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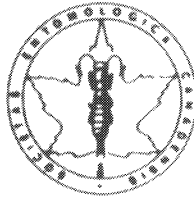
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ENTOMOLOGICAL SOCIETY OF CANADA

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# Bulletin

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SOCIÉTÉ ENTOMOLOGIQUE DU CANADA

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Vol. 18

March-mars 1986

No. 1



# Entomological Society of Canada Société Entomologique du Canada

## Bulletin

Vol. 18 March-mars 1986 No. 1

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R. B. Aiken: Bulletin Editor

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## EDITORIAL

In a past issue of the *Coleopterist's Bulletin*, Don Whitehead noted that one of the perks of editorship was writing editorials. Editorials are unedited. I'm sure anyone who has had their perfect prose vandalized by editors and reviewers can appreciate this perk. I do not, however, intend to monopolize this privilege. If any member of the Society feels strongly enough about any subject affecting entomology, entomologists or the Society to write a guest editorial, please don't be modest. Such interactions among members are one mark of a healthy society.

The future direction of this Bulletin is open. I have a few embryonic ideas (presently between the blastula and gastrula stages of development) but would appreciate and welcome any suggestions. This Bulletin is first and foremost a vehicle for conveying information among the members of the ESC. If we are to believe the present prophets of the age of information we seem to be entering, such a function is valuable indeed. Much of each issue has been, and will continue to be, taken up with the details of Society business—reports, financial statements, meeting announcements and the like. It is my hope that the Bulletin will be more than that.

Even though my name appears on the December, 1985 Bulletin as Editor, this is the first issue that I have put together. I must express a note of thanks to my predecessors Helen Liu and Bev Mitchell. The editorial system started by Helen and maintained by Bev has made the transition between editors a smooth process. Bev Mitchell took several hours out of his busy schedule to explain the nuts and bolts operation of the Bulletin to me. These two editors have produced a series of Bulletins that were interesting, informative and sometimes provocative but always of high standard. I shall endeavour to maintain that standard.

R. Aiken

# 35TH ANNUAL GENERAL MEETING

**Skyline Hotel  
Ottawa, Ontario  
September 24, 1985**

## **Minutes**

President S. B. McIver called the meeting to order at 1530 hours. There were approximately 70 people in attendance.

P. W. Riegert moved and G. E. Ball seconded that the Agenda be accepted as circulated. Carried.

1. *Notice of Meeting*

Notice of this meeting was published in the Bulletin, Volume 17, March 1985 and June 1985.

2. *Proxies*

None were received.

3. *Deceased Entomologists*

A moment of silence was observed in memory of D. D. Pond.

4. *Minutes of 34th Annual General Meeting (1984)*

The minutes of this meeting were published in Volume 17, March 1985. R. F. Morris moved and R. H. Gooding seconded that the minutes be accepted as published. Carried.

5. *Business Arising from the Minutes*

There was no business arising from the minutes.

6. *Report of the Governing Board*

President S. B. McIver presented a report which will be published in the Bulletin.

G. G. E. Scudder moved and R. F. Shepherd seconded that the President's report be accepted. Carried.

6.1 *Changes to Standing Rules*

J. A. Shemanchuk read the proposed change. Standing Rule IX—Meeting—Articles 3 (i) and (ii) to be replaced by:

(i) Twenty-five hundred dollars (\$2,500.00) to assist with arranging the scientific programs, such as notices of meeting, printing of programs, rental of conference halls, etc.

(ii) Up to fifteen hundred dollars (\$1,500.00) to pay expenses and honoraria for special speakers, in general, would be other than Society members. The twenty-five hundred dollars shall be paid as an accountable advance to affiliate hosting the meeting (or to the program committee) and the remainder paid as requested and shall be accounted for by the recipient. R. H. Storch moved and G. G. E. Scudder seconded that this change be accepted. Carried.

6.2 The President expressed sincere thanks to the Treasurer, E. C. Becker, for his long and loyal service to the Entomological Society of Canada. The appreciation was expressed by the members in a standing ovation.

7. *Report from the B.C.C.*

There was no report from the B.C.C. at this meeting, but one will be printed in the Bulletin.

8. *Report from A.A.S.C.*

There was no report from A.A.S.C. at this meeting.



9. *Auditor's Report*  
E. C. Becker reported that the Auditor's Report was published in the June 1984 Bulletin. E. C. Becker moved and H. V. Danks seconded that the Auditor's Report can be accepted. Carried.
10. *Election Committee Report*  
J. A. Shemanchuk read the Election Committee Report. Those elected were:  
For Second Vice-President: E. C. Becker  
For Directors-at-Large: L. C. Thompson  
R. H. Gooding  
Fellowship Selection Committee: D. C. Eidt  
D. G. Harcourt
11. *Installation of New Officers*  
President S. B. McIver turned the gavel and chair over to H. F. Madsen as the incoming President of the Society. The new President thanked S. B. McIver for her service to the Society and asked R. F. Morris to escort the Second Vice-President, E. C. Becker, to the dias.
12. *Service Awards*  
H. F. Madsen presented Service Awards to S. B. McIver, Past-President; S. M. Smith (in absentia), former Scientific Editor.
13. *Appointment of Auditor*  
E. C. Becker moved and H. V. Danks seconded that McCay, Duff and Company be retained by the Society as auditors for 1985. Carried.
14. *Resolutions*  
H. F. Madsen asked J. C. Conroy to present the following resolutions on behalf of the Society:  
The success of any meeting depends on three factors. The size of the attendance, the quality of the meeting facilities, and the organization. The very large attendance speaks for itself. We have all found the facilities to be of a very high standard. The Social yesterday was enjoyed by all and I am sure we will enjoy the dinner/dance later tonight. It is my real pleasure to call your attention to the unsung heroes of any meeting—the Organizing Committee and their subcommittees. Consequently, Mr. President, on behalf of the Executive and members of the E.S.C., I would like to move the following motion of thanks for all their efforts and hard work in making this meeting such a success, to Don Bright, Anne Hudson, and P. T. Dang.
15. *Other Business*
  - 15.1 H. F. Madsen urged members to submit nominations for Fellowships.
  - 15.2 H. F. Madsen urged members to submit nominations for the Gold Medal Award and for the C. Gordon Hewitt award.
16. *Notice of 36th Annual Meeting of the ESC*
  - 16.1 1986—Winnipeg, Manitoba, October 6-8, 1986, Holiday Inn South
  - 16.2 1987—Penticton, B.C., September 28-30, 1987, Delta Lakeside Inn
  - 16.3 1988—Vancouver in conjunction with the 18th International Congress of Entomology
17. *Adjournment*  
On a motion by J. C. Conroy, the 35th Annual General Meeting of the Entomological Society of Canada adjourned at 1630 hours.

# GOVERNING BOARD MEETING

September 21-22, 1985

Skyline Hotel, Ottawa, Ontario

## Actions

The Governing Board approved the following Actions:

1. *Finance Committee*
  - (1) Unaccountable expenses of Trustees remain at present level.
  - (2) Rejection of Elsevier proposal for publishing the Canadian Entomologist.
  - (3) Page charges for Canadian Entomologist remain the same.
  - (4) Publication Committee might try to increase paid advertising in the Bulletin.
  - (5) Referred to By-laws, Rules, and Regulations Committee to change by-laws to permit assessment of \$5.00 penalty for late payment of membership dues.
  - (6) Donation of unused funds from allotment to Regional Societies for Annual meetings to the Scholarship Fund.
2. *Scientific Editor*
  - (1) Appointment of Dr. A. Ewen as Scientific Editor.
  - (2) Appointment of Dr. M.K. Mukerji and Mr. C.H. Craig as Assistant Scientific Editors.
3. *Bulletin Editor*
  - (1) Accepted with regrets the resignation of H. Liu as Bulletin Editor.
  - (2) Appointment of Dr. R.B. Aiken as Bulletin Editor.
4. *Insect Common Names*
  - (1) In principle the combining of the English list of common names with the French list prepared by Q.S.P.P.
  - (2) Appointment of Dr. Belton as chairperson of the Insect Common names and Cultures Committee.
5. *Financial Support to Regional Societies*
  - (1) Support to Regional Societies be raised to \$4000, with \$1,500 for improvement of the Scientific Program and \$2,500 as general "seed money".
6. *Insect Stamp*
  - (1) R.F. Morris to continue to work on procuring an insect stamp.
7. *Search Committee for Treasurer*
  - (1) H.F. Madsen to strike a search committee for new Treasurer.
8. *Publications Committee*
  - (1) Review by managing editor and treasurer the publication cost of Canadian Entomologist and consider use of a different format to reduce costs.
9. *Meetings*
  - (1) Joint meeting with Entomological Society of Manitoba, Winnipeg, October 6-8, 1986.
  - (2) Joint meeting with the Entomological Society of British Columbia, Penticton, September 28-30, 1987.
10. *Biological Control Committee*
  - (1) H.F. Madsen contact Dr. E.J. LeRoux and express that the Entomological Society of Canada is prepared to support and assist in the selection of an Entomological component on the IPM Strategy Committee.
11. *Official Languages for B.C.C.*
  - (1) Ratified the official languages of Canada as the official languages of B.C.C.

12. *Financial Backing to AASC*  
 (1) Donation of five hundred dollars to AASC as seed money to finance a feasibility study to expand the quality of the magazine "Equinox".
13. *Graduate Student Involvement in ESC*  
 (1) Conduct of Student Paper Competitions at Annual Meetings of the ESC and ESC provide funds for prizes.  
 (2) Graduate Student involvement in the Employment Committee.
14. *Scientific Committee on Economics of Insect Pests*  
 (1) Appointment of a Steering Committee to proceed in obtaining a third contract with Agriculture Canada with livestock the commodity for study.
15. *Appreciation to Treasurer*  
 Expression of thanks for many years of valuable service to the Society to retiring Treasurer at the Annual General Meeting.

## **GOVERNING BOARD MEETING**

**September 25, 1985**

**Skyline Hotel, Ottawa, Ontario**

### **Actions**

1. *Executive Council*  
 Approved the Executive Council for 1985-86 as proposed: H. F. Madsen, President; G. G. E. Scudder, First Vice-President; E. C. Becker, Second Vice-President; and S. B. McIver, Past President.
2. *Trustees*  
 Approved the Trustees for 1985-86 as proposed: E. C. Becker, Treasurer; A. Ewen, Scientific Editor; C. H. Craig and M. K. Mukerji, Assistant Editors; R. B. Aiken, Bulletin Editor; B. K. Mitchell, Assistant Bulletin Editor; and J. A. Shemanchuk, Secretary.
3. *Committees and Representatives*  
 Approved Committees and Representatives for 1985-86 as proposed by the President: a list will be published in the Bulletin.
4. *Budget*  
 Approved a budget for 1985 as presented by the Treasurer.
5. *Search for Treasurer*  
 Approved a Search Committee consisting of B. J. R. Philogène, Chairperson, B. N. A. Hudson, and V. Behan-Pelletier, the committee responsible for nominating a Treasurer to succeed E. C. Becker.
6. *Mid-Term Executive Council Meeting*  
 Agreed that the meeting will be held in Ottawa in April, 1986.
7. *Next Governing Board Meeting*  
 Announced that the next Governing Meeting will be held at the Holiday Inn South in Winnipeg, Manitoba, on October 4-5, 1986, during the joint meeting of the Entomological Society of Canada and the Entomological Society of Manitoba.



