

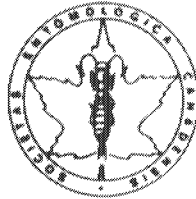
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ENTOMOLOGICAL SOCIETY OF CANADA

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# Bulletin

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SOCIÉTÉ ENTOMOLOGIQUE DU CANADA

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VOL. 16

September - septembre 1984

No. 3



Entomological Society of Canada  
Société Entomologique du Canada

*Bulletin*

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## GUEST EDITORIAL

### Some surprises from the E.S.C. Human Resources Survey

by  
B. K. Mitchell\*

Results of the 1983 Survey of Human Resources in Entomology in Canada published in the June Bulletin give us a good indication of likely openings in the next few years and of our preparedness to fill these gaps. These and other topics are well covered in the full report by Dr. Madder et al.

However, a comparison of the 1975 and 1983 survey leads me to wonder about the reasons for some of the apparent major changes in emphasis since 1975. Of particular interest is the change in research emphasis relative to teaching at educational institutions. This change is seen in responses from faculty as well as from students. I wonder if there has been as great a change as the survey seems to suggest? For instance, 86 of 125 faculty members saw teaching as their major function in 1975, while in 1983 only 43 of 146 thought this was the case. I doubt that many departments have dropped several courses in the years between the surveys, nor have we added a large group of researchers. Could it be that the heavy emphasis on research output by salary and promotion committees has contributed to this change? Are we reducing time spent in course preparation in favour of more research time? Is there reluctance to take on a new course because of the detrimental effect such a commitment would have on our research?

Perhaps things are not as serious as these questions suggest. The survey question asking us, in effect, to decide between naming teaching or research as our primary function may be at fault. It seems to me that a faculty member should always hold these two activities in balance. Under the best circumstances they would blend together so that it would be difficult to determine when one begins and the other ends. Many of our interactions with graduate students are good examples of this blending. Also, are papers presented and published part of teaching or part of research? Readers can pose other questions along this line. I suggest that the survey question forcing us to choose between teaching and research is inappropriate for many faculty members. I am not sure how this kind of information can be accurately obtained, but the widely varying results of the two surveys indicates that some new approach is necessary.

Perhaps of greater significance is the relative disdain shown for teaching by our graduate students. It was not pleasant to learn that only 62% of our graduate students would place teaching higher than fourth in their choice of entomological endeavours. What is happening? The poor opportunities available for teaching positions should not deter someone really interested in teaching from stating that is what he or she would like to do, given the opportunity. Are we, the faculty, giving our students the idea that teaching is not fun or rewarding? I, for one, am going to pay more attention to what we communicate to students regarding the joy of teaching.

## LETTER TO THE EDITOR

I would like to point out an error in Table 10 of the article *Human Resources in Entomology in Canada* in the June 1984 Bulletin.

Figures given for Canadian graduate students in entomology for 1983 for McGill University are:

M.Sc.	Ph.D.	Total
5 (-2)	4 (-3)	9 (-3)

On checking our 1983-84 registration I find that they should be:

M.Sc.	Ph.D.	Total
8 (+1)	10 (+3)	18 (+4)

\*Chairman, Department of Entomology, University of Alberta, Edmonton, Alberta.

In addition to these *Canadian* graduate students we have non-Canadian registrants as follows:

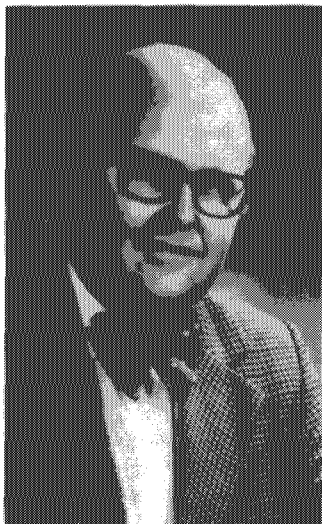
M.Sc.	Ph.D.	Total
3	2	5

Our total graduate student enrollment for the years 1975-1983 inclusive was: 21, 24, 23, 24, 18, 16, 22, 19, 23, which would indicate that our graduate school complement has remained relatively constant rather than having declined as Table 10 indicates.

Robin K. Stewart  
Chairman  
Department of Entomology  
Macdonald College of McGill University

## AWARD

### Kenneth George Davey, Gold Medal Recipient



The 1984 recipient of the Entomology Society of Canada's Gold Medal for outstanding achievement in Canadian entomology is Dr. Kenneth George Davey, Dean of Science, York University. In presenting this award, the Society recognizes not only his many contributions to the science of entomology but also his efforts on the promotion of biology in general through the Biological Council of Canada and the Natural Sciences and Engineering Research Council of Canada.

Dr. Davey is a native of Ontario and received his primary and secondary schooling at McKeough and Chatham Collegiate. He earned his B.Sc. and M.Sc. at the University of Western Ontario under Professor A. W. A. Brown. His Ph.D. was obtained at Cambridge University under Sir Vincent B. Wigglesworth. Following this, Dr. Davey was a National Research Council Postdoctorate Fellow at the University of Toronto in the Department of Zoology and spent 4 years as Drosier Fellow of Gonville and Caius College at Cambridge University with the responsibilities of teaching in Zoology, entrance and scholarship examinations and research on the control of visceral muscles in insects.

Dr. Davey's research accomplishments are in the area of insect physiology including digestion, cardioregulation, neurosecretion, parasitology and reproduction. He has published 130 scientific papers in his field including 28 on parasitic nematodes and cestodes which attests to his interest in a wide area of research. In addition to scientific papers, Dr. Davey has written a number of review articles and his text "Reproduction in Insects" is frequently cited eighteen years following initial publication. He is a highly respected authority within the international community of insect physiologists and is generally acknowledged as the preeminent scientist in this field in Canada. Evidence of his international status is provided by his editorship of the International Journal for Invertebrate Reproduction and Development and his membership on committees such as the International Committee for Symposia on Comparative Endocrinology.

Dr. Davey's professional career began as Associate Professor of Parasitology at McGill University where he became Professor and Director, Institute of Parasitology. He became Professor of Biology at York University in 1974 and was Chairman of Biology from 1974 to 1981. Following a Sabbatical, he was appointed Dean of Science in 1982.

At both McGill and York Universities, Dr. Davey's laboratory has provided a challenging and stimulating environment for students. His enthusiastic approach to science through teaching and contacts with graduates has resulted in twenty graduates receiving the M.Sc. or Ph.D. under his guidance. In addition, twenty-one postdoctoral scientists have worked with Dr. Davey and have benefitted from his expertise in the field and his stimulating leadership. In spite of increased administrative responsibilities, two doctoral students, three M.Sc.

students, one postdoctoral fellow and one research associate are currently working in Dr. Davey's laboratory.

Dr. Davey has been and continues to be a strong advocate for entomology and the biological sciences in general through his activities with the Biological Council of Canada. As president of BCC during the period 1979-1982, he contributed substantially to the initiation of the Biological Survey of Canada and to the increased awareness of the needs of biologists at the federal government level. His current appointment as a member of the Committee on Grants and Scholarships as well as of the Sciences and Engineering Research Council of Canada ensures that biological science in general and entomology in particular will be strongly supported at the national level.

Dr. Davey is a member of several professional societies, the Society for Experimental Biology, Canadian Society of Zoologists where he served as President in 1981-1982, International Society of Invertebrate Reproduction, European Society of Nematologists, Entomological Society of Ontario, and the Entomological Society of Canada. He is a Fellow of the Royal Society of Canada, Fellow of the Entomological Society of Canada, and recipient of the Queen's Jubilee Medal.

The Society is pleased to present Dr. Davey the Gold Medal for Outstanding Achievements in Canadian Entomology on October 2, 1984 at the Annual Meeting, 1984, St. Andrews, New Brunswick and extends best wishes for continued success in future years.

## MID-TERM REPORT FROM THE PRESIDENT

The Executive Council held its mid-term meeting in Ottawa on 24-25 April. Prior to the Executive Meeting, the Science Policy Committee met on 23 April, and the Scientific Committee of the Biological Survey of Canada (Terrestrial Arthropods) met following the Executive Meeting on 26 and 27 April. Developments reported by committee chairmen, together with other recent items, will be of interest to members.

The second Manpower Study of Entomologists in Canada was completed in January 1984, with the final report prepared in English and French. The primary objectives of this second study were:

- 1) Determine if the 1976 survey (ESC Bulletin, Vol. 8[3]) accurately predicted the manpower situation in Canada since that time.
- 2) Determine if the problems of oversupply in certain disciplines and undersupply in others have been corrected due to implementation of recommendations of the 1976 survey.
- 3) Assess the manpower situation in Canada for the next five years.

Agriculture Canada and Environment Canada endorsed the study and Supply and Services Canada funded the project through a contract received by the Society on 6 January 1983.

Copies of the report comprising 88 pages, plus 28 pages of appendices, have been sent to Agriculture Canada, and a summary has been prepared for publication in the Bulletin.\* Copies of the report are available from the ESC office.

In early November the Executive established a Steering Committee to investigate the possibility of holding the 1988 International Congress of Entomology in Canada. The recommendation of the Committee that an invitation should be extended to the Council of I.C.E. to meet in Vancouver, 3-9 July 1988, has been accepted by the Executive and the official invitation will be presented at the Hamburg Meeting in August of this year. Dr. G. G. E. Scudder has agreed to chair the committee responsible for the organization of the 1988 Congress.

Funding for the Society's proposal "The Economics of Insect Control in Wheat, Canola and Corn in Canada" was refused by D.S.S., on the grounds that the work described was not a new project but a continuation of the previous economic insect control review. Negotiations are now in progress with Agriculture Canada to fund this project. However, it may have to be funded over a three year period rather than two years as originally planned.

