual Meeting of the North American Benthological Society
May 30 - June 2, 1995, Keystone Resort, Colorado
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 will focus on "Landscape Influences on Watersheds". There will be two workshops entitled "The Use of Benthic Ecology in Assessing Sediment Contamination" and "Bridging the Gap: Benthos in Instream Flow Assessment". Abstracts are due 1 December 1994.

CONTACT: Program Chair: Cathy M. Tate, I.S. Geological Survey, WRD, Box 25046, MS 415, Denver Federal Center, Denver, CO 80225 USA, Tel 303-236-4882, Ext. 287; Local Arrangements: Steve Canton, Chadwick and Associates, 5575 S. Sycamore St., Suite 101, Littleton, CO 80120, Tel 303-794-5530.

American Society of Zoologists

January 5-8, 1995, St. Louis, Missouri

There will be two important symposia being planned for the forthcoming annual meeting of the American Society of Zoologists: (1) Risk Sensitivity in Behavior; (2) The State of Experimental Ecology: Questions, Levels, and Approaches

CONTACT: (1) Peter Smallwood Tel. (215) 526-5091; Fax. (215) 526-5086; E-mail psmallwo@cc.brynmawr.edu or Ralph Cartar Tel. (403) 220-7622; Fax. (403) 289-9311; E-mail rcartar@acs.ucalgary.ca; (2) Joe Bernardo Tel. (919) 684-2567; Fax. (919) 684-6168; E-mail jb@mendel.zoo.duke.edu or Bill Resetarits (Tel. (314) 553-6221; Fax. (314) 553-6223; E-mail swjrese@umslvma.umsl.edu.

International Plant Protection Congress

July 2-7, 1995, The Hague, The Netherlands

The theme of the congress will be *Sustainable crop protection for the benefit of all.*

CONTACT: XIII International Plant Protection Congress, c/o Holland Organizing Centre, Parkstraat 29, 2514 JD The Hague, The Netherlands. Tel. (+31-70) 365-78-50; Fax. (+31-70) 361-48-46.

Society for Invertebrate Pathology Annual Meetings

July 16-21, 1995, Cornell University, Ithaca, NY

The 28th Annual Meeting of the Society for Invertebrate Pathology will be held in Ithaca NY on the Cornell Campus. Symposia are being organized around the following topics: baculovirus biology and applications, the role of Bacillus thuringiensis in pest management, cooperative research between industry and non-profit organizations, pathogen-parasitoid interactions, pathology of marine invertebrates, protozoan biology, the use of fungi in the lab and the field, aerial dissemination of fungi, and other topics. Deadline for submission of abstracts is April 15. For more information contact Dr. H. Alan Wood, Boyce Thompson Institute for Plant research, Tower Road, Ithaca, NY 14853 Tel: 607-254-1200; Fax: 607-254-1242; Internet: haw5@cornell.edu

Phytochemical Society of North America

August 12-16, 1995, Holiday Inn, Sault Ste. Marie, Ontario, Canada

Phytochemical Redundancy in Ecological Interactions. The theme of the main symposium will stress the diversity, overlap, and variety of plant chemical defenses against biological stress including insects, fungi, and large herbivores.

CONTACT: Dr. Mamdouh Abou-Zaid, Natural Resources Canada, Forest Pest Management Institute, P.O. Box 490, 1219 Queen Street E., Sault Ste. Marie, Ontario, Canada, P6A 5M7. Tel. 705-949-9461, Ext. 2416; Fax. 705-759-5700; Internet Mabouzaid@eecnpcled.fpmi.forestry.ca

Agrobiotec Conference and Exhibition

October 19-22, 1995, Ferrara, Italy

Sessions will include: "Biodiversity for the Progress of Biotechnology and Biotechnology for the Conservation of Biodiversity", "Transgenic Solanaceae: Research and Applications", "Regulation,

Protection and Acceptance of Research, Results and Products", "Advanced techniques in fruit tree breeding".
CONTACT: BOLOGNAFIERE, Via Bologna, 534, 44040 Chiesuol del Fosso, Ferrara, Italy.

7th International Symposium on Pollination
June 24-28, 1996, Lethbridge, Alberta, Canada
Pollination: from theory to practise. General topics will include: Implications of evolutionary theory to applied pollination ecology; Modelling pollination; Pollination techniques/methods/standardization; Pollinator foraging behaviour; Commercial bumble bee management for pollination; Native bee management for pollination; Role of pollinators in species preservation, conservation, ecosystem stability and genetic diversity
CONTACT: Dr. Ken Richards, Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, Alberta, Canada T1J 4B1. Tel. (403) 327-4561; Fax. (403) 382-3156; Email: Richards@abrsle.agr.ca.

XX International Congress of Entomology
August 25-31, 1996, Palazzo dei Congressi, Florence, Italy
CONTACT: Organizing Secretariat, OIC, Via A. La Marmora, 24, 50121 Florence, Italy
Fax. ++39-55-5001912

MISCELLANEOUS

The 1995 Report of the Western Committee on Crop Pests is now available.

This guide contains rates and notes on pesticides recommended in Canada for arthropod pests of the following: cereal crops and grain corn; oilseed crops; forage crops; special crops; household pests; commercial and home vegetable crops; greenhouse crops; interior plantscapes and house plants; mushrooms; berry crops; tree fruits; shelterbelts, ornamental trees and shrubs; seasoned wood and timber structures; turf; warehouse and farm stored grain; as well as information on hazards and safeguards, product names, economics thresholds, bee safety, and research references. 167 pp.

