

Entomological Society of Canada  
Soci t  Entomologique du Canada

*Bulletin*

Vol. 14, No. 1 March-mars, 1982

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D.M. Davies

Bulletin Editor

Cover Design: M.A. Sydor

Published by the  
Entomological Society of Canada  
1320 Carling Avenue, Ottawa K1Z 7K9

## EDITORIAL

The 1981 letter by Dr. S. R. Loschiavo (then ESC President) to Prime Minister Trudeau urged the government to give more financial support for Research and Development (R & D) in agriculture and forestry (Bulletin: Vol. 13(4) 130-132, 1981). Of special concern to our Society is financial support for entomological research that will help us maximize our renewable resources - food and fibre - derived from our agricultural crops, domestic animals and our forests. His letter received favourable replies from the Honorable Eugene Whelan, Minister of Agriculture, and the Honorable John Roberts, Minister of State, Science and Technology. Since then, additional money has been provided for the Natural Science and Engineering Research Council (NSERC) mainly for replacement of obsolete research equipment and for Strategic Research conducted at universities. The recent budget, however, unfortunately neglected to provide much incentive for research geared to improving our output of food and fibre. Also the establishment of the Industrial Opportunities Program (IOP) Board within the Department of Industry, Trade & Commerce (ITC) may possibly be just a new name for the earlier Enterprise Development Program (EDP).<sup>\*</sup> IOP is to support "all phases of the product innovation cycle, including initial R & D, product and process design and innovation, prototype development, organizational change, market identification and market testing" (a reworking of EDP). The creation of the IOP board to deal with such programs, that might have logically come under the Treasury Board or the Ministry of State for Science and Technology (MOSST), seems to diminish the role and viability of MOSST although a representative of MOSST is expected to be on the IOP board. It is to be hoped that the government will stimulate R & D of our renewable resources as an important element in Canada's economic recovery.

\*see also G. Hutchinson - Can. Res. 14(7): 54, 1951.

D. M. Davies

## NOTICE OF ESC EXECUTIVE MEETING

The midterm meeting of the Executive Council will be held 27 and 28 April 1982 at the Embassy West Motor Hotel, 1400 Carling Avenue, Ottawa. Matters for consideration at the meeting should be sent to the Secretary, Dr. H. G. Wylie, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba R3T 2M9.

Note: The Science Policy Committee will meet 26 April at the same location.

## SCHOLARSHIP OPEN TO CANADIAN UNDERGRADUATES TWO ENTOMOLOGICAL SOCIETY OF AMERICA \$1000 UNDERGRADUATE SCHOLARSHIPS

sponsored by BioQuip Products and CHEMSAMPSCO,  
a Division of Albany International

To be awarded annually beginning with the 1981-82 school year

Qualifications: Applicants must be undergraduate student members of ESA\* or studying entomology at the undergraduate level at a recognized college or university in the U.S., Canada, or Mexico.

Please submit the following:

1. Certification by the registrar or similar school official of undergraduate student status.
2. Certification by school or other knowledgeable official attesting to student's need for financial assistance.
3. Transcript of college grades.
4. Two (2) written statements from a school official and any other qualified individual attesting to the student's character and qualifications.
5. Statement from the student concerning career goals, interest in entomology, and other factors which illustrate qualifications for the scholarship.
6. Photograph: 2" X 2" or passport photo is sufficient.

Send the above materials to the Entomological Society of America, 4603 Calvert Road, College Park, Maryland 20740, before June 15, 1982.

\*Applications for student membership are available from your entomology department head or from the Society at the above address.

## FROM THE PRESIDENT

Printed in this issue of the Bulletin are two documents of particular significance to the Entomological Society of Canada. The first (p. 3) is a Statement by the National Museum of Natural Sciences affirming establishment of the Natural History Survey of Canada. The Terrestrial Arthropods component of the Survey, initiated by the Entomological Society of Canada, is offered as the model by which other groups of animals and plants can be added to the Survey through the initiative of relevant agencies and societies.

The second document (p. 4) is the Memorandum of Agreement between the National Museum of Natural Sciences and the Entomological Society of Canada, setting down the terms under which the Society undertakes to guide the work of the Terrestrial Arthropods component of the Survey through provision of a Scientific Committee. Terms are subject to negotiation by both parties, as dictated by experience. Our Scientific Committee has recommended that the Society accept this Memorandum; it has been approved by the Society's Executive, and I have advised the Museum's acting Director, F. H. Schultz, of our acceptance.

Mr. Schultz has replied (in part)... "We feel that the Statement by the National Museum of Natural Sciences and the Natural History Survey of Canada confirms our commitment to the Survey and we look forward to letters of support from all scientific societies in Canada which have an interest in the Survey. The National Museum of Natural Sciences is pleased that such dramatic progress has been made to date in the furthering of Survey programmes and aims, but we recognize that the future is not as secure as we wish it to be, and that we must strive to bring the required resources into place to ensure the continuation and expansion of the programme. The achievements to date could not have been attained without the goodwill, the persistence and the invaluable assistance of the Entomological Society of Canada. We appreciate what has been done by the Society and look forward to continued cooperation."

Establishment of a functional Natural History Survey within the National Museum does not yet ensure that adequate funding is available because the Museum shares the fiscal restraint imposed on Government departments generally. But nonetheless, in nurturing the concept through to its establishment as a functional programme, and moreover one widely acclaimed both within and beyond Government, the Society has achieved a significant advance for entomology and for biology in Canada.

Against this background, I want to draw attention to the listing (p. 6) of current membership of the Society's Scientific Committee for the Biological Survey. A number of members have worked vigorously to bring the Survey to this first plateau of permanency. In particular, J. A. Downes, E. G. Munroe and D. K. McE. Kevan produced the first written brief and proposal; G. E. Ball, G. C. E. Scudder and J. A. Downes served as chairmen of the Scientific Committee; and H. V. Danks has been entomologist in charge of the Secretariat from the beginning. To them, and to other members who have served on the Scientific Committee since 1977, the Society is deeply indebted. Also listed here is the membership of the Scientific Committees for our Study of the Costs of Destructive Insects in Canada, and for our Study of Entomological Manpower in Canada. Participation on these committees is work and takes time, time that few have in excess but which is given voluntarily by members for the enhancement of entomology as a profession and as a science. Combining this list of committee members with that of the regular committees in the December '81 Bulletin, and adding Governing Board, other officers, and journal editors shows that something of the order of 130 members are actively engaged in the work of the Society. Moreover, committee members usually volunteer willingly when invited to serve. With that level of commitment and vitality from its membership, our Society has a potential for achievement not widely appreciated and certainly not yet fully mobilized.

Those who are responsible for carrying out the Society's business continue to be indebted to their predecessors who wrote the Standing Rules and Committee Guidelines which set forth clear and logical procedures. But from time to time changes in the Standing Rules are presented for approval of members at the annual meeting. Recently, composition of the Science Policy Committee was changed in this manner at the Banff meeting, and I think it important to convey to members the thinking underlying the proposal to place chairmanship and vice-chairmanship of this Committee with the First and Second Vice-Presidents respectively. Previously

the Standing Rules stipulated that the Science Policy Committee should comprise a Director of the Society with 3 other members, along with Society representatives to SCITEC and BCC. In recent years, however, a useful practice has been followed by Presidents in appointing the Second Vice-President as chairman of the Science Policy Committee; but responsibility for Science Policy lapsed when that individual succeeded to the First Vice-Presidency to become, again by recent practice, chairman of the Achievement Awards Committee. The changes are designed to bring the advantages of continuity and commitment to Science Policy and to strengthen the concerted and constructive voice that the Entomological Society of Canada must have if it is to represent the concern of entomologists for a larger role in the development of biology in Canada - a concern voiced repeatedly and vigorously by recent presidents of our Society. Thus the Second Vice-President becomes familiar with existing initiatives in Science Policy in his first year on the Executive, guides development of those initiatives and introduces others as Chairman of the Committee during his second year, and assumes the office of President involved in all aspects of Science Policy and with the opportunity to implement those that are most advanced.

The Governing Board recognizes that the Entomological Society of Canada has an international membership, for some of whom the Society's concerns with events in Canada may seem somewhat remote. Indeed, some Canadian members believe that the Society should be concerned entirely with entomological matters. The Board intends to maintain and enhance the international status of the Society, especially through continued improvement of its publications, and it is dedicated to promoting entomology through all activities of the Society; but the Board believes that these objectives can be met most effectively from a sound base in Canadian science.

Glenn B. Wiggins  
President

## STATEMENT BY THE NATIONAL MUSEUM NATURAL SCIENCES OF THE NATURAL HISTORY SURVEY

### Introduction:

1. A Natural History Survey of Canada has been established in the National Museum of Natural Sciences by the Board of Trustees of the National Museums of Canada. It is intended to promote knowledge of the natural history of Canada through species inventories, studies of systematics and distribution, biological properties, ecological significance and how these are affected by man.
2. The continued involvement of the Entomological Society of Canada at the policy level in a Natural History Survey of Canada responds to the often repeated view (e.g. Science Council of Canada) that scientific societies should assume a larger responsibility for the planning and fulfilment of nationally important objectives within their discipline.
3. The Biological Survey (Terrestrial Arthropods) is to be regarded as a model for biological surveys for other groups of organisms, the national centre for which would be at the National Museum of Natural Sciences in Ottawa. Hence, all components of the fauna and flora should eventually be included in a biological survey of Canada, and initiatives to this end should be taken by the relevant individuals, agencies and societies.

### Roles:

1. The general role of the Natural History Survey organisation should be the encouragement of biological survey effort from a national perspective, through discussion and examination of programs, facilities and policy in systematic and faunistic work, and acting as a centre for information on resources and current operations.
2. The Natural History Survey of Canada should encourage the publication of systematic and faunistic work through established channels, and should itself develop or publish bibliographies, reviews and comprehensive or individual studies, whenever appropriate. Since previously published

information relevant to a Natural History Survey is widely scattered, guides to this literature are needed to support the future development of the survey. The survey organisation would be able to identify priorities, and to guide the development of syntheses with great authority. These roles, and the field cooperation engendered, would also foster the preparation of works on the fauna, including handbooks, keys, etc.

3. The Natural History Survey should periodically publish resource inventories, such as lists of workers, and lists of collections.
4. The survey organisation should facilitate the contribution of existing national and regional efforts and collections to the objectives of the survey, but should not itself acquire systematic collections. The survey would therefore further the discovery, organisation and publication of basic knowledge on the flora and fauna of Canada primarily through the encouragement and stimulation of existing resources in order to support, not compete with, other agencies.
5. The Natural History Survey should propose desirable projects to appropriate agencies. The fulfilment of specific entomological needs could also be assisted by the Natural History Survey acting in an advisory capacity, with respect to the scientific design of projects and contracts or the location of qualified personnel.
6. Government agencies should be encouraged to discuss their needs with the survey, through the development of appropriate mechanisms.

October 1981

## MEMORANDUM OF AGREEMENT BETWEEN THE NATIONAL MUSEUM OF NATURAL SCIENCES AND THE ENTOMOLOGICAL SOCIETY OF CANADA

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Advice of an expert Scientific Committee for the  
Biological Survey of Canada (Terrestrial Arthropods)

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### Setting

1. The objective of the Biological Survey referred to herein is to promote knowledge of the insects and related arthropods of Canada, with respect to faunal composition and history, systematics, distribution, biological properties, ecological including environmental and economic significance, and how they are affected by the activities of man.
2. The permanent organization for such a program comprises a Secretariat, constituted through the National Museum of Natural Sciences, and a Scientific Committee, an expert advisory group representative of relevant discipline areas, geographical regions, and organisations, constituted through the Entomological Society of Canada.

### Roles of the Scientific Committee

1. The Scientific Committee is to provide expert advice as necessary to the Secretariat for the Biological Survey, and to the National Museum of Natural Sciences, on all aspects of the Biological Survey with respect to terrestrial arthropods, and especially to consider and advise on scientific needs from a national perspective.
2. The roles of the committee and its members therefore include the encouragement of the Biological Survey effort through discussion and examination of policies and resources for systematic and faunistic work in Canada, and the facilitation of coordination and cooperation among individuals and institutions as amplified in the statement by the National Museum of Natural Sciences on the Natural History Survey.

3. These roles are to be effected through appropriate means, to include:
  - Two annual meetings of the full committee.
  - Submission to the National Museum of Natural Sciences, through the Secretariat, of the minutes of such meetings.
  - Submission to the National Museum of Natural Sciences of an annual report that summarizes project activities, and that provides a long-term perspective on the development of the biological survey objectives.

#### Composition of the Committee

The Scientific Committee will comprise: the director and one other member of the Secretariat, nominated by the Entomological Society of Canada for non-concurrent 3-year terms; 15 expert individual scientists from across Canada active in the field, two of whom are to serve as Chairman and Vice-Chairman of the Scientific Committee for non-concurrent 3-year terms; in addition, the Director and one other representative of the National Museum of Natural Sciences, the Director and one other representative of the Biosystematics Research Institute, and the President of the Entomological Society of Canada.

#### Basis of Cost

Expenses will be paid at actual cost for members of the Scientific Committee on business under the terms of this contract, according to current guidelines for travel and living expenses of Government employees not to exceed (1980-81):  
\$4,000 per meeting of the full committee  
\$1,000 per annum for subcommittee and other related work.

Expenses to be paid on receipt from the Society of claims, properly documented.

#### Roles of the Secretariat

1. The Secretariat will implement the objectives of the Biological Survey of Canada (Terrestrial Arthropods) in consultation with the Scientific Committee. The roles of the Secretariat therefore include:
2. The organisation, with the chairman of the Scientific Committee, of twice-yearly meetings of the Scientific Committee, including participation in the preparation of agenda and background documents, and the preparation of minutes.
3. Maintenance of up-to-date registers of personnel, programs, facilities, collections, existing surveys, potential sites for survey-orientated field-work, and methods for faunal work.
4. Maintenance of contacts with entomologists across the country, by periodical travel to relevant institutions, to facilitate updating of the information noted in item 3 above, and to encourage cooperation and liaison.
5. Participation in the proposal of desirable projects to appropriate agencies, and in the development of appropriate mechanisms for various agencies to communicate their needs to the survey.
6. Conduct of scientific research, to include field or experimental participation, and preparation of scientific publications, especially those that synthesize available information relevant to survey goals.