*Dr. R. H. Sinha receives the ESC Gold Medal for 1985 from Susan McIver.*



*President Susan McIver presenting the gavel to incoming President Harold Madsen.*



*Susan McIver presenting the C. Gordon Hewitt Award for 1985 to Dr. M. L. Winston.*



*Governing Board, 1986. Seated (left to right): G. G. E. Scudder, H. F. Madsen, E. C. Becker. Standing (left to right): R. Cannings, L. Thompson, R. Gooding, D. A. Craig, S. McIver, G. Pritchard, R. Shepherd, J. Shemanchuk, J. Kelleher*





*Highlights of 1985 Annual Meeting*

## **MEETING NOTICES**

### **Executive Council Meeting**

The mid-term meeting of the Executive Council will be held April 22-23, 1986, at the Embassy West Motor Hotel, 1400 Carling Avenue, Ottawa. Matters for consideration at the meeting should be sent to the Secretary, Mr. J. A. Shemanchuk, Agriculture Canada Research Station, P.O. Box 3000 Main, Lethbridge, Alberta, T1J 4B1.

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### **Réunion de l'Exécutif-Conseil**

#### **Avis**

La réunion mi-semester de l'Exécutif-Conseil aura lieu le 22-23 avril 1986 à l'Hôtel Embassy West Motor, 1400 avenue Carling, Ottawa. Tous sujets pour être considérés devront être soumis au secrétaire de la Société, M. J. A. Shemanchuk, Station de Recherches, Agriculture Canada, C.P. 3000, Lethbridge, Alberta, T1J 4B1.

### **36th Annual General Meeting**

The Annual General Meeting of the Entomological Society of Canada will be held during the period of October 6-8, 1986, at the Holiday Inn South, Winnipeg, Manitoba. The date and time will be announced in the June Bulletin.

Matters for the consideration of this meeting or for the Governing Board meeting, to be held on October 4-5, 1986, in Winnipeg, Manitoba, should be sent to the Secretary, Mr. J. A. Shemanchuk, Research Station, Agriculture Canada, P.O. Box 3000, Lethbridge, Alberta, T1J 4B1.

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### **36<sup>e</sup> Réunion Générale Annuelle**

La Réunion Générale Annuelle de la Société Entomologique du Canada aura lieu le 6-8 octobre à l'hôtel Holiday Inn South, Winnipeg, Manitoba. Le lieu et l'heure précis sera annoncé dans le Bulletin de juin.

Le conseil de direction se réunira le 4-5 octobre 1986. Tous sujets pour être considérés devront être soumis au secrétaire, M. J. A. Shemanchuk, Station de recherches, Agriculture Canada, C.P. 3000, Lethbridge, Alberta, T1J 4B1.

# Entomology '86

1986 JOINT ANNUAL MEETING  
ENTOMOLOGICAL SOCIETY OF CANADA: ENTOMOLOGICAL SOCIETY OF MANITOBA

6-8 OCTOBER — HOLIDAY INN SOUTH WINNIPEG

## Second Notice Annual Meeting

Entomological Society of Canada  
Entomological Society of Manitoba  
6-8 October 1986  
Holiday Inn South Winnipeg  
Winnipeg, Manitoba

- October 4 and 5: 09:00 - 17:00 — Entomological Society of Canada Governing Board Meeting
- October 6      09:00 - 10:00 — Opening Ceremonies  
   — E.S.C. Awards (Gold Medal and Hewitt Award)  
   — Gold Medal Address  
                                 10:30 - 12:30 — Heritage Lecture: "The Research Branch—100 Years of Progress," Dr. E. J. LeRoux, Ottawa  
   — Plenary Lecture: "New Generation Insecticides," Dr. J. E. Hollebhone, Ottawa  
                                 13:30 - 17:00 — Paper Sessions  
   — Special Interest Groups  
                                 18:00 - 19:30 — Grad Students meet the Governing Board  
   — Reception  
                                 20:00 - 22:30 — Mixer at the Winnipeg Art Gallery
- October 7:      08:30 - 12:30 — Symposium: "Insect-Plant Relationships"  
   (i) Dr. J. M. Scriber, Madison, Wisconsin, "Foodplant suitability: behavioral, physiological, genetic, and ecological implications for insects".  
   (ii) Dr. J. H. Myers, Vancouver, B.C., "Insects as connoisseurs: the ability to choose and consequences of choosing the best food plants".  
   (iii) Dr. B. D. Roitberg, Burnaby, B.C., "Role of chemicals in host plant finding and acceptance".  
   (iv) Dr. D. R. Strong, Tallahassee, Florida, "The enigmatic role of natural enemies among insects on plants".  
                                 13:30 - 15:00 — Paper Sessions  
   — Special Interest Groups  
                                 15:30 - 17:00 — Entomological Society of Canada Annual Meeting  
                                 19:00 -            — Banquet  
   — Presentation of E.S.C. Fellowships, Criddle Award, and Winner(s) of Student Paper Competition
- October 8:      08:30 - 12:30 — Symposium: "Current Topics in Insect Physiology".  
   (i) Dr. S. S. Tobe, Toronto, Ontario, "The regulation of juvenile hormone biosynthesis in insects".  
   (ii) Dr. A. N. Starratt, London, Ontario, "Proctolin".  
   (iii) Dr. R. G. H. Downer, Waterloo, Ontario, "Octopamine as a target for insecticide development".  
   (iv) Dr. E. Huebner, Winnipeg, Manitoba, "Ovarian development and oogenesis in insects".



- 13:30 - 17:00    — Paper Sessions
- Special Interest Groups
- 12:30 -           — Entomological Society of Canada Governing Board Meeting

#### *Special Interest Groups*

Informal conferences on specialized topics will be arranged on request. Members interested in organizing and/or participating in a special interest group are asked to contact Dr. G. H. Gerber, Chairman, Scientific Program Committee, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba, R3T 2M9 (A.C. 204 - 269-2100) not later than 1 May, 1986.

#### *Student Competition*

Cash prizes will be presented by the Entomological Society of Canada for the best student papers. Papers, prepared and delivered by students, based on their own work and given on any entomological subject, are eligible. Students giving papers in this competition must be (1) a full-time student or have student status in the Entomological Society of Canada or in one of the Affiliated Societies at the time the paper is presented, and (2) be registered at the meeting.

#### *Poster Presentations*

Displays should be free-standing for placement on a table. Prepare for the top of the poster an easily readable label bearing the title of the display and the name(s) of the author(s). Display tables will be assigned to authors for a specific period of time. A number of displays will run concurrently if demand is great enough.

## Scholarship Winners



*Susan McIver presenting a 1985 E.S.C. Scholarship to Rosemarie DeClerck of the Univ. of Saskatchewan.*



*Louis Provencher (Univ. de Québec) receiving a 1985 E.S.C. Scholarship from Susan McIver.*

# POSTGRADUATE AWARDS 1986

## Invitation for Applications

### Entomological Society of Canada

The Entomological Society of Canada will offer two postgraduate awards of \$2,000.00 each to assist students beginning graduate study and research leading to an advanced degree in entomology. The awards will be made on the basis of high scholastic achievement.

*Eligibility.* The successful applicants must be either Canadian citizens, or landed immigrants with Bachelor degrees from Canadian universities. Applicants must begin their first year of postgraduate studies between June 15, 1985, and December 15, 1986. 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 a graduate school as a qualifying candidate is not eligible to receive an award.

*Method of Application.* Applicants should submit a properly completed form, with supporting documents, in accordance with the instructions printed on the application form. Applications must be received by the Secretary of the Society no later than June 15, 1986.

*Process of Selection and Award Presentation.* Applications are reviewed by a committee of the Society and 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 January 1987.

#### Regulations

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

All communications regarding the awards, including requests for applications, should be addressed to:

Mr. J.A. Shemanchuk, ESC Secretary  
Canada Agriculture, Research Station  
Lethbridge, Alberta  
T1J 4B1

# BOURSES POUR ÉTUDIANTS POST-GRADUÉS 1986

## Société Entomologique du Canada

### Avis

La société Entomologique du Canada offrira deux bourses d'un montant de \$2,000.00 chacun pour aider des étudiants entreprenant des études post-graduées et recherches en préparation d'un diplôme supérieur en entomologie. Les bourses seront accordées aux étudiants ou étudiantes en raison des seuls critères de réussite académique.

*Éligibilité.* Les candidats choisis doivent être citoyens canadiens ou résidents reconnus du Canada avec un baccalauréat d'une université canadienne. Il est aussi obligatoire que les candidats commencent leur première année d'études post-graduées entre 15 juin, 1985 et 31 décembre, 1986, et que les études et les recherches soient faites à une université canadienne. Chaque bourse ne sera accordée que lorsque le Chef du Département vérifie que les candidats choisis ont été acceptés en première année d'un programme d'études et de recherches en vue d'un diplôme supérieur avec tous les privilèges rattachés au status d'étudiants post-gradués. Un étudiant qui n'a pas pu obtenir son admission à une Ecole de Gradués ou qui s'inscrit en vue de compléter l'obtention de crédits n'est pas éligible pour recevoir une bourse.

*Formalités de la demande.* Les candidats devront soumettre leur candidature à l'aide du formulaire approprié et y ajouter tous les documents requis sur la formule de demande. Les demandes devront être reçues par le Secrétaire de la Société au plus tard le 15 juin 1986.

*Sélection et présentation de bourses.* Le choix sera fait par un comité de la Société et l'annonce des deux candidats choisis se fera à la réunion annuelle de la Société où ils recevront un certificat. Paiement de la bourse aura lieu en janvier 1987.

### Règlements

*Autres sources de revenus.* Un boursier pourra dans des circonstances normales donner des séances de cours ou de démonstrations jusqu'à un maximum de 200 heures par année pourvu que le chef de son département en exprime le désir et considère que ces tâches additionnelles n'iront pas à l'encontre du progrès de l'étudiant. Sauf pour fins de démonstration et les jours de congé, un boursier devra consacrer tout son temps à l'étude et à ses recherches et n'accepter aucune autre rémunération, mais pourra jouir d'une autre bourse ou d'un prix.

*Transferts.* Une bourse est accordée pour poursuivre des études du 2<sup>e</sup> ou 3<sup>e</sup> cycle conduisant à l'obtention d'un degré en entomologie au Canada. Les boursiers qui décideront de changer d'orientation pour d'autres disciplines que l'entomologie ou de transférer à une université hors du Canada peuvent se voir retirer leur bourse. Après acceptation d'une bourse, tout changement dans le programme d'études ou déplacement vers une autre université devra recevoir au préalable l'approbation du Comité de la Bourse de la SEC. Une telle demande doit être accompagnée de documents provenant de Chefs de Départements concernés.

*Frais supplémentaires.* Une bourse consiste en un montant total. Il n'y a pas d'autres formes de prix accordés par la Société. Des frais supplémentaires pour assister, par exemple, aux réunions scientifiques, ou pour frais de cours, publications, etc., ne sont autorisés pour aucune raison.

Toute correspondance relative aux bourses et toutes demandes pour formulaires doivent être adressées à:

Mr. J.A. Shemanchuk, secrétaire SEC  
Canada Agriculture, Research Station,  
Lethbridge, Alberta  
T1J 4B1

## NOMINATIONS

### E.S.C. 1986 Elections

*Second Vice-President:*

D. C. Eidt,  
Canadian Forestry Service,  
Box 4000,  
Fredericton, New Brunswick  
E3B 5P7

J. D. Shorthouse,  
Department of Biology,  
Laurentian University,  
Sudbury, Ontario  
P3E 2C6

*Director-at-Large:*

N. J. Holliday,  
Department of Entomology,  
University of Manitoba,  
Winnipeg, Manitoba  
R3T 2N2

I. M. Smith,  
Biosystematics Research Institute,  
Agriculture Canada,  
Ottawa, Ontario  
K1A 0C6

*Fellowship Committee:*

D. M. Davies,  
Department of Biology,  
McMaster University,  
Hamilton, Ontario  
L8S 4K1

R. F. Morris,  
Agriculture Canada,  
Box 7098,  
St. John's, Newfoundland  
A1E 3Y3

A. G. Robinson,  
Department of Entomology,  
University of Manitoba,  
Winnipeg, Manitoba  
R3T 2N2

Additional nominations from members must be submitted not later than 30 April 1986, to the Secretary, Mr. J. A. Shemanchuk, Research Station, Agriculture Canada, P.O. Box 3000, Lethbridge, Alberta, T1J 4B1.