Under the chairmanship of First Vice-President, S. B. McIver, the Science Policy Committee met on 23 April 1984. It was noted that an abridged version of the Holliday Report entitled "Review of Entomology Curricula in Canadian Universities" was published in the E.S.C. Bulletin, Vol. 15 (2). Since very little comment has been received on this publication, Chairman McIver will write heads of Canadian University Biology Departments, with entomology programs, to determine how the Holliday report was received or perceived. The Microbial Insecticides Sub-Committee was requested to have a progress report available for

\*ESC Bulletin, Vol. 16 (2), 1984 — Editor

the Governing Board meeting at St. Andrews, N.B., in September. The Public Education Committee will consider initiatives to obtain funds from MOSST's recently announced financial package for individuals or organizations with projects to increase public awareness of science and technology.

John Laing, Chairman of the *Ad Hoc* Committee on Biological Control of Insect Pests and Noxious Weeds, will review the Kelleher Report to see if it satisfies the objectives of the study committee and will forward recommendations to the Governing Board. The McNeil report "Need for Continuing Support of Entomology in Renewable Natural Resources by the Federal Government" will not be circulated, but retained on file by the Committee. SPC will maintain contact with the President of the Agricultural Institute of Canada.

Dr. S. B. McIver wrote on behalf of ESC to Dr. Douglas Wright, President, University of Waterloo, and Chairman of a MOSST Task Force organized to review Federal Technology and Development Programs on the contracting out of research. Comments on contracting out in agriculture were based on discussions with entomologists representing research scientists and administrators within agriculture, with professors and with university administrators.

Treasurer Becker reviewed the 1983 audited financial statement for the Society. Total revenue, including \$34,894 interest on investment, was \$305,630, while expenditures were \$315,961, for a deficit of \$10,331. It is too soon to evaluate the effect of increased prices for subscriptions, reprints and back issues on the Society's 1984 finances. The 1983 financial statement, but not the budget, will be published in the Bulletin.\*

It is a pleasure to advise members that the Society's application to NSERC for a grant to defray costs of publishing *The Canadian Entomologist* has again been funded for \$32,000. This will help maintain the page charges at the newly established rate of \$60 until the Spring of 1985.

The Finance Committee reported it was making progress toward acquiring a micro-computer system for the Society's office. The Committee recommended that allowable expenses for persons attending Governing Board Meetings be actual expenses up to a maximum of the prevailing "Government Rate". The Secretary was asked to urge members to make all possible savings when attending Governing and Executive Council Meetings. The Finance Committee has concluded that separation of the *Canadian Entomologist* and ESC membership is undesirable because of financial reasons.

Stephen M. Smith and Roger G. H. Downer, Department of Biology, University of Waterloo, have accepted the positions of Scientific Editor and Assistant Scientific Editor, respectively, November 1984. The Society is very fortunate in obtaining the services of such highly qualified and dedicated scientific editorial leadership. Expressions of gratitude and appreciation were conveyed to Doug C. Eidt and Charlie A. Miller, Forest Research Centre, Fredericton, N.B., for serving the Society in these capacities 1978-83. The Scientific Editor and headquarters staff are commended for the quality of the *Canadian Entomologist* and promptness of publication. The Bulletin Editor is still concerned with late deliveries.

After providing the Society with competent and diligent services as Secretary for three years, H. Glenn Wylie has decided to retire as of 31 December 1984. Glenn will be succeeded by Joe A. Schemanchuk, Lethbridge Research Station, Agriculture Canada, as of 1 January 1985.

The Executive was advised by R. H. Storch that plans for the 1984 meetings at St. Andrews, N.B., were on schedule. A formal announcement of the meeting, with information on lodging, registration and a call for submitted papers was sent to members in May.

The 1985 Annual Meeting to be sponsored by ESC will be held at Ottawa in September, with the co-operation of ESO. Dr. D. E. Bright is Chairman of the organizing committee. The theme for the meeting is "Entomology on the Northern Horizon", with several symposia, submitted papers and an ESO student competition. The Society will also participate in the BCC Congress of Canadian Biological Societies at London, Ontario, 23-28 June 1985. Dr. G. B. Wiggins, Chairman of the committee to develop the ESC program for the BCC Congress, advised Council that there will be interdisciplinary sessions and sessions organized by each Member Scientific Society. ESC will have two symposia, two sessions for submitted papers and an information booth for registrants and for publicizing ESC activities and publications. Concern was expressed by the Executive that financial support from ESC for the BCC Congress may be greater than originally expected. The program Chairman recognized the possibility of a financial shortfall.

The Executive suggests that following the meeting in 1985 the ESC should evaluate the success of having two major Entomological meetings in the same year. It is probable that BCC Congresses will be held at five-year intervals, and consideration should be given to procedures to be followed if the ESC hosts the 1988 International Congress of Entomology at Vancouver, 3-9 July.

\*ESC Bulletin, Vol. 16 (2), 1984 — Editor

Dr. S. B. McIver, our BCC Representative, advised that the Biological Council of Canada continues its activity in areas that are of great concern to biologists. For example, BCC has continued to press NSERC for the establishment of an "Advisory Committee on Life Sciences", quite probable sometime this year. Other current BCC activities include: the development of a national policy on Canada's Field Stations; of a National Botanical Garden System; of the 1985 Canadian Congress of Biology; BCC position paper on forestry research in Canada; and improvement in communications with constituent societies. Dr. D. C. Eidt, Forest Research Centre, Fredericton, N.B., has been appointed the ESC representative on the *Ad Hoc* Committee preparing the BCC position paper on forestry research in Canada. Additional information on BCC activities 1983-84 may be obtained from President South's report published elsewhere in this Bulletin.

Dr. S. B. Hill, our Association for the Advancement of Science in Canada representative, reported that the ESC role in this new group is not well defined and AASC itself has not yet found its niche. Dr. S. B. Hill will make a presentation on the purposes of AASC at the ESC/AES meeting in St. Andrews. Currently, there are 32 corporate members (of which ESC is one) of AASC, but no current figures on individual member numbers. The address for inquiries is: AASC National Office, 805-151 Slater Street, Ottawa, Ontario.

The Biological Survey of Canada (Terrestrial Arthropods), with Secretariat H. V. Danks and a scientific committee provided by ESC, has attracted international attention and recognition and is continuing its excellent work. Progress was reported on a wide variety of survey projects, including: preparation of keys to families of terrestrial arthropods and faunistic studies of the Yukon, Newfoundland, glacial refugia, wetlands, grasslands, springs and soil. Other items addressed at the meetings included: expansion of the survey through additional modules; establishment of a trust fund for publications; appraisals of environmental disturbances; use of insects in environmental impact assessment; climatic changes—long term; survey workshops; and ESC rules for the Scientific Committee. A complete report on BSC (TA) activities by Secretariat H. V. Danks is published elsewhere in this Bulletin.

Rene J. Martin, Chairman of the Board, Canadian Postal Corporation, advised the President in April that the Stamp Advisory Committee will consider the Society's suggestion, that the Corporation issue one or more commemorative stamps depicting Canadian insects, at its 1984 fall meeting.

Since assuming office last October, I represented the Entomological Society of Canada at the Annual Meeting of the Entomological Society of America in Detroit, 9-13 December. Past President, G. E. Ball, was our representative at the Joint Annual Meeting of the Entomological Societies of British Columbia and Alberta in Penticton, B.C., 20-22 October, and at the Annual Meeting of the Entomological Society of Manitoba in Winnipeg, 3-4 November. At the Annual Meeting of the Entomological Society of Ontario in Guelph, 27-28 October, Regional Director R. Harmsen represented the Society.

In conclusion, since the annual meeting in October 1983, a number of reports have been completed, some new initiatives have been taken, administrative changes have been made and routine administrative matters, including correspondence, are receiving the required attention.

Ray F. Morris  
President ESC

## 34th ANNUAL GENERAL MEETING

### Notice

The Annual General Meeting of the Entomological Society of Canada will be held Tuesday, October 2, 1984 at 3:30 P.M. at the Algonquin Hotel, St. Andrews, New Brunswick.

Matters for the consideration of this meeting or of the Governing Board meeting, to be held on September 29-30, 1984 at St. Andrews, should be sent to the Secretary, Dr. H. G. Wylie, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba R3T 2M9.

La Réunion Annuelle d'Affaires de la Société Entomologique du Canada aura lieu le mardi, 2 octobre 1984, dans l'Hôtel Algonquin, St. Andrews, New Brunswick. Ceux qui désirent soumettre des propositions pour cette Réunion ou au Conseil de Direction, voudront bien les envoyer à l'adresse donnée plus haut.

## COMMITTEES

### **Achievement Awards Committee: Gold Medal for Outstanding Achievement in Canadian Entomology and The C. Gordon Hewitt Award, Call for Nominations**

Members of the Society are invited to nominate individuals whom they regard as eligible for these awards. Nominations should be sent in an envelope marked "Confidential" to the following address:

Achievement Awards Committee  
Entomological Society of Canada  
1320 Carling Avenue  
Ottawa, Ontario K1Z 7K9

and should comprise: (1) the name and address of the nominee(s); (2) a statement of relevant achievements; and (3) the name of the nominator and at least one seconder. To be considered by the Achievement Awards Committee nominations must bear a postmark no later than November 30, of the current year.

The following conditions govern these awards:

1. Outstanding contributions should be judged on the basis of
  - (a) superior research accomplishment either as a single contribution or as a series of associated endeavours and which may be either in entomology or a related field where the results obtained are of great consequence;
  - or
  - (b) dedicated and fruitful service in the fields of Society affairs, research administration, or education.
2. No more than one of each award shall be granted per year but, where circumstances warrant, more than one individual may be mentioned in a single award.
3. Recipients need not be members of the Society providing their contribution is judged to have a major impact on entomology in Canada.
4. The award may be granted on different occasions to the same recipient but for different contributions to entomology in Canada.
5. Nominees for the C. Gordon Hewitt Award must be less than 40 years of age throughout the calendar year in which the award is both announced and awarded.