## ESC PUBLICATION

Laboratory Cultures of Insects and other Arthropods in Canada compiled by S. Kelleher for Entomological Society of Canada. For copies write Dr. J.S. Kelleher, Scientific Information Retrieval Section, Research Program Service, Research Branch, Agriculture Canada, Ottawa, Ontario K1A 0C6

## PERSONALIA

John M. Webster, Associate Academic Vice President of Simon Fraser University will add the title of Dean of Graduate Studies to his current ones beginning in September. Dr. Webster succeeds Professor Brian P. Beirne who has served as dean for the past three years.

## ESC SCIENTIFIC COMMITTEES

### Biological Survey of Canada (Terrestrial Arthropods)

G. G. E. Scudder (chairman)	Vancouver
J. M. Campbell	Ottawa
R. A. Cannings	Victoria
M. H. Colbo	St. John's
K. G. Davey	Toronto
J. A. Downes	Ottawa
P. P. Harper	Montreal
J. V. Matthews	Ottawa
D. K. McE. Kevan	Ste. Anne De Bellevue
R. D. McMullen	Summerland
S. B. Peck	Ottawa
G. Pritchard	Calgary
D. M. Rosenberg	Winnipeg
J. R. Spence	Edmonton
D. D. Williams	Scarborough

#### Secretariat

H. V. Danks	Ottawa
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#### Representing National Museum of Natural Sciences

F. H. Schultz, Acting Director
D. E. McAllister

#### Representing Biosystematics Research Institute

G. A. Mulligan, Director
I. M. Smith

#### Representing Entomological Society of Canada

G. B. Wiggins, President	Toronto
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### Cost of Destructive Insects in Canada

F. L. McEwen (chairman)	Guelph
E. A. C. Hagley	Vineland
C. R. Harris	London
A. W. MacPhee	Kentville
P. Martel	St. Jean
R. D. McMullen	Summerland
J. A. Shemanchuk	Lethbridge

#### Secretariat

J. A. George	London
M. Stemeroff	Guelph

### Study of Entomological Manpower in Canada, 1976 to 1986

F. L. McEwen (chairman)	Guelph
C. R. Harris	London
H. J. Herbert	Kentville

#### ESC Employment Committee

D. J. Madder	Guelph
R. S. MacDonald	Guelph
G. B. Kinoshita	Toronto
S. M. Smith	Toronto

## RETIREMENT

John W. Arnold, Ph.D., a Research Scientist in the Experimental Taxonomy Unit, Biosystematics Research Institute, Ottawa will retire on 31 March 1982, after completing 36 years of continuous service. His work has included insect haematology and toxicology. He will continue his association with BRI as an Honorary Research Associate.

## BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS) AQUATIC INSECTS OF NEWFOUNDLAND

The aquatic insects of Newfoundland are particularly interesting because they appear to represent a relatively simplified boreal fauna, in an area which is more accessible for study than many other regions of the country. In addition, because Newfoundland is isolated from the mainland, a comparison with mainland faunas suggests rewarding biogeographical implications. The fauna appears to be mainly of postglacial origin, at a considerable distance from ice-age refugia to the south, and the possibility of regional offshore refugia remains a question of considerable interest. From a present-day standpoint, moreover, strong maritime influences in Newfoundland, especially along the coast, provide variations in climate not found elsewhere in the range of most of the species, and this may give further insight into the various factors that influence populations of the aquatic insects.

A project to survey the aquatic insects of Newfoundland was initiated in mid-1977 by M.H. Colbo, during the Pilot Study for a Biological Survey of the Insects of Canada, and D.J. Larson soon joined the project when he arrived to take up an appointment at Memorial University in the fall of that year. Locally collected material was very limited and therefore a general sampling program was undertaken. Substantial collections have now been assembled. The major portion of these resulted from collecting trips of D.J. Larson to several areas around the Island. Other individuals such as R.F. Morris, and agencies such as Provincial Parks, also provided material.

To date, two manuscripts ready for publication have been completed. One, by J. Marshall and D.J. Larson, treats adult Trichoptera and is based on the M.Sc. thesis of J. Marshall, considerably expanded as the result of D.J. Larson's more complete sampling of the adult caddisfly fauna. This is to be published in the occasional papers of the Biology Department, Memorial University. The second manuscript is entitled "The Aquatic Insects of Newfoundland: Some Biogeographic Considerations" by D.J. Larson and M.H. Colbo, and was prepared for a proposed book edited by R. South of the Department of Biology, Memorial University, entitled "Biogeography and Ecology of the Island of Newfoundland". Final acceptance of this manuscript has not yet been received. Works on the mayflies and the aquatic Hemiptera are now being prepared, and D.J. Larson is continuing his long-term studies on the Dytiscidae. We have also investigated the Plecoptera and Odonata fauna but the species present on the Island have for the most part been recorded by previous researchers.

The considerable task of investigating the ecology of the groups is only beginning. Detailed studies on the ecology of the Island's fauna compared to the ecology of similar species or habitats elsewhere will be the long term aim. These studies are expected to provide valuable contributions to understanding aquatic systems.

We believe that our main role in the future will be to follow up some of our own preliminary observations in the groups of interest to us, and to act as contacts to coordinate work on the island conducted by other researchers. Thus, we would appreciate hearing of relevant work that is being planned, and we should be able to provide background information or call attention to previous studies, help to avoid duplication of effort, and offer suggestions (based on our experience as outlined above) that may enhance the results of the proposed research.

Entomologists planning studies in Newfoundland and others interested in this project are invited to write to:

Dr. M.H. Colbo  
Research Unit on Vector Pathology  
Memorial University of Newfoundland  
St. John's, Newfoundland  
A1C 5S7

Dr. D.J. Larson  
Department of Biology  
Memorial University of Newfoundland  
St. John's, Newfoundland  
A1C 5S7



## NOMINATIONS FOR THE 1982 BALLOT

### Second Vice-President

Susan B. McIver  
Department of Zoology  
University of Toronto  
Toronto, Ontario, M5S 1A1

R.H. Storch  
Department of Entomology  
University of Maine  
Orono, Maine, 04469  
U.S.A.

### Directors-at-Large

J.M. Campbell  
Biosystematics Research Institute  
Central Experimental Farm  
Ottawa, Ontario, K1A 0C6

G. Kinoshita  
Cyanamid Canada Inc.  
2255 Sheppard Avenue East  
Willowdale, Ontario, M2J 4Y5

J.A. McLean  
Faculty of Forestry  
University of British Columbia  
Vancouver, B.C., V6T 1W5

### Fellowship Selection Committee

J.A. Downes  
Biosystematics Research Institute  
Central Experimental Farm  
Ottawa, Ontario, K1A 0C6

D.K. McE. Kevan  
Department of Entomology  
MacDonald Campus of McGill University  
Ste. Anne de Bellevue, P.Q., HOA 1G0

H.R. MacCarthy  
4026 West 38th Avenue  
Vancouver, B.C., V6N 2Y9

Additional nominations from members must be submitted not later than 30 April 1982, to the Secretary, Dr. H.G. Wylie, Agriculture Canada Research Station, Winnipeg, Manitoba, R3T 2M9.

R. Brust  
G.H. Gerber  
S.R. Loschiavo (Chairman)  
Nominating Committee

## MEETING ANNOUNCEMENTS

American Institute of Biological Sciences will hold its 33rd annual meeting from 8-12 August 1982 at Pennsylvania State University, University Park, PA. Some participating societies are the Association for Tropical Biology, Ecological Society of America, and Society for Invertebrate Pathology. For further information write: The AIBS Meetings Department, 1401 Wilson Blvd., Arlington, VA, 22209, U.S.A.

Fifth International Congress of Parasitology, 7 - 14 August 1982, Sheraton Centre, Toronto, Canada. Included will be a workshop on "Recent Advances on Biology and Control of Arthropod Parasites of Animals" comprising these sessions with invited speakers: 1) Immune relationships of arthropods and hosts; 2) Myiasis in livestock; 3) Ticks; 4) Biting Flies. Contact: T. K. R. Bourns, ICOPA-V, Department of Zoology, University of Toronto, Toronto, Ontario, Canada M5S 1A1.

**ANNOUNCEMENT  
ENTOMOLOGICAL SOCIETY OF CANADA  
POSTGRADUATE AWARDS 1982**

The Entomological Society of Canada will offer two postgraduate awards to assist students in undertaking graduate study and research leading to an advanced degree in entomology. The awards will be made to men or women on equal terms on the basis of high scholastic achievement.

The purpose of this announcement is to outline the eligibility requirements, the method of application, and the regulations governing the use of the awards.

All communications regarding the awards should be addressed to:

Dr. H. G. Wylie, E.S.C. Secretary  
Research Station, Agriculture Canada  
195 Dafoe Road  
Winnipeg, Manitoba R3T 2M9

**POSTGRADUATE AWARDS**

Two Postgraduate Awards valued at \$1,000.00 each for 12 months will be awarded for postgraduate study and research in entomology in Canada.

**Eligibility**

The successful candidates must be either Canadian citizens, or landed immigrants with baccalaureates from a Canadian university. Candidates must be enrolled in their first year of postgraduate studies during the year 1982. The awards are conditional until the recipients have provided evidence that they have been accepted by a graduate school to engage, during 1982, in a programme of study and research for an advanced degree with full graduate student status. Failure to provide this evidence will result in cancellation of the award. Before the scholars may receive their award, a statement must be provided by the Dean of Graduate Studies at the university of tenure certifying that the student has been accepted for graduate studies and research with the full status of a graduate student. A scholar who enters a graduate school as a qualifying candidate is not eligible to hold a Postgraduate Award of the E.S.C. An award to a student who was unable to gain admission to a graduate school as a fully qualified student will be cancelled.

**Tenure**

The Entomological Society of Canada Postgraduate Awards are granted for tenure in Canada. A successful candidate may carry out his or her postgraduate research at the Canadian university of his or her choice. Tenure may commence on or after January 1982 but not later than the date on which the academic year begins.

**Method of Application**

The Entomological Society of Canada Postgraduate Award will be announced before 1 October 1982. Candidates 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 not later than 15 June 1982.

**REGULATIONS**

**Demonstrating and Instructing**

An Award holder is permitted under normal circumstances to demonstrate or instruct for a maximum of 200 hours per annum, provided that the Head of his or her department considers it desirable and that it does not hinder the progress of his or her work. An Award holder may accept remuneration for such work at the rate in effect at the university concerned.

**Emolument from Other Sources**

Apart from demonstrating and holidays, an Award holder will devote his or her whole time to study and research and will not undertake any paid work, but he or she may hold another award or scholarship.

## Transfers

After a postgraduate award is made, any change in the course of study or in the university of tenure requires prior approval of the Entomological Society of Canada Scholarship Committee. A request for permission to transfer must be supported by statements from each Head of department concerned.

An award is made on conditions that the winner engage in a programme of graduate studies and research for an advanced degree in Entomology. Students who, after receiving the Award, decide to transfer to a graduate programme other than entomological cease to be eligible and their award will be cancelled.

## Absence through Illness

If, on account of illness, an Award holder is absent continuously for more than two weeks, the Scholarship Committee of the Society should be notified.

## Payment of the Award

The Awards will be paid in January 1983 on receipt of a report of satisfactory progress from the supervisors.

## 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.

# AVIS BOURSES DE LA SOCIÉTÉ ENTOMOLOGIQUE DU CANADA POUR ÉTUDIANTS POST-GRADUÉS 1982

La Société Entomologique du Canada offrira deux bourses aux étudiants en études post-graduées et recherche en préparation d'un diplôme supérieur en entomologie. Les bourses seront accordées aux étudiants ou étudiantes en raison des seuls critères de réussite académique.

Le but de la présente est de préciser les conditions d'éligibilité, le processus de demande et les exigences rattachées à ces bourses.

Toute correspondance relative aux bourses doit être adressée à :

Dr. H. G. Wylie, secrétaire S.E.C.  
Research Station, Agriculture Canada  
195 Dafoe Road  
Winnipeg, Manitoba R3T 2M9

## BOURSES D'ÉTUDES POST-GRADUÉES

Deux bourses d'études post-graduées d'un montant de \$1,000.00 chacun seront accordées pour 12 mois à deux étudiants en travaux de recherches entomologiques au Canada.

## 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 doivent être inscrits en première année d'études post-graduées durant l'année courante 1982. Les bourses ne seront accordées qu'ilorsque les candidats auront soumis un dossier démontrant qu'ils sont enregistrés aux études supérieures pour l'année courante 1982 et que leurs programmes établis en vue d'un diplôme supérieur donne tous les privilèges rattachés au statut d'étudiant post-gradué. A défaut de ce dossier, la bourse sera annulée. Avant de recevoir leur bourses, le Doyen de l'École des Études Supérieures aura soumis par écrit un témoignage d'authenticité du programme d'études et de status de les étudiants. Un étudiant qui s'inscrit en vue de compléter l'obtention de crédits ne peut pas faire une demande pour la bourse de la S.E.C. Si la bourse était accordée à un candidat qui n'aura pu obtenir son admission à une École de Gradués, celle-ci sera annulée.

## Endroit

Les bourses ne peuvent être obtenues qu'au Canada. Les candidats pourraient s'inscrire à l'université de leur choix. Les bourses prendront effet en janvier 1982 ou plus tard sans excéder la date du début de l'année académique.

## Formalités de la demande

Les bourses seront annoncées avant le 1<sup>er</sup> octobre 1982. 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 1982.

## RÈGLEMENTS

### Démonstration et cours

Un boursier pourra dans de circonstances normales donner des séances de cours ou de démonstration 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. Un boursier peut accepter une rémunération au taux normal à l'université où il se trouve.