If you have already paid, you will receive a copy in February. Otherwise, send $20 for softcover, $5 for a copy on diskette (WP and ASCII), or the special combined price of $25 for softcover plus diskette to:

Dan Johnson, Editor
Western Committee on Crop Pests
Agriculture and Agri-food Canada Research Centre
P.O. Box 3000 Main Lethbridge, AB, Canada T1J 4B1
johnson@abrsle.agr.ca

Prices are complete and include postage. $1 U.S. = $1.40 Canadian. Make cheques payable to the "Western Forum". Reports will be mailed immediately.

Questions and suggestions regarding contents or format should be directed to the Editor or the Officers of the WCCP or Western Forum, shown below:

Western Committee on Crop Pests

Lloyd Dosdall, Chairman (403) 632-8225
Patrick Scholefield, Secretary (403) 297-8232
Dan Johnson, Editor (403) 327-4561

Western Forum on Pest Management

Hugh Philip, Chairman (604) 861-7211
Jim Jones, Secretary-Treasurer (403) 362-3391

These are not-for-profit organizations.

Canadian Forum for Biological Control gets Incorporated

The Canadian Forum for Biological Control was developed out of a resolution passed at the Workshop on Biological Control of Pests in Canada held in Calgary in October 1990. After operating on an ad hoc basis, a steering committee was formed in 1992. The steering committee recommended formal incorporation of the Forum as a not-for-profit organization and called for membership and developed bylaws. The draft bylaws were ratified by the membership and the society was incorporated on August 16, 1994 under the Canada Corporations Act.

The objectives of the society are to study, advance, and promote biological control in Canada and facilitate communication among biocontrol researchers. It is structured to allow the formation of working groups under its umbrella. Presently there are three working groups in the making: 1) Weeds 2) Nematodes and 3) Microbial Agents. Formation of other groups are expected in the near future. The society holds an annual meeting at which time symposia and workshops are organized. The next annual meeting will be held at the Chateau Victoria in Victoria, B.C. on Saturday, October 14, 1995 in conjunction with the Entomological Society of Canada Annual Meetings. Working Groups are encouraged to organize Symposia and Workshops at other meetings as opportunities arise. The society publishes a Bulletin which is mailed to members as well as contributes to the Agriculture and Agri-Food publication, Biocontrol News.

There are currently ca. 80 members in the society. All those interested in Biological Control in Canada are invited to join. Membership dues are $100 associate, $15 regular and $7 for student members. For an application form please contact:

Dr. Dan Johnson, Treasurer
Canadian Forum for Biological Control
Lethbridge Research Centre
P.O. Box 3000, Lethbridge, AB T1J 4B1.
Tel. 403-327-4591 ext 301; Fax. 403-382-3156; Internet JOHNSON@ABRSLE.AGR.CA

or send Dan your name, address, e-mail address and a cheque payable to the Canadian Forum for Biological Control.

Back Issues of *Opuscula Entomologica* For Sale

North American Carabidae. C.H. Lindroth: The Ground-beetles (Carabidae excl. Cicindelidae) of Canada and Alaska, 1961-69, parts 1-6, 1240 pp., $(US)91; same: Carabid beetles of Newfoundland, 1955-63, 2 vols, 272 pp., $(US)28; Ball, G.: A revision of North American spp of Cryobius, 1966, 166 pp., $(US)18; Baranowski, R.: Revision of the genus Leiodes of North and Central America, 1993, 149 pp., $(US)55. Postage will be added. Please contact Lennart Cederholm, Museum of Zoology, Helgonav. 3, S-223 62 Lund, Sweden; Fax +46/46-5 79 69.

The Keith Kevan Scholarship - New Contributions Welcome

Professor D. Keith McE. Kevan died suddenly on July 8, 1991. His family provided for a scholarship in systematics to be administered by the Entomological Society of Canada and presented a cheque to the Society at its meetings in Montreal in 1991. The first recipient of the Scholarship was Wanda Kuperus of the University of Regina, who in 1993 accepted the award at the Society's meetings in Sault Ste. Marie.

At the time of Keith Kevan's death and memorial service, numerous entomologists expressed their sympathy to the Kevan family and indicated that they wished to contribute to his memory by donation to a scholarship fund. Such kind offers were appreciated but acceptance deferred until such a fund was in place. After some deliberation, the Kevan family decided that a scholarship fund would be best administered on a national basis by the Society. Now that the program is soundly in place, and the next award is expected to be given in 1995 when the Society meets in Victoria, it would be a good time to supplement the original donation. Thus, any one who wishes is invited to make a donation to the Keith Kevan Scholarship Fund of the Entomological Society of Canada.

Please send your donation (noting that it is for the Keith Kevan Scholarship) to:

Entomological Society of Canada
393 Winston Avenue
Ottawa, Ontario
K2A 1Y8

Thank you very much.

List of Common Names Available

Common names of insects in Canada, by E.M. Belton and D.C. Eidt, is now available from the ESC. The list is available on computer diskette **in DOS format only**. It includes sets of names alphabetized by English, French and Scientific names, forms for proposed updates, and full information and instructions. The diskette is available from the Society at a cost of only $15 plus $3.50 for shipping and handling in Canada, and $15 plus $5 for shipping and handling elsewhere. Please specify whether a 3½" or a 5¼" diskette is required, and include payment to the Entomological Society of Canada in Canadian funds. 7% GST is payable by Canadian members. Send orders to: ESC, 393 Winston Avenue, Ottawa, Ontario K2A 1Y8

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Published by: The Entomological Society of Canada / La Société d'entomologie du Canada