### **Report of the Elections Committee**

The Elections Committee consisted of F.M. Barrett, T.M. Galloway and G.K. Morris (Chairman). It met 16 July 1984 and examined ballots for the 1984 election of officers.

Ballots mailed: 883. Ballots cast: 388. There was one partially spoiled ballot. The successful candidates were:

Second Vice-President: G. G. E. Scudder

Directors-at-Large: C. Cloutier and G. Pritchard

Fellowship Selection Committee: S. R. Loschiavo and R. W. Stark

The Election Committee hereby certifies that all of the ballots were accurately counted and that the results are correct.

Glenn K. Morris  
Committee Chairman



# BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS)

## Survey Report

The Scientific Committee met in Ottawa on April 26-27, 1984. Some highlights are summarized below. A fuller account of this meeting appears in the fall 1984 Newsletter of the Biological Survey of Canada (Terrestrial Arthropods).

### *Scientific projects*

1. Illustrated keys to the families of arthropods in Canada. The manuscript and figures of the keys to myriapods is in final form. A document summarizing the keys project will be produced to help solicit funds for publication.
2. Arthropod fauna of the Yukon. Field work continues in 1984, and collections in the U.S.S.R. are also being examined. An interim report on the orthopteroids of the Yukon has been published.
3. Arthropods of Canadian grasslands. Developments in grasslands projects have recently been summarized in a second Grasslands Newsletter.
4. Aquatic insects of freshwater wetlands. Arrangements are complete for the 1984 conference on aquatic insects of peatlands and marshes. Details were published in the June Bulletin.
5. Arthropods of freshwater springs in Canada. A preliminary bibliography of springs and a preliminary inventory of some organisms from selected springs has been assembled.
6. Arthropod fauna of soils in Canada. The International Symposium on soil structure (Edmonton, June 1984) was successfully funded and completed.

### *General developments*

1. Expansion of the Biological Survey of Canada. The Committee approved a document recommending avenues for expansion of the Survey into other groups of organisms in response to a request from the Director of the NMNS.
2. Statements on environmental disturbance. A brief on the appraisal of environmental disturbance was approved (see the insert to this Bulletin). A second, more specific, treatment of the use of insects in Environmental Impact Assessment is also being prepared for publication elsewhere.
3. Annual Report to the National Museum of Natural Sciences. The 1984 Annual Report of the Biological Survey of Canada (Terrestrial Arthropods) to the Museum was approved.

### *Liaison with other organizations*

1. Entomological Society of America. Dr. D. E. Bright, representing the Systematics Resources Committee of the Entomological Society of America, reported significant advances with the Biological Survey of the United States project (BISUS).
2. 17th International Congress of Entomology. The Survey will be represented at the International Congress in Hamburg, through a paper on "Biological Surveys" by Dr. H. V. Danks, and Dr. M. Kosztarab of the U.S.A.
3. NSERC guidelines for the use of collections. The Committee approved an appropriate wording for guidelines on collections of specimens, that will be recommended to NSERC.
4. Parks Canada. The conclusions and background information on National Parks given in the Final Report of the Pilot Study for a Biological Survey of the Insects of Canada will be forwarded to the organizers of discussions about the use of Parks, held in connection with the 1985 Parks Canada centennial.

### *Other items*

A subcommittee (Dr. J. V. Matthews, Chairman) was appointed to develop ideas on long-term entomological work relevant to climatic change. The Committee discussed documents on Canadian field and research stations prepared by a subcommittee of the Biological Council of Canada. Several designs for a logo to appear on Survey publications were reviewed, and a short leaflet to be produced by the Museum, intended to explain the Survey to a general audience, was approved. Ideas for organization by the Survey of taxonomically orientated workshops were discussed, and will be developed further (Dr. G. E. Ball). The Committee approved a format for a symposium on the Biological Survey of Canada (Terrestrial Arthropods) at the 1985 Biological Council of Canada Congress of Biology (Dr. G. B. Wiggins).

## ARTICLES

### **Allelochemicals as Host Plant Resistance Factors: Some Ecological Consequences**

by  
**M. B. Isman\***

The study of insect-plant chemical interactions has become a popular area of research in recent years, judging from at least three international symposia dedicated to the subject since 1980. However, few laboratories in Canada are presently dedicated to this area of research. An applied aspect of insect-plant chemical interactions which is helping to foster this type of research involves the development of host-plant resistance in agronomic plants, based on natural products in the plants. Two years ago, the Pacific Branch of the Entomological Society of America featured a symposium at its annual meeting entitled "A Perspective on Phytochemical Resistance and Insect Control". I was asked at the time to present an overview of the potential use of plant chemicals as bases for host resistance and to suggest possible ecological consequences arising from this practice. Realizing that this subject has received relatively little attention at ESC meetings and in our society's publications, I decided to share my thoughts with our membership by way of a summary of the aforementioned address.

We now generally accept that plant natural products often play important roles in the interactions between phytophagous insects and their hosts. Allelochemicals (i.e. plant natural products which have a negative impact on herbivores) can potentially render a plant more resistant to insect attack via modification of the insect's behaviour (deterrence of feeding and/or oviposition), or by interference with the physiology of the insect's growth and development. Much of the current literature on host resistance to insects documents the isolation, identification, and bioassay of plant allelochemicals which slow the rate of larval growth, rather than being acutely lethal. The commonest bioassays used to demonstrate a reduction in larval growth usually do not distinguish between an effect owing to reduced feeding, or to some post-ingestive physiological phenomena. Examples of allelochemicals from crop plants which are inhibitory to larval growth of pest insects include: tannins from cotton, flavonoids from cotton, tomatoes and wheat, terpenoids from corn, cotton and sunflower, and alkaloids from potatoes and tomatoes.

Prolongation of the larval stages of a pest insect by allelochemicals can accentuate the natural hazards to which the pest may be exposed, including predation, parasitism, pathogens and adverse weather. Life table data for a noctuid pest, the western yellow-striped armyworm, indicates that over 90% of the mortality per generation occurs before the 3rd instar; if mortality in the larval stages alone is considered, over 80% mortality occurs in the first two larval instars. This represents a type I survivorship curve (according to Price 1975), to which many phytophagous pest species belong. Cage exclusion experiments in the field provide strong evidence that larval mortality in the armyworm is largely attributable to the actions of parasites and predators. Laboratory studies have demonstrated that ichneumonid parasitoids attacking noctuids preferentially parasitize smaller larvae, possibly because larger larvae offer resistance to oviposition by the wasp. In addition, pest insects impaired by allelochemicals in their host may be forced to spend a greater proportion of their time feeding or searching for acceptable food, exacerbating their vulnerability to both biotic and abiotic mortality factors.

Considerable evidence exists that synthetic insecticides are more efficacious against early-instar larvae than against later instars. One reason for this is that the detoxicative enzyme system on which most species depend for metabolism of insecticides, the mixed-function oxidases, increases in activity in later instars. In simpler terms, smaller larvae tend to be less able to metabolically handle insecticide doses approaching the lethal level. Further, the higher surface area to volume ratio of small larvae relative to large larvae, favours greater cuticular penetration of insecticides, and subsequently, lower LD50's in smaller larvae. Finally, several pest species bore into the stems, leaves, or fruits of their host plants, often eliminating their risk of exposure to biotic and abiotic regulatory factors. Thus, allelochemicals in host plants which prolong early larval developments of the pest are advantageous in terms of pest management because they will extend the 'window of vulnerability' of the pest to numerous agents of control.

\**Department of Plant Science, University of British Columbia, Vancouver, BC V6T 2A2*

Crop plants often contain several classes of allelochemicals which could be manipulated to enhance host resistance (e.g. cotton, tomatoes). It may be possible in the foreseeable future to attain 'complex resistance' (based on several known factors) in some major crops. In such a case, relative to monogenic (vertical) resistance, the evolution of virulence of the pest (i.e. the evolution of resistance-breaking biotypes) would be slowed because regulation of the pest's population would be achieved with less direct selection (the proximate selecting agents would be the predators, parasites, etc. in the ecosystem). In theory then, resistance attained through allelochemicals could be more durable in time compared to the conventional vertical-type resistance.

*Potential drawbacks.* Although host resistance based on allelochemicals would appear to be very compatible with most other pest management tactics, some potential drawbacks to the utilization of allelochemicals must be acknowledged. Evidence exists that some allelochemicals are more deleterious to parasitoids attacking pest insects than to the pests themselves, suggesting that allelochemical-based host resistance may extend beyond the plant-insect interface to the host (=pest)-parasite interface. Some allelochemicals stimulate production of microsomal oxidase enzymes in insects, increasing the insects' detoxicative capabilities and subsequently rendering those larvae less susceptible to certain insecticides in current use. Some allelochemicals may also protect phytophagous insects from microbial pathogens. Further, certain allelochemicals which are inhibitory to particular insect species actually enhance the growth of other species, raising the possibility that some innocuous species could be elevated to pest status if particular kairomonal-type allelochemicals were bred into the host plant. If anything, these examples should demonstrate to us how poorly we understand the role of plant natural products in our agroecosystems, and to indicate how potentially profitable investigation of insect-plant chemical interactions can be in the immediate future.

A new wrinkle to the study of insect-plant relationships has recently been discovered. Entomologists with the USDA have found that resistance to pest insects in some crop plants can be stimulated by treatment of the plants with growth regulators. When a student recently tested this idea in my laboratory, we found that the insects actually grew faster on plants treated with one of the same regulators used in the U.S. study. It is obvious that growth regulators have profound physiological effects on treated plants; apparently the effects on insects feeding on treated plants warrants thorough investigation. It seems that many crop plants already possess the necessary arsenal of allelochemicals to deter pest insects—controlling production of the allelochemicals in the plants may be the future key to host resistance to insects. To be competitive in this emerging area of entomological research, we in Canada will have to insure that our students have broad training in insect ecology, behaviour and physiology, and in the physiology and biochemistry of plants.