Susan B. McIver  
(Chairperson, Nominating Committee)  
W. G. Friend  
A. D. Tomlin

### ESC Fellowships

The Entomological Society of Canada Fellowship Selection Committee invites nominations for ESC Fellowships. To help the Committee with their selection, please supply as much pertinent information about the nominee as possible, on not more than 6 typed pages. The nomination must be signed by four members of the Entomological Society of Canada.

Please send by April 30, 1986 to Dr. J. H. Borden, Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia V5A 1S6.

## Honorary Members

The Entomological Society of Canada has vacancies for up to two (2) new Honorary Members. Please forward nominations to the Chairman of the Membership Committee by May 30, 1986. All nominations must be accompanied by a 1-2 page biographical sketch highlighting those accomplishments that contribute to his/her being considered for Honorary Membership. A complete publication list should also be included. Send nominations to Dr. R. G. H. Downer, Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1.

## JOURNAL EXCHANGE

I recently received the following notice from Dr. J. A. Regil Cueto of the Entomological Society of Spain:

"Gentlemen,

It would be a pleasure for us to regularly send you the 'Boletin de la Asociacion de Entomologia' published since 1977 in exchange . . .

Our Bulletin appears yearly and contains 200 to 400 pages. It contains original entomological papers in Spanish with resumes in Spanish and French or English."

If any of the editors of regional society publications wish to pursue such an exchange, contact:

Dr. J. A. Regil Cueto,  
Departamento de Zoologia,  
Facultad de Biologia,  
Universidad de Leon,  
LEON 24071  
Spain

R. Aiken  
Bulletin Editor

# THE BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS)

## Survey Report

The Scientific Committee met in Ottawa on October 24-25, 1985. A fuller account of the meeting appears in the Spring 1986 issue of the Newsletter of the Biological Survey of Canada (Terrestrial Arthropods).

### *Notes on selected Scientific projects*

#### 1. Illustrated keys to the families of arthropods in Canada

The first fascicle of this series, a key to the myriapods and introduction to the arthropods, is now in press.

#### 2. Arthropod fauna of the Yukon

The contents of a major book on the Yukon and its fauna have been finalized. Manuscripts will be submitted at the end of 1986.

#### 3. Arthropods of Canadian grasslands

Information on areas containing native Canadian grasslands has been summarized. A symposium on the postglacial evolution of intermontane grasslands will take place in Vancouver in 1986, at meetings of the American Association for the Advancement of Science.

#### 4. Arthropods of peatlands

A project on peatland arthropods, including terrestrial forms, is being launched.

#### 5. Arthropods of freshwater springs in Canada

An international bibliography of spring habitats and their faunas, and a synthesis of available information on caddisflies from springs in Canada, have been completed. A symposium on arthropods of springs is planned for 1988.

#### 6. Arthropods of the boreal life zone

A new project focussing on the arthropods of jack pine and related species of pines is being launched.

### *Other scientific priorities*

#### 1. Arthropod fauna of soils in Canada

The proceedings of the 1984 International Conference on faunal influences on soil structure have been published.

#### 2. Climatic change

As suggested by the Survey, the Biological Council of Canada has accepted the task of soliciting the interest and involvement of a wide spectrum of biologists in considering the possible biological effects of climatic change. Entomologists interested in this topic are urged to contact the Biological Survey.

#### 3. Paper on environmental impact assessment

A paper discussing the use and value of insects in environmental impact assessments has been submitted for publication.

#### 4. General priorities of the Survey

The Committee discussed Survey scientific priorities at length, based on a summary of completed, current and numerous potential projects. The review confirmed that (with the new peatland and boreal projects) the balance of present projects accords with priorities established by the Survey's national scientific overview.

### *Secretariat activities*

Dr. H. V. Danks visited entomological centres across the country during 1985, and also attended the Biological Council of Canada Canadian Congress of Biology in London, Ontario (presenting papers on the survey and its projects), the Annual Meeting of the Société d'Entomologie du Québec in St. Jean-sur-Richelieu (presenting a paper on plant-insect interactions in arctic regions), and the Annual Meeting of the Entomological Society of Canada in Ottawa, Ontario. During the regular visits to exchange ideas and information informally and to determine changes in personnel Dr. Danks presented formal seminars and lectures on Biological Surveys and other topics.

### *Information and liaison with other organizations*

Recent developments at the National Museum of Natural Sciences, the Biosystematics Research Institute, the Canadian Forestry Service and the Inland Waters Directorate were reviewed by officials present at the meeting.

Contacts have been made with the Natural Sciences and Engineering Research Council, the Biological Council of Canada, the XVIIIth International Congress of Entomology, and other bodies.

*Other items*

1. Publication avenues for the Biological Survey

The publications subcommittee of the Biological Survey has decided on publication formats, reviewing procedures, and the form of a Trust Fund for funding Survey publications. Approaches have begun to secure seed money to establish the Trust Fund and to begin the publication of manuscripts soon to be in hand.

2. Other discussions

The Committee also considered various entomological activities across the country, the possibility of further workshops on the fauna, a list of amateur entomologists, and a logo design for the Biological Survey of Canada.



## NEWS OF ORGANIZATIONS

### The Biological Council of Canada in 1985

As in previous years, a steady interaction between the BCC, representing its member societies, and ministries, granting agencies and other institutions has been maintained.

The first formal activities took place in February, when the BCC, represented by Ralph Nursall, John McNeill, Brock Fenton and Gary Merriam took part in the lobby of the National Consortium of Scientific and Educational Societies to government MP's. Several days of intensive meetings in Ottawa by teams of Consortium members with P.C. MP's provided an effective means of argument for Established Program Financing and the establishment of a House Standing Committee in Research, Science and Technology, as well as general discussion of the role and importance of science to Canada. Although EPF policy is not yet fixed, the Consortium can take credit for positive steps made towards the Standing Committee. These efforts were reinforced in May by specific recommendations made by the BCC to the McGrath Committee on Reform of the House of Commons. The Third Report of the McGrath Committee recommends the establishment of such a Committee. Currently, the government is actively involved in implementing McGrath Committee recommendations.

The February period in Ottawa was also used to strengthen the personal contact BCC has had for years with NSERC, NRS and Science Council, as well as to make ourselves known at MOSST (where new faces were in place) and to develop stronger relations with AASC, CFBS and PIPS, among others in the alphabet of professional organizations. There is frequent and friendly correspondence with all these organizations, a sense of cooperative activity towards common goals, essentially a betterment of the role and support of science in Canada—for which, believe me, it is necessary to work assiduously all the time. We correspond as well with interested MP's of opposition parties, so that our opinions are available for wide discussion.

The spring was dominated by final preparation for the First Canadian Congress of Biology, held at the University of Western Ontario, 23-28 June, 1985. It is difficult to praise too highly the efforts of the Organizing Committee, especially its Chairman, David Walden, for the work put into the Congress. It was largely his persuasion and drive that brought us together in what was an important and successful scientific meeting and an occasion for biologists of all interests to come together to exchange ideas. It provided a severe test of the resources and capabilities of the BCC, but we succeeded. There were several symposia of importance, scientific sessions, banquets, special addresses and plenary sessions at which the problems and practices of the relationship between government and science were thoroughly explored, to the edification of all in attendance. Plans now proceed for a Second Canadian Congress in 1990. From what we learnt this year, we shall make the next Congress an event of wide interest and great importance.

Throughout the year a torrent of correspondence was maintained with the federal government, particularly, but not exclusively with MOSST. Your representatives to BCC have more detail of these matters, or if you wish specific information, please do not hesitate to ask me for it. Correspondence had to do with support of the Youth Science Foundation (it was continued), maintenance of the integrity and operating role of Science Council (cut in support but reaffirmed as an important consultative body), criticism of operating fund cuts to NSERC and strong support for its Second Five-Year Plan, as well as those of MRC and SSHRC (nothing forthcoming but platitudes as yet, but pressure is being maintained), request for participation in a proposed forum on policy in Canadian Science and Technology (no response as yet—things like this tend to suffer in ministerial changes, as has recently happened at MOSST), congratulations to the new Minister of State for Science and Technology (The Honourable Frank Oberle, M.P.), support for the action of the Minister of the Environment to protect the forest lands of South Moresby and neighbouring islands, expression of gratification at recommendations of the McGrath Committee Report on Reform of the House of Commons, wide dissemination of the proposal to establish a program of Science Associates as short-term parliamentary assistants to MPs with interests in science (initial returns are positive, though Mr. Speaker John Bosley has a Fellowship Program in mind that he wants to take precedence—see McGrath Third Report, p. 58; correspondence continues), and three nominations for NSERC, reflecting the strengths of BCC and matters of current importance in Canadian science (such nominations disappear into the Ottawa maw, but regular reminders about them are slipped into correspondence).

The BCC commentary on forest science has been published and widely distributed. Anyone wishing a copy can get it from Tom Moon, Secretary, BCC, Department of Biology, University of Ottawa, K1N 6N5. Societies will be asked for further input to this, through a questionnaire being developed.

We also keep our interests before the Advisory Committee on Life Sciences of NSERC, which is expected to develop a role of importance in policy for biology at NSERC. BCC was informed at its fall meeting that its promotion of ACLS was instrumental in the formation of the committee.

New activities, just getting under way, and for which help will be sought from member societies, include the possibilities of workshops on ecosystem health, with the possibility of establishing criteria and methods to maintain environmental standards, in cooperation with the Office of the Science Adviser, Environment Canada, and on climatic change, in cooperation with the Canadian Climate Planning Board and the Atmospheric Environment Service. BCC has also been asked to participate in public hearings in Ottawa, 22-31 May, 1986, to be held by the World Commission on Environment and Development (UN). Your Society executive will be asked to submit ideas and names of people for submissions to the hearings. Details will come from your Executive.

More mundanely, I have asked our Treasurer, Clarence Madhosingh, to project the financial requirements of BCC for the next five years. Executive work is entirely voluntary; the institutions which support our executive members have (largely) uncomplainingly shouldered substantial expenses (travel, telephone, copying, publication, provision of stationery, stenographic, etc. etc.). Ultimately, that could compromise our independence; our penury and lack of staff markedly affects our efficiency and speed of response. Our assessment per member now ranges from one-fifth to one-tenth (and maybe less) of that of equivalent organizations. Our ability to maintain a voice in the councils of science and the development of policy rests entirely on the initiative and reserves of energy possessed by executive members, working around their own professional demands. In an increasingly complicated, competitive and perhaps less friendly environment, that is a losing proposition. The BCC has achieved a position, through many long years, where it is recognized, listened to, asked for advice, invited to participate and expected to respond. We have some influence, we have affected policy positively, we are seen as a reflective, responsible body. Our strength lies in our unit of purpose, our diversity of interests and our knowledge of the importance of our science. To increase, or even maintain our role, I expect that we shall have to pay more to do it, especially if we try to keep individual members abreast of activities at the same time. The latter activity also takes time and money, and often is sacrificed to the primary task of keeping our needs before the federal agencies. We hope that the Society representatives keep societies informed of BCC efforts; sometimes that is not the case. Don't hesitate to ask them for information!

There are lots of things underway. We shall keep busy in 1986!

J. R. Nursall, President,  
Biological Council of Canada

## **Study Group on Biological Control in Canada**

The Science Policy Committee of the Entomological Society of Canada has been attempting to initiate a study group on Biological Control similar to the Microbial Control Study which is nearly completed. In the Science Policy Committee report published in the December Bulletin, it was stated that negotiations with Agriculture Canada to set up a Biological Control Study group under a broad study on Integrated Pest Management had not been successful. Since the report was written, progress has been made and Agriculture Canada is now prepared to establish a study group on Biological Control as part of a larger study on Integrated Pest Management. Initially, the representatives from the Entomological Society of Canada to this study group will be Dr. John Laing, University of Guelph and Dr. O. N. Morris, Agriculture Canada, Winnipeg.