### Autres sources de revenus

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

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 S.E.C. Une telle demande doit être accompagnée de documents provenant des deux Chefs de départements concernés.

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. Les boursiers qui décideront de changer d'orientation pour d'autres disciplines que l'entomologie deviendront inéligibles et se verront retirer leur bourse.

### Absence pour maladie

Si, pour en raison de maladie, un boursier est absent pour plus de deux semaines, il doit en informer le Comité de Sélection de la Société.

### Paiement de la bourse

Le paiement d'une bourse se fera au cours de janvier 1983 sur réception d'un rapport satisfaisant du professeur du boursier.

### 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.

## PUBLICATIONS OF RESEARCH JOURNALS BY NRCC TO CONTINUE

E.S.C. received a letter from B. A. Gingras, Vice-President, External Relations, National Research Council of Canada and C. T. Bishop, Editor-in-Chief, Research Journals that read in part: "It is a great pleasure to inform you that we have received a Treasury Board decision that publication of the research journals, on the same basis as presently done, will remain as a continuing program within NRCC. ...we appreciate the vigorous support for our position that came from societies and individuals in the Canadian scientific community. ...your representations to Cabinet Ministers were important to the eventual outcome".

Dr. G. B. Wiggins, E.S.C. President has written to the President of the Treasury Board and the Minister of State for Science and Technology expressing the Society's appreciation for their help in reaching this decision.

## A HERITAGE COMMITTEE — WHY?

Some may be surprised, as I was, to find that some of our members do not know of the existence of the Heritage Committee of the Entomological Society of Canada. To some it seems more appropriate to call it the Archives Committee. The name does not matter but the purpose and goals of the Committee are important. These are: "...to collect and deposit for safekeeping information and objects of future historic interest...to service requests for information...to prepare information of members...etc."

To date we have deposited records, publications, minutes, etc. of the E.S.C., and most of its provincial or regional affiliates, with the Public Archives of Canada. Here they are classified, catalogued, and stored but also made available to anyone who has an interest in entomological activities. Some photographs are also deposited there. The amount of material, however, is woefully small, especially when you consider that our Society has been in existence for over a century.

What can, and should we do about it? What kinds of things does one collect and preserve to remind us of our heritage? Here, to start things off, is a very short list of items that every member should look for in her/his files of memorabilia:

1. Programs of Annual Meetings of the E.S.C., prior to 1951, and after 1971.
2. Programs of all annual meetings of all Affiliate Societies.
3. Photos of Governing Boards (1863-1981); of members (group photos) at annual meetings. (Remember that all people, places, sites, etc. must be identified on a photo, or it means nothing!)
4. Biographies of members, past and present, with photo and curriculum vitae.
5. Local histories of projects, groups, or institutions; e.g. the Parasite Lab at Belleville, or the Forest Entomology group at Winnipeg.
6. Copies of minutes of Annual Meetings of the E.S.C. and of the Affiliate Societies.
7. Annual Financial Statements of Regional Societies. (These will make interesting reading in the year 2025, even if inflation slows down.)

The list could be extended and become as extensive as the ideas from fertile minds. Every entomologist has some item of archival interest hidden among the collected mementos of the past. If these were all unearthed and gathered in one place, it would make an impressive sight. Therefore, why not make an impressive archival collection? Dig into your files, your desk drawers, and search your notes for items of entomological interest. Send these to me; I will sort, evaluate, and send them to the Public Archives. Those items that are rejected, or are superfluous, will be returned to the sender, if so requested.

Please preserve our Society's heritage; send your items, be they ever so small or meagre, to the Chairman of the Heritage Committee: Dr. P.W. Riegert, Department of Biology, University of Regina, REGINA, Saskatchewan. S4S 0A2

## LA PUBLICATION DES REVUES SCIENTIFIQUES -UN PROGRAMME PERMANENT DU CNRC

SEC a reçu une lettre de B. A. Gingras, Vice-président (Relations extérieures), Conseil national de recherches Canada et de C. T. Bishop, Directeur général, Journaux de la recherche scientifique, citant en part: "C'est avec plaisir que nous vous faisons part de la décision du Conseil du Trésor à l'effet que la publication des revues scientifiques demeurera, dans sa forme actuelle, un programme permanent du CNRC. ...soyez assuré que nous avons apprécié l'appui énergique reçu des sociétés et des personnes de la communauté scientifique canadienne. ...vos représentations auprès des ministres du Cabinet ont joué un rôle déterminant dans cette décision."

Dr. G. B. Wiggins, SEC président a écrit au Président du Conseil du Trésor et au Ministre d'État à la Science et à la Technologie de leur exprimer notre appréciation de cette décision.

**NEARCTIC ENTOMOLOGY, CONTINENTAL COOPERATION**  
**Entomological Society of America, Entomological Society of Canada,**  
**Entomological Society of Ontario**

November 29 - December 3, 1982  
 Royal York Hotel, Toronto, Ontario

**Paper Presentation Notice**

The form below must be completed and postmarked on or before June 30, 1982 deadline when received by the Program Chairman. There will be no exceptions to this deadline.

There will be 4 formats for papers presented at the 1982 Toronto Meeting: (1) a 10-minute presentation with 2 minutes for discussion; (2) a paper by title and abstract only; (3) a display presentation; and (4) a 12-minute presentation entered in the student competition. Details on the four formats are printed on the previous pages. Please consult these pages before submitting a paper title. These formats are designed to give the program flexibility and provide more participation. When submitting your title, please state your choice of format. However, there will be no guarantee that everyone's choice of format can be honored. Notification of time of presentation and format will be made after program arrangement is completed. Each individual will be restricted to either one 10-minute paper, one symposium paper, one title and abstract, one poster presentation, or one entry in the student competition.

Submission of a 50-word synopsis is required to aid in assigning papers and displays to sections. They will not be printed in the program. The synopsis is also required for the title and abstract papers; and the author is responsible for providing 50 copies of his/her abstract to the Program Chairman.

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 CUT ALONG LINE

PLEASE TYPE

Mail to: Dr. F.L. McEwen, Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

Title of paper (not to exceed 15 words): \_\_\_\_\_  
 \_\_\_\_\_

To be read by: \_\_\_\_\_  
 (Note: Paper must be read by one of the authors)

Author name(s): \_\_\_\_\_  
 (First) (Middle Initial) (Last)

Institution and address: \_\_\_\_\_  
 \_\_\_\_\_

Zip \_\_\_\_\_ ( ) Tel. No. \_\_\_\_\_

CHECK SECTION PREFERENCE:

- |   |                          |                            |
|---|--------------------------|----------------------------|
| A. Systematics, Morphology, Evolution           | Cd. Behavior & Bionomics | Independent Sub-sections   |
| B. Physiology, Biochemistry, Toxicology         | D. Medical & Veterinary  | Acarology                  |
| Ca. Biological Control                          | Ea. Extension            | Aquatic Insects            |
| Cb. Apiculture & Social Insects                 | Eb. Regulatory           | Teaching                   |
| Cc. Insect Vectors in Relation to Plant Disease | F. Crop Protection       | Pests of Ornamental Plants |

FORMAL PREFERENCE: T & A only; 10-minutes; Display; Student Competition

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 THIS SPACE FOR USE BY PROGRAM COMMITTEE

Section	Date	Day	Time	Paper No.	Received	Misc.
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**Joint Meeting of the Entomological Society of America,  
the Entomological Society of Canada and the  
Entomological Society of Ontario**

Royal York Hotel, Toronto  
November 29 - December 3, 1982

**NEARCTIC ENTOMOLOGY, CONTINENTAL COOPERATION  
Description of Paper Categories for the Toronto Meeting**

10-Minute:

A formal presentation of research information and data that has had an extensive background of study and from which some definite conclusions can be drawn. Two minutes will be allowed after the presentation for brief questions and change of speakers. A 50-word abstract is required upon submission.

It is our plan that submitted papers will be allocated 12 minutes (10 minutes for presentation plus 2 minutes for discussion). If, however, the number of submitted papers is large, it may be necessary to restrict them to 10 minutes. Authors will be advised in August, the time at which their paper will be scheduled and the amount of time allotted.

Student Competition:

A special feature of the Toronto meeting will be a student competition and a prize awarded in each section (2 in Section C) for the best presentation. These papers will be presented on Wednesday morning with 15 minutes (12 for presentation, 3 for discussion and speaker change) allotted to each speaker (see additional details). The Program Committee hopes students will elect to present their papers in this competition and highlight the role of students in the Entomological Societies.

Title and Abstract only:

This provides for the dissemination of information *in lieu* of an oral presentation. Each submitted title must be accompanied by a 40-word abstract that summarizes significant results. The title and author(s) will appear in the program. In addition, the title and author(s) will be identified at the close of the respective session so that people interested in the subject can contact the author(s) for further information. Authors are responsible for providing 50 copies of the title and abstract to the program chairman.

Display Presentation:

These, often referred to as "poster sessions", are a presentation by exhibit and provide the author(s) a chance for in-depth discussion with other scientists interested in the area of work. Display areas will be assigned to authors for a specific period of time with several displays running concurrently in a given room. The display area from each presentation is a poster board 1.3 m high by 2 m wide in a free-standing aluminum frame. An abstract of about 50 words is required outlining the research to be presented. A short, concise title is required. The Program Committee will put the title, in prominent black lettering, on the display panel assigned to the author.

Special Note: In recent years, travel constraints, particularly on government scientists in both Canada and the United States, have resulted in a large number of paper cancellations in the annual meetings. This is very disruptive to the program. It is requested that authors, prior to submission of titles, will obtain reasonable assurance that they will be attending the meeting.

Deadline for submission of title - 30 June 1982

Authors are restricted to a single presentation at the annual meeting; either a symposium paper, 10-minute paper, a title and abstract, or poster presentation.

For many years, the 119-year-old Entomological Society of Ontario has held an annual competition for student papers. For the upcoming joint annual meeting, where the ESO is host, this competition will be extended to be "open" to all participating students and six prizes will be awarded, one in each of 4 sections and 2 in Section C as follows:

- A: Systematics, Morphology and Evolution
- B: Physiology, Biochemistry and Toxicology
- C: Ecology, Behaviour and Bionomics (2 sections)
- D: Medical and Veterinary Entomology
- E: Crop Protection Entomology

The six competitions will run concurrently on Wednesday morning, December 1, and will be chaired by the Section Chairmen or their delegates. A panel of three judges will be evaluating each of the competitions. The judges are appointed by the President of the ESO, but will be drawn from among the attending memberships of all three societies on the advice of the Section Chairmen.

Unfortunately, we will not be able to devote more time to the student competition than Wednesday morning. Thus it may be necessary to restrict the number of speakers if more than 15 submit abstracts for any one section. In such an event, the judges will select the 15 best abstracts. It is, therefore, important that participants pay considerable attention to the composition of their abstracts.

The judges will be guided by a precise set of criteria that are summarized on an evaluation form. A copy of this form will be sent to each participant upon submission of the abstract. The three completed evaluation forms covering each presentation will be sent to the contestants, since the organizing committee feels that such feedback from the judges will be of educational value to the contestants.

All students are eligible to enter; "student" is defined as a person who is registered at an institution of postsecondary education proceeding towards a degree or a person who has been awarded a degree within the current calendar year (i.e. 1982).

Each of the six prizes will consist of \$100-plus a certificate. The prizes will be awarded at the Thursday noon luncheon.

It should be pointed out that 1) students may submit papers in the regular submitted paper sessions instead of the competition if they so wish. 2) Any paper submitted for the competition which is not accepted (only in case more than 15 per category are submitted), will be automatically scheduled in a regular session unless the author wishes to withdraw it.

## NEARCTIC ENTOMOLOGY, CONTINENTAL COOPERATION

Joint Meeting, Toronto

### Informal Conferences, and Workshops

Members planning to organize Informal Conferences or Workshops on specialized topics are required to contact the Program Chairman before May 1.

In case of closely related proposals, the submitting members will be contacted and requested to arrange for a common theme. In the event that more proposals are received than can be accommodated for reasons of space and time, the final subject selection will be determined by the Program Committee.

When submitting proposals, provide the title, proposed moderator, anticipated attendance and projection equipment needed. Please provide, also, an indication of the audience it will likely attract. This will help the Program Committee in scheduling this in relation to other events in which the same audience may have



an interest.

Submit details to: Dr. F.L. McEwen, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

Deadline: Please submit details as early as possible. Deadline June 1.

### Symposia

The number of symposia is restricted to 3 in each of Sections A,B,D and F; 4 in Section C; and 5 in Section E.

These symposia must be developed in consultation with the section chairman. Some section chairmen have published earlier deadlines to meet their specific needs but for all others, the deadline is June 1.

Members planning symposia should contact the following:

Section A - Dr. F.C. Thompson, Systematic Entomology Lab.,  
ARS, United States Department of Agriculture,  
c/o US National Museum, Washington, D.C. 20560 USA

Section B - Dr. U.E. Brady, Department of Entomology, University of Georgia,  
Athens, GA 30602 USA

Section C - Dr. R.M. Weseloh, Connecticut Agricultural Experiment Station,  
P.O. Box 1106, New Haven, CT 06504 USA

Section D - Dr. J.R. Anderson, Department of Entomology & Parasitology,  
University of California, Berkeley, CA 94720 USA

Section E - Dr. D.E. Barnett, 6505 Belcrest Road, Room 665-A,  
Hyattsville, MD 20782 USA

Section F - Dr. S.L. Poe, Department of Entomology, VPI & SU,  
Blacksburg, VA 24061 USA

Details of the symposia must include title, proposed moderator, speakers and the titles of their presentations, anticipated attendance, Section affiliation, and projection equipment required. Details must be sent by June 1 to the Program Chairman: Dr. F.L. McEwen, Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

### Formal Conferences

Formal conferences must be arranged in consultation with the chairman for the formal conference.

Details must include title, proposed moderator, anticipated attendance, Section affiliation (where appropriate) and projection equipment required.

Details must be submitted to the Program Chairman by June 1.