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# MY LIFE WITH THE SPRUCE BUDWORM\*

by  
Muriel E. Miller



MURIEL MILLER

*Mrs. Miller is the wife of Charles Miller, who until recently was Assistant Editor of the Canadian Entomologist.*

I am a city girl, born and bred. My life before Charles consisted of working 9 to 5 on the 11th floor of an office building in downtown Toronto, running for streetcars, prowling stores on my lunch hour and eating out in as many different restaurants as possible.

One night, on a blind date, I met Charles. He was introduced as being an entomologist. I thought that had something to do with words. He assured me it had more to do with biology. I had to be fascinated; after all, I had never before dated anyone who spent most of the evening explaining how to sex a cigar.

Our friendship grew, based on mutual need. He needed someone to type his thesis. I needed the money. I learned he was from the Maritimes. I had never been to the Maritimes. Indeed, I had never wanted to. The West, the Calgary stampede, the mountains, all these beckoned to me and excited my imagination. The East seemed to draw a blank. It was not that the East received a poor press in Toronto, just that it seemed to receive no press at all. Even Beaverbrook is claimed as a native son in Ontario.

Our courtship continued, even after the thesis was finished. Winter turned into spring and in March, 1950, we became engaged. In May Charles left to take up his duties with the Canadian Forestry Service in a place called the Green River Research Station in northern New Brunswick. It was agreed that he would return in October, I would have everything arranged, and we would be married. I knew we would be living in Fredericton and, with a sense of discovery, I had found it on a map. I also knew we would be spending from May to October most years at this Green River Station, but that sounded like Paradise. In glowing terms, Charles had described the beautiful forest, the many lakes and streams full of speckled trout, the peace and tranquillity. He also told me, and I have never quite forgiven him this, that there were no mosquitoes in the woods.

Charles left Toronto in May weighing about 170 pounds and study hall pale. Early in October I opened the door to a mahogany-coloured individual weighing over 200 pounds. Four months in the bush, eating in a cookhouse where pies and cakes and peanut butter were routinely put on the breakfast table with the bacon and eggs and pancakes had changed my beloved considerably. It was the first of a series of shocks.

October is a great month for a honeymoon, because it is a great month for a motor trip. It took us two happy, colourful weeks to travel from Toronto to Fredericton, moving about a thousand miles eastward and several years backwards. It was late in the day when we reached the border towns of Calais, Me., and St. Stephen, N.B., and stopped for a cup of coffee. My new husband suggested I might want to use the facilities. "Not just now," I said. "We can always stop further along the road."

He shook his head. "There isn't anything along the road except the road," he said. I laughed.

It grew darker and darker as we drove deeper and deeper into what appeared to be unrelieved forest. Not even a gas station appeared. I became a bit nervous.

"Perhaps we should have stayed on the main highway," I ventured.

"This is the main highway," Charlie said.

I slipped down as far as possible in my seat, and kept my eyes straight ahead. I didn't want my new husband to see me crying.

But the winter of 1950-51 went well, with new friends and work to keep us busy. But as spring approached, our excitement grew. Soon we would be off to the Green River Research Station, to our own little cabin in the woods, to do battle with the spruce budworm, then reaching epidemic proportions.

The road from Edmundston to the Green River Research Station runs north for 40 unpaved miles through a balsam fir forest, and must have been designed by a drunken

\*Reprinted by permission of the Saint John Telegraph-Journal.

engineer. The quaint narrowness of the road was made more interesting by the frequent and unexpected appearance of fully loaded pulp trucks heading in the opposite direction. The trick seemed to be to do it in an hour, including the time required to stop at Fraser Company's gate to identify yourself and your business.

The first sign of civilization was Fraser Company's Summit Depot, a group of buildings clustered around the base of a hill. These included a sawmill with a great pile of sawdust and lumber; stables for horses; a fully operational blacksmith's shop; cookhouse, and bunkhouses. A steep little road going further up the hill to a sort of plateau revealed the federal government's Green River Station—a two storey laboratory, generator shed, weather station, cookhouse, two quonset hut type bunkhouses and several cottages for the married men. In the centre was a forlorn looking volleyball court with a tattered net which served the recreational needs of some 30 to 40 people from May to October.

My first reaction was relief at actually having arrived alive after all the curves, swoops, turns and dips. My next reaction was awe: we were surrounded by virgin forest of balsam fir, spruce and white birch. Only a few tall pine had been cut, many years earlier, required as masts for sailing ships. A small pond at the base of the hill served as a mirror to reflect the surrounding trees. White tailed deer could be seen drinking from the far side of the pond. It was a picture no self-respecting artist would attempt to paint. It was so pretty it was corny.

### *The Big, Black Box*

The cottage was better than I had hoped; living room, bedroom and a two-piece bathroom. Pleased to have indoor plumbing, I didn't quibble about the lack of a tub. The first hint of trouble came from the kitchen, where I was confronted by a big, black box. "What's that?" I asked suspiciously.

"It's the cookstove," Charlie replied.

"Oh? Who's going to cook on it?" I asked. Charlie looked at me.

"We are," he said carefully.

I doubted it, but was comforted by the presence on the counter of a two-burner Coleman stove. That, I thought, I could manage.

Charlie took me on a tour of the compound and at each cottage I was happy to be greeted by friends from Fredericton; Celia Morris, Laura Baskerville, Jean Greenbank, Joyce Bennett. We were all recently married, except for Celia who was the wife of the director, Dr. R. F. Morris. There were a couple of pet dogs around, but no children. Walking between the lab and the cookhouse I became aware of a little black cloud hovering directly over my head. Trying to brush it away from my forehead, I discovered blood on my hands. "What's this," I wanted to know. "I thought you said there were no mosquitoes."

"There are no mosquitoes," Charlie said reasonably. . . "Those are blackflies. Seem to have taken a liking to you, haven't they? Don't worry, you'll get used to them and they won't bother you any more, honest."

By the time we returned to the cottage, I was encrusted with small bloody bites behind my ears, around my hairline, and in the corners of my eyes. My fresh, big-city blood was like nectar to them. "They will never leave me alone," I wailed. "I'm supposed to stay here until October and I won't be able to go outdoors!"

"Don't be silly, there's some stuff you can put on. I'll bring you a bottle from the Lab. It'll keep them away."

"Is that what you use?"

"Heck no. I wouldn't touch the stuff. It stinks to high heaven." I retreated to wash my wounds.

### *Rooted In Tradition*

Looking back from this more liberated age I find it remarkable just how firmly rooted in tradition we were in the early 50s. The Green River society was very conformist. All of the professional staff were male. All of the students hired for the summer were male. We few women tended our cottages, picked berries for jam, talked over coffee in the mornings and tea in the afternoon. We made long lists of things to be done on our Saturday trip to town for shopping, and we planned weekend parties to help our husbands unwind. This was necessary because the men at Green River worked very, very hard; keeping roughly the same hours as the budworm. I doubt if there are many other living organisms on the face of the planet that have been as investigated, probed, studied and examined as the spruce budworm at Green River. As eggs, larvae, pupae and moths they were left with no shred of dignity or mystery. Voyeurs with microscopes took details of their sex life, under glass and in the field.

Their eggs were counted, their very excrement sifted, weighed and measured. I recall Gordie Mott, then a graduate student, shaking his head and saying, "How can I explain to my mother that after five years of university I've spent the summer doing this?"

Trapped by lights, traced by isotopes, tracked by radar, fooled by pheromones, and incorporated into mathematical models, the bugs themselves took no notice and went methodically on, munching through millions of acres of forest. Foresters, entomologists, ecologists and wildlife experts arose early and worked late, studying not only the budworm but all of its natural enemies: birds, spiders, other insects.

### *Not The First*

The budworm epidemic of the early 50s was not the first of its kind. The long history of periodic outbreaks was written clearly in the very trees that the scientists were trying to save. But this was the first one that mattered. Before, there had been more forest than people could use; if a whole section of forest was devastated, so what. There were still plenty of trees to go round. But by the fifties, there were sawmills everywhere, the world was crying for paper and lumber and, for the first time, man had to compete with the budworm, to try to harvest the trees for his own purposes. Green River was a unique experiment in which a private company and the federal and provincial governments combined to try to control budworm through forest management.

It was an unfair fight.

In the battle of the budworm, the scientists were greatly outnumbered. Only one thing seemed to be on their side: chemicals. Not that the budworm could be eradicated by chemicals, but he could be held at bay long enough for much of the forest to be saved and healthy trees harvested.

While Chas fought the battle of the budworm in the lab, I had my own battle in the kitchen. The uncooperative iron stove reduced me to tears. Either it would smoke and belch, not producing any heat at all, or it would flare up hot and before I had my batter ready, die. I took my problem to Celia. She had been at Green River since day one and knew everything. Small, blonde, energetic, Celia assured me her stove was no problem at all.

"I can have my oven up to 350 degrees in 10 minutes," she told me.

In the kitchen Celia put a handful of kindling into the stove, carefully placed a few larger pieces of wood on top, then reached under her counter for a large metal can with a spout.

"What's that?" I asked as I watched her pour a generous dollop of the liquid over the wood.

"Kerosene," she answered, as she dropped in a lighted match.

There was a "whump" sound like a muffled explosion and an instant orange glow. She was right, her oven was up to 350 in 10 minutes. But Charlie would never let me use this new trick I had learned, so I never did get the hang of the cookstove.

I did, however, learn to cook firm, pink trout right by the side of the stream, minutes after we had caught them. Fishing was a passion at Green River. Almost every Sunday was devoted to it, and seldom did anyone come back empty handed.

Once, within earshot of Dr. Morris, I made the mistake of saying I was bored. Early next morning we were awakened by hammering on the outside of the cottage. R. F. Morris was putting up a row of shelves.