Harold F. Madsen,  
President, E.S.C.

## **Wildlife Toxicology Fund**

A \$3 million Wildlife Toxicology Fund (WTF), established in the summer of 1985 as a cooperative venture between Environment Canada and World Wildlife Fund Canada, has started to channel funds to priority research initiatives in wildlife toxicology.

The Wildlife Toxicology Fund receives its financing from Environment Canada, but responsibility for the program's administration rests with World Wildlife Fund Canada. Additional funds of \$50,000 have been received from Noranda Inc. to cover administrative costs. Grants are approved by an independent, nine-member Research Advisory Board, with grantees required to obtain at least one-half of their project budgets from other sources.

The Wildlife Toxicology Fund is now inviting applications from interested researchers across Canada, for research in the following priority areas:

- 1) Effects of agricultural and/or forestry chemicals on wildlife.
- 2) Effects of toxic industrial pollutants on wildlife.
- 3) Monitoring the success of measures taken to mitigate the effects outlined in 1 and 2 above.
- 4) Developing and implementing techniques that use wildlife as indicators of toxic chemicals in the environment.
- 5) Examining environmental pathways by which toxic substances may affect wildlife.

In addition, the following Canadian habitats have been identified as critical areas for WTF support: Prairie sloughs and wetlands elsewhere in Canada; Arctic marine and terrestrial habitats; and the Great Lakes.

The Wildlife Toxicology Fund is a cooperative program supporting up to one-half the cost of approved research proposals, provided matching funds can be found from other sources.

For details contact:

Pegi Dover,  
Wildlife Toxicology Fund  
c/o World Wildlife Fund Canada  
Suite 201  
60 St. Clair Avenue East  
Toronto, Ontario  
M4T 1N5

Telephone: 416-923-8173

## **Insect Pathology Unit**

The United States Department of Agriculture, Agricultural Research Service, International Activities announces the opening of an Insect Pathology Unit at the European Laboratory (EPL), France.

An open house and a workshop on the "DUAL ROLE OF PATHOGENS AND PARASITES IN INSECT CONTROL" will be held at EPL on Saturday, August 23, 1986 following the 4th International Colloquium on Invertebrate Pathology taking place in the Netherlands, August 18-22, 1986.

Speakers interested in addressing the topic and anyone wishing to participate in this event are kindly requested—for organizational reasons—to contact us as soon as possible but no later than April 15, 1986 at:

Dr. Richard Soper  
USDA-ARS-PPRU  
Boyce Thompson Institute  
for Plant Research  
Tower Road  
Ithaca, N.Y. 14853, USA  
Tel. (607) 257-2030

or

Dr. Tad Poprawski  
USDA-ARS-IA  
European Parasite Laboratory  
13-17 rue de la Masse  
78910 Orgerus-Behoust, France  
Tel. (1) 3487-2075

## International Commission on Zoological Nomenclature

Reference: ITZN 11/5 A.N.(S.) 136

14 December 1985

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the *Bulletin of Zoological Nomenclature*, volume 42, part 4 on 6 December 1985, and would welcome comments and advice on them from interested zoologists.

Correspondence should be addressed to the Executive Secretary at the above address, if possible within six months of the date of publication of this notice.

### Case No.

- 2345 *Drasterius bimaculatus* (Rossi, 1970) (Insecta, Coleoptera, Elateridae): proposed suppression of *Elater bimaculata* Fourcroy, 1785.  
2453 *Microchrysa* Loew, 1855 (Insecta, Diptera): proposed conservation by the suppression of *Chrysomyia* Macquart, 1834.  
2503 *Eugynothrips* Priesner, 1926 (Insecta, Thysanoptera): proposed designation of *Cryptothrips conocephali* Karny, 1913 as type species.  
2496 HETEROGYNIDAE Rambur, 1866 (Insecta, Lepidoptera) and HETEROGYNINAE Nagy, 1969 (Insecta, Hymenoptera): proposals to remove the homonymy.

Reference: ITZN 59

14 December 1985

The following Opinions have been published by the International Commission on Zoological Nomenclature in the *Bulletin of Zoological Nomenclature*, volume 42, part 4 on 6 December 1985:

### Opinion No.

- 1354 (p. 330) *Agrotis redimicula* Morrison, 1874 (Lepidoptera): conserved from 1874.  
1358 (p. 341) *Calaphis* Walsh, 1862 and *Callaphis* Walker, 1870 (Insecta, Hemiptera): a ruling to remove the confusion.  
1359 (p. 344) UROPLAT- as the stem of family-group names in Reptilia, Sauria and Insecta, Coleoptera: a ruling to remove the homonymy.  
1360 (p. 347) *Oeciacus vicarius* Horváth, 1912 (Insecta, Hemiptera): conserved.  
1361 (p. 349) *Larentia capitata* Herrich-Schäffer, 1839, given nomenclatural precedence over *Phalaena posticata* Fabricius, 1794 (Insecta, Lepidoptera).  
1362 (p. 351) *Phalaena coracina* Esper, 1805, given nomenclatural precedence over *Phalaena hirtata* Fabricius, 1794 (Insecta, Lepidoptera).  
1363 (p. 353) *Ancistroceroides* Saussure, 1855 (Insecta, Hymenoptera): type species designated.

The Commission regrets that it cannot supply separates of Opinions.

P. K. Tubbs,  
Executive Secretary

## ARTICLES

### How Flies Do It

CBC Fredericton has a daily feature on Information Morning in which listeners are invited to submit questions on diverse subjects which the program staff will research and provide answers. Norman Gange asked, "When a common house fly lands upside down on the ceiling, does it roll or loop in its approach?"

Paddy Gregg, the host of Information Morning approached the whole thing rather lightly and assumed (incorrectly) that no serious research had ever been done. He phoned the 434 Squadron and Canadian Forces Base, Chatham, a fighter squadron, and put it to them. The Squadron's official position was that the fly would have to roll—it would need the stability provided by a roll to make a proper landing.

Hearing this, I wondered if the CBC would ask an entomologist about flying a jet plane. To determine the true facts, I eventually contacted Hugh Danks, Biological Survey of Canada, (Ottawa), who recalled reading the definitive answer: The fly reaches up and seizes the ceiling with the fore tarsi, then swings the rest of the body upward to grasp the ceiling with all six tarsi. The manoeuvre approximates a loop and leaves the fly facing in the opposite direction.

Tony Thomas (CFS, Fredericton) showed me an apocryphal article (Wilkerson, R. C. and J. F. Butler. 1984. *Ann. Ent. Soc. Amer.* 77: 293-295) in which the ability of a male horse fly to execute a combination loop and roll is described. A similar manoeuvre was developed as a tactic by Max Immelman, a German World War I fighter pilot, as the quickest means of turning and facing a pursuer with the added benefit of a gain in altitude.

I phoned Paddy Gregg, the host of CBC's Information Morning, and we discussed Gange's question on the air. He followed the interview with this untitled, five stanza limerick.

I hope it amuses you as much as it did me.

Doug Eidt  
Canadian Forestry Service, Maritimes  
Fredericton, N.B.

A wonderful creature, the fly . . .  
Not just when it's up in the sky,  
But few understand  
When it comes in to land  
The manoeuvre it uses . . . and why.

The air force we chose for a poll . . .  
No doubt, they said, it's a roll,  
It just had to be true  
'Cause that's what they'd do . . .  
Claim you have to, to stay in control.

Now science comes up with a scoop . . .  
I'm afraid it exposes our bloop,  
A study discovers  
These wonderful buzzers  
Don't roll when they land . . . no they loop.

Now the horse fly's amorous stunts . . .  
Make the common fly look like a dunce,  
In pursuit of the girls  
He does intricate twirls  
And seems to go both ways at once.

For the horse fly when passion doth burn . . .  
Conventional tactics will spurn  
The trick he will use  
The girls to confuse  
Is the classical Immelman Turn.

Paddy Gregg  
CBC Fredericton, N.B.

# Biological Control Revisited\*

by

D. G. Embree and B. A. Pendrel

Canadian Forestry Service - Maritimes

Biological control is a very old concept.

You want dates? Try 1775, 1840, or 1870. It depends on which textbook you read. However, in reviewing the subject we were struck with certain similarities between the history of biological control and Coca-Cola. Let's say that both were spawned sometime in the last century. In the world of advertising hype we have just witnessed the appearance of the new Coke and thank goodness the survival, through the smoke of battle of the old Coke—now Coca-Cola Classic. We gather that new Coke is the same old thing only sweeter—at least that's what we read in the papers. In the world of "ecological conflict" hype we now have classical biological control and a new form of biological control, somehow better than the old, somehow the "alternative" to chemicals that will solve our insect problems—at least that's what we read in the papers.

*Classical biological control* is defined (at least by the authors) as "control" through the release of natural agents that are self-perpetuating: control is defined as a reduction in host populations to a level where damage becomes economically acceptable.

*New biological control* is not necessarily self-perpetuating and control usually consists of a one-shot drastic reduction in population levels of the pest.

We would like to start somewhere near the beginning and review the development of ideas, principles, and concepts related to biological control. We will then discuss the record of the biological control effort in New England—one of the nine nations of North America. Just what we mean by the nine nations, we will leave you to ponder until later. Finally, we will introduce current work, and examine the new biological control and the problems it presents.

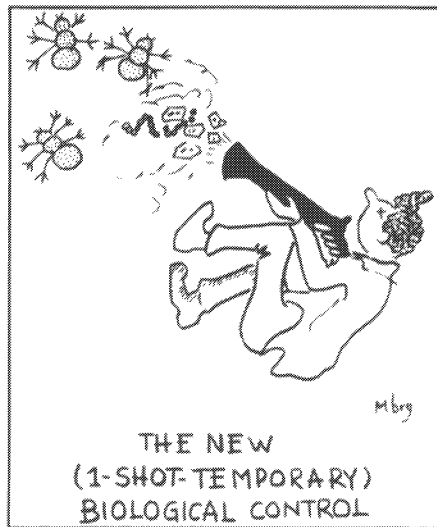


Fig. 1

*Variations on a Theme or did Sweetman say it all?*

In 1936, Harvey L. Sweetman, while an assistant professor at the Massachusetts State College wrote a text on the Biological Control of Insects. Does this comment of Sweetman's, 49 years ago, sound familiar in today's debate on aerial spraying? "The widespread interest

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\*Based on a paper presented to the Acadian Entomological Society, St. John's, Nfld. Aug. 6-8, 1985.

among laymen and trained entomologists in the biological method of controlling pests is so great that one might be led to believe that it is the most important weapon of the entomologist. This is far from true for, undoubtedly, insecticides furnish today the major method of combating insect pests."

Other contentious issues related directly to the practice of biological control discussed by Sweetman were:

1. Multiple releases vs single releases.
2. Polyphagous parasites vs monophagous parasites.
3. The need to monitor and risk of overstated claims of success.
4. Control of introduced pest vs native pests.
5. Parasite adaptability.

These five points have been debated almost continually since Sweetman's time and while agreement has not always been unanimous, his ideas have prevailed. Generally, single releases are favoured over multiple releases, polyphagous and monophagous parasites are considered to be equally effective even though theory favoured the monophagous parasites. The need for long-term monitoring is accepted but not always funded. The increased chances of success against introduced pests are acknowledged but the possibility of control of native pests is not ruled out. On the subject of the problems of adaptation, Sweetman observed that biological control was more likely to succeed on islands, real or ecological, than on large land masses. The language of modern genetics has translated this observation into gene pools, genetic drift, etc.