### Notice to Members

1. The privilege of presenting papers at the Joint Meeting in Toronto is reserved for members in good standing of any of the three participating Societies. However, there are certain exceptions. Non-entomologists who are members of other professional societies may present papers which are co-authored by members of one or more of the participating entomological societies. In addition, entomologists from other countries who may be temporarily studying or working in Canada or the United States and who are members of entomological societies in their own country, may present a submitted paper. These restrictions do not apply to non-members who are invited to present papers. No member shall be permitted to read more than one submitted paper, but may serve as co-author on other papers.

2. Policy on slides - Speakers are encouraged to have slides organized in standard Kodak carousel slide trays and bring these directly to the meeting room at least 10 minutes prior to the beginning of the session. Extra carousels will be available in the meeting rooms and speakers should organize their slides at least 10 minutes before the beginning of the session. Also, a projection room will be available 8:00 AM - 5:00 PM for previewing slides. Be sure to retrieve your slides at the conclusion of the session.

3. Slides are to be made as uncluttered as possible. As a courtesy to color-blind members, try to avoid red and green colors, substituting blue, orange or yellow. LIMIT DATA TO 14 SINGLE-SPACED LINES (INCLUDING TITLE) PER SLIDE. Use cardboard-mounted 2" x 2" slides only. For additional information refer to "Guidelines for Preparing Slides for Use in Oral Presentations." Bull. Entomol. Soc. Am. 23(4): 255.

4. Display Presentation - Keep the display simple. All drawings and illustrations should be enlargements readable from a distance of 1 m or more. Presentation at this time is 1 hour - subject to change.

5. Time Limits - The 10-minute maximum for the presentation of submitted papers will be enforced. If discussion is desired beyond 2 minutes, presentation time must be shortened.

6. The Toronto meeting will be 4 days, Monday afternoon through Friday noon. Pre-meeting conferences and post-meeting events will be publicized in BULLETINS and NEWSLETTERS of the participating Societies.

7. Authors presenting papers that would be of public interest, or of interest to science editors, should prepare 25 copies of a newspaper-type summary of his/her paper and turn it in at the Press Room at the Toronto meeting.



STATUS AND  
RESEARCH NEEDS  
OF  
CANADIAN SOIL  
ARTHROPODS

A brief prepared by the  
Biological Survey of Canada (Terrestrial Arthropods) — 1982

# ÉTAT ET BESIIONS DES RECHERCHES SUR LES ARTHROPODES TERRICOLES DU CANADA

## Résumé

Cette communication fait remarquer que la connaissance des arthropodes terricoles du Canada est étonnamment insuffisante. Bien que la faune terricole soit relativement riche, surtout dans les habitats septentrionaux caractéristiques de notre pays, on sait très peu de chose sur les groupes typiquement terricoles, et en particulier sur leur taxonomie.

La faune terricole est abondante et importante au point de vue écologique, surtout pour la décomposition et le recyclage des éléments nutritifs, donc d'un intérêt immédiat pour les activités qui, comme l'agriculture et la sylviculture, dépendent de la fertilité des sols. Certaines espèces d'arthropodes terricoles ont une importance directe comme animaux nuisibles et d'autres servent d'espèces indicatrices, d'agents de contrôle biologique ou d'aides pédagogiques.

Les lacunes qu'accusent les connaissances à ce sujet se manifestent principalement au sujet des formes immatures, en particulier chez les groupes qui rassemblent de nombreuses espèces, comme les mites, les podures et les mouches; cependant, moins de la moitié de nos espèces terricoles - qu'on estime du nombre de 18 000 ou davantage - sont décrites, même pour la phase adulte. Ces lacunes résultent du peu d'appui que reçoit généralement l'étude des arthropodes terricoles à l'heure actuelle. Le manque de compétences taxonomiques est un problème fondamental qui entrave grandement le travail écologique. Cette communication tente d'ouvrir la voie aux initiatives et aux démarches visant à améliorer cette situation que permettront les circonstances.

## Abstract

This brief points out that knowledge of soil arthropods in Canada is strikingly deficient. Although the fauna of the soil is relatively rich, especially in the northern life-zones characteristic of the country, the expertise available in typical soil groups is very limited, especially in taxonomy.

The soil fauna is abundant and ecologically important, particularly in decomposition and nutrient-cycling, and hence of immediate concern in activities such as agriculture and forestry that depend on soil fertility. Some species of soil arthropods are directly important as pests, and others may serve as indicator species, agents of biological control, or aids for teaching.

Deficiencies of information are greatest for immature forms, especially in groups that contain many species, such as mites, springtails and flies; however, fewer than half of our estimated 18,000 or more soil species have been described even in the adult stage. These deficiencies reflect a general lack of support for study of soil arthropods at the present time. A basic problem is the lack of taxonomic expertise, which in turn greatly hinders ecological work. This brief is intended to provide a basis for initiatives and representations that can be made as circumstances permit to improve this situation.

## INTRODUCTION

The Biological Survey of Canada (Terrestrial Arthropods) develops and coordinates national initiatives in taxonomic and ecological entomology on behalf of the National Museum of Natural Sciences and the Entomological Society of Canada. Several active projects have been selected for special emphasis because of their particular scientific importance. The arthropods of the soil were readily recognized as an area of particular concern, but an active project could not be developed in this case because resources are inadequate; instead the importance of soil forms is indicated in this brief, which thus points out a significant deficiency in the national entomological effort. The brief is intended to provide general support for the development of appropriate studies in the future.

The enormous gap in our knowledge of soil animals has been recognized for over a decade, as the following statement for invertebrates other than insects (Lindsey *et al.* 1970) demonstrates: "Canada has no basic faunal studies of invertebrates compared to the extensive and well-illustrated series of books 'Fauna of the U.S.S.R.'. The abortive 'Canadian Fauna' series of the Fisheries Research Board, started some 40 years ago, has been discontinued. Except for molluscs, there is no check list of Canadian species in any major invertebrate group (and in the mollusc check list perhaps 50% of the identifications are erroneous)... Taxonomy of Canadian freshwater and land invertebrates is not in much better shape. Earlier remarks concerning the state of knowledge of spiders [Araneae], mites [Acari] and nematodes are particularly applicable to Canada. A list of groups for which there are no adequate keys to Canadian species would include most Orders and most Families of the invertebrates."

Canadian arthropod groups that have been well documented are mainly not permanent soil forms. They include: the fleas (Holland 1949, (and in press)), ticks (Gregson 1956), dragonflies (see Corbet 1979), specific groups of insects and spiders in the recent (since 1977) handbook series from the Biosystematics Research Institute (including crab spiders), centipedes (Kevan 1979), and orthopteroids (Vickery and Kevan, in press). The knowledge of collembolans has been greatly improved by a recent treatment for North America (Christiansen and Bellinger 1980), but is still deficient. However, for the majority of true soil forms the situation today has changed little since 1970, and perhaps for the worse, when compared to other advanced countries. This is difficult to understand, because the soil arthropod fauna is ubiquitous, abundant, diverse and ecologically important.

## NATURE OF THE SOIL ARTHROPOD FAUNA

### Distribution

Soil arthropods occur wherever there is natural vegetation. Embryonic soils are populated by a few species, but the fauna of the soil grows in numbers and diversity to reach astronomical figures in mature forest soils. Virtually every arthropod Class, except the Pentastomida, is represented in one soil or another (Table 1). Some groups, such as the Acari and Collembola, are abundant even in cold arctic soils; others are significant only in localized areas. The majority of the taxa, listed in Table 1, are found throughout the country. The millipedes (Diplopoda) and terrestrial Malacostraca (some decapods, amphipods and isopods) are restricted to soils of the southern part of the country. The Dictyoptera, represented in the soil by termites, and Diplura are restricted to the southeastern and southwestern parts of Canada. The centipedes (Chilopoda) are absent only in the high arctic.

In Canada, and indeed in North America as a whole, an increasing fraction of the northern fauna is found in the soil, because the advantages of this habitat increase as climates become more harsh, since soil habitats are relatively warm and stable compared with the air.

### Abundance and diversity

Densities of 200,000 arthropods/m<sup>2</sup> should be common in Canadian soils, and 1,000,000 individuals/m<sup>2</sup> were obtained from a black spruce stand in southern Quebec (Behan *et al.* 1978). Over 8,000 species have been recorded from our soils and more than this number still remain to be discovered. The estimate of uncollected species is very conservative. Dondale (1979) estimated that there were five species of Pseudoscorpionida (Arachnida), but emphasized that the group was inadequately collected in Canada. We now know that over 50 species of pseudoscorpions occur in Canada

<sup>1/</sup> Developed by a subcommittee of the Biological Survey: V. G. Marshall (Chairman), D. K. McE. Kevan, J. V. Matthews, Jr., A. D. Tomlin

(D. K. McE. Kevan, pers. comm.). Similarly, the eight species of Protura estimated by Tomlin (1979) is small compared to the 40 known from Japan. Other comparable examples could be cited.

#### Ecological Importance

Nutrient cycling - Although the microflora is responsible for mineralization, soil arthropods greatly accelerate decomposition because they comminute organic matter. The majority of soil arthropods are saprophagous or obtain their food from fauna and flora that themselves feed on dead organic matter. They serve as a reservoir of nutrients that become available to plants when the arthropods die. Soil arthropods stimulate fungal growth by cropping, and disperse bacterial and fungal spores, thereby enhancing mineralization. They may also condition dead organic materials in other ways that facilitate microfloral action. These animals improve soil aeration and water status by burrowing and other activities and by opening passages occupied by decaying roots. Their role as decomposers is critical under Canadian conditions, because of the paucity of macrofauna, such as earthworms, in most soils. A better knowledge of soil arthropods could also contribute greatly to our understanding of global issues such as carbon dioxide evolution and nitrogen cycling. Nitrogen is an important element for plant growth and is universally deficient in forest soils. With the advent of "no-tillage" or "direct-drilling", the role of arthropods in agricultural soils takes on new importance.

Indicator species - Soil arthropods have the potential of being excellent indicator species, because of their relatively short life history and limited tolerance to changes in environmental conditions. However, such studies must be done at the species level: generic or suprageneric taxa are usually not sensitive enough to indicate the impact of human activities. Soil fauna might also be used as indicators of soil type. Such soil classification has been developed in the U.S.S.R. (Ghilarov 1965), but few attempts have been made in Canada to classify soil by its arthropod fauna. However, it has been suggested that the Diplopoda may be useful soil indicators for some of our forest lands.

Pests - Apart from Tardigrada, Araneae, "other arachnids", Pauropods, Chilopoda and Protura, all taxa listed in Table 1 contain pest species that feed on germinants or underground parts of living plants. Some proturans feed exclusively on mycorrhizal fungi, an interesting association that might have implications for reforestation work. In addition to feeding on plants, some groups affect man in other ways. Soil mites contaminate stored products, and some species of one suborder, the Oribatei, transmit helminth pathogens to vertebrates and are therefore important to veterinary medicine. Collembolans also infest stored products and well water. Mites, collembolans and millipedes sometimes invade houses in such numbers as to constitute a nuisance. Termites (Dictyoptera) and some Hymenoptera, for example carpenter ants, cause structural damage to buildings. Some Diptera are important for reasons of public health and preventive medicine.

Biological Control - Very little use has been made of soil arthropods to control pests. Ants are being investigated in Quebec as a potential agent for the control of insect pests in forests (Finnegan 1977; McNeil et al. 1978). Research with predaceous oribatid mites to control nematode pests is in progress in the U.S.A. (Rocket 1980), but no such work has been undertaken in Canada. Other potential control agents exist. Members of many other soil groups are predaceous (including spiders, some beetles, and larvae of various Diptera, for example). Several species of parasitoid Diptera and Hymenoptera are also associated with the soil.

Environmental impact studies - Knowledge of the effects of agricultural and forestry practices on soil arthropods is essential if we are to manage our soils wisely. Limited information on the results of some practices, such as burning and the application of fertilizers and pesticides, is available, but nothing is known in Canada about other potential hazards, such as mine spills, sewage sludges, forest biomass removal, acid rain and radiation.

Chemical and municipal waste dumps, for example, could benefit from using soil fauna as an index of the stability of waste storage. Before waste dumps are established, baseline studies of soil fauna in the proposed sites should be made for comparisons with the fauna after the dumps have been established.

Teaching aids - Soil arthropods are excellent organisms to study genetic, physiological, ecological and evolutionary hypotheses. Some arthropod Classes, for example mites and collembolans, show great diversity of species and numbers in closely integrated ecosystems. They are readily accessible throughout the year to any university classroom, for even samples of frozen soil yield large numbers of specimens.

## RESEARCH NEEDS

On the human time scale, soil is our most precious non-renewable resource. Canada is seriously lacking in the study of many phases of soil science, and particularly in sub-disciplines dealing with the fauna of the soil.

Table 1 points out several important deficiencies related to soil arthropods. There is a strong need for studying immature forms, especially in large taxa such as the Acari, Collembola and Diptera. Inadequate taxonomic knowledge also extends to adults, since more than half of our soil arthropods are still undescribed. This lack of taxonomic knowledge greatly hampers ecological work. The following quotation sums up this difficulty (Entomological Society of Canada 1974): "The first part of any impact assessment program is one of conducting an inventory on the biota in the area of proposed impact. We have tried to use this approach but, because of the tremendous diversity of...invertebrates (especially Insecta), the inadequate taxonomic knowledge of immature forms, and the paucity of collections... in the areas of our studies we have encountered insurmountable difficulties. Despite the fact that we have expended vast amounts of time and money tackling these problems, the results are not encouraging. The general feeling within the group is that we were foolish to have even tried. More important, however, is that we are unlikely to embark on such surveys again in future studies. Thus, we have a paradox. Lower level taxonomic identifications are essential for the experimental part of our program, but we cannot spend the time and money doing taxonomic studies because of constraints intrinsic to impact assessment groups. (I dare say that other groups not doing impact assessment have similar problems, too)."