"Can't have anyone complaining of nothing to do," he said. "There's so much to do we'll never be finished." He left me with a row of jars containing budworm. I was instructed to insert different kinds of foliage, keep notes, and watch to see which kind of foliage the bugs ate first, then second and third. "It's called the spruce budworm," he said, "but I think it's a misnomer. Seems to me the damn thing will eat anything." For two weeks I watched and recorded the activity in the numbered jars. Sure enough, my little charges attacked the balsam fir first, spruce next. No doubt this little bit of budworm trivia is buried somewhere in the files deep within the Maritime Forest Research Centre. But it did give R. F. ideas about unpaid, volunteer help. Soon we women were recruited for the egg count. The egg count is an exercise designed to sell glasses to people who never had any trouble with their eyes before.

The Bennetts and the Millers probably started the population explosion at Green River. In the summer of '53 the first two babies arrived at the compound, Bruce Bennett and Susan Miller. After that, it's hard to keep track. Our family was really quite modest, Susan's brother Paul spent his first summer at Green River in 1956. All told, the Bennetts had four children, Baskervilles had four, Greenbanks hold the record with six. There was a house full of tots who belonged to the Motts. One by one the boys would get married and bring their wives to Green River, and one by one babies began to arrive. No time for boredom now. The compound began to resemble a giant daycare centre. New housing had to be improvised. At one time a giant mobile home was actually delivered, in one piece, by a very surprised driver.

I wrote long descriptive letters home. My mother didn't believe them. She came to see for herself. She was still talking at 11 o'clock at night when the gas generator ran dry. "What happened to the lights?" she exclaimed. I had to explain that they would not come back on till the generator was filled in the morning. Everyone was expected to go to bed early at Green River. This was the only time I ever saw my mother speechless.

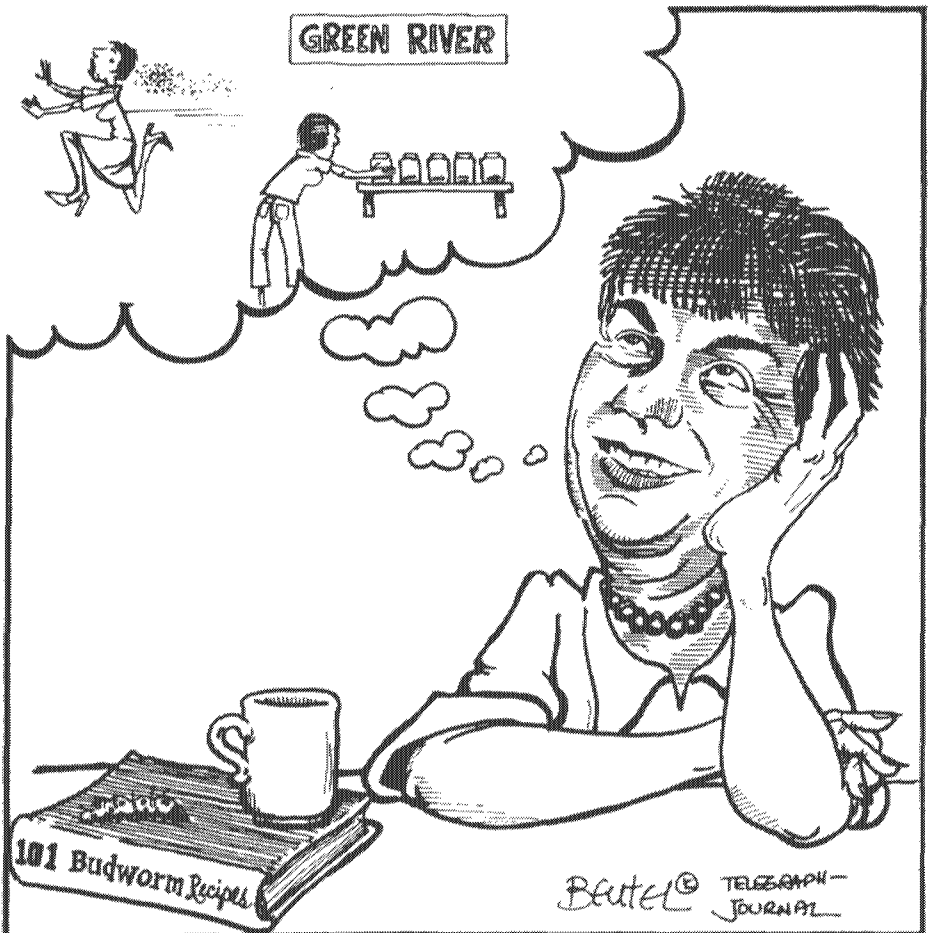
Ten Summers

All told we spent about 10 summers at Green River. The kids were fishing as soon as they were out of diapers. Susan caught her first trout from a little wooden bridge over a stream.

If the researchers at Green River were responsible for some scientific "firsts," I think it should be duly recorded that the Green River Wives also accomplished some "firsts."

Wedding showers for men were first introduced at Green River. We did it up beautifully for them with gifts, ribbons, sandwiches and a large, decorated cake which they had to cut with a beribboned knife. George McDougall was probably the first to be so honored. His immediate reaction was to bolt, but he was held on each side by a sturdy pair of students, another blocking the door behind him. Once he realized there was no escape he behaved beautifully, exclaiming over each gift, tying the ribbons together, cutting the cake with charm and grace. He brought his bride Fran to the station the following summer and over the years they became the "block parents" for many of the young fellows who felt a bit lost and lonely 40 miles from the nearest hamburger joint and liquor store.

Once the children started school, Green River became a July and August holiday for us; a time to pick berries, fish and read. The station closed in 1973. I often wonder how it looks now, quiet and empty. Has the forest reclaimed our painfully cultivated grass? Do squirrels and chipmunks live in the bunkhouses? Looking back, I feel I wouldn't have missed it for the world. But I wouldn't do it again for all the trees in New Brunswick.





## NEWS OF ORGANIZATIONS

### Biological Council of Canada: Conseil Canadien de Biologie President's Report, 1983-1984

This report covers the period from April 1983 to May 1984. During the past year the Council has been extremely active on a number of fronts, and I can report some encouraging if slow progress on various initiatives. The question of government hiring policies, which formed the basis of a BCC position paper<sup>1</sup> has continued to occupy the Council. Feedback on the report was generally positive, and I received a substantial number of requests for additional copies, principally from government scientists. It is interesting to note that many of the concerns that were expressed by the Biological Council on behalf of government scientists and about government science were echoed in the 1983 report by the Professional Institute of the Public Service of Canada.<sup>2</sup> The PIPS report was also a prelude to the Task Force on Federal Policies and Programmes for Technology Development, which was established by the Honourable Donald J. Johnston in November 1983 to review the government's intramural science and technology activities. It will make recommendations on whether government research is relevant to industry's needs. As President of the Council I prepared a brief report to the Task Force which was presented during the early phase of their discussions. In addition, I participated in a hearing conducted by one of its members, Dr. Angus Bruneau, on the campus of my own university. I was able to convey the views of the Council as well as my own at this meeting, although there was inadequate opportunity for lengthy exchange. The Task Force was constrained by an extremely short time-frame, and there appears to have been little opportunity for the kind of extensive input that should have been solicited on such a major issue. It is perhaps symptomatic of the government's attitude to science and technology that the Task Force may turn out to have been little more than a political road show.

Further to the question of government hiring practices, it is noteworthy that the Public Service Commission of Canada has suggested that they might advertise scientific positions in Society newsletters. This process is being facilitated, and I am hopeful that the Public Service Commission will avail itself of this opportunity. This does not, however, constitute a change in government hiring policy, although it does indicate a willingness on the part of government to spread their net more widely in the search for government scientists.

The BCC was unable to make a formal submission to the MacDonald Commission. Among other things, we were caught unawares with respect to the time frame that was required for presentation of briefs, and it would have been impossible to have prepared an appropriately researched document. The BCC did, however, have opportunity for input into some of the issues relating to the Commission through its participation in the Ottawa Consortium, and specifically through the invitation by the President of CAUT to comment on the CAUT's draft and final brief. The CAUT brief was of course focussed on universities, and insofar as those issues relate to the mandate of the BCC I felt reasonably comfortable with the points that were being made.

You will recall from my report last year that the BCC together with the CCUBC, was actively pursuing what we perceived as problems in Agriculture Canada's manpower programme. While it is yet early to determine how successful we were in bringing about any changes in policy, it is plainly evident that Agriculture Canada is now advertising very widely for these positions, this I feel certain in response to the lobby which we and others have directed at them. As I indicated last year, our efforts were complemented by those of the Canadian Association of Graduate Schools.

During the past year we have continued to press NSERC for the establishment of an Advisory Committee on Biology. NSERC provided a revised document concerning this Committee, expanding the mandate and giving it the name Advisory Committee on Life Sciences. We provided further commentary to NSERC on the revised policy, which met with general BCC approval. NSERC has yet to move on the establishment of the Advisory Committee on Life Sciences, although it is my understanding that this can be expected during the coming year. The growing pressure on science in Canada, and the need to meld the activities of universities, governments and industries in a wide variety of perceived national goals make it extremely important that this Committee be established as soon as possible. One question which relates specifically to the mandate of such a committee is that of forestry research in Canada. The 1983 Science Council of Canada's report on Canada's forests was an extremely well prepared and provocative document which resulted in some early changes in NSERC policy with respect to funding of forestry research, but which had



many other far reaching suggestions which have yet to be implemented. In response to this initiative by Science Council the BCC at its Fall meeting in 1983 approved the establishment of an *ad hoc* Committee whose mandate would be to develop a BCC position paper on the question of forestry research in Canada. Dr. Taylor Steeves, of the University of Saskatchewan agreed to serve as Chairman of the *ad hoc* Committee on Canada's forestry research, and the membership of the Committee was drawn from representatives of a number of BCC constituent societies. I am hopeful that a preliminary report of this Committee will be available in the near future, and that it will lead towards early publication of a position paper.