The history of biological control is reflected in three volumes published by the Commonwealth Institute of Biological Control on biological control programs against insects and weeds in Canada. We were struck by the differences in the thickness of the volumes and could not resist plotting the number of releases, as an indication of the amount of biological control effort, against this thickness. We were aghast at the inverse relationship that resulted. Could this mean that we now know much more about less and less? More sobering was the general discussion in each volume which enabled us to define the three ages of biological control, at least in Canada: the Age of the Release; the Age of Elegance (or the Age of the Cage), and the Age of Love's Labour Lost.

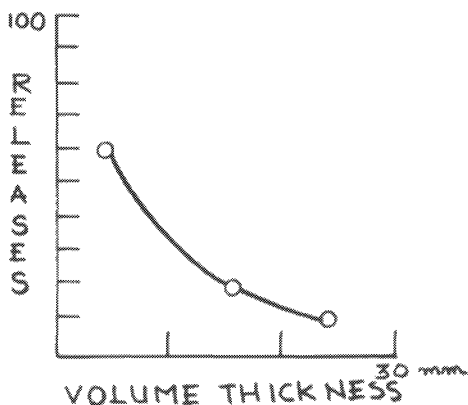


Fig. 2

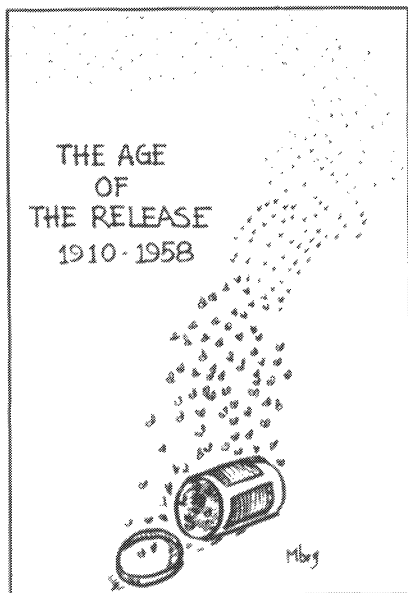


Fig. 3

#### *The Age of the Release 1910-1958*

From 1910-1958, 60 species of parasites were released against 11 major forest insect pests in the Maritimes and Newfoundland. A total of 21 was recovered from 11 major pests and 17 incidental insects. The largest releases were against the European spruce sawfly one of which, *Drino bohémica* was released in 153 locations and in numbers ranging from 18 to 3500, with about one-half of the releases consisting of about 400 individuals each. The general tone of the CIBC publication was one of reasonable satisfaction for a job well done.

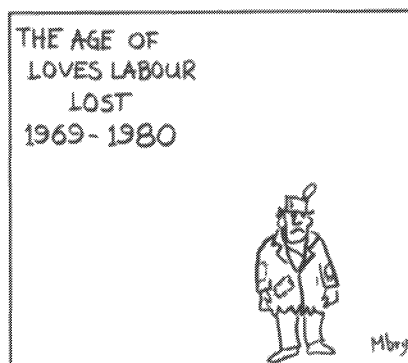
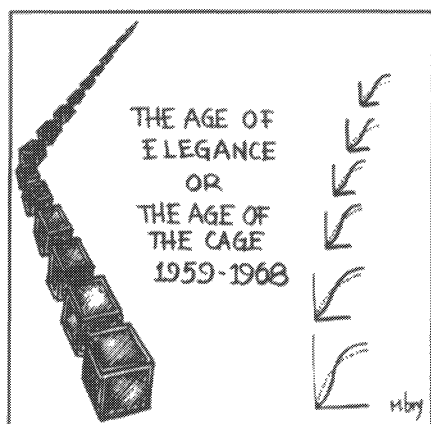


Fig. 5

#### *The Age of Elegance, or the Age of the Cage 1959-1968*

Almost all releases involved some form of cage release. In the Maritimes, Newfoundland, and Maine a total of 23 species was released against four major pests; 18 species were recovered. There were 19 cage releases. The discussion in the CIBC volume during this period covered work by Holling on functional numerical response curves, the advent of serious mathematical modelling, and studies by Syme showing relationships between parasite food supply and fecundity. Calls for research in the areas of theory, inventory, taxonomy, behaviour, methodology, and genetic lines, and a major recommendation that a centre of biological control be established, conveyed an attitude of enthusiasm and hope.

#### *The Age of Love's Labour Lost 1969-1980*

In the Atlantic Region only 12 parasite species were released against five forest pests, nine were recovered. Across the country much attention was paid to inundative treatments of *B.t.* and NPVs, with success rated good to excellent in eight out of 12 cases. But much of this work is not self-perpetuating and belongs with the new biological control. Nevertheless, the tone of the CIBC summary is dismal, emphasizing the decline of effort due entirely to austerity measures. Unfortunately, the increase in research, and the centre of biological control called for in the Age of the Cage did not come to pass. In fact, the focal point of the Center-to-be, the Belleville Laboratory devoted to biological control, was closed and its staff "released" into other "ecosystems" across Canada, hopefully to adapt enough to be recovered. The reason, reduction in funding!

#### *The Next Age: the Age of Great Expectations—New Coke 1980-*

We are concerned here only about current work throughout New England; one of the nine nations of North America. The Nine Nations of North America, a book by Joel Garreau (Houghton Mufflin Company 1981), groups North America into nine nations based on the behaviour patterns of the natives rather than political or geographical boundaries. Not surprisingly, we Newfies, Bluenosers, Herring-Chokers, and Mainiacs are all in the same clump called the Nation of New England.

Field studies related to spruce budworm control either by pheromones, inundative release of *Trichogramma*, or perhaps through successful introduction of parasites are on the horizon (so far attempts to establish *Phytodietus gresiaeana*, a European parasite of *Zeiraphera diniana* on larch failed when oviposited eggs did not develop in the bud moth).

Studies at Memorial University on the possibilities of nematode inundations excite us, (but if they do come to pass won't the general public itch and scratch!). Work at Dalhousie University investigates a possible virus-carrying parasite of the gypsy moth. The gypsy moth, like the camel, has his nose in the tent in Nova Scotia and New Brunswick and is well inside in Maine.

Work continues on pheromones at U.N.B. and the Research and Productivity Council of New Brunswick—but with a shortage of funds. In Maine, except for a serendipitous release of lady beetles against arboreal aphids, there is not much to report.





Fig. 6



Fig. 7

The selection of the term "Age of Great Expectations" for this final period is ironic.

Great expectations are held by the proponents of integrated pest management, alternative methods, and "better forest management," including not only every environmentalist but of course every politician who has ever been asked his opinion on the use of pesticides. Entomologists reflecting on 75 years of experiencing more failures than successes, hope first for ideas, then breakthroughs, but most of all for enough money and the security of tenure to do their jobs.

For our part we list a few facts and fancies about biological control, classic or otherwise, the contemplation of which may make our endeavours easier.

#### *Two is Better than a Slew*

Evidence, at least circumstantial, exists that the release of a large number of parasite species to control a single pest may only set in motion competition among parasites, diluting their effectiveness and resulting in the pest being the real winner. The winter moth situation may be an example of this. *Cyzenis albicans* and *Agrypon flaveolatum* seem to have forest populations of winter moths in check. We would not recommend interfering with this balance by the introduction of more parasites in an attempt to improve control.

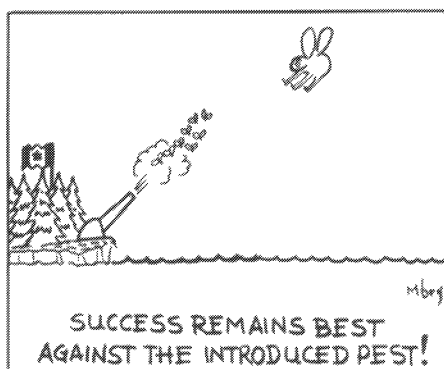


Fig. 8

#### *Biological Control is Still Most Likely to Succeed Against Introduced Pests*

This is an axiom of biological control which needs little elaboration. First try to establish a pest's 'own' parasites for they are the most likely to be adapted to do the job.

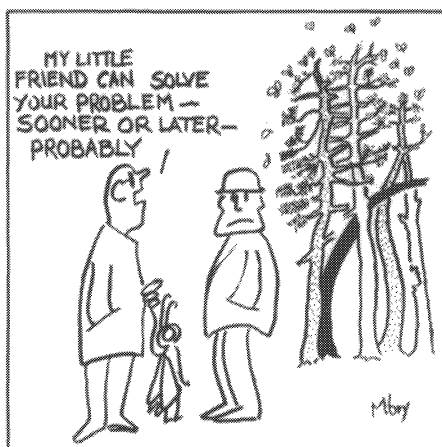


Fig. 9

*Success is not Predictable the First Time Around*

For every success in biocontrol there are a great many 'failures.'

*Past Results have been Exaggerated*

Especially in the public press, some oversell and resultant high expectations may be hurting biological control.

*It Only Works on a Few Insects*

We can't expect the self-perpetuating types of biocontrol to work in all situations.

We must conclude that further advances in self-perpetuating biological control only will occur when we get back to more monitoring, controlled releases, and more basic research.

# Program for an IBM-PC Microcomputer to Design Field Experiments and to Facilitate Data Collection\*

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Entomologists who are investigating the effects of various treatments on populations of insects usually require a randomized and replicated experimental design. The routine and exacting procedures of creating the experimental design, labelling the plots and materials taken to and from the plots, recording data and transmitting data in an appropriate manner to a computer based statistical package is time consuming. Recently, a few computer programs have been developed that facilitate these procedures, for example PESTICIDE RESEARCH MANAGER® (Gylling and Gylling 1985). Often these programs are specific to one type of commonly employed design or are complex and difficult to use. Our objective was to develop an inexpensive and adaptable program to create and edit experimental designs, to provide peripheral documentation such as data collection sheets and plot labels, and to provide a means of collecting and storing data which would interface with proven, comprehensive statistical packages.

Our program was designed to run on any IBM-PC or compatible computer (minimum 64k and one disk drive). The program can be installed to self-activate with AUTOEXEC to an opening menu with 8 options. Each option is called by number and the user follows a series of explicit, on-screen prompts.

OPTION 1 accesses the help manual. It is stored as an ASCII file and thus can be printed to any printer on LPT1: (parallel port) to produce a manual, or it can be viewed on-screen. The help manual, together with the explicit prompts, should enable users with a limited computer background to use this program.

OPTION 2 is PLOT PLAN, the core of the program package. PLOT PLAN is used to conversationally enter the parameters that define the layout of plots in a field experiment, and to produce a map of the plots (Fig. 1A). There is a choice of 5 types of randomization: 1, treatments and replicates completely randomized; 2, treatments randomized within replications; 3, same as (1) but split; 4, same as (2) but split; or 5, Latin square. Multiple subsplits are allowed in split plot designs. After selecting the type of randomization and the numbers of treatments and replications (maximum is 99 for each but less than 5000 total plots per experiment), there are further options that define how the plots will be arranged on the

**A**

EXPERIMENT: example  
FILENAME: test  
6 TREATMENTS  
4 REPLICATIONS  
BLOCKING: RANDOMIZED BLOCK DESIGN  
RANDOM SEED: 71  
DATE: August 11 1985

REP # 4

401 5	402 3	403 6	404 4	405 2	406 1
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REP # 3

301 6	302 5	303 2	304 4	305 3	306 1
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REP # 2

201 2	202 1	203 6	204 5	205 3	206 4
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REP # 1

101 5	102 4	103 6	104 3	105 1	106 2
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**B**

DATA SHEET  
example

FILE: test  
PAGE: 1  
DATE: 1985

		VAR(1) # OF INSECTS; (2) PLANT HEIGHT								
PLOT	TREAT VAR	1	2	3	4	5	6	7	8	9
101	5 1									
	2									
102	4 3									
	2									
103	6 1									
	2									

**C**

EXPT: EXAMPLE PLOT NO: 401 TREATMENT: 5	EXPT: EXAMPLE PLOT NO: 402 TREATMENT: 3	EXPT: EXAMPLE PLOT NO: 403 TREATMENT: 6
EXPT: EXAMPLE PLOT NO: 404 TREATMENT: 4	EXPT: EXAMPLE PLOT NO: 405 TREATMENT: 2	EXPT: EXAMPLE PLOT NO: 406 TREATMENT: 1

Fig. 1. Examples of computer print-out for an experiment created using an IBM-PC Microcomputer. A, a plot plan; B, part of a data recording sheet; C, part of a set of treatment labels.