Coupled with these inadequacies of taxonomic knowledge is the lack of Canadian specialists for many groups of soil arthropods. Seven of the groups (Tardigrada, Pauropoda, Diplopoda, Symphyla, Protura, Diplura, and some "other arachnids") are not being studied by Canadian taxonomists. In the recent compendium, Canada and its Insect Fauna (Danks 1979), sections on the tardigrades, pauropods, diplopods and symphylids were written by non-Canadian authors. Even where taxonomists are available, they are too few to cope with the formidable array of soil arthropod species. For example, fewer than 4 person-years in Canada are devoted to the taxonomy of soil mites and dipterous larvae combined, although each group contains thousands of soil-dwelling species.

## CONCLUSIONS

The Canadian soil arthropod fauna is an important heritage that deserves more study than it has received in the past. The greatest need is increased taxonomic information; this is a prerequisite to ecological studies focussed on nutrient cycling and relationships with the soil microflora, indicator species of soil conditions, pests, biological control, and environmental impact studies. There is, of course, also a need for studies in other areas, including physiology, morphology, and behaviour.

Our fragmentary knowledge of soil arthropods has been obtained chiefly over the past two decades, primarily from a small group of universities, and Canada Departments of Agriculture and Environment. Attempts should be made to strengthen such incipient "centres of specialization", and to encourage other agencies to include soil arthropod research as part of their future programs. Agencies that fund research should also be made aware of this major deficiency in the study of the Canadian fauna, so that the problem may be addressed through soil zoology working groups, "strategic" research support, solicited or unsolicited proposals, or other specific vehicles.

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Table 1. Major classes of arthropods in Canadian soils

Taxon	Estimated No. Spp. <sup>1/</sup>			No./m <sup>2</sup> in a forest site <sup>2/</sup>	Canadian specialists (PY) <sup>3/</sup>
	Recorded	Uncollected	With immature instars described		
TARDIGRADA	48	162	0	9,132	0
ARACHNIDA					
Aranese	800	100	0	214	2
Acari	1,000	5,000	60	168,000	3
Other arachnids	54	?	?	233	1
MALACOSTRACA	45	4	?	?	1
PAUROPODA	0	20	0	516	0
DIPLOPODA	47	23	1	258	0
CHILOPODA	31	9	15	82	0.2
SYMPHYLA	1	10	0	107	0
PROTURA	3	50	?1	660	0
COLLEMBOLA	400	150	-	17,500	2
DIPLURA	2	3	0	201	0
INSECTA					
Coleoptera	2,800	500	300	75	2 <sup>4/</sup>
Dictyoptera (Termites only) <sup>5/</sup>	5	0	5	?	0.2
Diptera	3,000	3,000	600	1,400	0.5
Hymenoptera	200	50	?	25	2
Lepidoptera	500	50	350	31	1
Other insects	20	10	?	1,189	0
<b>Total</b>	<b>8,956</b>	<b>9,141</b>	<b>1,331</b>	<b>199,623</b>	

1/ Based partly on Danks 1979, with non-soil forms excluded, and with more recent information added.

2/ Tardigrades from a Douglas-fir forest, B. C.; other figures from the Morgan Arboretum, southern Quebec (V. G. Marshall, unpubl.)

3/ PY = person years. These figures are intended only as general indicators of the effort applied to soil forms in the taxa listed.

4/ One working on larvae

5/ Excluding casual interceptions (non-soil forms)



**Published by**  
**The Entomological Society of Canada**  
Supplement to *Bulletin*, Vol. 14, No. 1  
March 1982

**Réunion collective de la  
Société entomologique des Etats Unis,  
la Société entomologique du Canada et la  
Société entomologique de l'Ontario**

Hôtel Royal York, Toronto  
29 novembre - 3 décembre 1982

**ENTOMOLOGIE NÉARTIQUE ET COOPÉRATION CONTINENTALE**

**Déscription de catégories pour la réunion à Toronto**

10-minutes:

Une présentation d'informations et données provenant d'une recherche approfondie de laquelle des conclusions précises pourront être tirées. Il aura 2 minutes pour discussion après la présentation. Un résumé de 50 mots doit être soumis.

Présentement on planifie de céder 12 minutes pour chaque présentation (10 minutes pour présentation et 2 minutes pour discussion) mais si le nombre de résumé est grand, il sera nécessaire de céder que 10 minutes. En tous cas, l'auteur sera averti en août, de l'heure de sa présentation ainsi bien que le temps alloué.

Compétition étudiante:

Un événement spéciale de cette réunion sera une compétition étudiante; un prix sera décerné dans chaque catégorie (2 dans catégorie C) pour la meilleure présentation. Cette compétition aura lieu mercredi matin pour laquelle 15 minutes (12 minutes pour présentation et 3 minutes pour discussion) seront cédés pour chaque présentation (voire autre feuille pour plus de détails). Le Comité de programme espère que les étudiants décideront de présenter leur recherche dans cette compétition afin de souligner leur rôle dans les Sociétés entomologiques.

Titre et Résumé:

Cette structure permet la dissémination d'information sans présentation orale. Chaque titre soumis doit être accompagné par un sommaire de 50 mots résumant les résultats importants. Le titre et auteur(s) apparaîtront dans le bulletin du programme. En plus le titre et auteur(s) seront identifiés à la clôture des sessions respectives afin que ceux intéressés dans la matière peuvent discuter avec l'(es) auteur(s). Les auteurs sont tenus responsables de soumettre 50 copies du titre et résumé au Président du programme.

Présentation affiche:

Cette structure consistant d'une présentation par affiches permet l'auteur de discuter en profondeur avec d'autres intéressés dans la matière. Un endroit d'étalage sera cédé aux auteurs pendant une période de temps limité dans une salle où d'autres présenteront concurremment. L'endroit d'étalage consistera d'un tableau d'affichage dans un cadre d'aluminium ayant 1,3 mètres de hauteur par 2,0 mètres de longueur. Un sommaire de 50 mots résumant la recherche qui sera présentée doit être soumis en plus d'un titre concis et court. Le Comité du programme affixera ce titre en lettrage noire sur le tableau d'affiche cédé à l'auteur.

N.B. Récemment dû aux contraintes imposées sur les déplacements des scientifiques gouvernementaux canadiens et américains, il y a eu plusieurs annulations de présentation. Sans rien dire ceci cause des difficultés à la continuité du programme. On demande que les auteurs s'assurent qu'ils pourront être présents avant de soumettre un résumé.

Date limite pour soumission de résumé - 30 juin 1982

Auteurs sont limités à une présentation, soit une présentation de symposium, une présentation de 10 minutes, un titre et résumé ou présentation affiche.

**Compétition étudiante pour le Prix du Président  
de la Société entomologique de l'Ontario  
Toronto 1982**

Depuis plusieurs années déjà la Société entomologique de l'Ontario, qui a 119 ans, tient annuellement une compétition pour les présentations étudiantes. L'hôte de la prochaine réunion collective, la Société entomologique de l'Ontario, accordera le droit de participation à cette compétition à tous étudiants. Six prix seront décernés, un dans chacune des 4 catégories et 2 dans catégories C comme indiquer:

- A. Systématique, Morphologie et Evolution
- B. Physiologie, Biochimie et Toxicologie
- C. Ecologie, Ethologie, et Bionomique (2 catégories)
- D. Entomologie médicale et vétérinaire
- E. Protection des récoltes.

Les six compétitions auront lieu concurremment le mercredi matin, le premier décembre, et seront présidées par le Président de la catégorie ou leurs représentants. Un jury de trois juges évaluera chaque compétition, ceux-ci seront sélectionnés par le Président de la Société entomologique de l'Ontario, des membres des trois Sociétés qui seront présents en consultant avec le Président de la catégorie.

Malheureusement il n'y aura pas plus de temps à consacrer aux compétitions étudiantes. Alors il sera nécessaire de limiter le nombre de participants à 15 dans chaque catégorie. Dans le cas où il y aura plus de 15 résumés soumis, les 15 meilleurs seront choisis, ce qui veut dire que l'étudiant devrait porter attention à la composition de son résumé.

Les juges seront guidés par une liste de critères resumée sur la formule d'évaluation. Une telle formule sera expédié à chaque participant dès qu'un résumé sera soumis. Les trois formules d'évaluation complétées seront retournées à chaque participant car le comité d'organisation croit qu'un tel "feedback" pourrait être utile.

Tous étudiants seront éligibles, un étudiant étant toute personne inscrite dans une institution post-secondaire qui complète un degré ou toute personne qui a été reçu en 1982.

Chacun des six prix consistera de \$100.00 et un certificat qui seront décernés au luncheon de jeudi.

A souligner 1) l'étudiant pourra soumettre un résumé pour les sessions régulières s'il le désire et 2) le résumé soumis pour la compétition qui ne sera pas accepté (seulement dans le cas où il aura plus de 15 résumés par catégorie) sera cédulé dans les sessions régulières à moins que l'auteur désire de la retirer.

## ENTOMOLOGIE NÉARTIQUE, COOPÉRATION CONTINENTALE

### Réunion collective, Toronto

#### Conférences non-structurée et Ateliers

Les membres qui comptent organiser des conférences ou ateliers sont priés de communiquer avec le Président du programme avant le premier mai.

Dans le cas où il y a des propositions qui portent des thèmes semblables, on communiquera avec les proposants et demandera qu'un thème commun sera soumis. Dans le cas où il y a un trop grand nombre de propositions pour être accomoder, la sélection des thèmes reposera sur le Comité du programme.

En soumettant une proposition, donnez le titre, le mon du président proposé, le nombre attendu dans l'auditoire et l'équipement de projection nécessaire. S'il-vous-plait donnez aussi le genre d'auditoire qui assistera. Ceci aidera le Comité du programme dans l'organisation du cédulle en relation aux autres événements dans

esquels cet auditoire pourrait avoir intérêt.

Soumettez les détails au: Dr. F.L. McEwen, Dept. of Environmental Biology,  
University of Guelph, Guelph, Ontario, Canada N1G 2W1

Date limite le premier juin.

### Symposia

Le nombre de symposia est limité à 3 dans chaque catégorie A,B,D et F; à 4 dans catégorie C; et 5 dans catégorie E.

Ces symposia devraient être organisés en consultant avec le Président de la catégorie. N.B. Certains Présidents de catégorie ont des dates limites antérieures au premier juin.

Les membres qui planifieront un symposium doivent communiquer avec les suivants:

Catégorie A - Dr. F.C. Thompson, Systematic Entomol. Lab., ARS, United States Department of Agriculture, c/o US National Museum, Washington, D.C. 20560 USA

Catégorie B - Dr. U.E. Brady, Department of Entomology, University of Georgia, Athens, GA 30603 USA

Catégorie C - Dr. R.M. Weseloh, Connecticut Agricultural Experiment Station, P.O. Box 1106, New Haven, CT 06504 USA

Catégorie D - Dr. J.R. Anderson, Department of Entomology & Parasitology, University of California, Berkeley, CA 94720 USA

Catégorie E - Dr. D.E. Barnett, 6505 Belcrest Road, Room 665-A, Hyattsville, MD 20782 USA

Catégorie F - Dr. S.L. Poe, Department of Entomology, VPI & SU, Blacksburg, VA 24061 USA.

Les détails des symposia doivent inclure le titre, le nom du président proposé, les noms des conférenciers et titres de leur présentation, le nombre attendu dans l'auditoire et l'équipement de projection nécessaire. Tous les détails doivent être expédiés au Président du programme avant le premier juin: Dr. F.L. McEwen, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

### Conférence Structurée

Les conférences structurées doivent être organisées en consultant avec le Président des conférences structurées.

Détails doivent inclure le titre, nom du président proposé, nombre attendu dans l'auditoire, et l'équipement de projection nécessaire.

Détails doivent être expédiés au Président du programme avant le premier juin.

### Avis aux membres

1. Le privilège de présenter à la réunion collective de Toronto est réservé aux membres des trois Sociétés participantes. Cependant il y a des exceptions, les non-entomologistes, membres d'autres Sociétés professionnels peuvent présenter un travail dont un des co-auteurs est membre d'une des Sociétés participantes. En plus les entomologistes étrangers qui travaillent temporairement au Canada ou aux Etats Unis et qui sont membres d'une Société entomologique dans leur pays peuvent présenter. Ces limitations ne s'appliquent pas aux non-membres invités à présenter. Aucun membre sera permis de présenter plus qu'une fois, mais par contre peut être co-auteur d'une autre présentation.

2. Diapositive. Les conférenciers sont encouragés d'organiser leur diapositives dans un carroussel Kodak et de l'apporter à la salle de conférence au moins 10 minutes avant la session. Des carroussels de surplus seront disponibles dans les salles de conférence. Une salle de projection sera disponible de 8:00 à 17:00 afin de prévoir les diapositives. Recuperez vos diapositives à la fin de la session.

3. Les diapositives devraient être lisible et de courtoisie aux gens daltoniens évitez les rouges et verts en substituant avec des bueus, oranges et jaunes. Pas plus de quatorze lignes par diapositive et utilisez seulement les cadres 2" x 2" en carton. Pour autres renseignements counsultex "Guidelines for Preparing Slides for Use in Oral Presentation". Bull. Entomol. Soc. Am. 23(4): 255.

4. Présentation affiche. Gardex le plus simple possible. Dessesins et illustrations devraient être lisible d'un mètre. La durée de la présentation à ce moment sera d'une heure, ceci pourrait changer.

5. Limites de temps. Le maximum de 10 minutes pour présentation orale sera respecté. Si une discussion d'une durée supérieure à 2 minutes est désirée la présentation orale doit être racourcit.

6. La réunion de Toronto durera 4 jours; du lundi après-midi à vendredi midi. Les conférences avant et après la réunion seront annoncées dans les BULLETINS et NEWSLETTERS des Sociétés participantes.

7. Les auteure présentant des resultats de recherches qui pourraient être d'intérêt publique ou d'intérêt aux rédacteurs scientifiques, devraient préparer 25 sommaires en forme journalistique et les remettre à la salle de reportage de la réunion.