The question of developing a national policy on Canada's Field Stations has occupied a major proportion of my time during the past year. I am glad to report that, jointly with the Science Council of Canada Dr. Gary Bell was contracted to conduct the first stage of the procedure, that is the publication of a detailed inventory of Canada's Field Stations. This stage of the work was finished in the early Fall in 1983, and copies of the inventory are now available to universities and government scientists throughout the country. The survey was perceived as a first step towards development of the policy, and was a major collaborative effort for which many individuals and organizations should be thanked. In particular, we received cooperation from the Canadian Council of University Field Stations, who were invited and have agreed to serve as observers on the Biological Council for the next two years. At the Fall meeting in 1983 the Council agreed to establish an *ad hoc* Committee whose task would be to review the field station inventory, and to draft the national policy on field stations for consideration at the Spring 1984 meeting of Council. Chaired by Dr. Brock Fenton, Secretary of the Council, the other members were Dr. G. G. E. Scudder of the University of British Columbia, and myself. The policy document has now passed through two draft stages and has received very wide input from the Canadian field stations user community. Following the Spring meeting of Council 1984 it is hoped that a further meeting will be held at which a final version of the policy will be put together for publication. In this final stage it is expected that participation from NSERC, the Science Council of Canada, the Canadian Council of University Field Stations and the BCC will be involved.

I can report no progress so far with the question of reviving the 1973 proposal on a National Botanical Garden System for Canada. It was my hope that in collaboration with Dr. Roy Taylor, Director of the Botanical Garden at UBC and Mr. Alan Patterson, Director of the Royal Botanical Gardens in Hamilton a new version of the 1973 proposal could be drafted. Dr. McNeill and I did discuss the 1973 document with Agriculture Canada in Ottawa; our impression from these meetings was that while Agriculture Canada may be interested in the question of developing a National Botanical Garden in Ottawa, there seemed rather less interest in the question of a broader, national network of botanical gardens. I did receive a commitment from Dr. Taylor and Mr. Patterson to revive the 1973 document, and if and when such a revision is available I have assured them that the BCC will stand behind them in developing a lobby concerning the question of the National Botanical Garden System.

During the past few months activities have speeded up with respect to planning for the 1985 Canadian Congress of Biology. Following the Fall 1983 meeting of Council, Dr. Walden has convened two meetings of the Steering Committee of the Congress, and preliminary arrangements have been made to contract the organization of the Congress to a company in Toronto, Congress Canada. The 1985 Congress will certainly prove to be a major event, and I look forward to the BCC's role in this with considerable enthusiasm. It is particularly encouraging that not only are most of the constituent societies of the BCC participating, but in addition the Canadian Society of Microbiologists have a representative actively serving on the Steering Committee. I anticipate that the first circular of the Congress will be available early in the summer, and I urge as many members as possible of our constituent societies to attend this important first Canadian Congress of Biology.

The first BCC Gold Medal was awarded to Dr. Michael Shaw of the University of British Columbia, and I was pleased to have been able to personally present this to him at the summer 1983 meetings of the Canadian Phytopathological Society, who nominated him for the award.

I have made a significant effort during the past year to communicate more widely with our constituent societies. I am especially thankful to the editors of the various Society newsletters for making space available for publication of my annual report, and for correspondence relating to the role of the BCC. I am further grateful to members of the Executive and Council of the BCC who have themselves written communications on issues being actively pursued by the BCC. A further attempt to communicate was in the form of a small bilingual brochure which by now many of you will have received through your Society. This brochure was drafted and approved at our Fall meeting before final printing and circulation. I must apologize, however, for the errors that crept into the final version.

The BCC continues to represent its constituents and members through participation in

the Ottawa Consortium, which is proving to be a very active lobby in Ottawa. Further, as corporate members of the Association for the Advancement of Science in Canada, we are kept abreast of activities which relate to that organization.

During the coming year or so it is obvious that there will be major changes in government, and conceivably in government policy. It is a critical period therefore and one in which the BCC must continue to be active on many fronts. In particular, the Council will be developing a position paper with respect to NSERC's second five-year plan. We hope that we will see the establishment of the Advisory Committee in Life Sciences during the coming year, and that we will complete our drafting of a national policy on Canada's field stations. Further, I am hopeful that the position paper on the future of forestry research in Canada will be developed during the coming year. These activities, combined with the imminent change of government following the forthcoming election, will launch us into the twentieth year of the Biological Council of Canada, highlighted by the first Congress of Canadian Biology. I look forward to the coming year with considerable enthusiasm, and hope that as always you will join with me in the important task of bringing respectability and awareness of science to government, universities, industry and the general public. We are, as I stressed in my last report, a voluntary organization but I remain confident that the Executive and Council of the BCC will continue to do all in their power to strengthen the role of biology in Canada.

G. Robin South  
President  
April 1984

#### FOOTNOTES

- <sup>1</sup>A statement on Hiring Policy for Scientists in the Federal Government. BCC, April, 1983.  
<sup>2</sup>Discussion Paper. Public Service Intramural Research and Development: Problems and Remedies. Professional Institute of the Public Service of Canada, 1983.

#### EXECUTIVE MEMBERS 1983-1984

<i>President:</i>	Dr. G.R. South	(Memorial University)
<i>Past-President:</i>	Dr. K.G. Davey	(York University)
<i>Vice-Presidents:</i>	Dr. G.B. Wiggins	(Royal Ontario Museum)
	Dr. J.R. Nursall	(University of Alberta)
<i>Treasurer:</i>	Dr. L. Lapierre	(Université de Moncton)
<i>Secretary:</i>	Dr. M.B. Fenton	(Carleton University)
<i>Members-at-Large:</i>	Dr. J. King	(Univ. of Saskatchewan)
	Dr. D.M. Walden	(Univ. of Western Ontario)

### BCC Gold Medal Award, 1985

At its recent Spring meeting the Executive Board approved the recommendation from the BCC Gold Medal Committee, that Dr. R.H. Haynes, Professor of Biology, York University, be awarded the 1985 BCC Gold Medal. Dr. Haynes was nominated by the Canadian Council of University Biology Chairmen.

### Professional Pest Management Association of British Columbia

All those involved in management of insect, disease, weed or other pest problems will be interested in the Professional Pest Management Association of British Columbia. The Association is open to all those interested in pest management and costs just \$10.00 a year for membership, which includes a newsletter subscription. The PPMABC is dedicated to promoting professionalism in the practice of pest management in B.C., promoting scientific research and dissemination of information on pest management and contributing to any proposed legislation pertaining to pest management.

The PPMABC has taken an active role in lobbying the government of B.C. to maintain or expand forest pest management activities in the face of cutbacks. It has also taken an active interest in applicator training, education of pest management students, pesticide registration and regulation and many other issues.

The newsletter is packed with information of interest to pest managers on current pest management techniques, job opportunities, meetings, issues and items of general interest.

If you are interested in this dynamic organization, write to: Eric R. Littley, Secretary-Treasurer, PPMABC, Department of Biological Sciences, Simon Fraser University, Burnaby, B.C. V5A 1S6, for further information and applications.

## International Commission on Zoological Nomenclature

Reference: ITZN 11/4 A.N.(S.) 130

2 July, 1984

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in the *Bulletin of Zoological Nomenclature*, volume 41, part 2, on 29 June, 1984 and would welcome comments and advice on them from interested zoologists.

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

### Case No.

- 2442 *Zygaena anthyllidis* Boisduval, [1828] (Insecta, Lepidoptera): proposed conservation.
- 1456 GOERIDAE Ulmer, 1903 versus TRICHOSTOMATIDAE Rambur, 1842 (Insecta, Trichoptera) request for a ruling under Article 23d(ii).
- 2393 *Atractocera latipes* Meigen, 1804 (Insecta, Diptera, Simuliidae): proposed conservation in the common usage with rejection of the presumed holotype under the plenary powers.
- 2448 *Leucaspis* Signoret, 1869 (Insecta, Homoptera, Diaspididae): proposed conservation by the suppression of *Leucaspis* Burmeister, 1835 (Insecta, Hymenoptera, Leucospidae).
- 2333 CAECILIIDAE in Amphibia and Insecta (Psocoptera): alternative proposals to remove the homonymy.
- 2421 *Laspeyresia* Hübner, [1825], (Insecta, Lepidoptera): proposed conservation by the suppression of *Cydia* Hübner, [1825].
- 2314 *Byrrhus murinus* Fabricius, 1794 (Coleoptera, Byrrhidae): proposed conservation by the suppression of *Byrrhus undulatus* and *Byrrhus rubidus* Kugelann, 1792.
- 2456 *Rhopalocerus* W.Redtenbacher, 1842 (Coleoptera, Colydiidae): proposed conservation by the suppression of *Spartycerus* Motschulsky, 1837.
- 1748 *Capys* Hewitson (1865), (Lepidoptera, Lycaenidae), proposed conservation under the plenary powers: a restatement of the case.
- 707 *Cochliomyia* Townsend, 1915 (Diptera, Calliphoridae): proposed conservation by the suppression of *Callitroga* Brauer, 1883.

R. V. Melville (Secretary)  
c/o British Museum (Natural History)  
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## MEETING ANNOUNCEMENTS

Annual Meeting *Entomological Society of Ontario*, at the Petawawa National Forestry Institute, Chalk River, Ontario, on 13-15 September 1984.

CONTACT: Dr. W. H. Fogel, Petawawa National Forestry Institute, Canadian Forestry Service, Chalk River, Ontario K0J 1J0. Telephone (613) 589-2280.

Annual Meeting *Entomological Society of Saskatchewan*, at the Research Station, Agriculture Canada, and the University of Saskatchewan, Saskatoon, Saskatchewan, on 1-2 November 1984.

CONTACT: Dr. P. G. Mason, Research Station, Agriculture Canada, 107 Science Crescent, Saskatoon, Saskatchewan S7N 0X2. Telephone (306) 343-8214, ext. 43.

Annual Meeting *Entomological Society of Manitoba*, at the Freshwater Institute, Winnipeg, Manitoba, on 8-9 November 1984.