\*This paper has been reviewed by external referees.

print-out (and ultimately arranged in the field). One option arranges treatments in columns or in rows (Fig. 1A shows treatments in rows). Another sets the number of plots in a row (or column) as some factor of the number of treatments. (Fig. 1A shows the 6 treatments in a single row; alternatively, replication 1 could be 2 columns of 3 plots or 3 columns of 2 plots.) These options give flexibility in shaping the block of plots to fit a particular field or need.

After options are entered, all values are displayed on the screen in the verify/edit portion of the program. After editing is completed, the plot plan can be stored on disk to serve as the basis for the other options or printed to the screen or printer.

The print-out as seen in Fig. 1A includes the experiment name, the file name, date, and details of the experimental design to permit easy identification. Each plot has two numbers (Fig. 1A). The top number identifies each plot by its row and column number in the experimental layout. The bottom left plot is always identified as plot 101 (for row 1; column 1). That is, row numbers increase from bottom to top and column numbers from left to right. If the plots are set in the field with plot 101 as the front left plot, then they exactly follow the printed computer plan. The bottom number in each plot is the treatment number. If the plot plan is too wide for the printer, the first 8 columns of plots are printed with successive pages of remaining columns printed below. These additional pages can be torn off and attached adjacent to the appropriate rows by referring to the plot numbers.

**OPTION #** produces data sheets for a plot plan. These sheets are tailored to the particular experiment and are useful for recording data in the field. One can create up to 50 blank cells per plot for data entry and specify the name above the data columns. Treatment identification can be suppressed to avoid bias during data collection or printed to aid in tabulating data later. Plots can be sorted and listed on the data sheet by plot number or treatment. If more than one page is needed to list all the plots, each page is numbered and the particulars of the experiment are printed on the top of each sheet. Fig. 1B shows a portion of a data sheet produced using the same file that created Fig. 1A and specifying 2 rows of 6 data cells with treatment identification requested by number and plots sorted by plot number. Formatted data sheets are not stored because they are easily created as needed by using the plot plan file.

**OPTION 4** produces stick-on labels for easy identification of material being taken to, or collected from, the plots. An easy-to-use configuration option enables printing on peel-off labels regardless of how they are arranged on the printer paper. More than one copy can be requested and, if so, one has the option of printing complete sets or printing all copies of one label together. Fig. 1C shows the first few labels of one set of labels generated using the same data file that produced Figs. 1A & B.

**OPTION 5** edits a PLOT PLAN file. This option is especially convenient for correcting errors in a plot plan or for producing a series of plot plans for an experiment that is repeated at several sites or in different years. A previously stored plot plan is retrieved by filename and any or all parameters changed. The edited version can be stored under a new filename, can be printed using option 2, and can be used with all of the other options.

**OPTION 6** interfaces with a TRS-80 model 100 computer (32K) used in the field as a data logger. A file created using options 2 or 5 is directed to a TRS-80 model 100, a computer that is battery-operated and portable. A Null Modem adapter and an RS232 cable are needed to connect to the IBM-PC. When loaded with the file, specific prompts are produced which are unique for the data entry for the specific experiment. The data recorded on the TRS-80 can then be down-loaded to the IBM following on-screen prompts on both computers. The data are stored in a matrix that is readable by LOTUS® (McComb and Van Buren 1984) and other spreadsheet packages. In short, this is the electronic equivalent of option 3. The corresponding program for the TRS-80 is on cassette and is run at the same time as the IBM program. Several data loggers are available. We have programmed the TRS-80 for this purpose because of the much lower cost. Because the program is in BASIC a programmer can edit to accommodate other data loggers.

**OPTION 7** allows treatments to be interchanged in an existing plot plan. Mistakes sometimes occur while applying treatments in the field. This option allows you, within limits, to correct the layout so that it agrees with the modified plot plan in the field. This is desirable when treatments have been misapplied and you want, for example, to use options to print labels or make data sheets that are correct for the revised experimental design. Some changes can have statistical implications and there is an opportunity to enter a note that is stored in the plot plan file.

**OPTION 8** exits the program and returns to DOS.

Some other programs, such as PESTICIDE RESEARCH MANAGER® have an option for statistical analysis of data. Our program does not have this option but instead organizes data in tabular form so that it can be readily manipulated using programs such as LOTUS® and SYSTAT®. These are powerful multi-disk programs and we feel that it is better to have compatibility with them than to have a built-in statistical option which by comparison would be inadequate. Files of data also are formatted so that they can be transferred to a main-frame computer for analysis with statistical programs such as SAS® (SAS Institute Inc. 1982). The main advantages of our program over others such as PESTICIDE RESEARCH MANAGER® is that ours is available at cost (\$25. to C.R. Ellis, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1 for the disk, cassette and handling; or \$15. without the cassette for the TRS-80) and is not copy-protected. Our program is also user-friendly and simpler to use.

### **References**

- Gylling, S. R., and F. O. Gylling. 1985. Pesticide Research Manager User's Manual. Gylling Data Management, Brookings, S.D.
- McComb, G., and C. Van Buren. 1984. Lotus 1-2-3™ and the IBM PC and XT. New American Library, New York.
- SAS Institute Inc. 1982. SAS User's Guide: Basics, 1982 Edition. Gary, NC. SAS Institute Inc.

## PUBLICATIONS

### Book Reviews

Carter, David J. 1984. *Pest Lepidoptera of Europe with special reference to the British Isles*. Series entomologica. Vol. 31, 431 pp. Dr W Junk Publishers, Dordrecht/Boston/Lancaster. ISBN 90-6193-504-0. \$US 89.50.

This is a large and useful work with 228 species treated in thorough detail, 79 plates of original line drawings, mainly of larvae, 41 black-and-white photographic plates, and 40 distribution maps. Each species text is divided into: Hostplant, Damage, Distribution, Description (of Ovum, Larva, Pupa and Adult), Biology (of all stages separately) and References.

The main problem of the book is unevenness in geographic and systematic coverage. The number of species could have been higher. Closely related species to those covered are not even mentioned (e.g. in the genera *Hepialus*, *Trichophaga*, *Mesapamea*, *Noctua*, *Agrotis*, *Euxoa*). In general, more comparative treatment would have been welcome.

The regional treatment is strongly biased towards the British Isles, and a more appropriate title for the book would be *Pest Lepidoptera of the British Isles with reference to adjacent parts of Central Europe*. Of 391 references in the bibliography from A to K, 163 (41.7%) were estimated to be British, 47 were North American, 43 German, 28 French and 22 Italian. Of the remaining 88, 19 were unclear, 12 from other countries outside Europe, and only 10 from Northern and 7 from Eastern Europe.

Two of the worst pests of the North are not mentioned at all: *Eurois occulta* (L.) has been blamed for the fact that Greenland remained uninhabited over long periods and *Epirrita autumnata* (Bork.) defoliated 7000 km<sup>2</sup> of birch forests in Finnish Lapland in 1965, causing a long-term descent of the timber-line. Also the spectacular damage made many years in Eastern Europe by *Lymantria dispar* (L.) would have been worth mentioning (the contrast to the "damage" made by e.g. *Dahlica* spp. in Britain is quite obvious!). Some of the maps showing general distributions are deficient: for instance *Pieris brassicae* (L.) has proceeded a few thousands of kilometers from the areas shown and has already invaded the Lake Baikal area in eastern Siberia.

In spite of the too ambitious title, David Carter's book will be most useful, both in pest management and in scientific research. The thorough descriptions, clear drawings and good photographs of larvae are the most valuable parts of the work and make it an indispensable text to researchers in the field of pest management.

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Cock, M. J. W. (Editor) 1985. *A Review of Biological Control of Pests in the Commonwealth Caribbean and Bermuda up to 1982*. Technical Communication No. 9. Commonwealth Institute of Biological Control (CIBC). xii-218 pp. Commonwealth Agricultural Bureaux, Farnham Royal, Slough SL2 3BN, United Kingdom. £35.00 (CAB Member Countries) \$U.S. 52.50 (non-member countries).

This is the ninth in a series which was started on the recommendation of a Commonwealth Entomological Conference. It covers the geographic area in which the West Indian Station of the CIBC in Trinidad has had a major influence. Fortunately, it was written when the major contributors to the biological control programs are still active, in particular F. D. Bennett, F. J. Simmonds and I. W. Hughes. The first two named are former Directors of the CIBC and hence exert a profound influence on biological control activities throughout the world.

Canadian workers have contributed three volumes to the Technical Communication series and Canada has been closely associated with the West Indian Station of the CIBC. Recently, the Canadian International Development Agency (CIDA) has funded an addition to the Station in Trinidad and the International Development Research Centre (IDRC) has supported financially a project to obtain natural enemies in the neotropics for cassava mites in Africa, although this is not mentioned in the Review. It would have been worthwhile to name the sponsors for the different projects.

The Contents are divided into three Parts covering programs in the Caribbean, Bermuda and Exports from the Caribbean. Chapters deal mainly with commodity groups and/or the pests of the commodities. This provides easy access to detailed information. But even those who have no keen interest in the particular pests will want to read the two chapters on Discussion. There, successes and failures are reviewed and comments made which apply to biological control programs everywhere. This is a most useful reference and should be placed in all biological control libraries.

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Martineau, P. 1984. *Insects harmful to forest trees*. Canadian Forestry Service, Forestry Technical Report 32. x + 261 pp.

This book provides a good overview of the most important forest insect pests in eastern Canada. The text for the species is attractively arranged, concise and accurate and the accompanying color plates of insects and damage are excellent.

The book, however, does have some serious drawbacks. For some species the nomenclature for scientific names is out of date and distribution data are sometimes out of date for species with expanding ranges. For example, the range given for the gypsy moth reflects the status of the species in the mid 1970's. Another drawback of the book is that the information is much less extensive than is suggested by the title. Only major parts of the most important forest trees are treated and coverage is restricted to eastern Canada. Harmful species are placed in one of three categories; most species categorized as major pests are covered, less than one half of the species categorized as of moderate importance are covered and a small proportion of species categorized as of minor importance are covered. The emphasis of the book on trees of the eastern boreal forest also results in uneven treatment of tree species. Only seven pests of oak are discussed briefly and pests of many other trees, including hickories, ashes, cherries, beech, basswood and red juniper, are not discussed at all. This bias to the boreal forest is also reflected in the placement of some species; for example, the gypsy moth, a serious pest of oak in most of its ranges, is treated under birch.

In general, the book provides an excellent overview of the more important insect pests of eastern Canada. Unlike several other works available, however, the book can not be considered to be a comprehensive, definitive treatment of the subject. The limited number of pest species treated and limitations on tree species covered will result in other works having to be consulted for positive identification of pests.

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Torp, Ernst. 1984. *De danske svirrefluer (Diptera: Syrphidae). Kendetegn, levevis og udbredelse*. Danmarks Dyreliv Bind I. Fauna Bøger, Lundbyvej 36, DK-5000 Svendborg, Denmark. 300 pp. D. Kr. 283.00.

This work is the third major publication on Syrphidae of western Europe in four years. Before 1981 many species, other than those of Great Britain, could not be reliably identified, and there was no good recent summary of biology and immature stages of European Syrphidae. This situation is now changed markedly.