# ENTOMOLOGIE NÉARTIQUE, COOPÉRATION CONTINENTALE

## Réunion collective

Société entomologique des Etats Unis, Société entomologique du Canada

Société entomologique de l'Ontario

29 novembre - 3 décembre 1982  
Hôtel Royal York, Toronto, Ontario

### Avis de Présentation

La formule ci-dessous devrait être complète et expédier au plus tard le 30 juin 1982 au Président du programme. La date d'oblitération la plus tardive acceptée sera le 30 juin 1982, sans exception.

Il y aura quatre structures de présentation à la réunion de Toronto 1982: 1) une présentation de 10 minutes avec 2 minutes de discussion; 2) une présentation par titre et résumé; 3) une présentation affiche et 4) une présentation de 12 minutes dans la structure compétition étudiante. Les détails de ces structures se trouvent sur les pages précédentes; consultez ces pages avant de soumettre un titre. Ces structures permettent une certaine souplesse au programme. Indiquez votre choix de structure, cependant il n'y a aucune garantie que tous les choix seront respectés. Un avis vous disant l'heure, la date et dans quelle structure votre présentation a été accepté vous sera expédié. Chaque individu sera limité soit à une présentation de symposium, une présentation de dix minutes, un titre et résumé seulement ou présentation affiche.

La soumission d'un résumé de 50 mots est nécessaire afin d'assister l'organisation des catégories. Ces résumés ne seront pas imprimés dans le bulletin du programme. Un résumé est aussi nécessaire pour les présentations titre et résumé; l'auteur est tenu responsable de soumettre 50 copies de son résumé au Président du programme.

-----  
DECOUPEZ

-----  
DACTYLOGRAPHIEZ

Expédiez au: Dr. F.L. McEwen, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

Titre de présentation (à ne pas excéder 15 mots): \_\_\_\_\_

Lu par: \_\_\_\_\_

(N.B. Présentation doit être lu par un des auteurs)

Nom d'(es) auteur(s): \_\_\_\_\_

Prénom

Initiaux

Nom de famille

Institution et adresse: \_\_\_\_\_

( )

# Téléphone

#### COCHEZ CATÉGORIE DE PRÉFÉRENCE

- |  |                             |  |
|--|-----------------------------|--|
| A. Systématique, Morphologie, Evolution                | Cd. Ethologie et bionomique | Acarologie                                 |
| B. Physiologie, Biochimie Toxicologie                  | D. Médicale et vétérinaire  | Insectes aquatiques                        |
| Ca. Lutte biologique                                   | Ea. Extension               | Enseignement                               |
| Cb. Apiculture et Insectes sociaux                     | Eb. Contrôle législatif     | Insectes nuisible aux plantes ornementales |
| Cc. Insectes vecteurs en relation à la phytopathologie | F. Protection des récoltes  |  |

STRUCTURE DE PRÉFÉRENCE: T & R seulement; 10 minutes; Présentation d'affiche; Compétition étudiante

-----  
CETTE ESPACE EST RÉSERVÉE POUR LE COMITÉ DU PROGRAMME

Section      Date      Day      Time      Paper No.      Received      Misc.

## 1982 JOINT MEETING OF THE ENTOMOLOGICAL SOCIETIES OF AMERICA, CANADA AND ONTARIO

"Nearctic Entomology: Continental Cooperation" is the theme for this joint meeting to be held from 29 November through 3 December, 1982 at the renovated Royal York Hotel, 100 Front Street West, Toronto, Ontario M5J 1E3 Canada.

- Contacts are:
- 1) Freeman L. McEwen, Program Chairman, Department of Environmental Biology, University of Guelph, Guelph, Ontario, N1G 2W1.
  - 2) Susan B. McIver, Local Arrangements Chairman, Department of Zoology, University of Toronto, 25 Harbord Street, Toronto, Ontario, M5S 1A1.
  - 3) Stanley D. Beck, President, ESA, Department of Entomology, University of Wisconsin, Madison, WI 53706, USA.
  - 4) Glenn B. Wiggins, President, ESC, Department of Entomology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6.
  - 5) Rudolph Harmsen, President, ESO, Department of Biology, Queen's University, Kingston, Ontario, K7L 5C4.

Note: Change in date to avoid Grey Cup Football Celebrations

### LOGO CHOSEN FOR 1982 JOINT MEETING



This logo, chosen by the ESA Committee on Student Affairs, was designed by Albert Greene, a graduate student at the University of Maryland, College Park, Maryland. It features a representation of the Nearctic region with two stylized bald-faced hornets, Dolichovespula maculata (L). This species was selected for the logo for two reasons: 1) It is one of the most striking and conspicuous members of our Nearctic insect fauna, ranging throughout the entire region. It is one of the best known Nearctic insects. Furthermore, it is highly beneficial, an effective natural biological control agent against pestiferous insect species, especially flies.

2) As a social insect, it emphasizes the traits of cooperativity and industriousness, thus highlighting the theme of the 1982 meetings. The two individuals in the design are facing each other with antennae and forelegs crossed, symbolizing productive interaction among entomologists throughout the Nearctic region.

The ESC congratulates Al Greene for his original design! (excerpted from ESA Newsletter 5(1): 1982)

### PERSONALIA

The following members of ESA and ESC were among ten entomologists who received Certificates of Appreciation signed by the Forest Service Chief, R. Max Peterson, for their contribution to the Expanded Southern Pine Beetle Program. - Robert N. Coulson, Texas A. & M. University "for contributions to sampling, population dynamics, and integrated pest management research on the southern pine beetle"; T. Evan Nebeker, Mississippi State University "for studies of biological control agents and thinning practices for preventing or reducing beetle-caused losses", and Fred M. Stephen, University of Arkansas "for leadership in developing improved sampling methods and predictive models for the southern pine beetle". Emmett P. Lampert has joined the Department of Entomology, North Carolina State University as assistant professor. His primary responsibility will be to conduct research in the area of tobacco insect management. Previously he was a post-doctorate at Michigan State University where he also achieved his M.S. and Ph.D. degrees. Success to this ESC member.

In nearly every country of the world, Entomology has become rather frightening, especially to those who consider themselves to be amateurs. Today, in the many journals now available, we can find an almost bewildering array of topics dealing with every aspect of insect life. As studies deepened, so did vocabularies until one finds the professionals digging into their glossaries too. The task facing Entomologists is enormous to say the least. Estimates of the number of species of insects yet to be described ranges from 3-8 million. All of these have to be based on preserved material, which someone has to collect. Most of the great collections in the world today had their origin in material gathered largely by amateurs. Before the middle of the 19th Century, Rev. D.J.S. Bethune and Wm. Saunders brought together a group of people interested in insects and established themselves as a Society in Toronto in 1863.

As the years passed and the importance of insects in our lives was recognised, professional training became necessary. With professionalism came complexity and with complexity the waning of the ranks of amateur Entomologists. The grouping of Entomologists into two camps was regrettable. With so much to be done, it is obvious there should be a reunion. It will call for many amateurs to leave the butterflies and moths and delve into the lesser-known groups in all orders of insects. The professionals must become accessible to amateur groups and readily give assistance to help in the understanding of the insects involved. Gathering material needed for taxonomic studies will lead to progress in taxonomy and other fields of Entomology as well. This is the challenge that can be met by amateurs and professionals working together.



## TORONTO ENTOMOLOGISTS' ASSOCIATION

by Alan J. Hanks

In the early to middle 1960's, numbers of amateur Entomologists were living in the Toronto area and meeting informally from time to time. In 1967, a proposal was made that a definite group be formed, affiliated with the Michigan Entomological Society. The Michigan group apparently met with all the aims and aspirations of the people concerned, and affiliation duly took place. Some of the early members, such as J.C.E. Riotte and Anker Odum, were working in the R.O.M., and the other members were local enthusiasts. The membership during this time rose to approximately 30, and this state of affairs continued until 1969.

At this time, it was felt that there were sufficient members to form an independent group, and the Toronto Entomologists' Association (TEA) was born late in the year. With the blessing of the membership and support from the ROM Dept. of Entomology, the first 'Occasional Publication' appeared in 1970. It was titled 'Checklist of Ontario Skippers and Butterflies and 1969 Seasonal Summary' and was 15 pages in length. The latest TEA publication is 80 pages in length, and indicates that far more material is being submitted these days, which is a very good sign. Other TEA publications include 'The Occurrence of the Little Sulphur Butterfly in Ontario', 'Pieris virginiensis Edwards in Ontario' and 'Butterflies and Moths on Stamps'.

During this period, the membership has fluctuated from a high of about 75 to a low of about 12, and currently stands at 67. One of the members, A.M. Holmes, is working on a very large project - 'The Distribution of Ontario Butterflies', of which 3 parts have appeared in draft form. Eventually it is hoped to combine all parts and publish a book on this subject. Another member, W.F. Hess, is the Ontario co-ordinator for the Lepidopterists' Society, and one of the founders, J.C.E. Riotte, is working in Hawaii. It is interesting to note that 12 current members names appeared in the list from 1969 when the TEA was founded, and hopefully their names will still be on the rolls after another decade has passed.



## ESC NORMAN CRIDDLE AWARD WINNER FOR 1981

**Mr. B. J. (Buck) Godwin**

Olds, Alberta

Buck Godwin has had a distinguished career as an instructor at regional agricultural colleges in Alberta for the past 27 years. After obtaining a B.Sc. (Agriculture) from University of Alberta and a Diploma in Agriculture (Vermilion Agricultural College), Buck began instructing in horticulture and related courses at Fairview and Vermilion. Upon arriving at the Olds Agricultural College (now known as the Olds Agricultural and Vocational College), Buck assumed instructor duties in entomology as well as in horticulture. He soon developed a very keen interest in entomology which he was able to pass on his students. His students were required to make an insect collection as part of their course requirements, and many of these collections were entered each year in the Entomological Society of Alberta Insect Collection Competition. Indeed, if it was not for these collections, there would not have been a competition in some years.

Buck is very patient with and supportive of his students. He would often bring in outside lecturers to speak to his students on applied entomology so that they became aware of the role of entomology in agriculture and forestry. Buck soon became recognized not only as an authority on the identification of local plants, but also on local nuisance and pest insects. His office desk often was cluttered with insect specimens dropped off by local residents and farmers seeking advice on the identification and control of particular insects. If he did not know, he would consult with provincial entomologists so that his "clients" did not go away without an answer.

Members of the Entomological Society of Alberta have long recognized and appreciated Buck's involvement in teaching college entomology and the strong support and encouragement that he provided students taking his courses. Our society is proud to select Buck Godwin as the 1981 recipient of the Norman Criddle Award for outstanding achievement in amateur entomology, so that his contributions to amateur entomology in Alberta can be recognized nationally through this Entomological Society of Canada award.

H.G. Philip, President  
Entomological Society of Alberta

*B. J. "Buck" Godwin receives the 1981 Society's Criddle Award from President S. R. Loschiavo at Banff, Alberta for an outstanding effort in stimulating interest in entomology among young people.*



### TIEG NEWS

The Teen International Entomology Group Miscellaneous Publications are newsletters mainly to encourage young entomologists in developing an interest in the field and to provide a medium for exchange of information and specimens. For more information about TIEG and its newsletter write to Dale Hoopingarner, Editor, TIEG News, Department of Entomology, Michigan State University, East Lansing, Michigan 48824, U.S.A.

## A. P. "Randy" Randall RETIREES AFTER 36 YEARS



When A.P. "Randy" Randall retires from the Forest Pest Management Institute of the Canadian Forestry Service on 30 December, 1981, an era will have drawn to a close in the history of forest protection in Canada. During his 35-year career, Randall became the country's leading expert in aerial applications technology, the science concerned with the development of

equipment and techniques for the safe and effective aerial spraying of pesticides to control harmful forest insects, such as the spruce budworm. Today's state-of-the-art in this science is largely due to his pioneering efforts and his continuing, applied research in this field.

Randall's career began in 1940 when he joined the RCAF and, after receiving the Gold Medal Award for top standing in his training class of 130, he served overseas as a flight engineering instructor. Returning in 1946, he attended the University of British Columbia where he won the Shanahan Scholarship in Entomology. He graduated with honours in 1949 with a Bachelor of Science in Agriculture and went to work at the Canada Department of Agriculture Fruit Insect Laboratory in Victoria. The winter of 1950-51 found him back at UBC doing course work toward a Master of Science in Agriculture and, in the spring, he was reassigned to the Victoria Laboratory of Forest Zoology. In 1952, he received his M.Sc.A. and was seconded to the Chemical Control Section, Defence Research Board at the Suffield Experiment Station in Ralston, Alberta where he became involved in research on the aerial application of pesticides for forest insect control. This Section was transferred to Ottawa in 1953, just as the New Brunswick spruce budworm infestation was beginning to assume serious proportions, and Randall was dispatched to assist in the technical aspects of the aerial spray operation. Later that year he enrolled in a Ph.D. program at the University of Western Ontario, completing the required course work in 1955.

By this time, Randall's career was becoming inextricably linked with the worsening spruce budworm problem in the east and with the aerial spray program that it had engendered. He directed his efforts towards upgrading the relatively primitive spray technology of the day, including development of new spray nozzles and systems, formulations and application techniques to improve pesticide targeting, spray efficacy and environmental safety. His work led to the introduction and acceptance of new and revolutionary mechanical atomization concepts, such as represented by the Micronair and Turbair. He spear-headed the replacement of the little Stearman biplane spray aircraft with the larger, faster Grumman Avenger, and his field trials of the early 1970s led to the adoption of large, multi-engine aircraft for the massive spruce budworm control program in the Province of Quebec. In addition, Randall's contributions to research on pesticides and formulations were instrumental in developing the materials which became the mainstay of budworm control operations in this country.

In 1977, Randall moved to Sault Ste. Marie when the Chemical Control Research Institute was transferred here from Ottawa and combined with the Insect Pathology Research Institute to form the present Forest Pest Management Institute. During the latter part of 1982, Randall plans to return to British Columbia to spend his retirement near Courtney on Vancouver Island.