CONTACT: Dr. R. J. Lamb, Chairman, Program Committee, Research Station, Agriculture Canada, 195 Dafoe Road, Winnipeg, Manitoba R3T 2M9. Telephone (204) 269-2100.

*I Canadian Congress of Biology*, organized by the Biological Council of Canada, at the University of Western Ontario, London, Ontario, on 23-28 June 1985.

CONTACT: Dr. Glenn Wiggins, Department of Entomology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6.

Annual Meeting *Florida Entomological Society*, at the Sheraton Hotel, Ocho Rios, Jamaica, on 5-8 August, 1985.

CONTACT: Dr. Carl S. Barfield, Department of Entomology and Nematology, 3103 McCarty Hall, University of Florida, Gainesville, FL 32611, U.S.A. Telephone (904) 392-7089.

*International Conference on the Movement and Dispersal of Biotic Agents*, at Louisiana State University, Baton Rouge, Louisiana, U.S.A., on 17-19 October 1984.

CONTACT: Dr. D. R. MacKenzie, Conference Chairman, Department of Plant Pathology, and Crop Physiology, 302 Life Sciences Building, Louisiana State University, Baton Rouge, LA 70803, U.S.A.

*Workshop on the Care and Maintenance of Natural History Collections*, in conjunction with the Annual Meeting of the *Canadian Museums Association*, at the Royal Ontario Museum, Toronto, Ontario, on 21-22 May 1985.

CONTACT: Janet Waddington, Department of Invertebrate Palaeontology, Royal Ontario Museum, Toronto, Ontario M5S 2C6. Telephone (416) 978-3678.

Triennial Meeting *Pan American Acridological Society*, at the University of Saskatchewan, Saskatoon, Saskatchewan, on 30 July - 1 August 1985.

CONTACT: Dr. A. B. Ewen, Local Chairman, PAAS, Research Station, Agriculture Canada, 107 Science Crescent, Saskatoon, Saskatchewan S7N 0X2. Telephone (306) 343-8214.

*II International Congress on Computers in Science*, at the Washington Hilton, Washington, D.C., U.S.A., on 28 October - 1 November 1984.

CONTACT: Mr. E. Ruffing, Sherago Associates, 1515 Broadway, New York, N.Y. 10036, U.S.A. Telephone (212) 730-1050.

*III International Congress of Systematic and Evolutionary Biology*, at the University of Sussex, Brighton, England, on 4-10 July 1985.

CONTACT: Dr. B. Cox, ICSEB Congress Office, 130 Queen's Road, Brighton, Sussex BN1 3WE, U.K.

## COURSE

*Scanning Electron Microscopy and X-Ray Microanalysis: Theory and Practice*, at Lake Mohonk, New Paltz, New York, U.S.A. Materials Science on 15-19 October 1984; Biology and Medicine on 22-26 October 1984; Advanced SEM/X-Ray Microanalysis on 22-26 October 1984.

CONTACT: Dr. A. V. Patsis, Materials Research Laboratory, Coykendall Science Building, State University of New York, New Paltz, New York 12561, U.S.A.

## PERSONALIA

*Susan B. McIver* has accepted a 5-year appointment to the Chair of the Department of Environmental Biology, University of Guelph. She will take over from *John E. Laing* who has served as Acting Chairman for the past year. As well as taking over the duties of running a university department and continuing to conduct research in areas of behavioural and sensory physiology of mosquitoes and black flies, Susan will assume the Presidency of the ESC at the Annual Meeting to be held in St. Andrews this fall. We send our congratulations and best wishes.

*David Francis Hardwick* is the 1984 recipient of the Karl Jordan Medal Award. The award was presented at the Annual Meeting of the Lepidopterists' Society, held in Fairview, Alberta. Dr. Hardwick has conducted extensive studies on the taxonomy and development of the subfamily Heliiothidinae and on the taxonomy of the cutworm genus *Euxoa*. In presenting the award, the Karl Jordan Committee recognized his especially significant contribution on the corn earworm complex as a well rounded and thorough study of an extremely difficult group.

*Stanley Cameron Jay* has been chosen by the University of Manitoba, where he is also Head of the Department of Entomology, to receive its 1984 Alumni Jubilee Award. His research has included studies of the pollination of the kiwifruit and coconuts, although he is perhaps best known for his considerable research on the bee and his tireless volunteer service to beekeepers in Manitoba and Canada, a work that has earned numerous professional honors.

*Maurice J. Tauber* has been reappointed as Chairman of the Department of Entomology in the New York State College of Agriculture and Life Sciences, Cornell University, Ithaca, New York. Tauber has been a faculty member in the department since 1966. His area of expertise is in biological control and insect phenology. Currently he has a book entitled *Insect Seasonal Cycles* in press.

*Daniel T. W. Quiring* has been awarded the 1984 Eastern Branch (Entomological Society of America) J. Henry Comstock Award in recognition of his outstanding overall performance as a graduate student. Daniel recently completed his Ph.D., on intraspecific competition in the alfalfa blotch leaf miner, in the Département de Biologie, Université Laval. This is another honour for Daniel, since in 1981, when he was a M.Sc. student, he received a Post-Graduate Award from the ESC.

We congratulate these members of our Society on their outstanding achievements.

## PUBLICATIONS

### Book Review

Borkovec, A. B. and T. J. Kelly, Editors. 1984. *Insect Neurochemistry and Neurophysiology*. Plenum Press, New York and London. xiii + 523 pp. \$U.S. 69.50.

*Insect Neurochemistry and Neurophysiology* is a collection of review papers, technique papers, and brief summaries (often one or two pages) of recent research in the field. The papers were given at the Proceedings of an international conference on insect neurochemistry, held at the University of Maryland in 1983.

The range of topics in the proceedings is truly astonishing. There are 46 brief summaries of recent research in fields as diverse as insect neurohormones, peptide hormones and even one paper on "nonlinear maserlike radiation in biological systems". The brief summaries are a useful feature of the book and enable a busy reader to acquire, relatively painlessly, an update of current research topics in insect neurochemistry and neurophysiology.

The techniques papers (6 in all) are possibly the least useful. Those working in the field are already conversant with methodology, having either developed it themselves or learned it first hand from the research literature. For those not doing neurophysiological or neurochemical research, the technique papers will attract only cursory interest.

I have mixed feelings about the quality of the full review papers (9 in all) and the choice of review topics. However, the paper by H. Duve and A. Thorpe dealing with comparative aspects of insect-vertebrate neurohormones is fascinating and makes up for lack-lustre reviews by some others in the section.

Overall, *Insect Neurochemistry and Neurophysiology* has much to offer to general biologist and specialist alike.

Robert P. Bodnaryk  
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Research Station  
Winnipeg, Manitoba

### Book Notices

Dubitskii, A. M. Editor. 1983. *Natural Population Regulatory Factors Affecting Biting Flies in S.E. Kazakhstan*, U.S.S.R. Amerind Publishing Co. Pvt. Ltd., New Delhi.

This book is a translation from Russian of an earlier publication by the same editor (1973). M. Laird, who until very recently was Director of the Research Unit on Vector Pathology, Memorial University of Newfoundland, wrote the preface to the English version and contributed numerous editorial comments throughout the book.

The book is a collection of 17 papers, by numerous Russian scientists, including the editor. There are 8 papers on pathogens of mosquito larvae: Mosquito Irridescent Virus, Coelomomyces, Spirochaetes, Microsporidia, Mermithids and one paper on the thermostable exotoxin of *Bacillus thuringiensis*. The authors of the various papers describe infections in Culicidae, Ceratopogonidae, Tabanidae and Simuliidae, all of S.E. Kazakhstan. There are two papers on insect predators (dragonflies, wasps, backswimmers, water-scorpions, and the water-creeper *Naucoris cimicoides*), two papers on larvivoracious fish, and one on birds and bats as predators of biting flies.

Papers 15 and 16 at first appear to be anomalies, since they are on organophorous insecticides and their use in biting fly control. However, it seems the editor intended to include a chapter (paper 17) on integrated control measures, and needed to illustrate some advantages and disadvantages of chemical control.

Since the book was written in 1973, it suffers from being somewhat out of date. Also the papers deal with natural control of biting flies in S.E. Kazakhstan, and are not reviews of what is known on the topic worldwide. However, researchers in the natural control of biting flies in

the western world will find some interesting accounts of parasitism and predation in biting flies that have not been reported elsewhere.

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Laird, M., Editor. 1981. *Biocontrol of Medical and Veterinary Pests*. Praeger Publishers, New York. xx + 235 pp. \$U.S. 39.95.

This volume is based on Symposium 11S-1 of the Sixteenth International Congress of Entomology (Kyoto, Japan, 3-9 August 1980). It consists of 9 chapters, contributed by different authors, detailing a variety of topics related to the biological control of medical and veterinary pests.

The volume is introduced by a chapter which describes the role of biocontrol agents in relation to an integrated approach to pest management. It continues with a review of a wide variety of organisms in regard to their potential use in controlling arthropod-borne diseases, assessing the control agents in terms of their efficacy, environmental impact, specificity, and stability, as well as their availability. A number of chapters then provide a detailed account of a specific biocontrol effort, drawing examples from around the world. These examples have been targeted mainly towards mosquitoes and include special reference to poeciliid fish, as well as *Culicinomyces* and *Lagenidium giganteum* fungi. One chapter deals exclusively with the natural occurrence of pathogens of blackfly larvae in Guatemala. Ecological considerations in biocontrol strategies are expressed several times throughout the volume and are dealt with at length in chapters by M. Mogi and M. W. Service. Here the fundamental idea of the need for a broad biological awareness is brought to light. The final chapter highlights the recent history of the biological control of biting flies. It details the many obstacles to be overcome, but is optimistic of the future, citing, as an example, the recent discovery of *B.t.i.*

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Resh, V.H. and D.M. Rosenberg, Editors, March 1984. *The Ecology of Aquatic Insects*. Praeger Special Studies; Praeger Scientific, New York. x + 625 pp. Hard cover \$U.S. 35.00.