The first of the three works, by V. S. van der Goot in 1981 (in Dutch), contains keys to the 473 species of northwestern Europe and European U.S.S.R., based in large part on earlier keys by A. A. Stackelberg to about 433 species of the latter area. Biological information in this work is limited mostly to brief notes on the habitats of species of the Netherlands.

The second work, by A. E. Stubbs and S. J. Falk, appeared in 1983; it has keys to the 256 species of the British Isles. It has brief general sections on biology, collecting, immature stages, etc. and rather extensive comments on adult habitats, and often larval habitats, of each species. Two features are of special value. For each species there is a discussion of significant characters apart from those given in the keys; variation within the species, differences between similar species, and any doubts about specific status and nomenclature are

also mentioned. It is made clear that even in one of the best-studied regional faunas many problems still exist. The 262 colour illustrations of 190 species, by Falk, are magnificent. They far surpass any previously published illustrations of Syrphidae, and sometimes include up to five figures of one species to show continuous colour variation or distinct mimetic forms.

The work by Torp treats the 263 species of Syrphidae of Denmark. Like van der Goot, Torp includes supplementary characters in the keys to give a brief description of each species. The keys are adequately illustrated by 219 line drawings, all from previous publications by many authors. Captions for these figures, plus those in other sections, are in Danish and in English. Also included are four excellent colour plates of photographs of 108 species and four additional mimetic forms. The work differs markedly from the other two in its much more extensive treatment of subjects other than species identification (this covers only 49 pp.). The keys are preceded by a historical account of adult morphology. They are followed by 64 pp. on mating, eggs, larvae and larval biology (including a key to about 50 genera), pupae, cytotaxonomy, predators and parasites, mimicry, diapause and migration, habitat selection, distribution patterns, phenology, economic importance, and collecting, preparing and preserving specimens.

One of the most interesting sections outlines the changes in the Danish syrphid fauna during this century. I know of no comparable treatment of a fauna this large. For each species the number of 10 km-quadrates in which specimens have been collected before 1900, from 1900-1949 and from 1950 is given. The distribution maps, one for each species, use symbols based on these three periods; the maps are large and clear. Six species have not been taken since 1900 and five more not since 1949; for *Rhingia rostrata* the figures for the three periods are 8, 0 and 0. In contrast for the four most abundant species, all with larvae in decomposing matter or polluted water, the range for the three periods is 0-1, 8-12 and 312-391. Seventeen other species, most with larvae saprophagous or feeding on a wide variety of aphids in disturbed areas, show increases almost as marked. The figures suggest a great change in available habitats since 1900.

Only one section of the book is in English: A survey of the faunistics and bionomics of the Danish species of Syrphidae. For each species notes on distribution in Denmark and seasonal occurrence are given, and for many habitat preferences, records of flowers visited, and references to published larval descriptions. An extensive list of references and a brief glossary complete the work.

It is most heartening to see that the two more recent of these works agree almost entirely in generic and specific nomenclature. The first differs a little more, but the genus-group categories are nearly comparable, and many specific synonyms have come to light only since 1980. Perhaps stability of nomenclature is no longer an idle dream.

Dick Vockeroth  
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Ottawa, Ontario

## Books Received

Ball, G. E. (ed.), 1985. *Taxonomy, phylogeny and zoogeography of beetles and ants. A volume dedicated to the memory of Philip Jackson Darlington (1904-1983)*. Junk. The Hague. xiii + 514 pp.

Matthews, E. G. 1985. *A guide to the genera of beetles of South Australia. Part 2*. South Australia Museum. 68 pp.

Vincent, C. & L. Burgess. 1985. *Bibliographie sur les altises phytophages des crucifères au Canada. / A bibliography relevant to crucifer-feeding flea beetle pests in Canada*. Technical Bulletin #22. Saint-Jean-sur-Richelieu Research Station. Agriculture Canada. 31 pp.  
(Note: This volume is free. Send requests to C. Vincent, Station des recherches, C.P. 457, Saint-Jean-sur-Richelieu, Que. J3B 6Z8 or L. Burgess, Agriculture Canada Research Station, 107 Science Crescent, Saskatoon, Saskatchewan S7N 0X2)



## PERSONALIA

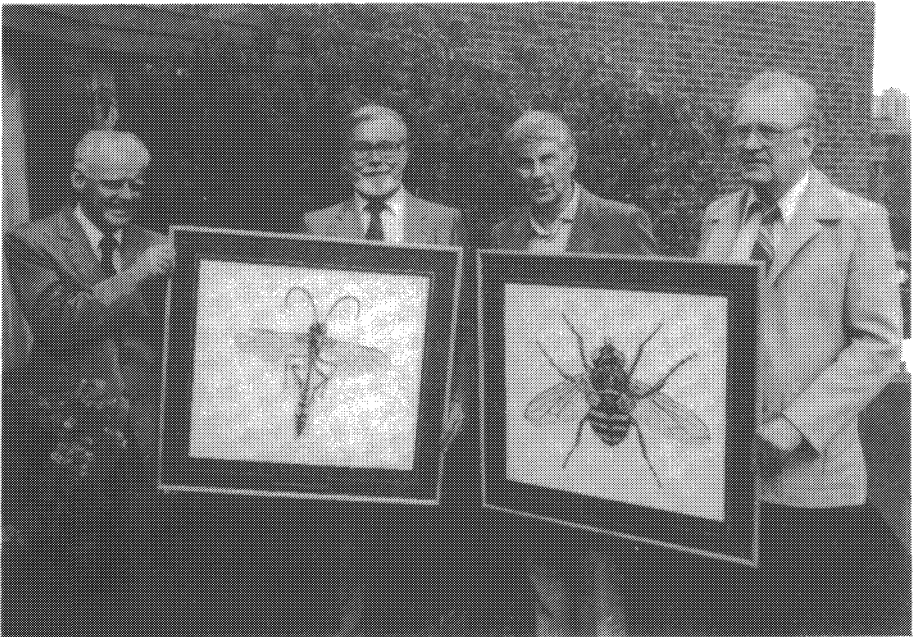
### SWAT Squad?

We're not used to having entomological exploits dramatized by such colorful language. Nevertheless it was used by the Victoria, B.C., press to describe entomologists Doug Embree, Don Marks, Sergei Condrashoff, and Jack Arrand and the insect parasites *Cyzenis albicans* and *Agrypon flaveolatum* for their triumph over the winter moth, *Operophtera brumata*. The winter moth was characterized as "ravening jaws of millions of loopers who had turned Victoria into a free lunch zone."

Victoria's broadleaf trees were tattered and torn when Sergei Condrashoff, former Canadian Forestry Service entomologist, Saanich orchardist, co-founder and Vice-President of Safer Agro-Chem Ltd., contacted his old friend Douglas Embree, C.F.S. Fredericton, to find out how they had solved the problem in Nova Scotia. Doug's involvement in Nova Scotia had been to explain the population dynamics of winter moth (E.S.C. Memoir 46) and how *Cyzenis* and *Agrypon* had fared among six parasites introduced on the advice of Glenn Wiley, now at Agriculture Canada, Winnipeg, and European entomologists. Both parasites are host specific. The tachinid *Cyzenis* had been effective against high populations because it is a prolific egg layer, but it oviposits on the host plant and the loopers must swallow the eggs with their food. *Agrypon*, an ichneumonid, oviposits directly in the larvae and was most effective against low larval populations. Embree warned it would take six years from release for the parasites to become effective.

Condrashoff also enlisted Jack Arrand, entomologist with the B.C. Ministry of Agriculture, who cut through red tape to find the money and persuaded the people in his Ministry, at the federal Pacific Forestry Centre, the University of Victoria, and the City of Victoria, to identify, count, select release sites, monitor, and all the other details of a complicated operation. Then they asked for collections of parasitized winter moth larvae from Nova Scotia.

Embree recruited the help of Donald Marks, Forest Insect and Disease Survey Extension Officer for Nova Scotia, who in turn mustered a small army of collectors. He persuaded fellow workers at C.F.S. Truro, Nova Scotia Lands and Forests, family, friends, and even a bus load of enthusiastic Girl Guides to collect over 100,000 parasitized winter moth loopers. Condrashoff wintered and reared the parasites to adults, and following Embree's advice on



The SWAT Squad. Left to right, back row: Don Marks, Sergei Condrashoff, Doug Embree, Jack Arrand. Front row: *Agrypon flaveolatum*, *Cyzenis albicans*.

where, when, and how many, they were released. Imre Otvos of the Pacific Forestry Centre monitored the releases, the spray people held their fire, and the people of southern Vancouver Island tolerated the defoliation. By the sixth year, as predicted, the winter moth was under control, although *Agrypon* has not yet performed to expectations.

The City of Victoria honored the key players in this drama last September by making Doug Embree, Sergei Condrashoff, Don Marks, and Jack Arrand honorary citizens. The characteristically unconventional Embree countered by presenting the City with a framed woodcut of each parasite. The woodcuts had been specially commissioned by Embree and are executed by C.F.S. Maritimes' staff artist Michiel Oudemans. Embree warned Mayor Pollen of Victoria that the prints carried a curse—should they end up in a closet instead of hanging in a prominent place, the winter moth would return with a vengeance.

An outstanding entomological accomplishment and four worthy entomologists have been honored by the community at large. This is certainly unusual; entomologists are usually only recognized by other entomologists. The City of Victoria not only honored the four, but showed its own sophistication with the understanding, patience and faith it takes to wait for the slow but sure biological solution.

D. C. Eidt  
C.F.S. Maritimes

## Ray F. Morris - Hall of Famer

Ray F. Morris, who retired at the end of 1984 after serving for 35 years as a Research Scientist with Agriculture Canada at the St. John's Research Station, was inducted into the Atlantic Agricultural Hall of Fame, at the Atlantic Winter Fair, Halifax, N.S., on October 11, 1985. Morris was also elected an honorary member of the Acadian Entomological Society at its 45th Annual Meetings held at St. John's, Newfoundland, August 5-8, 1985. These honours demonstrate the respect and admiration which Morris' colleagues hold for his achievements in entomology.

Ray received his Diploma in Agriculture from the Newfoundland Government Demonstration Farm in 1940, following which he served five years in the Army, graduating from the Canadian Army Officers Training College, Brockville, Ontario, in 1943. In 1947 he received his Associate Diploma from the Ontario Agricultural College and his Bachelor of Science Degree in Agriculture from the University of Toronto in 1950. In 1955 he received his Master of Science Degree from the University of Maine. Morris began his career with the Research Station in 1950, the year after Newfoundland joined Confederation, and up to the time of his retirement in 1984 his name was synonymous with entomology in Newfoundland.

Ray's major research focus has been pests of vegetable crops, but his interests are broad and have included ornamental, livestock and domestic pests as well as general studies on the insect fauna of the island. He has built up an insect collection of over 5,000 species which is currently housed at the Agriculture Canada Research Station in St. John's. In addition to 39 scientific and 89 miscellaneous publications, Ray has reviewed and catalogued the introduced terrestrial insects of Newfoundland in a chapter of the book *Biogeography and Ecology of the Island of Newfoundland* (Monographiae Biologica, Vol. 48), and has published the book *Butterflies and Moths of Newfoundland and Labrador: The Macrolepidoptera*. In spite of his scientific achievements, Ray is better known in Newfoundland for his extension work. He is acknowledged throughout the island as the source of information on insects and horticulture and as someone always willing to provide advice on a problem or information about an interesting insect. He is a popular resource person on entomological problems and has been an honorary lecturer at Memorial University. He produces a weekly radio program, "Gardening Time," on VOWR radio, St. John's.