J.C. Edwards  
Technical Advisor and Liaison Officer  
Forest Pest Management Institute  
Canadian Forestry Service, Environment  
Canada  
Sault Ste. Marie, Ontario P6A 5M7

OFFSET PUBLICATIONS OF THE  
LYMAN ENTOMOLOGICAL MUSEUM

Macdonald Campus of McGill University

Box 800, Macdonald College P.O., Ste. Anne de Bellevue,

Quebec, Canada, H9X 1C0 (available from the Secretary of the Museum)

MEMOIRS

- No. 1 "The Orthopteroid Insects of Quebec and the Atlantic Provinces of Canada". By V.R. Vickery, D.E. Johnstone and D.K. McE. Kevan: i + 207 pp. Published October 23, 1974. Revised price (including handling and mailing). \$7.00
- No. 2 "The Land of the Grasshoppers, Being some Verses on Grigs..." (i.e. on orthopteroid insects; ancient and modern). By D.K. McE. Kevan: ix + 326 pp. Published December 31, 1974. O.O.P. A few unbound photocopies available at cost (\$25.00 each).
- No. 3 "Checklist of the Butterflies and Skippers of Canada." By W.W. Gregory: i + 44 pp. Published April 30, 1975. Price (including handling and mailing). \$5.00
- No. 4 "The Higher Classification of the Orthopteroid Insects", edited by D.K. McE. Kevan. (Papers presented at Section 1 Symposium, XV International Congress of Entomology, Washington, D.C., U.S.A., August, 1976). iv + 52 + (26) pp. Published December 29, 1977. Price (including handling and mailing). \$6.00
- No. 5 "The Skipper Butterflies of the Province of Quebec/Les papillons hespérides de la province de Québec (Lepidoptera: Hesperidae)." By D. N. Duffy and J.A. Garland. vi + 165 pp., 4 colour plates. Published June 12, 1978. Price (including handling and mailing) \$10.00
- No. 6 "The Land of the Locusts, Being Further Verses on Grigs: Part I (up to 450 A.D.)." By D.K. McE. Kevan. x + 530 pp. Published October 10, 1978. Price (including handling and mailing). \$16.00
- No. 7 "Studies on Nearctic *Craspedolepta* Enderlein 1921 (Homoptera: Psylloidea): Taxonomic Revision." By A.R.P. Journet and V.R. Vickery. 1-164 pp. Published June 29, 1979. Price (including handling and mailing) \$7.50
- No. 8 "The Orthopteroid Insects of the Bermudas." By D.K. McE. Kevan. vi + 182 pp. + 1 pl. Published October 1980. Price (including handling and mailing). \$12.50
- No. 9 "Immature Grasshoppers of Eastern Canada (Orthoptera: Acrididae). By V. R. Vickery, L.M. Crozier and M.O'C. Guibord. V + 74 pp. \$8.00
- No. 10 "The Land of the Locusts, Being Further Verses on Grigs: Part II (between 450 and 1500 A.D.)." By D. K. McE. Kevan. In Press.

The above prices will be increased after 31 December 1981 to meet the new postal rates.

- No. 1. "Information regarding the Genus *Atractomorpha* Serville (Orthoptera: Acridoidea: Pyrgomorphidae)." By D.K. McE. Kevan. 3 pp. September, 1973.
- No. 2 "Suprafamilial Classification of "Orthopteroid and Related Insects, Applying the Principles of Symbolic Logic - - A Draft Scheme for Discussion and Consideration. (XV International Congress of Entomology, Washington, August, 1976." By. D.K. McE. Kevan. 24 pp. August, 1976. O.O.P.; revised Ed. 1977 (included in Memoirs 4).
- No. 3 "Taxon Ranking in Grylloidea and Gryllotalpoidea." By. V. R. Vickery. 20 pp. August 1976.
- No. 4 "The Lyman Entomology Museum and Research Laboratory: A History to 1978." By D. K. McE. Kevan. 35pp. October, 1978.
- No. 5 "The Department of Entomology, McGill University - A History to 1978." By D. K. McE. Kevan. 88 pp. April, 1979.
- No. 6 "Parasitoids and Hyperparasitoids of the Gypsy Moth *Lymantria dispar* (Linnaeus) (Lepidoptera: Lymantriidae) in Quebec." By F. J. Madrid and R. K. Stewart. 11 + 29 pp. October, 1980.
- No. 7 "Students' Guide to the Recognition of the Families of the Class Collembola (Arthropoda: Hexapoda)." By. D.K. McE. Kevan. 10 pp. Nov. 1980.
- No. 8 "Notes on Two African Species of *Pyrgomorpha* (Orthoptera: Pyrgomorphidae) Reared in the Laboratory." By late William J. A. John, D. Keith McE. Kevan and Chia-Chi Hsiung. 44 pp. May, 1981.
- No. 9 "Utamaro's "Insect Book", 1788." Edited with Kyōka Translations. By D. K. McE. Kevan. 37 pp. June, 1981.

\$3.00

Due to financial difficulties we are no longer able to distribute "Notes" free of charge. For No. 9 and future issues, there will be a nominal charge of \$3.00. This will also cover handling and mailing costs. Earlier numbers available at 5c per page plus postage, whilst stocks last. Donations to Museum funds gratefully received in lieu of prices quoted.

## NEW BOOKS

Nakamura, Shingo. 1981. Morphological and taxonomic studies of Cerambycid pupae of Japan (Coleoptera: Cerambycidae). 158 pp. 75 b/w plates. Wako Shoji Corp., Togo Bldg. 1-5-7, Yaguma, Meguro-ku, Tokyo 152, Japan. \$40.00 cloth, \$30.00 paper. (Includes 182 species; pupae of 62 species newly described).

The proceedings of the first "International Symposium on Renewable Resources and the Economy of the North" are now available. The symposium was held in May and included academics, businessmen, government officials and policy advisers from 10 countries. It was sponsored by the Association of Canadian Universities for Northern Studies and the United Nations Education, Scientific and Cultural Organization's (UNESCO) man and the biosphere program. Copies can be ordered for \$8.50 from the Association of Canadian Universities for Northern Studies, 130 Albert St., Ste 1915, Ottawa, Ont. K1P 5G4.

## PERSONALIA

Robert L. Rabb was promoted to William Neal Reynolds Professor of Entomology at North Carolina State University on 1 July 1981. This is the highest honour bestowed upon a faculty member in the School of Agriculture and Life Sciences at NCSU. The honour recognizes Bob's many contributions to entomology and pest management. We congratulate this member of ESA and ESC.

## BOOK REVIEWS

Chaboussou, F. 1980. Les plantes malades des pesticides. Editions Debard. Paris. Paper 265 pp. 75 FF.

This book bears the subtitle: new basis for prevention against disease and pests. It is an attempt to show that pesticides modify the physiology of cultivated plants so much that they render crops more susceptible to attack by pathogens and insects.

The author, Francis Chaboussou was, until 1976, the Director of the INRA research station at Pont-de-la-Maye. He put forward the theory of trophobiosis which states that any pest owes its virulence to the nutritional elements found in a plant and required for its development. Chaboussou is currently interested in the impact of fertilization on plant resistance, particularly the influence of oligo-elements.

The book is divided into two parts and 8 chapters. The first half deals with plant diseases, the physiology and resistance of plants, the theory of trophobiosis, the repercussions of pesticides on the physiology of plants, and the factors responsible for triggering infestations and diseases in the presence of pesticides. In the second part the author discusses fertilization and plant resistance, the correction of deficiencies as a therapy for diseased plants, agricultural techniques and quality of crops, and general conclusions. Every chapter has its own bibliography.

Chaboussou is of course pushing his trophobiosis theory throughout the book. Considering the amount of work that has been done over the past fifteen years on plant resistance, phagostimulants, antifeedants both from a physiological and an ecological standpoint, this book is a bit of a disappointment. The substance of the book suffers greatly from lack of reference to the work of scientists such as Dethier or Feeny.

The index is rather awkward: it is arranged according to the plants that have been studied experimentally, the diseases and pests affecting them and the environmental factors involved. There is no author index. The book is well illustrated (41 figures and 8 tables) and has 4 coloured plates.

In spite of its shortcomings, Chaboussou's book should be of interest to all entomologists and plant pathologists because of the evidence presented that pesticides play such an important role in modifying the susceptibility of crops to their natural enemies.

Bernard J. R. Philogène  
Université d'Ottawa.

## BOOK NOTICE

Energy Metabolism in Insects (1981). Edited by R.G.H. Downer. xii + 244. Plenum Press, New York. U.S. \$32.50.

This book deals primarily with molecular, biochemical and physiological aspects of bioenergetics in insects. R.G.H. Downer has brought together many of the leading researchers in insect energy metabolism who contribute eight chapters to the book: Physiological and Environmental Considerations in Insect Bioenergetics (R.G.H. Downer), Hormonal Regulation of Substrate Transport and Metabolism (D.J. Candy), Role of Lipids in Energy Metabolism (A.M.T. Beenackers, D.J. Van der Horst, W.J.A. Van Marrewijk), The Role of Carbohydrate Metabolism in Physiological Function (J.E. Steele), The Role of Proline in Energy Metabolism (E. Bursell), Lipid Transport by Hemolymph Lipoprotein - A Possible Multiple Role of Diacylglycerol-Carrying Lipoprotein (H. Chino), Energy Metabolism in the Insect Nervous System (R.H.C. Strang) and Neuroendocrine Regulation of Mitochondrial Development and Function in the Insect Fat Body (L.L. Keeley).

Energy Metabolism in Insects will be welcomed by biochemists and physiologists as a current and exacting account of the energy transformations that occur in insects and the various hormones, neurohormones and neurotransmitters that regulate these processes.

Robert P. Bodnaryk

The book contains the opening address and 12 papers from the Symposium on "Environmental Protection and Biological Control of Pest Organisms", held in Stockholm on 14-17 May 1979. The book title differs from that of the Symposium as the papers include topics from a broader area of knowledge than is usually defined as biological control.

The purpose of the Symposium and the book was "... to assess present knowledge of the risk aspects of biological control..." by fostering discussions between representatives of pesticide registration authorities and scientists. These are presented in this volume and a short consensus report of the discussions concludes the book.

Topics included are lepidopterous pheromones, and other behaviour modifying chemicals; genetic modifications; viral, bacterial and fungal pathogens of insects, parasites and predators. Each paper concisely reviews the real or potential benefits of the use of each type of organism in an integrated pest management program, evaluates possible risks of their use and difficulties in obtaining registration for them. Three papers are concerned with the specific testing requirements of biological pesticides in the U.S.A., U.K. and France. The requirements are similar in each country in that biologicals, because of their lower real and potential threat to humans, are relaxed versions of those for chemicals. Comparisons of the requirements of each country, that perhaps mirror the public concern or size of the environmental lobby in each country, are good reading. The pathological risks to humans; the methods of testing efficacy and determining the risks posed by the use of bacteria, fungi and viruses are well laid out. I found the lead-off paper by D. Pimentel unexpected in content, yet its title, "Environmental risks associated with biological control" did fit the prefacing position. He focused on past mistakes in importing natural enemies and low success rates of biological control. These past errors, based on the depauperate state of biological knowledge decades ago, do suggest current risks, but I think that those lessons have been learned. What is at stake now is the use of chemicals of biological origin or their mimics, and pathogenic species, not the use of parasites and predators. In the latter case very few risks have been realized because of their specificity.

The paper by W. L. Roelofs on lepidopterous pheromones is well organized. It leads the reader through the specific tests and problems of identification, extraction, bioassay, composition determining efficacy, use, and registration. D. L. Wood's paper on behaviour-modifying chemicals accomplishes a third as much in about as many pages but he concentrates on the use and efficacy testing of these materials in pest management not their chemistry. L. E. Caltagirone and C. B. Huffaker discuss the well-known benefits and difficulties of using predators and parasite for pest suppression. I found that these papers were almost identical to recent review papers by the same authors.

The remainder of the book covers the assessment and identification of risks, quality control, pathogenicity to humans, methods of use, and pathology of each of the groups of insect pathogens. The major problems of registration for each group is for the most part identical; yet each is discussed at length. There is a 10-page appendix printed in a very small type font that gives the official EPA regulations at the time. I would expect that this is also available free of charge.

The book is concisely written and has few errors, the most glaring of which is the table of contents where U. K. appears as U. S. It is very readable and presents a clear view of the state of the science, legislation, and the art of all forms of biological pest control at the time of the symposium (1979). I would not recommend its purchase, however, as so much of its content is available elsewhere in almost the same form. It is expensive for its slinness and even more so if only the newly available material is considered. It also suffers because of the length of time between the symposium and publication. The novel registration information has undergone changes since 1979.

Bryan D. Frazer  
Agriculture Canada, Research Station,  
6660 N.W. Marine Drive,  
Vancouver, B. C. V6T 1X2

## BOOK NOTICES

Barrons, K.C. 1981. Are Pesticides Really Necessary? Regnery Gateway, Inc., Chicago. 245 pp. Soft cover. \$6.95.

In this book the author's stated goal is to examine objectively the information on the role of pesticides in modern agriculture and health care. The book is aimed at the layman; there is an index but no reference list and few footnotes. The professional entomologist or informed layman will find little in this book that he does not already know. It is advertised as an update to *Silent Spring*, but I doubt that it will contribute appreciably to the continuing debate on the place of pesticides in our lives, since its pro-pesticide point of view is already widely accepted by one group of protagonists.

The tenor of the book is exemplified by the titles of its three sections: I. Why pests have not overwhelmed us; II. The pesticide drama; III. Pesticide safely. The first section emphasizes various non-chemical methods of control and their limitations. The second speaks in very positive terms of the benefits of pesticides. The third discusses pesticide safety, emphasizing the low human toxicity of the chlorinated hydrocarbons and the importance of considering trade-offs between slight health risks and the benefits of pesticides.

R.J. Lamb  
Agriculture Canada  
Winnipeg Research Station

*Locomotion and Energetics in Arthropods* (1981). Edited by C.F. Herreid and C.R. Fournier. Plenum Press, New York viii + 546 pp. U.S. \$59.50.