Although the book is a collection of nineteen chapters by twenty-four authors, it offers much more than other books with similar format. The editors have selected the chapter subjects carefully, involved authorities in their fields to write the chapters, and then organized the entire effort to provide a substantially coherent and logically organized volume.

The book can basically be subdivided into three component areas. The first ten chapters deal with the aquatic insects and their roles in aquatic habitats: Introduction—V. H. Resh and D. M. Rosenberg; Relationships between the taxonomy and ecology of aquatic insects—H. B. N. Hynes; Life histories of aquatic insects—M. G. Butler; Factors influencing life history patterns of aquatic insects—B. W. Sweeney; Behavioral adaptations of aquatic insects—M. J. Wiley and S. L. Kohler; Role of aquatic insects in the processing and cycling of nutrients—R. W. Merritt, K. W. Cummins and T. M. Burton; Aquatic insects as primary consumers—G. A. Lamberti and J. W. Moore; Predator-prey interactions among aquatic insects—B. C. Peckarsky; Fish predation on aquatic insects—M. Healey; Secondary production of aquatic insects—A. C. Benke.

The next five chapters deal with the interactions of aquatic insects with their physical environment: Hydrologic determinants of aquatic insect habitats—R. W. Newbury; Aquatic insect-substratum relationships—G. W. Minshall; Colonization dynamics of aquatic insects—A. L. Sheldon; The hyporheic zone as a habitat for aquatic insects and associated arthropods—D. D. Williams; Insects of extremely small and extremely large aquatic habitats—D. R. Barton and S. M. Smith.

The final four chapters can be considered simply as applied aquatic entomology: Hypothesis testing in ecological studies of aquatic insects—J. D. Allen; Responses of aquatic insects to environmental pollution—T. Wiederholm; Ecological perspectives in the management of aquatic insect habitat—J. V. Ward; Aquatic insects and mankind—H. B. N. Hynes.

The book itself is handsomely bound, has been printed in an easily readable format and contains complete author, taxonomic and subject indices. The scattered typographical errors and omissions do not distract seriously from the content.

This book will undoubtedly become a standard source of reference for researchers in aquatic ecology and essential reading for students of aquatic entomology.

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## New Books and Publications

- Advances in Applied Biology*. Volume 8. T. H. Coaker, Ed. Academic Press, New York, 1983. 240 pp. \$U.S. 49.50.
- Advances in Insect Physiology*. Volume 17. M. J. Berridge, J. E. Treherne and V. B. Wigglesworth, Eds. Academic Press, New York, 1983. 328 pp. \$U.S. 50.00.
- Agricultural Chemicals Book I*. (1982-83 Revision). Insecticides, Acaricides, and Ovicides. W. T. Thomson. Thomson Publications, Fresno, California, 1983. \$U.S. 13.50.
- Agricultural Chemicals Book III*. (1983-84 Revision). Fumigants, Growth Regulators, Repellents, Rodenticides. W. T. Thomson. Thomson Publications, Fresno, California, 1984. \$U.S. 13.50.
- The Anophelines of India*. Rao, T. R. Malaria Research Centre, Delhi, India, 1984. xvi + 518 pp. \$U.S. 45.00.
- The Ceratophyllidae*. Key to the Genera and Host Relationships. The Rothschild Collection of Fleas, with Notes on Their Evolution, Zoogeography and Medical Importance. R. Traub, M. Rothschild and J. Haddow. Academic Press, London (distributor), 1983. 304 pp. \$U.S. 93.00.
- Ecology and Evolutionary Biology: A Round Table on Research*. G. W. Salt, Ed. University of Chicago Press, Chicago, Illinois, 1984. \$U.S. 7.95.
- The Eriophyid Mites of Alfred Nalepa*. Thomas Say Foundation, Volume 9. R. A. Newkirk. Entomological Society of America, Hyattsville, Maryland, 1984. 138 pp. \$U.S. 20.00 (\$U.S. 12.00 for ESA members).
- Exotic Plant Pests and North American Agriculture*. C. L. Wilson and C. L. Graham, Eds. Academic Press, New York, 1983. 528 pp. \$U.S. 59.00.
- Functional Neuroanatomy*. N. J. Strausfeld, Ed. Springer-Verlag, New York, 1984. 500 pp. \$U.S. 78.00.
- Measurement of Ion Transport and Metabolic Rate in Insects*. T. J. Bradley and T. A. Miller, Eds. Springer-Verlag, New York, 1983. 288 pp. \$U.S. 39.00.
- Photoreception and Vision in Invertebrates*. Ali, M. A., Ed. Plenum, New York, 1984. x + 858 pp. \$U.S. 115.00.
- Pollination Biology*. L. Real, Ed. Academic Press, New York, 1983. 368 pp. \$U.S. 49.00 cloth, \$U.S. 19.50 paperback.
- Techniques in Pheromone Research*. H. E. Hummel and T. A. Miller, Eds. Springer-Verlag, New York, 1984. 424 pp. \$U.S. 59.00.



## Update on Publications

The following ESC Memoirs are now available:

No. 127: *A Catalogue of the Eggs of Some Canadian Noctuidae (Lepidoptera)*. E. H. Salkeld. 1984. 167 pp. \$12.50 (ESC members \$9.00).

No. 128: *The Systematics and Phylogeny of the Stenochironomus Complex (Xestochironomus, Harrisius, and Stenochironomus) (Diptera: Chironomidae)*. Borkent. 1984. 269 pp. \$18.75 (ESC members \$13.50).

The *Butterflies of Europe* will be published in eight volumes, each with approximately 450 pages. The volumes will be published at intervals of 18 months to 2 years, with the first one due in 1984; they are Volume 1: Concise Bibliography, Volume 2: Introduction to Lepidopterology, Volume 3: Papilionidae, Pieridae, Volume 4: Lycaenidae, Riodinidae, Volume 5: Satyridae, Volume 6: Nymphalidae, Libytheidae, Dandidae, Volume 7: Ecology of European Butterflies, Volume 8: Aspects of Conservation of Butterflies in Europe.

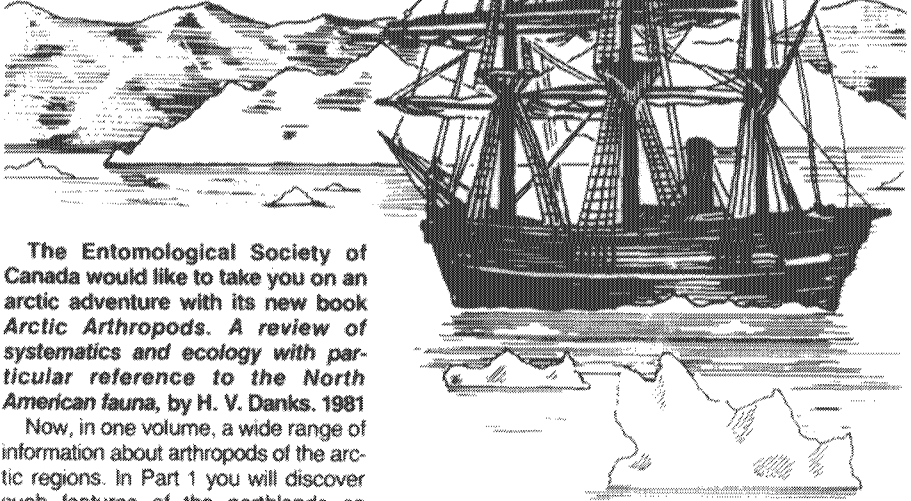
Further information may be obtained from AULA-Verlag GmbH, P.O. Box 1366, D-6200 Wiesbaden, W. Germany.

The *International Quarterly of Entomology* is to be published in Istanbul by Ömer Erkin Publishers from January 1985. The journal is devoted to the natural history of insects and other arthropods. Original research papers and reviews of specialized topics written in English, French or German are being considered for publication.

Information concerning manuscripts may be obtained from Tahsin Yazicioglu, P.O. Box 74 Ege University, Izmir, Turkey.

Annual dues (including postage and handling) in Europe and Middle East are \$U.S. 67.00 or equivalent, elsewhere \$U.S. 70.00, and are to be submitted to Ömer Erkin, PK 1318, Istanbul, Turkey.

# Let us take you on an arctic adventure



The Entomological Society of Canada would like to take you on an arctic adventure with its new book *Arctic Arthropods. A review of systematics and ecology with particular reference to the North American fauna*, by H. V. Danks. 1981

Now, in one volume, a wide range of information about arthropods of the arctic regions. In Part 1 you will discover such features of the northlands as physiography, climates, soils and plants and animals. Part 2 begins with a history of the exploration of the arthropod fauna and continues with a detailed study of the composition, distribution and ecology. In Part 3 the author lists over 2000 reported species of terrestrial arthropods from arctic North America with notes on their distribution.

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Annual Review of Entomology ..	29 January 1985	\$31.00 (Canadian)*
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Send your order and remittance to the Entomological Society of Canada, 1320 Carling Avenue, Ottawa, Ontario, Canada K1Z 7K9. In order to reduce the workload, we would appreciate having your orders 4-6 weeks before the publication date (see above). Individual copies of back issues may be ordered anytime. The book(s) will be sent postpaid from the California office of Annual Reviews.

If you are interested in purchasing the Annual Reviews, you can help your Society by ordering them through us.

Additional information is available on request.

\*Price may fluctuate depending on exchange rate.

## RECENT DEATHS

*Boch, Rudolph (Rolf)*, Ottawa, Ontario. On 13 June 1984, aged 55. Apiculturist at Ottawa Research Station specializing on effects of specific odours on bee behaviour.

*Manson, George F.*, Kingston, Ontario. On 23 June 1984, aged 83. Born in Eden, Manitoba. Former Director Chatham, Ontario Laboratory. Honorary Member ESC, former member ESO.

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**Bulletin Deadline**

The deadline for the next issue, vol. 16, no. 4, for December 1984 is 1 November.

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