Ray's entomological activities have not been restricted to Newfoundland, for he has done much to promote entomology in Canada. He has recently completed terms as Vice-President (1981-83) and President (1983-84) of the Entomological Society of Canada, and has served the Society as a Director, Associate Editor of *The Canadian Entomologist*, and on many committees acting as Chairman of the Scholarship, Achievement Award and Science Policy Committees. He has been equally active in the Acadian Entomological Society, service as Vice-President (1954-55) and President (1968-69). He was a member of the founding committee of the Biological Survey of Canada (Terrestrial Arthropods) and continues to take an active role in the Survey.



Ray Morris and his family at his induction into the Atlantic Agricultural Hall of Fame. Left to right: Wayne L. Morris, D. Keith Morris, Margaret Ann Morris, Daisy Morris, Ray Morris.

Ray and his wife, Daisy, continue to live in St. John's. They have two sons, Wayne, who is the Director of the Plant Health Division with Agriculture Canada in Ottawa; and Keith, a Corporal with the Royal Canadian Mounted Police in Fredericton, N.B. Ray maintains his entomological research interests, more now than during his last few pre-retirement years when time was taken up by diverse administrative duties. As an Honorary Research Assistant, Ray is finishing work on the click beetles of Newfoundland and is now turning his attention to the microlepidoptera as a sequel to his *Butterflies and Moths of Newfoundland and Labrador*.

Ray exemplifies the best forms of professionalism in his entomological work; he is a respected researcher and agriculturalist, a dedicated servant to the establishment and expansion of the discipline and a well known public emissary of entomological information and interest. He received the Canada Silver Jubilee Medal in 1977.

## **POSITIONS AVAILABLE**

### **Chairman - Department of Entomology Macdonald College of McGill University**

Applications are invited for the position of Chairman of the Department of Entomology in the Faculty of Agriculture. The Department has undergraduate and graduate programs in entomology as well as teaching responsibilities in other areas of biology.

The successful candidate will have a productive research program in either Insect Taxonomy or Biotechnology (see associated advertisement) and provide leadership to the Department in the areas of research and graduate student training. He will provide the Faculty of Agriculture with an expansion of undergraduate teaching programs.

Applications should include a complete Curriculum Vitae and the names of three persons who may be contacted as references. In accordance with Canadian immigration requirements this advertisement is directed in the first instance to Canadian citizens and permanent residents. Send appropriate documentation to:

Dr. R. B. Buckland  
Dean of the Faculty of Agriculture  
Macdonald College of McGill University  
21,111 Lakeshore Road  
Ste-Anne de Bellevue, P.Q. H9X 1C0

### **Entomology**

The Department of Entomology, Macdonald College of McGill University, invites applications for two tenure-track positions at the assistant Professor level, effective September 1, 1986, subject to budgetary approval. Applications at the Associate and Full Professor level will be considered only with respect to the position of Chairman as advertised in the associated advertisement (see above).

Appointees will be responsible for teaching courses complementary to the present offerings of the department, as well as developing a strong research program in their area of expertise.

One position will be in the area of Insect Taxonomy and will include curatorial responsibilities in the Lyman Entomological Museum and Research Laboratory. This unit is closely associated with the department and will provide excellent research facilities.

The second position is in the area of Insect Biotechnology. Preference will be given to candidates with expertise in the application of insect biotechnology to crop protection, insect-plant relations, or the development and use of insect pathogens for pest control.

Qualifications include a Ph.D. in Entomology and a strong orientation to research. In accordance with Canadian immigration requirements this advertisement is directed in the first instance to Canadian citizens and permanent residents. Send curriculum vitae, a statement of research and teaching interests, and the names of three referees to:

Dr. Robin K. Stewart, Chairman  
Department of Entomology  
Macdonald College of McGill University  
21,111 Lakeshore Road  
Ste-Anne de Bellevue, P.Q. H9X 1C0

Applicants who wish to be considered for the Chairman's position should write directly to Vice-Principal Roger Buckland, Macdonald College of McGill University.

## **Postdoctoral Research Associate in Ecosystem Modelling**

Ph.D. and research experience in mathematical modelling of biological systems and computer simulation. Training in one or more areas of entomology, zoology, plant pathology, mycology, ecology or agricultural engineering desirable. Develops and tests simulation models of stored grain ecosystems to predict interaction among environmental variables, fungi, insects and mites associated with spoilage of cereals, stored and ventilated under Canadian climatic conditions. Ability for team work with biological workers as part of a well-established bioengineering research group. Full time, grant-supported University of Manitoba position with annual starting salary \$23,000 to \$27,400 depending on qualification and experience, renewable up to 3 years. Available early 1986. Submit CV, sample publications, 4 reference names and addresses:

Dr. R. N. Sinha,  
Agriculture Canada Research Station,  
University of Manitoba,  
Winnipeg, Manitoba, Canada R3T 2M9.  
Tel: (204) 269-2100.

## **SCHOLARSHIP**

### **Ontario Mosquito Control Association**

From the capital generated from a successful joint meeting of the Ontario Mosquito Control Association and the American Mosquito Control Association, the OMCA will make available a \$500.00 annual scholarship. The scholarship is open to any student registered at a Canadian university conducting research on arthropods of medical importance. Applicants are asked to submit:

- 1) An academic record.
- 2) A two-to-three page summary of research objectives and methods.
- 3) Two letters of recommendation.

For further information or submission of applications write to:

Mr. G. Rodgers, Secretary  
Ontario Mosquito Control Association  
City Engineer's Department  
City of London  
P.O. Box 5035  
London, Ontario  
N6A 4L9.

*Deadline:* August 1 of each year.

*Notification of Award:* by September 15 of each year.

*Award Criteria:*

- 1) Primarily based on competence and objectives of student's research program.
- 2) Academic performance.
- 3) Letters of recommendation.

## WORKSHOPS

The Biosystematics Research Institute will be holding a second workshop on the insect order Hymenoptera from May 1 to 9, 1986, in the K.W. Neatby Building on the Central Experimental Farm in Ottawa.

The major hymenopterous groups will be taught by the following B.R.I. taxonomists: H. Goulet (Symphyta), W.R.M. Mason (superfamilies of Hymenoptera, Aculeata), M. Sharkey (Ichneumonoidea, Braconidae), C. Yoshimoto and G. Gibson (Chalcidoidea and Cynipoidea), L. Masner (Proctotrupoidea) and M. Sanborne (Ichneumonidae). Lectures will cover classification, diagnosis, identification, life histories and economic importance of these groups of Hymenoptera. In a special session, our enthusiastic Dr. Masner will cover modern sampling techniques, the preparation of specimens and the principles of curation.

Classes will begin at 8:00 a.m. and continue until 10:00 p.m. with lunch and supper breaks. Typically, the mornings and afternoons will include lectures and laboratory periods, but the evenings will be reserved entirely for laboratory work (catching up or attention to specific needs). Refreshments will be available. On the first evening, a complimentary dinner will be provided. This will afford an opportunity to meet the teachers and members of the class as well as other Ottawa entomologists.

Each participant will receive a syllabus containing the lecture material with illustrations, keys and pertinent literature. The syllabus will be forwarded to successful candidates at least one month before the beginning of the workshop. The course will be limited to 25 applicants and a fee of \$300.00 (CDN) will be charged. Candidates will be chosen on a first come first serve basis. (Overall reaction to the first Hymenoptera Workshop was very favorable).

Course application forms and further information may be obtained by contacting: Mike Sarazin, Biosystematics Research Institute, K.W. Neatby Building, Room 3135, C.E.F., Ottawa, Ontario, K1A 0C6, (Tel.: 613-996-1665).

## MEETINGS

### Announcements

*34th Annual Meeting of the North American Benthological Society* at the Kansas Union on the University of Kansas campus on May 20-23, 1986.

CONTACT: Leonard C. Ferrington, Jr., Kansas Biological Survey, University of Kansas, Lawrence, Kansas 66045-2969.

*Nato Advanced Research Workshop on Numerical Ecology* at Roscoff (Brittany), France on June 2-12, 1986.

CONTACT: Dr. Pierre Legendre, Département de Sciences biologiques, Université de Montréal, C.P. 6128, Succursale A. Montréal, Québec H3C 3J7.

*Deuxième Conférence Internationale des Entomologistes d'Expression Française*, organisée par la Société d'Entomologie du Québec, du 15 au 18 juillet 1986, à l'Université du Québec à Trois-Rivières. Conférences libres; symposiums: Ecologie et biologie des moustiques et mouches noires; évolution du développement chez les insectes sociaux; problèmes entomologiques en agriculture; problèmes entomologiques en foresterie.

CONTACT: Dr Jean-Pierre Bourassa, Département Chimie-biologie, Université du Québec à Trois-Rivières, 3351, boul. des Forges, Trois-Rivières, Qc G9A 5H7

*Acadian Entomological Society Annual Meeting*, at the Ramada Inn, Bangor Maine on April 29-30, 1986.

CONTACT: H. W. R. Houseweart, College of Forest Resources, 227 Nutting Hall, University of Maine, Orono, Maine. 04469. 207-581-2861.

*Joint Annual Meeting of the Entomological Society of Canada and the Entomological Society of Manitoba*, 6-8 October 1986, Holiday Inn South Winnipeg, Winnipeg, Manitoba.

CONTACT: Dr. N. J. Holliday, General Chairman, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2, or Dr. G. H. Gerber, Chairman, Scientific Program Committee, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba, R3T 2M9.

*XVI Pacific Science Congress* at Seoul, Korea on 20-30 August, 1987.

CONTACT: Prof. Choon Ho Park, Secretary-General, Organizing Committee, XVI Pacific Science Congress, Seoul, 1987, K.P.O. Box 1008, Seoul 110, Korea.

*XVIII International Congress of Entomology*, at the University of British Columbia, Vancouver, B.C., on 3-9 July 1988.

CONTACT: Dr. G. G. E. Scudder, Secretary General, XVIII International Congress of Entomology, Department of Zoology, University of British Columbia, Vancouver, B.C. V6T 2A9. Telephone (604) 228-3168.

## RECENT DEATHS

Wilkes, A.—at Ottawa, Ontario on November 28, 1985. Former Director of the Belleville Laboratory, then with the Biosystematics Research Institute. Specialist in insect genetics.

## NOTICE TO AUTHORS

### Submission of Manuscripts to the Canadian Entomologist and Memoirs of the Entomological Society of Canada

- 1) As of March 1986, authors should send 3 copies of manuscripts submitted for publication to:

A. Ewen, Scientific Editor,  
The Canadian Entomologist,  
Research Station, Agriculture Canada,  
Saskatoon, Saskatchewan  
Canada S7N 0X2

**Do not send manuscripts to the Ottawa office of the ESC after 1 March 1986.**

2. Authors **should not** send original artwork (e.g. oversize line drawings) until the manuscript has been accepted. However, authors should be sure that good reproductions of all figures are included with each copy of the manuscript submitted for review.
3. Authors are reminded that manuscripts should be typed, double spaced on paper with numbered lines and that the SI system for measurements and weights should be used. More detailed instructions to authors may be found in the January, 1986, issue of The Canadian Entomologist.

## AVIS AUX AUTEURS

### Présentation des manuscrits aux "The Canadian Entomologist" et les Mémoires de la Société Entomologique du Canada

- 1) Après 1 mars 1986, les auteurs doivent renvoyer trois copies de leurs manuscrits soumis pour publication à:

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- 2) Les auteurs **ne doivent pas** soumettre leurs illustrations originaux avant que le manuscrit soit accepté. Cependant, les auteurs doivent s'assurer que de bonnes photocopies de leurs figures sont inclus avec chaque copie du manuscrit.
- 3) Les auteurs sont rappelés que les manuscrits doivent être tapés à double interligne soient numérotées et que la système SI pour les unités de poids et de mesurage doit être employé. Les directives aux auteurs peuvent être trouvées dans le numéro de janvier 1986 du "The Canadian Entomologist".



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