Among the arthropods are a beguiling array of fliers, swimmers and pedestrians that flit (and zoom!), undulate, scamper and burrow through their environment using an amazing assortment of locomotory styles - an "evolutionary phantasmagoria" in the words of coeditor C.F. Herreid. Much that will delight the biologist is found in this book. Nineteen contributed chapters on arthropod locomotion and energetics are skillfully arranged into eight sections: Evolution, Mechanics and Kinematics, Neuromuscular Interactions, Circulation and Gas Exchange, Temperature Regulation, Energetics and an Overview and Summary. Nine of the chapters deal specifically with insects: Insect locomotion on land, Insect flight aerodynamics, Neuromuscular mechanisms of insect flight, Role of muscle in insect posture and locomotion, Biochemical adaptations in insect muscle, Insect spiracle control, Ventilation in active and inactive insects, Temperature regulation during locomotion in insects, and Insect flight energetics.

Each chapter ends uniformly with a summary (useful, and no doubt due to the editors' insistence) and a list of cited References. The book is well indexed, well done and even worth its price.

Robert P. Bodnaryk

Judd, W. W. 1980. *Diary of William W. Judd: Goose Bay, Labrador, 1948.*

Judd, W. W. 1981. *Diary of William W. Judd: Yukon Territory - 1949.*

Both published by Phelps Publ. Co., 87 Bruce Street, London, Ontario. N6C 1G7. Each \$3.00 Can.

Both books record the author's activities (with maps) while employed during spring and summer with the Northern Insect Survey. Included are records of insects, plants, birds and mammals observed or collected, and biographical information on persons mentioned. Dr. Judd is Emeritus Professor, University of Western Ontario, and Archivist, McIlwraith Field Naturalists, London, Ontario.

The objective of this book is to make available the information on agricultural and horticultural pests in southeast Asia that had been published (in Dutch) by Dr. Kalshoven in 1950/51 plus at least some of the additional information that has been published since then. The translation and editing are excellent and the multitude of species are well-indexed, both alphabetically and in a Host Plant/Pest Index. The book is sumptuously illustrated and most of the figures are clear and informative. In a few cases, e.g. Figs. 235, 276, 385, 477 and 489, the black and white illustrations lack contrast and contribute little to the text. Fig. 368 is a lovely photo of palm trees against the setting sun but the rhinoceros beetle damage is not obvious to the un-initiated. The revisers include 150 references from 1950-1980. For the diamond back moth, *Plutella xylostella*, search of recent literature revealed 4 references from 1962-1975 and 8 references from 1979-80 that were not included. It also seems strange that no references are given to lead the reader to further information on *Heliothis armigera*.

For temperate-climate entomologists, this book reveals the complexity of the tropical agro-ecosystem. It could be a useful addition to libraries at institutions where students from tropical countries are studying entomology and pest control.

W. J. Turnock  
Agriculture Canada  
Winnipeg



photo by Pierre Langlois, Dept. of Entomology, Macdonald College, P.Q.

### AN ADVENTIVE GIANT KATYDID

At the joint meeting of the Entomological Societies of Alberta and Canada held at Banff, Alta. in October, 1981, among the insects displayed in the student collections was an excellently preserved female of the Florida Giant Katydid, *Stilpnochlora coulouiana* (Saussure). It had been taken alive by its exhibitor, Miss Kim Webber (a student of Olds College, Olds, Alta.) at Calgary, Alta., on 19. viii.1981. It was on a consignment of subtropical plants destined to decorate a shopping centre in the city. This is the first known record of the importation of the species into Canada. A native of Florida, Cuba, and possibly parts of Mexico, it would not be likely to establish itself in Canada even under artificial conditions, where its large size (half as large again as that of our largest native katydid) would lead to its rapid detection and undoubted extermination; it certainly could not survive our winter out of doors, even in the egg stage. As commerce in subtropical plants is now considerable, it could be encountered again, in which case I should be glad to learn of such an occurrence. Apart from its large size including wings (body over 60 mm long) it may be recognized by the dorsal surface of the pronotum being slightly concave and margined posteriorly with blackish crenulations.

D.K. McE. Kevan  
Ste. Anne de Bellevue, Quebec



## MEETING ANNOUNCEMENTS

A symposium titled "Environmental Monitoring" is being sponsored by the Alberta Society of Professional Biologists on 20-21 April 1982 at Edmonton Weston Hotel. For information contact D. Thompson, Alberta Society of Professional Biologists, Box 566, Edmonton, Alta. T5J 2K5.

Michigan Entomological Society will hold its 28th annual meeting on 28-29 May 1982 at the Chippewa Nature Center, just SW of Midland, MI. For details contact M.C. Nielsen, Exec. Sec. of MES, Dept. of Entomology, Michigan State University, East Lansing, MI 48824, U.S.A. (phone 517-321-2192).

Canadian Phytopathological Society will meet 20-23 June 1982 at the University of Alberta, Edmonton. The program will include an in-depth look at the controversy surrounding chemical control of plant diseases (arranged by Ieuan Evans), and a session on forest pathology (arranged by Yasu Hiratsuka). John Davidson is arranging a non-competitive photo salon and Rick Reeleder a poster session. For more information write: Lu Piening, Research Station, Agriculture Canada, Lacombe, Alberta T0C 1S0

The Republic of China - U.S.A. Seminar on Allelochemicals and Pheromones will be held from 21-26 June 1982 in Taipei, Taiwan (ROC). Information on this new cooperative venture is available from Gerry A. Rosenthal, School of Biological Sciences, University of Kentucky, Lexington, KY 40506, U.S.A.

The Lepidopterists' Society will hold its 33rd annual meeting on 15-19 July 1982 at the University of Wyoming, Laramie, Wyoming. Besides submitted papers there will be symposia on Rocky Mountain fauna and on endangered species. For information contact M.C. Nielsen, Exec. Sec., Michigan Entomological Society, Dept. of Entomology, Michigan State University, East Lansing, MI 48824, U.S.A. (phone 517/321-2192).

International Symposium of Odonatology will hold its 7th meeting on 14-20 August 1983 at the University of Calgary, Alberta. For details contact Dr. Gordon Pritchard, Biology Dept., University of Calgary, Calgary, Alta. T2N 1N4.

15th Pacific Science Congress will be held 1-11 February 1983 at Dunedin, New Zealand arranged by the Pacific Science Association and sponsored by the Royal Society of New Zealand and University of Otago. Theme: CONSERVATION, DEVELOPMENT AND UTILIZATION OF THE RESOURCES OF THE PACIFIC. General Symposia: 1) Energy in Agriculture; 2) High Latitude Resources: Their Assessment and Development; 3) Resources, Science and the Law of the Sea; 4) Pacific Island Potentials. Sections: A) Ecology, Conservation and Environmental Protection; B) Solid Earth Sciences; C) Geography; D) Museums in Pacific Research; E) Marine Sciences; F) Coral Reefs; G) Botany; H) Forestry; I) Fresh-Water Sciences; J) Entomology; K) Social Sciences and Humanities; L) Public Health and Medical Sciences; M) Nutrition; N) Science Education and Communication. Various national and international scientific societies and organizations will meet in Dunedin as part of the Congress. Pre- and post-Congress tours are being provided. Papers are invited. Further information can be obtained from: Secretary-General, 15th Pacific Science Congress, P.O. Box 6063, Dunedin, New Zealand.

## CORNELL UNIVERSITY INSECT COLLECTION

Professor L.L. Pechuman's retirement as Curator of the Cornell University Insect Collection is effective 1 February 1982. Until a successor is recruited, all correspondence relating to outstanding loans and new loans should be addressed to Dr. Q.D. Wheeler, the Acting Curator during the interim. Correspondence relative to Dr. Pechuman's research interest, the Tabanoidea, should be addressed to him.

## PROFESSIONAL RECRUITMENT

The Biosystematics Research Institute, Ottawa is now recruiting for a Biologist in the Hymenoptera Unit to work on the taxonomy of Chalcidoidea (parasitic wasps). As previously announced the Institute is recruiting for a Research Scientist in the Hemiptera Unit.

TWO TEACHING POSITIONS IN ENTOMOLOGY: Two tenure-track positions are available in the Department of Environmental Biology, University of Guelph, for teaching and research in entomology. One of these positions is in systematics and carries responsibility for teaching introductory and advanced courses on the subject; for the supervision of graduate students and research in systematics. The other position is in insect physiology and the incumbent will be expected to teach this subject at both the undergraduate and graduate levels, to supervise graduate students and to develop a research program in insect physiology appropriate to a department with an applied orientation. In addition, the incumbent in one of these positions will be expected to teach insect morphology. The positions provide the opportunity to be involved in a dynamic entomology program in a department that includes the disciplines of plant pathology, microbiology and weed science. Excellent opportunities for research are provided through funding relationships with the Ontario Ministry of Agriculture and Food and close cooperation with Agriculture Canada and the Ontario Ministry of the Environment. Both positions involve a considerable teaching commitment but each provides the opportunity to develop a major research program. Qualifications: A Ph.D. in entomology, preferably with some postdoctoral experience. Ability to communicate effectively in a teaching role will be a definite asset. The appointments, contingent on the availability of funds, are available September 1, 1982. Applications should include a complete resumé and the names and addresses of three references and should be sent to: Professor F.L. McEwen, Chairman, Department of Environmental Biology, University of Guelph, Guelph, Ontario, Canada, N1G 2W1. Closing Date: April 1, 1982. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents.

FOREST ENTOMOLOGISTS: Four positions available in the Forest Pest Management Institute, Sault Ste. Marie, Ontario. 1) Forest entomologist: biology and control of insects of high value stands. 2) Toxicologist: screening and basic toxicology of pesticides for forestry use. 3) Herbicide specialist: field development of herbicides for forest regeneration. 4) Pesticide applications specialist: spray cloud behaviour and weaker effects. All applications will be considered but qualified Canadians will be given preference. Contact: Director, Forest Pest Management Institute, Canadian Forestry Service, P. O. Box 490, Sault Ste. Marie, Ontario, Canada P6A 5M7 (phone: 705/949-9461).

Agriculture Experts Needed in Asia and Africa:  
Experts en Agriculture Requis en Asie et Afrique:

Agriculture Canada executes CIDA agriculture projects in India, Pakistan, Sri Lanka and Tanzania to develop a practical technology to improve agricultural production in the dryland areas. Most positions require candidates with specialized training, preferably to Ph.D. level and also sufficient experience to head the planning and implementation of research programs in their specific areas of specialization. Scientists are required initially for two years. For further information contact: Overseas Project Secretariat, International Affairs Directorate, Agriculture Canada, Sir John Carling Bldg., Room 953, 930 Carling Ave., Ottawa, Canada K1A 0C5 (Phone: 613-995-8195).

Le ministère de l'Agriculture du Canada met à exécution les projets agricoles que l'ACDI parraine en Inde, au Pakistan, au Sri Lanka et en Tanzanie. Le but de ces projets est de développer une technologie pratique en vue d'améliorer la production agricole dans les régions arides. Pour la plupart des postes les candidats doivent posséder une formation spécialisée, de préférence au niveau du doctorat, et avoir assez d'expérience pour être capable de diriger les travaux de planification et de mise en oeuvre des programmes de recherches relatifs à leur spécialité. Personnel scientifique requis pour une période initiale de deux ans. Pour plus de renseignements, prière de communiquer avec: Le Secrétariat des projets d'outre-mer, Direction des affaires internationales, Agriculture Canada, Immeuble Sir John Carling, Pièce 953, 930 Carling, Ottawa, Canada K1A 0C5.

## INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

Ref. No.: A.N. (S.) 120

8 December, 1981

The Commission hereby gives six months' notice of the possible use of its plenary powers in the following cases, published in Bull. zool. Nom. volume 38, part 4, 8 December 1981, and would welcome comments and advice on them from interested zoologists. Correspondence should be addressed to the Secretary, c/o British Museum (Natural History), Cromwell Road, London, SW7 5BD, U.K., if possible within six months of the date of publication of this notice.

### Case No.

- 2359 Typus Sellards, 1909 (Insecta, Protodonata), proposed conservation under plenary powers.
- 2148 Capsus ater Jakovlev, 1889 and Lygaeus quadripunctatus Fabricius, 1794 (Insecta, Hemiptera, Heteroptera), proposed nomenclatural validation.
- 2317 Byrrhus semistriatus Fabricius, 1794 (Insecta, Coleoptera, Byrrhidae), proposed conservation.

Ref. No.: ITZN 59

8 December, 1981

The following Opinions and Directions have been published recently by the International Commission on Zoological Nomenclature in the Bulletin of Zoological Nomenclature, volume 38, part 4, 8 December 1981.

### Opinion No.

- 1188 (p. 239) Aphis pyri Boyer de Fonscolombe, 1841 (Insecta, Hemiptera), conserved.
- 1191 (p. 249) Berytus consimilis Horváth, 1855 (Hemiptera, Berytinidae), lectotype designation confirmed.
- 1192 (p. 252) Lecanium acuminatum Signoret, 1873 (Insecta, Homoptera, Coccidae), neotype designated.
- 1193 (p. 254) Ceratophysella Börner, 1932 (Insecta, Collembola), conserved.

### Direction No.

- 109 (p. 276) Seven family-group names in Insecta, Heteroptera, placed on Official List.
- 110 (p. 280) Ixodes Latreille, 1795 (Arachnida, Acarina), entry in Official List of generic names confirmed.

The Commission regrets that it cannot supply separates of Opinions or Directions.

R.V. Melville,  
Secretary.

## POSITION AVAILABLE / DISPONIBLE

GRADUATE STUDENT or POSTDOCTORAL FELLOW: for research in tick physiology/pharmacology/biochemistry with some teaching responsibility at Department of Zoology, University of Alberta. Candidates should provide a Curriculum Vitae and the names and addresses of at least three referees to Dr. William R. Kaufman, Department of Zoology, University of Alberta, Edmonton, Alberta T6G 2E9. For information about the University's graduate programme and for application forms write to The Dean, Faculty of Graduate Studies and Research, 2-8 University Hall, University of Alberta, Edmonton, Alberta T6G 2E9.